The moments of, and movements for national accounts: contextualising changes to British national accounting during the 1930s to 1950s

Matthew Philip James Fright

Queens' College

June 2020

This thesis is submitted for the degree of Doctor of Philosophy

Declaration

This thesis is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared in the Preface and specified in the text. It is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree or diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. I further state that no substantial part of my thesis has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. It does not exceed the prescribed word limit for the relevant Degree Committee.

The moments of, and movements for national accounts: contextualising changes to British national accounting during the 1930s to 1950s

Matthew Philip James Fright

Abstract

Despite a renewed interest in the origins of national income accounting, and increasing scholarship on the relationship this has to the State, there is further scope for us to better understand the context of how this came about. We do not fully understand how institutional factors shaped them or what the numbers themselves meant to the researchers.

This thesis adopts a historical approach informed by the works of Geoffrey Hodgson and Quentin Skinner to better understand a critical juncture in national accounts transformation – the 1941 publication of White Paper Command Paper 6261 *An analysis of War Finance and an Estimate of National Income and Expenditure* – and how it was influenced by wider intellectual and institutional changes from the 1930s.

The thesis is organised in two parts. In the first part, the *Moments of National Accounts*, Chapter 3 argues that 1930s economics drew on heroic figures from the distant past to justify new approaches to economics. Chapter 4 zooms out to consider the influence of international bodies such as the League of Nations and the Rockefeller Foundation during the 1930s upon a new data-driven, "realistic" approach to economics. Chapter 5 looks at how wider pressures for new wartime finance approaches justified new technocratic approaches which led to the publication of the first official national accounts.

The second part, the *Movements for National Accounts,* examines the institutionalisation of this new technocratic national accounting approach through two case studies. Chapter 5 considers the way Keynes and Stone founded the Department of Applied Economics in Cambridge as a research centre for furthering a "realistic" research agenda. Chapter 6 examines a confluence of interests between the Colonial Office's desire to export national accounts public finance, the researchers of the DAE and the colonial government of Nigeria led to the publication of the National Accounts of Nigeria in 1951.

The contribution of the thesis is twofold: 1) showing how context matters to the idea of National Accounts culminating in the 1941 publication; and 2) showing why and how ideas became institutionalised after World War II. By unpacking both, this thesis shows how different bases of

thought, rationale and contextual factors informed what National Accounts became in the UK, importantly, in ways that differ from thinking about National Accounts today.

Acknowledgements and dedication

In the process of preparing this document there are many people to whom I owe deep and sincere thanks. Whilst the flaws of this document remain my own, the submitted document wouldn't have been possible without the guidance, help and support from the people below.

I sincerely thank Dr Mark Pigott for the award of a scholarship that supported the first three years of my research. Particular thanks are merited to Queens' College for the Munro Studentship which alongside support from the Cambridge Political Economy Trust financed my final year of study. Thanks also go to Queens' for its continued assistance towards conference presentations and archival travel in addition to providing a warm and friendly environment for my time in Cambridge. Further thanks for financial support go to the Centre of Development Studies for its contributions towards fieldwork costs.

Significant intellectual thanks are owed to the many people that have provided considerable assistance throughout the writing process. Firstly, to my supervisor Dr Shailaja Fennell, someone with an encyclopaedic knowledge of a range of topics, who, after introducing me this subject, inspired me to think big and challenged me to refine my analytical style. I would not have applied were it not for her and would not have been able to do this research otherwise; Shailaja has now, and always, my deepest heartfelt thanks. Joint second goes to my friend and colleague Dr Henry Midgely and to Dr Peter Sloman for their encouragement, guidance and support. Henry regularly discussed my work with me and asked me to look further in my research. Peter, out of the generosity of his time, has reviewed chapters and provided important insights into wider literatures. Fourth to Professor Geoff Harcourt who reviewed and provided valuable ideas on the strengths and weaknesses of early thinking. Fifth to Dr Gay Meeks who has always inspired me to follow thoughts through to their logical conclusions. Sixth to Professor Martin Daunton for reading and discussing chapter five with me.

Equally sincere intellectual thanks go to the many talented friends who have reviewed chapter drafts: Drs Shachi Amdekar, Lou Cantwell, Steph Diepeveen, Or Rosenboim and Victoria Stewart-Jolly, you've all provided really valuable insights on how to improve the draft and throughout had my back. Many, many thanks.

Other intellectual thanks should be noted for the many academics who have provided input to earlier stages of the research: Raymond Atherton, David Clark, Michael Kuzcynski, Peter Nolan and Richard Sidebottom in the Centre of Development Studies all provided significant inspiration for many lines of enquiry. I am also grateful for the insightful conversations, feedback and comments from Gareth Austin, Diane Coyle, John Eatwell, Edo Gallo, Jane Humphries, Duncan Kelly, Murray

Millgate, Mary Morgan, Rhyll Nolan, Tinashe Nyamunda, Constantinos Repapis, Sharlene Swartz, and Adam Tooze.

My biggest thanks go to my family, for letting me move back home and for all your support while drafting the thesis, often under quite pressing circumstances. From the early stages reviewing scrappy drafts of my writing and for patiently enduring my many gripes about trivia and general life, for all the loving care and support you've shown particularly in the past 12 months, and, for you just being you, I'm extremely lucky. Most of all thank you for the distractions from work: sitting reading books to you on my knee, blowing bubbles and encouraging me to be brave while going on bear hunts, not just with the childish older members, but particularly with Sandy and Ebelle.

Personal thanks go to the many friends who have been a bedrock of support through hard times. Firstly to my former housemates Alison Bumke, Amy Gilligan, David Neave, Agnes Upshall, Olga Zeveleva, Manu Signer, Charlie Cadby, Arseniy Khitrov and Taras Ferdiko who have always been a constant source of good humour and even better food. It is true to say I would not have been able to submit this without you all. Secondly, there has been a wealth of other friends who have supported throughout challenging times from friends at Queens' (Alex, Eduardo, Sandra, Loughlin, Jack, Rao, Jenny, Simon, Diane), from the Department of Politics and International Studies (Maha, Katie, Sophie, Annette and her parents) and Paulina. Thirdly, to the many many inspirational people in the Centre of Development Studies in my intake in particular Albert, Mihiri, Chris, Noura, Christine, Nungari and Arief, as well as students from the other PhD cohorts – Ivanka, Sophie, Jolly, Jane, Shakti, Jas, Joao, Lorena, Halima, Rekha, Sharmeen and the Family Fennell Reading Group. Fourthly, I am also indebted to many London-based friends that helped to support me while juggling a job and working long hours on the thesis – John, John, Marili, Kaye, Marc, Ailbhe, Stefan, Alex, Tim, Areti, Luke, Jenny, you all, and many others, have helped me across this line. Penultimate thanks go to Andrew for relaying advice and for his support. Thank you all. I leave the last thanking of friends to Anand Shrivastava who back in 2011, on the Diploma in Economics, recommended I look at the MPhil at the Centre of Development Studies.

Final thanks are noted for the many members of government and academia for their time during interviews conducted in the early stages of the thesis and, to Caroline Stone, for her kindness in letting me access the resources of her father. Thanks are also owed to the many members of library and archival staff who have helped me purchase books and access the materials needed for this work – particular thanks should be emphasised for the staff of the Marshall Library, African Studies Library Cambridge, Cambridge University Library, Fryer Library, Rockefeller Archive Centre, The Loveday Archive, The Nuffield College Archives, the Bodleian library and the British Library, all of

whom went particularly above and beyond the call of duty. I also want to pass thanks to the support from the Administrators at the Centre of Development Studies (formerly Diana Kazemi, Doreen Woolfrey, Nathalie Henry, Emma Cantu and Élise Lapaire, now, to Annabel Sherwood) and to Mark Rogers in the Mond Building for always reminding me to backup.

This thesis is dedicated to my friend Giulio Regeni. I miss our discussions over the nature of the developmental state, the thesis would've been better had we been able to have more of them.
The world will always be brighter for the memories of the ideas, energy and humour you kindled in it.

Table of Contents

Table of Figures

Abbreviations and Glossary

CERC	Colonial Economic Research Committee (Colonial Office)
CSO	Central Statistical Office (UK)
DAE	Department of Applied Economics (Cambridge)
EDSAC	Electronic Delay Storage Automatic Calculator
EFS	Economic and Financial Section (of the League of Nations)
ENIAC	Electronic Numerical Integrator and Computer
GDP	Gross Domestic Product
HMT	His Majesty's Treasury
IARIW	International Association of Income and Wealth
IFK	Instiüt für Konjunkturforschung (Trade cycle research institute)
LCES	London and Cambridge Economic Service
LoN	League of Nations
LSE	London School of Economics
LSRM	Laura Spelman Rockefeller Memorial
MIT	Massachusetts Institute of Technology
NIAP	National Income Advisory Panel (Colonial Office)
NIESR	National Institute of Social and Economic Research (UK)
NBER	National Bureau of Economic Research (USA)
OECD	Organisation for Economic Co-operation and Development
OEEC	Organisation for European Economic Co-operation
SAM	Social Accounting Matrix (or Matrices)
SNA	The UN System of National Accounts
UN	United Nations

Chapter 1: Introduction and literature review

1.1. Introduction

In 1944 Phyllis Deane, an economics researcher who had moved from Glasgow to London, was headed into work. Having previously been taught by Alex Cairncross a lecturer 'fresh with Keynes in his hand' for approximately the past three years she had been working as a researcher on a project overseen by James Meade, Richard Stone, Arthur Lewis and Austin Robinson. Perhaps it was this interaction with some of the brightest empirical minds England had to offer (three of whom went on to get Nobel prizes) which kept her in London in spite of the danger of the Blitz, rather than joining other evacuated National Institute staff in Cambridge. But upon arriving at work one Monday in July 1944 police would not let her towards the site. There had been a direct hit to the building, instead she would have to work elsewhere.[1]

But what was it about the nature of her enquiry that drove her into work in spite of the real risks to her life? Deane had been commissioned to research whether the newly developed wartime "national accounts" could be used in a colonial setting. The purpose of the research was not to estimate "economic growth", nor "Gross Domestic Product." Instead, the purpose of her research was to synthesise a range of data sources into a set of colonial social accounts for the then Northern Rhodesia (now part of Zambia) and Nyasaland (now Malawi). But why did a set of national accounts matter and, ultimately, why would you risk your life to estimate a set of accounts?

In contrast the early twenty-first century has seen an emphasis on one output from the national accounts – Gross Domestic Product (GDP) – a headline figure which captures the total value of goods and services in an economy. Much thought has gone into documenting the emergence of the concept of GDP and the importance this plays in twenty-first century policy-thinking. Yet a history of GDP focuses only on one aspect of the national accounts to the exclusion of others. Such enquiries rarely stop to ask about the prior purposes of a more holistic measurement tool and whether GDP and national income, abstracted from their context, mean the same thing today as they did then. Instead the thesis argues that national accounts were part of a broader shift in economics which sought to use economic statistics to inform government decision making. This is therefore not a thesis on the history of growth, but a history that emphasises the contextual environment in which national accounting emerged, and how this shaped the purpose of national income accounting. The

[1] Phyllis Deane: oral history by Nigely Harte, 19 September 2002.

thesis seeks to address the question: what did national income accounts mean to the researchers of 1930s-1950s Britain?

In answering this question the thesis splits in two parts. The first part of the thesis considers how the national accounts came to be measured in an accounting framework by considering the changes in economic thinking, the changes in institutional support and the changes to government which led to the British government publishing a data series on national income accounts. The second part of the thesis examines how in the postwar period national income accounting evolved in new academic and colonial contexts. The accounting measures from this time particularly matter because of the significant role they played in early "developmental" state planning.

1.2. Literature review

The thesis examines a moment of change in national income accounting from the 1930s by considering the meaning that the participants of this change attributed to national income accounts. Understanding this change is however a complex task in light of the volumes of literature which have emerged in recent years considering the origins of GDP. This literature, and historical accounts which focus on the roots of national income have typically downplayed the significance of the accounting contribution to the origins of national income accounting.

The literature review opens by examining features from the national income literature, in particular the commonly recognised critical juncture of the 1930s. In addition, the review considers discussions in the history of national income literature which argue that the concept of national income has normative implications. Afterwards, the review outlines the arguments within the literature on the history of national income that suggest British national income thinking was relatively significant compared with other schools of national income thought during the 1930s. But the national income literature often overlooks the importance of the 1930s as a moment of *accounting* change. A case for a history of national income accounting is put forth based on the works of Tily and Suzuki who argue that national income for the 1930s was more than just a headline figure, instead the transformation of national income into an accounting process is highly significant. As these authors show, the national income accounts could now inform government economic planning as estimates of Keynesian macroeconomic variables. This point is supported through a brief examination of the 1950s UN system of National Accounts and the works of Phyllis Deane which show that national income accounts mattered during this period because they were an accounting approach which could inform government intervention. Despite the importance of the new accounting approach to

researchers during this time, this element of national income accounting remains a relatively under-discussed topic.

Unlike authors like Studenski and Mitra-Kahn who trace a history of national income calculations back over a long time period, the task for a thesis seeking to better understand the contextual meaning of national income accounting differs. Instead a wider examination is required of political and economic changes underway during the 1930s-1950s and the broader colonial political economy context in which this occurred. Section 1.2.2. elaborates on this further, in particular, the intellectual challenge of explaining a change in a measurement approach alongside the other interlinked changes in the economy and changes in government which characterised the 1930s-1950s. The works of Tooze are instructive in overcoming this challenge as they look at a similar subject in a German context. In contrast to Tooze this thesis does not however adopt a Foucauldian framing because it aims to understand the meaning attributed to national accounts during the 1930s-1950s. The literature review then provides an overview of the political and economic context in Britain in which national accounts changed during wartime. The literature review finishes by outlining the emergence of government interventionism in colonial settings in particular in post-war settings.

1.2.1. National income histories and the case for a national income accounting history

The terms we use in our historical analysis are important for defining which historical events are considered relevant to our enquiry. To that end it is useful to make a distinction between three interrelated terms*:* 1. *Gross Domestic Product (GDP)*, which is a measure of 2. *National Income* which can be computed with the assistance of 3. *the National Accounts*. GDP – an estimate of the total goods and services produced within a geographic territory – is often used to generate estimates of growth and yet this is not the purpose that national accounts were generated for (Tily, 2015).[2] Despite this, recent years have seen multiple publications on the emergence of GDP and national income (Coyle, 2015; Fioramonti, 2013; Hirschman, 2016; Lepenies, 2016; Masood, 2016; Philipsen, 2015). This new literature has often failed to give due attention to the significance of the accounting aspect of national income accounting; the national accounts themselves are an interlocking double-entry system which provides rich data on transactions between sectors of the economy. For example, few historians have considered whether the volumes of data in the many rows and columns of the national accounts – containing rich data on mining, agriculture, food production and many other variables – served any other purpose than to generate a national income calculation. Yet

[2] The thesis discusses "national income" in some chapters. Prior to 1941 many of the national income enquiries were estimates of Gross National Product. This differs from GDP by including net income receipts from abroad.

by solely focusing on national income definitions and how they varied over time, the new "history of national income" literature has only used the notion of "national accounts," as a means for calculating national income estimates (Tily, 2015). Whilst the thesis focuses on the meaning ascribed to national income *accounting*, both the old and the new "history of national income" literature can shed some light onto the origins of national income accounting.

National income histories: the 1930s to 1950s as a critical juncture in national income thinking

The *Income of Nations* (Studenski, 1958) is both authoritative and important in framing in the history of national income. Studenski, in two volumes, considered the methodology of national income and the history of national income. The history of national income volume is a widely referenced text amongst new authors (Coyle, 2015; Mitra-Kahn, 2011) and it documents the many researchers that have undertaken national income enquiries over a 300-year timespan. In this sweeping historical review Studenski highlights in particular the exponential changes to national income enquiries which had occurred in the recent past. Studenski argues these changes occurred due to a range of factors: national income figures had become more useful for economic analysis, theoretical advances had occurred, new statistical series had emerged, the UN had patronised the figures, it was possible to use them on a comparative basis, they had become more useful to economics, and, they were informing newspapers and journals (Studenski, 1958, pp. 3–4). Studenski's framing suggests that the period immediately prior to the 1950s had seen a remarkable change in national income during the 1930s to 1950s. Yet Studenski doesn't provide a detailed account as to why this occurred. Whilst in his final chapter he outlines eleven factors which contributed to changes in national income over his 300-year study, he does not specifically identify which factors impacted the 1930s – 1950s (though several are recognisable as having impacted this time such as: the influence of individual scholars, the advance of economic theory, development of governmental fiscal and economic planning, reform to improvements in statistical data and methods) (Studenski, 1958, pp. 158–160).[3] Because of the huge breadth of Studenski's study we gain relatively little insight into the contextual factors shaping the vibrant 1930s-1950s period he highlights.

By virtue of the date of publication however, Studenski only discusses national income up to the 1950s. This has led many other scholars to attempt to fill the historical account of the time period afterwards and reappraise the 1930-1950 period. Some of this literature is targeted to a public policy

[3] The others are: agitation for fiscal reform, rapid technological changes in the economy, class and group interest conflict, international commercial and political rivalries, introduction of the income tax, the influence of international organisation (post World War II).

audience,[4] and others to a more academic audience.[5] Echoing Studenski, several of these newer scholars highlight the importance of the 1930s as a critical juncture in national income accounting measurement. Coyle (2015, pp. 11–12) identifies both the aftermath of the Great Depression during the 1930s and World War II as the "birth of modern national accounts." Similarly, for Schmelzer (2016, p. 75) the response to the Great Depression and World War II feature as important episodes in the development of a new attitude towards economics.

The argument for the 1930s as a turning point in estimating national income also gains support from Timothy Mitchell. Writing from a political theory perspective Mitchell (2005, p. 298, 1998) argues that economists in the 1930s "invented" the notion of the national economy. It was a newly defined need to evaluate the economy on a national level in this period that led to new national economic measures and the emergence of the macroeconomy. This argument is supported by Schmelzer who argues there was a common impetus to see the national circulation of money around the economy that drove changes to macroeconomic measurement in the 1930s (Schmelzer, 2016, p. 75). This argument that the "economy" was, in a sense, discovered during the 1930s, contrasts with the account suggested by Mitra-Kahn (2011) who, like Studenski, undertakes a long-view approach to the emergence of national income. For Mitra-Kahn the notion of the "economy" dates back to the 1620s and the works of a parliamentary adviser called Edward Misselden who argued that the economy of the nation was separate from the resources of the crown (Mitra-Kahn, 2011, chap. 2). Whilst approaching the discussion from a different perspective Mitra-Kahn does agree that a different type of economic estimation occurred during the 1930s. Indeed, common to several authors who argue that the notion of the economy dates back to the seventeenth century, is the argument that the 1930s matter for national income estimation (Coyle, 2015; Lepenies, 2016; Mitra-Kahn, 2011, chap. 1; Schmelzer, 2016, p. 88). Few, if any however, have pursued detailed enquiries to understand how national income accounting was shaped by the wider context of the historical and institutional circumstances in which the national accounts emerged.

National income histories: defining "the economy" by estimating national income and the normative critique

Historical accounts on the emergence of national income also provide useful insights into the classification approach adopted by different 1930s scholars as they estimated the economy. This discussion over the boundary between observation and exclusion from measurements is termed the

[4] For example: Masood (2016), Lepenies (2016), Fioramonti (2013) and Pilling (2018).
[5] For example: Coyle (2015), Philipsen (2015), Schmelzer (2016), Danby (2017), Mitra-Kahn (2011) and Morgan (2011, 2008).

"production boundary" (Coyle, 2015, pp. 38–9; Danby, 2017, pp. 32, 82; Schmelzer, 2016, p. 99). For many newer national income historians, this measurement threshold, by excluding some activity and focusing on monetary flows, has important normative implications.[6] The default position of much of the new literature is to comment that national income is not a measure of welfare before highlighting which aspects of economic life are excluded from the measure typically in relation to domestic labour and the environment. Driven by the decision to focus on the monetised economy, household domestic labour is not counted in national income estimates (Danby, 2017; Mitra-Kahn, 2011; Schmelzer, 2016, p. 99). This exclusion disproportionately impacts women's labour which makes up the bulk of non-market-based labour (Ogle, 2010, chap. 1; Schmelzer, 2016; Waring, 1989).[7]

Similarly, the emphasis on monetary transactions, leads to an underestimation of the value of environmental assets leading to sustainability critiques. The importance of the normative consequences of this measure has been a dominating concern in the literature particularly for a range of national income historians (Danby, 2017; Lepenies, 2016; Masood, 2016). This concern has led to national income historians such as Schmelzer (2016, p. 97) commenting on the origins of these critiques observing that these normative criticisms are as old as the national income accounts measures themselves. Other researchers such as Danby (2017) and Mitra-Kahn (2011) have sought to explain the origins of the distinction between the "household" and the "economy" as far back as Adam Smith before tracing this thinking through to Alfred Marshall in the late nineteenth century. Whilst these types of enquiries help to explain aspects of the intellectual lineage of national income, and often emphasise some of the British thinkers that contributed to national income development, they are not fully comprehensive meaning we don't have a fully rounded picture on why the 1930-1950s mattered for national income development.

National income histories: British contributions to national income development

Several historical narratives discuss in detail a British lineage in the development of new national income estimation approaches. For example, by the twentieth century, Arthur Bowley, a student of Marshall, carried out estimates of national income alongside other researchers such as Stamp and Flux (Danby, 2017; Mitra-Kahn, 2011; Tily, 2009). Relatively few estimates followed the work of these early twentieth century researchers until Colin Clark developed new estimates in 1932. These figures and the estimates that followed are argued to be important because they provided the starting point for Keynes's estimates, which, in turn provided the national income definition used for

[6] For example: Masood (2016), Lepenies (2016), Fioramonti (2013) and Pilling (2018).
[7] For efforts to estimate the domestic goods and services see the works of Ironmonger (2012, 1996).

the first public official national accounts in Britain. This estimate was published alongside the 1941 wartime budget in the White Paper Cmd 6261 *An analysis of the sources of war finance and national income in 1938 and 1940*. What is missing from some historical accounts is the importance of the interactions between Clark and Keynes. Clark's initial national income estimates had been influenced by Keynes's *Treatise on Money* and had structured his national income estimates within an early Keynesian framework (Tily, 2009, pp. 343–8).

The contributions of Clark and Keynes to national income thinking occurred during what Studenski (1958, p. 149) termed the "extraordinary flourishing" of national income research around the world during the 1930s. In addition, several approaches to macroeconomic measurements emerged that were separate from American efforts to measure national income, and efforts in the USSR to estimate the Material Product Balances in the economy (Studenski, 1958; Yanovsky, 1965). Recent contributions by several scholars (Aukrust, 1994; Lie, 2007) have drawn attention to the Scandinavian schools of national accounting and how this came to shape later releases of the UN System of National Accounts (SNA). For example, several authors note that during this time Ragnar Frisch's Ecocirc model emerged as a way to monitor economic and financial flows (Aukrust et al., 1949; Bjerkholt and Knell, 2005; Bjerve, 1996; Eriksen et al., 2007). Similarly, authors have highlighted the efforts of Tinbergen in Holland in developing models which could inform macro-scale decision-making (Bos, 2006; den Bakker, 1994). The emergence of a simultaneous need to measure economies however poses deeper questions of how precisely these events could emerge at the same moment in time. One explanation suggested in Chapter 4 is the efforts of international bodies such as the League of Nations and the Rockefeller Foundation in encouraging "realistic" macroeconomic measurements.

Whilst the national income literature is clear that British national income contributions were one among many, there are differing views in the literature on the level of influence that British national income thinking had upon efforts to standardise national income definitions between countries. One school of thinking suggests it was an American enterprise. A flourishing school into national income estimation had been founded in the USA under Wesley Mitchell and continued under Simon Kuznets which emphasised using national income to measure welfare (Carson, 1975; Danby, 2017, pp. 70–2; Fogel et al., 2013; Hirschman, 2016). Carson (1975, pp. 154–6) notes this school of national income research had been underway since the early 1920s and came to influence the American government with official publications emerging from the US Department of Commerce from 1932.

The American approach to national income measurement did not, however, endure (Coyle, 2015, p. 12; Mitra-Kahn, 2011, chap. 9). Instead, through a process of Anglo-American meetings and

interaction between figures such as Keynes and Milton Gilbert[8] (Danby, 2017, pp. 70–2; Mitra-Kahn, 2011, chap. 9; Schmelzer, 2016, pp. 102–107), the British national income approach, which linked national income to a broader national accounting framework, prevailed. As Morgan (2011) and Speich (2008) argue this British national income approach travelled across many different countries. This was achieved through Anglo-American forums in the 1940s to 1950s which sought to generate a more uniform approach to national income measurement internationally, and gained support from new global governance institutions such as the Organisation for European Economic Cooperation (OEEC) (Danby, 2017, p. 70; Schmelzer, 2016) and bodies such as the UN adopting national income measurement (Coyle, 2015; Danby, 2017; Schmelzer, 2016).

National income histories: the Mitra-Kahn (2011) framing of the emergence of the 1941 White Paper as a change in income definition

Common to several of the more recent national income historians who advance the case for the importance of British thinking is a reliance on the thesis of Mitra-Kahn (2011). Mitra-Kahn argues that the changes to national income during the 1930s into the 1940s were attributable to Keynes, that through his advocacy the government was convinced to measure and publish regular national income series (Mitra-Kahn, 2011, chap. 8). Having convinced the UK government, the measurement proposed by Keynes then took over the world by being carried forward by Richard Stone, Keynes's successor, at the UN Committee on Statistics. Whilst the point about transmission is widely acknowledged by the wider literature (Coyle, 2015, p. 18; Schmelzer, 2016), Mitra-Kahn's contribution is sustained through detailed analysis documenting the transmission of Keynes's definition of national income from publishing *How to Pay for the War* through to the publication of the White Paper on national income and war finance in 1941. In this sense the British contribution to international national income development follows Keynes's framing of the concepts and measures.

The contribution of Keynes to the development of national income thinking is undeniable and widely acknowledged (Coyle, 2015, p. 17; Fioramonti, 2013; Pilling, 2018). But the tacit argument – that *How to Pay* and *the White Paper* matter only to national income histories because they contain a different national income – is itself driven by the Mitra-Kahn (2011) focus on national income definitions. Mitra-Kahn's wider argument is that a new definition of national income is required every 40 to 70 years to capture the changing concepts of the economy that evolved during the past almost 400 years for a new generation of scholars. 'It is not the tool that has changed, but our definition of the world and its economic realm. I argue that the concept of the economy has changed' (Mitra-Kahn, 2011, p. 200). Yet the publication of the British White Paper also saw national

[8] Director of Statistics then Director of Economics at the OEEC.

income estimated using an accounting process for the first time. For Vanoli (2005, p. 26) this change in estimation approach saw a shift in scholarship away from national income estimation towards national accounts estimation.

As the Mitra-Kahn argument is premised on the notion that national income definitions have evolved over time, there is less scope for him to discuss the significance of this new accounting approach. Indeed Mitra-Kahn (2011, p. 200) advances an auxiliary argument that double-entry bookkeeping is a 450-year-old methodology. By emphasising the age of the double-entry bookkeeping the only explanation for the novelty of the new 1940s national income approach comes from Keynes's changes to the national income definition. Yet whilst double entry accounting is old, the application of double entry accounting to national income studies in the 1940s *is* a change from prior practise. To that end the application of a double-entry book keeping framework is important, because it is a contextualising factor in how national income accountants saw their practice. If we are to better understand this 1930s-1950s critical juncture we therefore need to see this moment through the terms, meanings and functions defined by the context of the 1930s-1950s.

The case for a national income accounting history

Whilst Mitra-Kahn (2011) provides an account as to the "emergence of GDP", as indicated earlier, national income accounts were more than this (Tily, 2015, 2009). An alternative framing for the origins of national income accounting places a stronger emphasis on national income accounting as an accounting approach. This alternative history can be seen through two texts firstly, Tily (2009) who argues that along with Rothbarth, a statistical research aide in Cambridge, Keynes improved on Colin Clark's estimates of national income in *How to Pay for the War* as a way of increasing wartime economic employment without the counterproductive effects of inflation. Tily (2009, p. 351) notes that in order to do this an *accounting* approach was adopted. Secondly, Suzuki (2003) advances the case that the national accounts themselves are structured along Keynesian terms and balanced out on a Y = C + I + G basis,[9] primarily Suzuki (2003, p. 502) argues that it is the British approach to national accounting that spread across time and space in the afterwar period. Whilst both texts are referenced by several authors (Danby, 2017; Hirschman, 2016; Schmelzer, 2016), the importance of their observation on the role of national income accounts as an accounting approach are often overlooked. Both authors are discussed below.

In the first text, Tily (2009, p. 352) cautions how we use Keynes's contribution to the development of national income accounting; and notes that previous interpretations saw Keynes as only a patron of

[9] This is the expenditure approach definition of national income and is commonly found in most undergraduate textbooks.

national accounting or vaguely affiliated to national accounting rather than a crucial part. Mitra-Kahn, to that end, helps to rectify this mistake by acknowledging Keynes's intellectual contributions. Yet Mitra-Kahn's focus on the progression of national income definitions, has meant he focused little on the contribution made by James Meade and Richard Stone, both of whom worked closely with Keynes in the development of the White Paper. This is in contrast to several other authors who highlight contributions of both Meade (Howson, 2017) and Stone (Deaton, 2008; Pesaran and Harcourt, 2000; Stone, 1984). Tily (2009) differs from Mitra-Kahn and several contemporary national income accounting histories in this regard. Tily (2009, pp. 350–2) acknowledges the accounting contributions of Meade and Stone in the publication of the 1941 White Paper: *An analysis of the Sources of War Finance and an Estimate of the National Income and Expenditure in 1938 and 1940*. This is done by explaining that the White Paper's presentation of national income alongside expenditure was an *accounting* innovation (Tily, 2009, p. 351). This helps to bring the people who performed this work, Meade and Stone, back into the picture.

In addition, Tily makes a contribution to the literature by providing a richer contextual account of the British intellectual climate to which Keynes was contributing. In contrast to previous 1930s national income estimates undertaken by Clark, Bowley, Flux and Stamp, Tily shows that for Keynes new national income concepts, as expressed in his 1941 publication *How to Pay for the War,* were to be used to help determine how much of the public's income needed to be removed from circulation to prevent counterproductive inflationary effects (Tily, 2009, p. 347). From this we are able to see Keynes's national income accounting enquiry for its practical purpose rather than just an estimate of an abstract "national income" figure.

The second text, Suzuki (2003) provides insights into how the 1940s change in purpose to national income was accompanied by a change in the way national income was calculated through the introduction of a double-entry accounting framework. Suzuki (2003) emphasises the importance of the adoption of an accounting framework on how national income enquires were followed after 1940s and how it became a tool for government. Suzuki (2003, p. 474) explains that the national accounts framework is a useful calculational approach for government and economists alike for inferring macroeconomic economic identities. The approach they adopted 'subtly propagated the role of the state by suggesting what government economic advisers could do with the public expenditure and the multiplier' (Suzuki, 2003, p. 489).

The accounting framework drew on partially complete estimates of economic variables to help inform decision making (Suzuki, 2003, pp. 493–496). But instead of seeing this as an incomplete picture, Suzuki argues the national accounts were not intended as a complete picture of reality,

instead, the national accounts are 'a means to analyse and manage economic reality' (Suzuki, 2003, p. 501). This notion - that the national accounts themselves are a structured order of estimates which can be used to inform decision making - gains support from Danby (2017, p. 83) who contrasts the national accounts with business accounts which are supposed to be a fully complete record of transactions. Instead, national accountants are characterised as 'scavengers' by Danby (2017, p. 84), that bring together disparate sources of data for processing within one framework. What mattered to the national accountants at the time was not that they were estimating national income, instead, as Suzuki (2003, p. 480) explains, they emphasised the importance of the accounting aspect of the new national income accounts.

The case for a national income accounting history: a late 1940s / 1950s narrative on the purpose of national accounts

Suzuki's insights are also reflected in an earlier literature, including, the UN System of National Accounts (SNA) themselves which place a more significant emphasis on the importance of the accounting aspect of the national accounts. A 1947 UN report into national income studies presented the national accounts as a mechanism that related to the level of allocations in an economy and was designed to aid peacetime administration (Subcommittee on national income studies, 1947, p. 9). The accounts were explained to be a way of describing 'complicated interrelationships of different transactions and branches of activity' (Subcommittee on national income studies, 1947, p. 7). The reason being 'national income studies which had their origin in an attempt to measure certain broad totals have a much more general interest and usefulness if they provide information on the structure of the constituent transactions and on the mutual interdependence of these transactions' (Subcommittee on national income studies, 1947, p. 7). Unlike public policy discussions today, 'it is the interrelationship of transactions that is important rather than individual totals, such as national income or gross national product' (Subcommittee on national income studies, 1947, p. 7).

The importance of accounting at a national level was also emphasised in the early colonial social accounting literature. This literature is relevant to this thesis Vanoli argues because the notion of "social accounting" is synonymous with the twenty-first century notion of "national accounting" today and was a 1940s-1950s term designed to separate the national accounting methodology from earlier national income estimation approaches (Vanoli, 2005, p. 169). This social accounts literature follows along similar lines to the UN SNA narrative that national income alone provides at best a limited picture of the economy (Deane, 1953, p. 1). Instead, 'the administrator requires information on the share of different groups of individuals in the national income, on what goods and services they produce in return for their incomes, and what goods and services become available for their

consumption and investment when they lay out their incomes' (Deane, 1953, p. 3). This level of information would enable clearer policy decisions and it was argued could be enabled by the national accounts. Even with limited data on transactions, it was argued estimates could be produced to help inform administrators on the nature of important questions such as the transition from agriculture dependence to manufacturing (Deane, 1953, p. 5).[10] Deane is supported by the Ward (2004) history of the intellectual heritage of UN statistics. Ward (2004, p. 10) argues the national accounts provided policy makers with a 'statistical framework that enabled them to evaluate and even model outcomes and conduct simulations of alternative scenarios and strategies.'

The line of argument followed by these 1940s-1950s narratives is that British national income accountants played an essential role in informing the development of what would become the UN System of National Accounts. While undeniably the System of National Accounts adopted a Keynesian-style definition of national income, this reveals only part of the picture. It is also possible to identify in early iterations of the UN SNA, other elements of British National Accounts doctrine, namely, as Suzuki (2003, p. 478) alludes to above, that by the 1940s-1950s the national accounts were *intended* as a monetary policy tool to aid state administration of macroeconomic accounting identities. This section of the literature review examines this notion of accounts as a monetary policy tool and locates it within the extant literature that national accounts-as-a-tool-of-planning was shaped by the broader politics and economics of the mid-twentieth century. But unlike a history of national income, which has to trace prior definitions of national income, the task for a national income accounting history differs. Instead we need to account for the introduction of a new measurement approach within broader economic and political contextual factors. Yet determining which factors shaped this change and why people sought to change the measure is a complex task. The next section of the literature review opens by considering how best to analyse changes to national income accounting within a changing contextual landscape, before then considering the Tooze (2001) approach.

1.2.2. Locating national income accounting within wider changes of mid-twentieth century British politics and economics

In order to understand the contextual environment in which national income accounting changes we need to consider a series of complex interrelated political and economic changes from the mid-

[10] Similar narratives can be seen on page 2 of the 1968 SNA which argued that it provided information on the structure of the economy providing information on issues varying as widely as reliance on foreign trade, foreign aid and the relative contribution of different sectors to production.

twentieth century. The task differs from that of a history of the concept of national income, or in the case of Mitra-Kahn (2011, pp. 197–200), a history of notions of the economy. For these types of histories, they need to only identify the national income concept and how it was redefined over time. In contrast to those enquiries, we need to consider how the concept of national income accounting was shaped by wider contexts. For example, whilst national income historians have typically looked at the 1941 White Paper on national income, published alongside the 1941 Budget, as a major moment in national income measurement, the White Paper was however far more than that, as it helped to usher in a radical change to government budgeting practise. As Peden (1996, p. 182) argues – from the publication of the Budget of 1941 "the Chancellor's budget was no longer simply a cash account for central government but was also a macroeconomic instrument". However, as Tomlinson (2017, pp. 10–12) shows, it was the combination of the notion of the "economy", the case for fiscal activism and the development of national income accounts that led to 'a new discourse of macroeconomics.' This change had been foreshadowed in Keynes's *How to Pay for the War* and represented a significant change for the State in terms of economic measurement, government practise and economic thought.

Toozean analysis of simultaneous changes in the economy, government and economic measurement

A seminal text in understanding how to analyse both changes in macroeconomic measurement and the function of the state is Tooze (2001) *Statistics and the German State*, which outlines the interrelated changes in government, statistics and concepts of the economy underway in the German Weimar Republic. Drawing on his German case study, Tooze argues that changes to government administration, statistics and economic thinking were themselves driven by fundamental changes underway in industrial economies (Tooze, 2001, 1998). The need for change became self-evident during World War I, when businesses looked to government to provide advice on economic production yet found the country's statistical architecture was too slow, inefficient and inaccurate to provide the relevant information. The pace of industrial production had increased but Germany had lacked the informational architecture to provide the necessary information to govern the state in war which led to coordination problems. In order to govern more effectively, new national-scale data series were generated by bodies, such as the Institut für Konjunkturforschung (IFK) under Ernst Wagemann, to help inform policy. These statistics shaped and were shaped by new economic thinking.

Similar changes to government administration, statistical collection and economic concepts can be seen in Britain (and other countries) during this time period. Whilst based on a German case study, the Tooze (2001) approach provides detailed insights into the institutional factors shaping the

emergence of new data series in early to mid-twentieth century Germany.[11] His contributions also help us to analyse how wider economic and political factors shaped and influenced reforms to national measurement.

While the Toozean framing offers a compelling account as to how to analyse the changes to national income accounting underway in the 1930s to 1950s, it draws on the Foucauldian notion of "governmentality." Other authors researching national income have to varying degrees used Foucault's notion of governmentality as a way of understanding the emergence of statistics and national income such as Danby (2017), Hirschman (2016) and Mitchell (2014, p. 485). This notion stems from 1970s lectures by Michel Foucault (2009 [1978]) and is defined as: the approaches adopted by government in its exercise of power (Rose et al., 2006).[12] A focal point of the lectures is the mechanisms adopted by government to control the population (Foucault, 2009 [1978] p.373). Within the Foucauldian argument, increased official statistics improve the state's knowledge and help to structure society.

Whilst these notions are helpful to some degree in explaining some of the changes to national income accounting during the 1930s-1950s it is a sufficient but not necessary assumption. It provides an account of how institutional arrangements may be organised to structure a population, yet it does not necessarily explain the actions and motives of individuals operating within government superstructures. There is therefore a nuanced difference in the treatment of government-produced economic statistics between the argument of this thesis and that of Foucauldian-based approaches. Whilst the Foucauldian approach can be used to explain the changes in national income statistics within the context of how the government structured the economy, this thesis, instead, considers government as one institution among many that helped to define the context in which new ideas emerged. By looking at for example the wider empirical and "scientific" mood influencing individuals we can help to explain why they undertook their research and how ideas passed across borders. So while Chapter 5 concurs with Tooze with respect to the influences of World War I and the Great Depression as factors impacting government, statistics and concepts of economics, Chapter 4 also highlights some level of influence to the actions of patrons of empirical research such as the Rockefeller Foundation.

[11] Other works by Tooze such as Tooze (2008), Tooze (1999a), Tooze (1999b) and Tooze (1998) provide detailed accounts of the contextual factors shaping the evolution of macroeconomic statistics in the Weimar Republic and the Third Reich.

[12] 'First, by "governmentality" I understand the ensemble formed by institutions, procedures, analyses and reflections, calculations, and tactics that allow the exercise of this very specific, albeit complex, power that has the population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technical instrument.' (Foucault, 2009 [1978] p.108).

The British context: economic turmoil and changes to government practice

Like Germany, the tumultuous mid-twentieth century saw Britain undergo considerable political and economic change which shaped the emergence of national accounts. Indeed, it is commonly acknowledged in the history of GDP literature that World War I, the Great Depression and World War II shaped how researchers came to understand the purpose of the UK's first official national income figures (Coyle, 2015, p. 12; Masood, 2016; Paul Studenski, 1958). During this time the State underwent significant change in response to radical events. As Hobsbawm (1968, p. 7) argues 'a world economic crisis of unprecedented depth brought even the strongest capitalist economist to their knees' fundamentally challenging the liberal economic world order which came from the nineteenth century. It was 'an Age of Catastrophe… shaken by two world wars, followed by two waves of global rebellion and revolution' (Hobsbawm, 1994, p. 7).

The economic malaise and lack of coordination seen during the Great Depression further legitimised the need for greater government intervention. With high levels of unemployment in the UK (Hatton, 2004), empty factories, and a perception that the USSR was performing well (Ellman, 2014, p. 11), increasingly countries resorted to interventionism and protectionism as a response to the deepening global economic situation (Eichengreen, 2004).

New demands on the state during the interwar period, for example in welfare provision, saw a change to government practice. Whilst the welfare state dates back to the 1600s (Szreter, 2012, 2009, 2007; Szreter et al., 2016), as Polanyi (1991) argues, welfare provision significantly changed as campaigns to abolish the Elizabethan poor laws led to a new approach to welfare. Polanyi (1991, p. 153) observes that the nineteenth century drive for a laissez-faire economy fuelled calls for greater social protection against the market through public health and factory conditions laws, public subsidies, public utilities and social insurance. State interventions increased significantly in the early years of the twentieth century through the introduction of national insurance (Thane, 2011). These increasing demands on the state saw, between 1900 and 1937, state spending expanding into areas such as social services with UK expenditure on social services increasing from over 2 per cent of GDP to over 10 per cent of GDP (Middleton, 2004, p. 462). The increasing capacity of the state was in part enabled through political demands changes to financing (Daunton, 2008, 2001) which led to new data sources on the economy (Clark, 1932, pp. v–vi) and a more thorough statistical understanding of the society and the economy. Alongside this development of state service provision, new statistics emerged through bodies such as the Board of Trade (Agar, 2003).

The importance of economic statistics

For Britain entering World War II, national-scale, macro-data played an important role in war administration (Edgerton, 2012). The volume, timeliness and accuracy of this data was aided by the emergence of bodies such as the Central Statistical Office (Ward and Doggett, 1991). As Middleton (1998, pp. 119–20) argues prior to this 'in the economic sphere there was as yet little systematic data collection and no expectation that decision-making should routinely proceed on the basis of data analysis.' In contrast to World War I, World War II saw the mobilisation effort influenced by a greater level of data which informed allocation decisions in relation to labour (Tomlinson, 2017), raw resources (Edgerton, 2015), industrial capacity (Fear, 2015) and government finances. Economic statistics played an important role in the mobilisation of resources for World War II. Mobilisation mattered during World War II because Britain needed to considerably increase defence expenditure and manufacturing production to catch up with Nazi Germany (Kennedy, 1989, pp. 382, 386).

Yet the argument that Allied resource mobilisation was a major contributory factor in *winning* the war has been challenged statistically by some economic historians (Broadberry and Howlett, 2016; Crafts and Mills, 2013). The narrative emerging from these economic historians is however overly reliant on data generated after the war and pays little attention to how the wartime data series informed decision making. Self-reported accounts of the war explain how important economic statistics were to wartime strategy (Cairncross, 2011, p. 197), (Cairncross, 2016). These accounts are strengthened by Middleton (1998, pp. 119–120) who highlights the increasing role economic statistics played in informing decisions within the Treasury. For Wagner (2003, pp. 603–607) newly emerging data series are argued to have helped "scientific" planned government. Such thinking gains support from accounts which argue that data in government enabled the war machine (Agar, 2003; Edgerton, 2012). Chapter 5 supports this argument by showing how national income accounting helped to inform budgeting war strategy to address the inflationary risks posed by rapid resource mobilisation. In its argument the chapter emphasises that the policy response to World War II's fiscal problem was seen through the legacies of World War I. This provided the environment to help legitimise new approaches to economic management.

Macroeconomic statistics in the shadow of the "Keynesian" Revolution

Alongside this shift in economic statistics and economic policy was a shift in economic thinking. The interwar period in Britain saw the publication of Keynes (2012a [1936]) *The General Theory*. Pasinetti (2007, pp. 6–24) outlines how, through discussion with groups of academics in Cambridge, the *General Theory* was developed in response to Keynes's earlier tract *the Treatise on Money* (Keynes, 2012b [1930]). In his *General Theory*, Harcourt and Kriesler (2011) argue, Keynes challenged conventional wisdom by showing full employment was not a necessary outcome in market

economies. Instead, Keynes used the *General Theory* to advance a theory of the economy where real and monetary variables interacted and where liquidity shaped investment which in turn impacted real income (Harcourt and Kriesler, 2011, p. 507).

The *General Theory* was an intentionally radical text which inspired many economists in the interwar period and the run up to World War II. Pasinetti (2007, p. 6), quoting Keynes, argues that by 1934 Keynes had started to think of the text as a revolution in economics designed to change '"how the world thinks about economic problems."' Cord (2009, p. 196) argues that part of the reason for its influence was the scope for empirical investigations through national income accounting which helped to draw in the interest of younger economists. These younger economists, in turn became part of the new paradigm by arguing for Keynesian ideas in government (*ibid.*).

The development of the new "Keynesian consensus", particularly through the neoclassical synthesis however led to the more subtle points of Keynes's argument becoming lost in translation. For example despite a strong emphasis on the role of uncertainty in shaping economies and the difference between mathematical representations of a messy real work (Tily, 2007, pp. 141–2), deterministic and formulaic models of the economy emerged as others interpreted his texts (Danby, 2017). Chick and Tily (2014) caution how we should understand Keynes and *the General Theory* because of the panoply of interpretations of "Keynesian" thinking. As they highlight, our understanding of Keynes's work has been distorted by waves of interpretation by Hicks, Robertson and Samuelson who argued for distorted accounts of his work (Chick and Tily, 2014, pp. 685–690).

Another interpretation of Keynes is via "The Keynesian Welfare State" a term used to describe fiscal interventionism. But state interventionism was a feature of debates in the 1930s to 1950s and not the exclusive vestige of Keynes (Tily, 2007, chap. 4). Indeed as Sloman (2015, pp. 42–3) shows, segments of the Liberal Party had supported the notion of state interventionism in the name of "national development" even earlier in 1909. Yet emerging from World War II a social democratic consensus emerged which fused a vision of the welfare state articulated by the Beveridge reports with "Keynesian" style demand management aimed at securing full employment (King, 1987, p. 50). As Backhouse (2010, p. 46) argues "Keynesian" full employment mattered not only as a way of delivering improved welfare, but 'without reasonably low levels of unemployment, it would be impossible to fund social security systems that would keep people out of poverty.' This new "Keynesian" consensus drew on intellectual systems like the national accounts and using a scientific rhetoric which would come to shape early "development" thinking through colonial channels (Danby, 2017; Prest and Stewart, 1953).

1.2.3. British colonialism and post-war "development"

With the exception of Danby (2017), Speich (2011, 2008) and Morgan (2011), few national income historians have sought to understand how the World War II approach to national income accounting was transmitted through colonial channels. Danby (2017) looks at Deane's colonial social accounting and estimates of Nigeria's national accounts by Prest and Stewart (1950), but focuses on the national income definition. Similarly, by analysing across the works of Colin Clark, Phyllis Deane and, Prest and Stewart, Speich (2011) argues that national income accounting spread during the period of colonial decline. Speich's work identifies that national income definitions changed whilst measuring, and mentions that macroeconomic statistics aided planning in developed countries, India and Ghana. Yet as the archival records discussed in Chapter 7 show, for the Colonial Office, national planning was an integral part of the national income accounting approach.

Likewise, Morgan (2011) frames the 1950s Nigerian estimates as an application of the idea of national income. By doing this Morgan provides valuable insights into the transmission and imposition of new modes of national income accounts thinking in the post-war era. Thinking of national income as an imposition of knowledge in a colonial setting can be understood through colonial historical literature. Tilley (2011) notes a long relationship of using the colonialised African continent as a living laboratory for discovering new facts and testing new systems of thought. This was notably the case during the interwar years which as Tilley (2011, p. 213) highlights by quoting a figure from the 1930s '"Africa is, as Lord Hailey points out, a vast living laboratory of biological and social experiments."' The use of the language of science in colonial contexts for testing new theories is reflected in Morgan (2011) which forwards the case that attempts to transfer national income accounting to Nigeria struggled because the intellectual system was designed for the observation of more monetised economic transactions.

Whilst Danby, Speich and Morgan's approach to national income is helpful in identifying that national income estimation operated in colonial settings, the studies focus on the relative lack of success in applying an income accounting estimation approach that were tailored to a British context are applied in a different environment. Chapter 7 furthers this discussion by looking at the broader influences shaping these measures for example explaining why the Colonial Office became a patron of national income *for planning purposes* and how the Nigerian estimates became an estimate of regional wealth. This British colonial context is necessary in order to understand the function that the measures were performing.

British Colonial Context

The colonial context is relevant to discussions on the emergence of national income accounting for two reasons. Firstly, it helps to explain why national income proliferated and secondly because the Colonies were an important element of mid-twentieth century British Political Economy. Unlike the German case study in Tooze (2001), a history of British national income accounting which reflects the wider political economic environment needs to consider this international colonial context. As Goswami (2018) argues, the broader colonial project was an integral part of British Political economy. As Offer (1993, p. 236) notes, overall the British empire increased the wealth of Britain. It is perhaps not surprising tools of economic management fashioned during World War II would spread to colonially administered countries.

Yet Britain's ability to influence colonial administration was diminishing in the post-World War II environment through decolonisation movements and the rise of Bretton Woods Institutions. Overall, the colonial project was in a period of imperial decline (Brendon, 2008). Alongside 'demand for reform, the protest against capricious colonial rule, and the struggle for independence', Betts (2004, p. 37) argues international developments and national politics shaped decolonization in the Post-World War II era. Accompanying an internal change to colonialism, geopolitically the role of Britain on the world stage was impacting the country's ability to project its influence. The decline of Pax Britannica, and the development of the Bretton Woods system occurred alongside a shift in international sentiment which became increasingly hostile towards the imperialist project (Betts, 2004, p. 25; Kennedy, 2017; Scott, 2005, p. 95).

This shifting international context occurred alongside and shaped changes to the British approach to Colonialism. The international relations literature, in particular, argues the post-war colonial project became a mechanism for shaping development and exporting British approaches to governance. These changes were part of a shift from the notion of "Empire" to the notion of "Commonwealth" and occurred in response to increasing hostility to British Imperial rule (Kent and Young, 2013, p. 16). Through mechanisms such as the Colonial Development and Welfare Act 1940, Britain no longer projected the view that the Empire was an outlet for British produce, instead Britain moved to provide development funds for colonies which would change the colonies (Kent and Young, 2013, p. 16). Young and Kent (2013, p. 16) argue that these post-war recovery efforts focused on increasing colonial production were, in a sense self-serving, as they would aid Britain's peacetime production and benefit the value of the sterling area. This post-war activism in colonial development has been described by Low and Lonsdale (2010, p. 173) as the "second colonial occupation" as Britain exported new approaches to economic management such as "development plans" which would prepare colonies for self-government whilst aiding British interests. Chapter 7 adds to this by

showing how these moves led to the Colonial Office encouraging new forms of statistical estimation such as national income accounting.

The international consensus for developmental "Keynesian" state planning

Alongside the British push for "development planning" an American-driven consensus had emerged on the need for science to aid development. Preston (2012 [1982]) for example characterised this period as a crystallization of "positivist" social science orthodoxy, notably in America, and argues this helped to inform the Truman Doctrine and led to the Marshall Plan (Preston, 2012 [1982] p.44). This scientism was also seen in several organisations within the emerging international architecture of international organisations which 'were created in the postwar years born from a progressive faith that held that applying expertise could transform the world for the better…many thought they could employ advances [in] science and technology to bear on perplexing social problems' (Macekura, 2015, p. 25). Macekura (2015, p. 26) argues that postwar development thinking can be seen both in humanitarian and strategic terms – helping to counter the destabilising effects of "underdevelopment," and, fostering an integrated prosperous 'international community along liberal, capitalist lines.' For the late 1940s emerging American superpower, foreign aid became a vehicle for targeting the underdeveloped world in an attempt to prevent countries falling into a Soviet orbit (Macekura, 2015, p. 27).

The move to scientific interventions in developing countries also provided intellectual support to economic theories which encouraged state-driven rapid development. Rapley (1997, p. 14) argues that the new conceptualisation of the "Third World" had enabled the Prebisch-Singer thesis that to develop further "third world countries" should export increasingly more commodities to be able to purchase capital-intensive imports from the first world. This, Rapley argues, was unsustainable and led to a series of new economic theories such as Big Push models which would see a country prioritise one sector. A pre-requisite for such analysis was the capacity of governments to hold detailed information on their economies.

Yet Leys (2009, pp. 8–9) argues that prior to these American modernisation theories, there had been other efforts to intervene in developing countries as countries used social-democratic theories of planning in a colonial setting. As Leys (2009, p. 9) notes these post-war development notions were 'the work of economists, all strongly influenced by the ideas of Keynes and the wartime and post-war practises of state intervention in the economy.' These efforts, under the British Labour administration, led to planning becoming increasingly common in the post-war environment (Chick, 1998).

In colonies around the world development plans functioned as medium term programmes of public investment (Urrutia, 1988, p. 2). Urrutia (1988, p. 2) draws this assessment of several development plans including the 1946 *Post-War Development Proposals* for Sri Lanka, the Malaysia *Draft Development Plan* and the *Ten Year Plan of Development and Welfare for Nigeria*. By the late 1950s and early 1960s, aid agencies were developing modernist plans which linked economic structural changes to a potential for extra economic growth (Urrutia, 1988, p. 3). The effects from this period were long standing, as Ukelina (2017, p. xxviii) notes in Nigeria, legacies of 'multiyear centralized planning, agrarian bias, and a reliance on international experts for development' in addition to a colonial mindset stemming from the second colonial occupation, led to the 1945 Nigerian Development Plan. Chapter 7 demonstrates this by showing how the national income estimates of Prest and Stewart provided some insights for later development plans.

Given the wider moves to technocratic state planning, and the informational requirements that this would require it is apparent that national income accounting could play a role in informing state planning. But as Chapter 7 shows, broader colonial contexts shaped the national income estimates of Nigeria in the 1950s and changed them into regional estimates of wealth and resources. As it currently stands the history of national income literature has not sought to explain how and why this happened.

1.2.4. The need for greater context in national income accounting history

The literature review has shown that the national income history literature identifies the 1930s to 1950s as an important period, particularly in Britain, and particularly in the development of national income accounting. Yet other than for a few exceptions, there is little appetite to think of national income accounts as an accounting tool. Instead often this history of national income literature undertakes historical enquiries which emphasise the concept of national income. Whilst this has documented a clear lineage of key authors to the development of national income definitions, we learn little about the complex mid-twentieth century setting in which these ideas developed. This period saw turmoil, it saw the emergence of new macroeconomic statistics and these statistics played an increasing role in economic governance. In the immediate aftermath of World War II British social democratic thought was asserted through some colonial channels during the second colonial transformation. This saw the spread of economic ideas. Yet few national income accounting histories have looked at these colonial mechanisms as a means for transmitting international thought. While Morgan (2011) does discuss the measurement of national accounts in Nigeria, it doesn't inform on the planning purposes that national income accounts were intended for. There

therefore remains a research gap in terms of understanding how these wider colonial, development and mid-twentieth century economic planning contexts shaped the meaning that national income researchers ascribed to national income accounting. The thesis seeks to add to the history of national income literature by asking: what did national income accounts mean to the researchers of 1930s-1950s Britain?

Chapter 2: Methodology, methods, outline and contribution

2.1. Methodology

Chapter 1 identified there is scope for us to develop new insights on national income accounting by re-examining the wider contextual environment of the 1930s-1950s. To help us reconsider the fuller features of national income accounting in the 1930s-1950s, the thesis advances a history in economics methodology informed by two approaches. Firstly, the thesis draws on the institutional economics of Geoffrey Hodgson, who argues that individuals are shaped by their contextual surroundings. Through Hodgson's approach we can identify new perspectives on national income accounting by looking at the 1930s-1950s institutional context. Secondly, the thesis draws on insights from intellectual history approaches, such as the Cambridge School of Quentin Skinner, to argue that through a richer contextual understanding we can better explain what past thinkers meant by their previous actions and words. By drawing on the insights of intellectual history, we can and should visit earlier texts and archives to help us understand the past. When combined, these approaches help to advance an historical analysis in economics which may broaden our understanding of what national income meant and help to remedy the current narrow understanding of the concept as a measure of "growth". By opening the archives of the past, we can bring in richer detail about the national accounts which can help inform our understanding of both the past and the present meanings of national accounts.

History plays an important, yet underappreciated, role in economics by allowing us to uncover new ways of understanding what ideas meant in their original context. Previously, history of economic thought played an integral role in the economics curriculum with a similar prestige as mathematics or econometrics (Nelson, 2002, p. 109). Increasing specialism in economics from the 1970s onwards however saw the economics curriculum narrowing and history of economic thought playing less of a role in economic thinking (Backhouse, 2004, 2002, p. 324). Yet history of economic thought is important for economics; as Backhouse (1994) argues, historical analysis enables a range of new insights for economics: we can better understand the historical contingency of ideas, we can reappraise what economists meant by their actions, we can better identify how contemporary ideas emerged and, ultimately we can better understand how to perform economics.

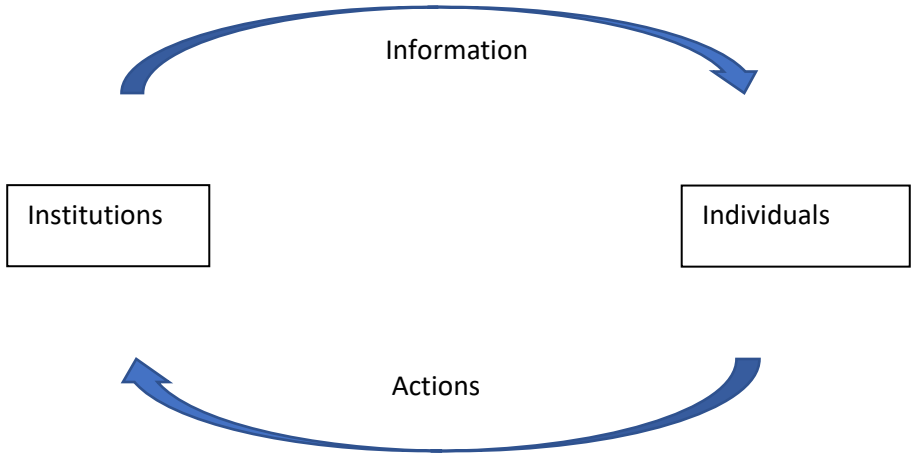
Hodgson's institutional economics approach is a compelling tool for analysing history in economics. As Nelson (2002, pp. 109–110) argues, Hodgson enables us to draw on the history of social and economic thought to 'raise issues and make points highly relevant to contemporary discussion and analysis.' As such Nelson argues Hodgson's institutional economics can be used to understand

history of economic thought. It is precisely Hodgson's arguments that individuals and their actions are embedded in wider social contexts that makes his approach compelling for historical analysis.

The Hodgson argument starts by saying that institutions determine individual behaviour. For Hodgson (2000, p. 2) institutions are defined broadly 'as systems of established and prevalent social rules that structure social interactions. Language, money, law, systems of weights and measures, table manners, and firms (and other organizations) are thus all institutions.' The Hodgson argument follows that in order to understand the actions of individuals we need to consider how people were shaped by the institutional context in which they lived.

In using Hodgson's institutional economics approach, a clear distinction needs to made from other institutional economics thinking such as the New Institutional Economics school.[13] In his earlier works Hodgson (1998) distinguishes himself from New Institutional Economics by critiquing their Institutionalist Action-Information Loop:

Figure 2.1. New Institutional Economics approach

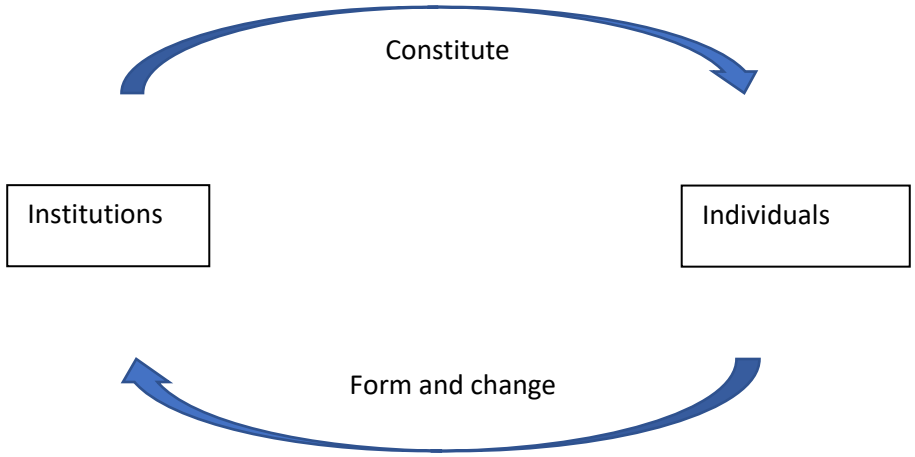


Hodgson critiques this approach by arguing that institutions are more than simply an information exchange which informs individuals. Instead, in addition to the notion that 'institutions, knowingly or unknowingly, are formed and changed by individuals' Hodgson (1998, p. 189) argues individuals are '*constituted* by institutions.' By this he means that the notions of individuals are grounded in the wider socio-economic context (Hodgson, 1998, pp. 188–189). Institutions do more than provide an informational basis for rational agents, instead following Hodgson (Hodgson, 2006, p. 13) institutions

[13] Hodgson (1998: 176) notes North (1981), Richard Posner (1973), Andrew Schotter (1981), and Williamson (1975) as examples of the New Institutional economic approach. Notably in Hodgson (2006) *What are Institutions?* Hodgson publishes correspondence with North from 2002 over the completeness of the definition of the term institutions.

are ‘durable systems of established and embedded social rules that structure social interactions.’ As implied below:

Figure 2.2. Hodgson Institutional Economics approach



While Hodgson’s work on institutional economics is more frequently directed to reinterpreting market-based interactions, it is relevant to the thesis. Firstly, the case for language as an institution encourages us to better understand the institutional context in which national income accounting researchers operated. Secondly, the emergence of new institutions such as the national income accounting approach are best understood in reference to the wider institutional precedents which defined the ideas and norms that constituted the actions of individuals to “create” new institutions. For these reasons, we need to better understand what influenced national accounts researchers, embedded in a 1930s-1950s context, to develop a new approach to measurement and in so doing devise a new national income accounting institutional arrangement.

Whilst Hodgson justifies the use of institutional context, we gain further insights into the practicalities of “history in economics” approach from a methodological perspective, by considering other intellectual history approaches. As Lovejoy (1948, p. 2) and Armitage (2013, p. 29) argue intellectual history can add to economic history because history of economic thought is itself a form of intellectual history. We can therefore look to the heuristics, the modes and practices adopted by intellectual historians to help inform our enquiry. One such school of intellectual history, is the Cambridge School of Intellectual History which follows from debates raised in the 1970s by Quentin Skinner.

The Cambridge School of Intellectual History, following the approach of Quentin Skinner, argues we can, and should, identify the original meaning of historical texts. Arriving at the original intended meaning or “illocutionary force” of a text means we have to understand what a writer meant when

they wrote a text a particular way (Runciman, 2001, p. 84; Skinner, 1988 [1976], p.74).[14] This differs from asking about what specific terms such as national income mean, and, also differs from how we read the work from our contemporary perspective (Skinner, 1988 [1976], pp.70-3). A key implication of Skinner's approach is that in the absence of sufficient contextualisation of the meaning of words, and numbers, we risk implanting our own contemporary understanding upon the past. To prevent that Skinner (1988 [1972] pp.76-7) suggests we should 'focus not just on the text to be interpreted but on the prevailing conditions governing the treatment of the issues or themes which the text is concerned' and to 'focus on the writer's mental world, the world of his empirical beliefs.'

Whilst slightly esoteric, and grounded in 1970s debates about political texts, the methodological insights arising from the Cambridge School debates are relevant. As Bevir (2000) argues the Cambridge School approach acts as a valuable heuristic for historians searching for the meaning of a text. Further as Runciman (2001) notes, since the Cambridge School debates, it is commonplace for historians to contextualise a text in order to arrive at its intended meaning. To that end Bevir (2002, p. 309) directs us to think of historical enquiries as drawing on 'relics from the past…a collection of source material consisting of books, newspapers, works of art, government reports, census data, and other such things.' When engaging in historical economic enquiries we therefore have a range of textual and archival resources which can be analysed to identify new perspectives on the past. Doing so can help provide a more rounded picture of, for example, the changes to national income accounting in the 1930s-1950s.

Across the insights of both Hodgson's approach and broader intellectual approaches, and in line with general historical practise, it is apparent that we can gain more detailed insights into the origins of national income by understanding the contextual environment from which it emerged. By revisiting the texts of the past, and archival resources, we can uncover new perspectives which show why those ideas were relevant to the past and, potentially, how they may be relevant now.

[14] Bevir (1999:32-1) provides an outline of different schools of intellectual history. In contrast to contextualists who believe linguistic context defines meaning, Skinner is categorised as a conventionalist i.e. someone who argues meaning is defined by social convention. 'the hermeneutic meaning of a given utterance comes from its conventional meaning. To be precise, Skinner argues that to understand an utterance we have to grasp both its meaning and its illocutionary force, where its meaning comes from its sense and reference, and its illocutionary force derives from the conventions that determine what the author was doing in making it.' Bevir (1999:40-1).

2.2. Methods and Sources

The thesis uses a range of archival resources to get a more comprehensive account of individuals' intentions than publications alone. This material has then been synthesised and analysed in comparison with the existing literature.

The thesis examines Cambridge based or Cambridge-linked figures such as Colin Clark, John Maynard Keynes, Richard Stone and the Department of Applied Economics. This thesis does not seek to claim a Cambridge exceptionalism, or uniqueness or any form primacy of British thought. It emphatically is not arguing that national accounting research wasn't already occurring around the world, in many cases this work advanced prior to the UK. This is discussed further in Chapter 4. Instead, these individuals were selected in light of both prominence in the national accounts literature and access to resources. While this ensures that the thesis speaks directly to the existing literature it underemphasises the contribution of other research centres around the UK such as in London, Manchester and Oxford. These have been largely considered by looking at documents sent through to their funder, the Rockefeller Foundation.

The following archives were used: John Maynard Keynes (Kings College Cambridge Archives), Richard Stone (Kings College Cambridge Archives and private papers and books) and Colin Clark (Brasenose College Oxford and Fryer Library University of Queensland). The thesis is also based upon archival materials from researchers sharing commonly held beliefs during this time such as Alexander Loveday (Nuffield College), Austin Robinson (Churchill College), and, Alan Prest (LSE).

To better understand the context to the developments I also consulted the archives of institutional bodies prominent at this time including documents relating to the foundation of the Department of Applied Economics (University Library Records, Records held in the Faculty of Economics and Marshall Library) and its funder the Rockefeller Foundation (Rockefeller Archive Centre) in addition to official records linked to a research project in Nigeria (Colonial Office Records at the National Archives). Given the volume of research commissioned by the Rockefeller Foundation during this time it also provided valuable access to records on the NIESR, the Oxford Institute of Statistics, and other empirical bodies at this time.

In light of the impact on public finance administration I also consulted official records at the National Archives. This research focused on the preparation of the 1941 budget, the emergence of the Central Statistical Office, the Stamp Survey and prior examples of national income measurement. These have been supplemented by materials from the Austin Robinson archives (Churchill College) from his time working for the Stamp Committee.

Interviews with a range of academics linked to the Department of Applied Economics were undertaken to gain a clearer understanding of the issues to consider while consulting the archives. More extensive oral histories were not followed because, by selecting a 1930s-1950s time period, there were few people who could provide a first-hand account.

Documentary records face their own limitations in terms of the choice of materials selected for historical record. In the case of the Stone Archive for example, there appears to have been a collection of materials linked to Stone's *Political Arithmetic, Econometrics and Keynes* lecture to the British Academy. The effect of this appears to have reordered historical materials from elsewhere, including official documentation, into a comprehensive account on the origins of national income. To reduce the risk of presenting a Stone-shaped narrative of events, the national archives were consulted.

Similarly, archival records can face limitations such as archival categorisations which structure how we examine the actions of historical agents. Further some documents may also not be fully preserved, in the case of Phyllis Deane, extensive searches were made but only a limited number of unpublished papers remain. [15]

A further limitation to the archival materials used here is the reliance upon Rockefeller Foundation materials. Whilst extensive records were maintained, and large volumes of correspondence and annual reports were sent through, this still shapes the information held on file – i.e. a body bidding for resources, or sending through accountability documentation, will likely adopt the language and manners of the donor organisation. In the case of understanding the correspondence on the origins of the Department of Applied Economics (DAE) in Chapter 6, it means we cannot ascribe "realistic" research as a motive for the origins of the department with full certainty. Yet in the case of some bodies, such as the NIESR, the Rockefeller Archive provided far easier access to documentation than via other routes.

Finally, while the discussion above has focused on specific limitations to individual archives, a potential limitation to the thesis needs to be addressed – why not consider the American school of national income accounting under Simon Kuznets? His work in the 1930s, and the fast advances in the American school of national income could, arguably, be a matter for more detailed discussion in the thesis. To have done so, would however, have required a thorough examination of the American school of national income which is largely addressed through the work of Fogel et al. (2013). This would have changed the thesis into a comparative piece across the American and British schools of

[15] After consulting various legal sources and her friends it became apparent that the majority of her private papers were most likely destroyed during her life meaning a greater reliance upon publications was required.

national accounting which would have required a more extensive discussion. This alternate thesis style would have meant a breadth and depth of research beyond a PhD thesis. A clearer understanding of the illocutionary force of national accounts in the USA would be an avenue for further research. In addition, I would like to indicate that the thesis uses the device of setting up a section called "literature gap" in Chapters 3, 4, 5 and 6 to make it easy for the reader to understand the logic of the chapter.

2.3. Thesis outline

The thesis splits into two parts: I) the *moments* of national accounting and II) the *movements* for national accounting in Britain between the 1930s and 1950s.

In the first part of the thesis, *the moments of national accounts,* three chapters outline different contextual factors that influenced the emergence of national income accounting in World War II. Chapter 3 creates a bridge between the methodology of the thesis and the main body chapters by arguing that national income thinking was shaped by more than just the immediate past. The chapter does this by considering how 1930s economists approached the past. The chapter shows how William Petty and his works were reinterpreted as an empirical, scientific and practical way of approaching economics. The chapter concludes by saying we should consider wider contextual factors that shaped the meaning of national income accounting queries.

Chapter 4 considers the international institutional influences on national income thinking during the 1930s. It argues that international bodies such as the League of Nations and the Rockefeller Foundation were part of, and shaped, a new "realistic" economics. The chapter does this by using a Hodgson-type institutional analysis to trace the support of international institutions to the British economic environment. Notably, it is suggested this may have influenced the late 1930s works of Clark, his students, and the broader Cambridge economics community. The chapter contributes to the thesis by arguing these international institutions were part of, and shaped, a "realistic" economics. In turn this "realistic" economics may have acted as catalyst for national income enquiries by providing a more amenable environment for economic statistics research. The resulting greater literacy in and legitimacy of economic statistics may have been an important factor in legitimising the adoption of national accounts in World War II.

Chapter 5 considers the institutional changes to government during World War II that enabled the official estimation of national income accounts. The chapter contextualises these changes within the broader lessons of the inflation effects and the debt-financing strategies deployed in World War I.

This desire for a new grand war finance doctrine was met and aided by efforts to run the war on a more scientific basis including through centralisation and through engagement with economists such as Keynes. The argument concludes by considering the "revolution in public finance" (to quote Keynes in 1941) and how public finance strategies changed though their linkage to national income accounting. The chapter contributes to the thesis by showing how national income accounts measurement was part of the emergence of a new government fiscal budgeting approach that linked government financing decisions to a wider macroeconomic framework.

The second part, *the movements for national accounts,* looks at how this new technocratic national accounting approach, and its relationship to public finance, continued after the war through two case study chapters. Chapter 6 looks at the DAE founded by Keynes and Stone and their attempts to further "realistic" research into national accounting. It analyses the various factors which shaped the foundation of a research centre which became a thought-leader in national income accounting. It also considers several intellectual legacies from this institute including the Cambridge Growth Project.

Finally, Chapter 7 looks at a specific research project at the DAE – the measurement of the National Accounts of Nigeria in 1951. The chapter examines the desire of the Colonial Office to encourage colonial administrators to adopt the British national accounts approach to public finance. This met a particular need by the Nigerian administrators to help solve a federal tax constitutional crisis. In response the DAE sent a research team to create national and regional income accounts. This colonial administrative episode is emphasised in contrast to the more American / UN "developmental" approaches to national income prevalent at the time.

In summary, the contribution of the thesis is twofold: Part I shows how context matters to the idea of National Accounts culminating in the 1941 publication; and Part II shows why and how ideas became institutionalised after World War II. By unpacking both, this thesis shows how different bases of thought, rationale and contextual factors informed what National Accounts became in the UK, importantly, in ways that differ from thinking about National Accounts today.

2.4. Thesis contribution to the literature

The thesis makes a twofold contribution to the literature in addition to several minor contributions. Firstly, it outlines additional factors that influenced the idea of national income accounting and the emergence of the 1941 White Paper. Secondly, the thesis shows why and how this new approach to national income accounting was institutionalised after World War II.

The first contribution adds to discussions by Suzuki (2003) and Tily (2009) on the meaning and purpose of national accounts. In part, the evidence supports the common consensus that the wartime national accounts were themselves part of a financial strategy which sought to improve the allocation of financial resources in a non-inflationary way. But where this argument differs is that Chapter 5 contextualises this moment explaining that the British wartime state was prone to innovate at this time because it was seeking to improve on the lessons from World War I. Instrumental in driving this change were economists coming from an increasingly empirical economics discipline (Chapter 3) which had been shaped though the sponsorship and influence of international empirical patronage from bodies such as the Rockefeller Foundation and the League of Nations (Chapter 4).

The second contribution comes by showing how and why the new national income accounting approach to public finance was institutionalised after the war. One element of this discussion considers how this was applied in an academic setting as the University of Cambridge sought to develop empirical credentials. For wartime technocrat economists like Keynes and Stone it offered the opportunity to embed a "realistic" economics and further the national income approach. Despite opposition to national income research from some groups within the University, several legacies endure from this institution. The other element of this discussion considers how the British State, more widely, became an advocate of Keynesian national income accounting as a finance budgeting tool in colonial settings. But it also shows, that the national accounts purpose could change in new settings as, in the case of Nigeria, the national accounts became an audit of national and regional resources designed to inform colonial nation-building discussions.

Additionally, new archival insights gathered during research have led to chapter-specific, minor contributions to the literature. Chapter 3 explains there was a relationship between the ideas of political arithmetic in the 1690s and national income thinking in the 1930s, contributing to discussions by Goodacre (2019). Chapter 4 illustrates the influence that a particular strand of thinking had upon empirical economics and how international bodies such as the Rockefeller Foundation supported efforts to change economics. Chapter 5 argues that national income was understood as a tool of public finance by researchers in the 1940s. Chapter 6 provides a history on the emergence of the Cambridge DAE. The DAE is receiving increasing prominence in the history of economic thought,[16] meaning this chapter makes a timely contribution on an underdiscussed moment in the DAE's history. Chapter 7 reframes discussion of the first national accounts of Nigeria in light of an overlooked historical episode which saw the Colonial Office acting as an advocate for

[16] See Shipman (2019).

national income accounting. The chapter also explains the political economic context which led to a regional emphasis on measurement in the Nigerian figures. Combined, these chapters show contextual factors that shaped national accounts thinking and the wider political economy consequences of these changes.

Chapter 3: William Petty in the 1930s - finding new role models in the past to support a change in economic thought, policy and methods

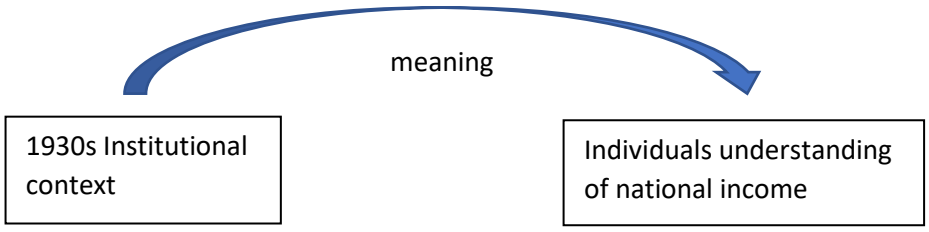
3.1. Introduction and literature gap

3.1.1. The contribution of the chapter to the wider thesis

This chapter acts as a bridge between the opening discussions in Chapters 1 and 2 – that motivated the need to understand the context to national income accounting – and, the other main body chapters of the thesis – which seek to contextualise national income accounting to uncover what it meant when viewed through the eyes of past scholars. In Hodgson's terms we want to understand how the ideas that individuals were using were shaped by wider institutional settings (see Figure 3.1. below). In Skinner's terms we want to understand the meaning that these economists ascribed to their understanding of the past. In particular, by answering "how did 1930s economists engage with past ideas?" the chapter suggests that histories were misconstrued in the 1930s to advance new approaches to economic analysis. By investigating the selective histories coming from the 1930s it suggests that 1930s national income thinking was shaped by more than just the immediate past.

The chapter uses a Hodgson-style approach to consider the way the individuals were shaped in their understanding of national income research by the broader institutional context in which they worked (Figure 3.1).

Figure 3.1. Institutional approach for analysing the 1930s institutional context



To these ends, the chapter analyses how and why national income researchers, and other economists from the 1930s looked back to the works of William Petty. Why did they turn to such an early thinker for inspiration and intellectual foundation for their new conceptions of national income, when the historical, political and economic context of his theories seems, at a first glance, so different from their own times? Moreover, what can we learn about the 1930s environment in which they worked by looking at the narratives they drew from Petty's work?

The approach used to answer these questions is to look at the way figures in the 1930s reinterpreted the past. In many senses the argument that economists used partial-histories of famous figures to advance their work is not unique. Kelly (2019) shows Keynes regularly used representations of

Malthus to support various positions Keynes adopted throughout his life. Famously, Keynes used Malthus to ground his notion of effective demand in opposition to classical economics (Skidelsky, 2004, pp. 462–465), but Keynes also "chose to present very pointed and partial readings of different aspects of Malthus and his legacy across the period from 1914 to 1937" (Kelly, 2019, p. 4). It is therefore clear that representations of historical thinkers helped to inform some 1930s economics debates. This was particularly true of English economics discussions which, unlike American economics, had 'a curious continuity of tradition and ancestor-worship' (Gide and Rist 1948, p. 5). What is suggested here however is that there is a case for understanding why economists in the 1930s were reinterpreting Petty differently from before. In advancing this approach it helps to show that national income thinking was influenced by more than just the immediate past. In order to better understand the origins of national income accounting we therefore need to better understand these broader contextual factors shaping economic thinking.

3.1.2. Chapter outline and literature review

The chapter suggests that for 1930s economists national income research was informed by more than just the immediate past notion of national income. Instead it was linked to a distinctive empirical economics consciously designed to support practical economic management. The chapter proceeds by looking at two Cambridge affiliated economists – Colin Clark[17] and John Maynard Keynes – and their use of William Petty to advance a new practical empirical economics. Rather than produce a historically accurate analysis of his figures, these economists relied on an interpretation, a constructed version of his thought to support their own arguments. The narratives advanced by these thinkers, and others, helped to develop a grand pedigree to their work by emphasising a distant forebear, one that could be portrayed as a powerful economics administrator inspired by science, and scientific rational economic observations. This reappraisal of Petty was advanced in contrast to the tradition of classical political economy and helped to justify the national accounts project as part of a distinctive tradition of applied, empirical economics which was consciously designed to support practical economic management

The chapter advances by contrasting the different emphasis on William Petty between the 1930s and previous generations. It does this in Section 3.2. arguing that Petty was not held in the same regard as other earlier thinkers such as Smith and Ricardo by the neoclassical school, an economic tradition which emphasised deductive economics in relation to inductive economics. In contrast in

[17] Colin Clark, a chemist by training, was a graduate of William Petty's College in Oxford, Brasenose College (Maddison, 2003, p. 8) and one of Richard Stone's favourite lecturers at Cambridge (Stone, 1985). Whilst he was previously noted as a major contributor to national income thinking (Arndt, 1988; Peters, 2001; Studenski, 1958, p. 151) his name has been a point of focus in recent discussions on national income (Coyle, 2015; Lepenies, 2016; Mitra-Kahn, 2011; Tily, 2009).

Section 3.3. economists linked to innovations in national income accounting such as Keynes and Colin Clark used Petty to develop a grand pedigree to a different type of economics. They advanced a triptych representation of Petty: as a major figure of science, as a major figure in economics and as a policy maker. Section 3.4. shows the triptych was used to advance a more inductive, applied form of economics in contrast to the Smith and Ricardo tradition.

The chapter contributes to the wider literature by suggesting that Petty was reinterpreted by economists in the 1930s. The existing literature on the origins of national income focuses on William Petty's contributions to national income development (such as Mitra-Kahn (2011), Vanoli (2005), and Studenski (1958)), but it does not explain how or why William Petty was reappraised during the 1930s. Little mention is made of the use of Petty by figures such as Clark. Authors such as Goodacre (2019) and Castles (2014) have considered Clark's use of Petty, but have not discussed this in reference to Clark's national income accounting work. Lepenies (2016, p. 33) references Clark's use of Petty, but doesn't locate this within broader shifts in attitudes underway at this time. This chapter therefore makes a new contribution to the literature, and, helps to demonstrate that national income thinking was shaped by wider contexts than just the immediate past. Having done so, this opens the space to discuss in greater, detail how international thinking shaped 1930s British thinking national income thought. This is discussed in Chapter 4.

3.2. Differing interpretations of William Petty: the neoclassical portrayal of Petty as an economic statistician

William Petty (1623 to 1687)[18] gained increasing prominence among some 1930s economists seeking to create a grand pedigree for their work. Petty's works were known a generation earlier during the formation of the neoclassical school of the 1900s. As will be shown in subsequent sections a change of sentiment by the 1930s however would see the same 1900s texts used to develop a grand pedigree for a more scientific and applied form of economics. In order to understand how Petty was seen by neoclassical economics, the section starts by considering how texts about Petty shaped thinking on Petty in the 1900s before moving on to explain how Petty was seen in the 1900s.

Understanding what Petty meant, in his own terms, has been a perennial source of difficulty with several recent scholars highlighting that the framing of his work has been distorted after he died.

[18] As this chapter discusses the way William Petty's biography was used during the 1930s this makes an explanation of his background difficult as it may reproduce aspects of his life which were emphasised by prior researchers. That said, most histories describe him as an official who worked in both Cromwellian and Restoration regimes in the administration of Ireland, and who helped to found the Royal Society.

Goodacre (2019, p. 14) for example emphasises that because of compartmentalisation of researchers through the years, and, a tendency to Whig history which presents his work relative to Adam Smith, our understanding of Petty is blinkered. Similarly McCormick (2009) outlines multiple accounts which distort Petty's political arithmetic approach and misrepresent his views. Petty's work was intended as an act of social control (Goodacre, 2019; McCormick, 2009). Petty was not undertaking objective pictures of the economy, instead, Buck (1977, p. 67) notes Petty 'conceived the uses of mathematics in terms of creating order rather than in discovering its immanent principles.' In part the difficulties arise from the limited circulation of his works in his own lifetime. As McCormick (2009, chap. 8) notes posthumous publications of his works by followers of his method misrepresented Petty's political arithmetic as an exercise in linking public finance to the size of the taxable base. As noted by McCormick (2009), Smith was opposed to political arithmetic, notably saying 'I have no great faith in political arithmetic computation' (Smith, 1776, p. 277). Smith's criticism may however have been directing criticism more towards Petty's followers than Petty himself (Smith, 1776, p. 473). These misunderstandings of Petty, were in some part due to the reproduction of only a limited range of his papers.

The communication of Petty's thought underwent a significant change in the 1900s when Charles H. Hull brought together several previously unpublished papers into one easily accessible book. This brought together outputs such as his earliest estimate of national income a pamphlet called Verbum Sapienti and his many works on Political Arithmetic. Prior to this Petty's work was a 'scarce and dear' resource (Bonar, 1900).[19] This Hull (1899a) collection was well received,[20] and later became an influential source for writers in both the 1900s and the 1930s. For example, copies can be seen held in the libraries of Sraffa, Keynes and Marshall in Cambridge.[21,22] Others, such as the historian of economic thought, E.A.J. Johnson emphasised the influence of Hull's scholarship (Johnson 1937).[23] Similarly, Heckscher (1955 [1938]), in a book on Mercantilism, was influenced and informed by the

[19] The British Economic Association had been eager to produce a more publicly available collected volume of Petty's works (Bonar, 1900).
[20] See for example Higgs (1899), Seligman (1899) or Laughlin (1899).
[21] Marshall's copy, held at the Marshall Library of Economics in Cambridge, demonstrates an active interest with Hull's scholarship through private correspondence with Hull which is still stored in the dustjacket of the book.
[22] The enduring influence of Hull's collection can be seen referenced by Deane (1955) in a paper reviewed by Stone. Based upon records from Stone's library he bought a copy in approximately 1983.
[23] Johnson dedicated his work 'to the memory of Charles Henry Hull for his critical edition of the economic writings of Sir William Petty, all students of the history of economic thought are grateful.' Johnson also highlights three other publications, Bevan (1894), Fitzmaurice (1895) and the Marquis of Lansdowne (1927) as examples of other authors who have significantly contributed to the understanding of Petty (Johnson, 1937, p. 338).

Hull collection.[24,25] Access to a broader collection of Petty's thought provided a new light on his thinking (Johnson, 1937, p. 338) which had the potential to portray Petty as a scientist. For example, Hull's edition was introduced with an extended biographical discussion which emphasised Petty's engagement with the natural sciences[26] and the influence of the philosopher Francis Bacon on his thought.[27] Whilst this would become an important narrative in the 1930s, neoclassical economists did not emphasise this element of Petty's thought.

Instead, core economic textbooks from the 1900s (such as John Neville Keynes and, Mary and Alfred Marshall) acknowledged aspects of Petty but not these elements. Often, he would be presented as an economic statistician rather than a generator of economic thought. As Endres (1982, p. 74) highlights Neville Keynes – a prominent Cambridge Economist - made a reference to Petty as the father of economic statistics in his *Scope and Method of Political Economy*. The Neville Keynes reference was however an isolated reference: 'Statistics in this sense may be traced back to the "Political Arithmetick" of Sir William Petty, and other writers of seventeenth and eighteenth centuries' (Keynes, 1904, footnote 215). It is not clear there is any indication that economic statistics from such an early time could be given the same level of prestige as economic theory for Neville Keynes. While acknowledging contemporary efforts to advance statistics can be scientific in nature, from Neville Keynes's twentieth century vantage point the facts which it derived did not necessarily constitute a science. In this sense, the work of Petty was acknowledged as historical fact rather than celebrated by economists.

A similar conclusion – that Petty was a figure to be acknowledged but not lauded during the 1900s - can be reached by looking at Marshall's portrayal of Petty in the Principles of Economics. Petty is invoked far more frequently, in particular in relation to: population estimates (Marshall, 1910, p.

[24] Additional materials released in Petty (1928) drew on the Lansdowne collection of Petty's papers adding further to the 1930s scholarship on Petty. These papers came to influence Hogben (1938). In turn this influenced Clark (1940).

[25] In addition to the works on Petty discussed here active scholarship was underway by Jacob Hollander at Johns Hopkins University, who like C.H.Hull edited two tracts by early thinkers. The first a contemporary of Petty (see Graunt (1939 [1662])) and the second one of Petty's followers (King (1936)). As Gehrke and Kurz (2002) highlight Hollander's wider historical work was well known to Keynes and Sraffa.

[26] See Hull (1899b, pp. xxi–xxii). In addition to emphasising Petty's relationship with the Royal Society, Petty is portrayed as a scientist applying his knowledge to the social sphere (Hull, 1899a, p. lxiv), a person of experiment (Hull, 1899a, p. lxv), and a person who established statistical investigation (*ibid*.). With a scientific methodology clearly articulated, Hull turns to his subject matter Petty.

[27] Bacon, the philosopher accredited with refining the scientific method and is argued by Hull (1899a, p. lxii) to be the biggest influence upon Petty. Elsewhere Hull drew attention to Petty's use of the Baconian phrase number, weight and measure as evidence of the Baconian influences on political arithmetic (Hull, 1900, p. 314).

106),[28] expenditure statistics (Marshall, 1910, footnote 79), and, statements regarding rents (Marshall, 1910, footnote 50). To some degree, Marshall also acknowledged Petty's economic thinking regarding the value of labour (Marshall, 1910, footnote 50) and in relation to the value of the cost of production (Marshall, 1910, footnote 41) but in both cases the discussion is relegated to footnotes. Petty's estimation of national income is also used as a way of attempting to understand how the English economy had changed over time (Marshall, 1910, p. 137). Despite these repeated but limited references to Petty, Marshall (1910, p. 441) downplays the contributions of Petty's statistical contributions by arguing that later periods (the eighteenth and nineteenth centuries) were the true starting point of statistical studies.[29] Across these examples, unlike the 1930s generation, no reference is made to Petty as a substantive contributor to economic methodology, instead he was at times downgraded to an economic statistician.[30]

From the vantage point of the 1900s economics an "economic statistician" labelling may have had negative connotations. At the time there was a significant discussion underway on the role of inductive reasoning and economic data in economic thought. Marshall advanced a nuanced position in *Principles of Economics* which allowed a role for both deductive and inductive economics,[31] yet in some areas of economics, deductivism was preferred.[32] Marshall (1910, p. 616) for example argued 'Adam Smith saw clearly that while economic science must be based on a study of facts, that the facts are so complex, that they generally can teach nothing directly.' Data could be used, like Adam Smith, as a rhetorical flourish to help the reader feel abstract principles were relevant to the real world.

In the pre-1930 period Cambridge economics stalwarts insisted that deductive reasoning played an essential role in the development of economic thought. This question over the role of inductive

[28] Note the 1910 edition of the Principles of Economics has been selected due to restricted access to books while revising the thesis.

[29] 'During all this time the study of economic facts was not neglected in England. The statistical studies of Petty, Arthur Young, Ede, and others were ably continued by Took, McCullock and Porter. And thought it may be true that an undue prominence is given in their writings to those facts which were of direct interest to merchants and other capitalists.' Marshall (1910, p.441.).

[30] This narrative of Petty as a figure limited to the study of statistics was one which endured in the 1930s notably with references in American papers by Willcox (1938).

[31] 'Induction, aided by analysis and deduction, brings together appropriate classes of facts, arranges them, analyses them and infers from them general statements or laws. Then for a while deduction plays the chief rôle: it brings some of these generalizations into association with one another, works from them tentatively to new and broader generalizations or laws and then calls on induction again to do the main share of the work in collecting, sifting and arranging these facts so as to test and "verify" the new law' (Marshall, 1910, p. 457).

[32] Marshall (1910, p. 441) identifies trade and money are areas which are well disposed to solely deductive reasoning. Elsewhere, drawing on Mill, Marshall argues that economics is a subject 'of mechanics rather than of chemistry' meaning it was advantageous to analyse it using deductive reasoning (Marshall, 1910, pp. 448–9). Marshall did not solely advocate abstraction highlighting that even in mechanics engagement with the real world was needed to aid calculation.

knowledge based on economic statistics had been at the forefront of a controversy in Cambridge between the history department and the nascent Faculty of Economics and Politics. [33] After the election of Marshall to the chair of political economy in Cambridge the historian Cunningham was concerned as he viewed Marshall's work as anti-historic (Maloney, 1976, p. 441). Cunningham was extremely critical of Marshall's concept of "science" by wanting to analyse Ricardo's law of rent (Maloney, 1976, p. 441). As Maloney explains the two differed on the nature of how to use empirical generalisations; for Marshall they could be used to verify theory, for Cunningham this approach distorted the past into a theoretical straightjacket (Maloney, 1976, p. 443). Economists at this time were largely antithetic to data, whilst economic historians were arguing for more data in economics (Maloney, 1976, p. 449).[34] The debate was revisited during the 1920s when Clapham (1922) mocked the use of abstract terms as the sole basis for policy making.[35] This was strongly rebutted by Pigou (1922, p. 460) who argued that from the days of Adam Smith the aim of economics had been to 'disentangle and analyse the causes by which the values of different things are determined.' The discussion was only later resolved through the work of Pierro Sraffa who demonstrated the role of both forms of knowledge (Vaggi and Groenewegen, 2006, chap. 28).

As will be argued in the next section, a new appreciation of the works of Petty emerged during the 1930s. Whilst the works of William Petty were known to earlier generations of economists, and they gained access to new insights into Petty through the works of Hull, there was less of an effort to draw his works into their economic pedigree. Certainly, there was limited purpose for earlier economists such as Marshall in seeking to appeal to 'scientific' narratives around him. In part this may be understood to have been influenced by a greater emphasis on the role of deductive economics in the works which helped to underplay the role of data in arriving at new economic knowledge. Data was something which could be used to illustrate the findings of economic science but was not necessarily an end in itself. Instead an economic science was deemed necessary to advance along Smithian and Ricardian lines. The next section, however, shows a reappraisal of Petty's works during the 1930s as economists such as Colin Clark sought to establish a long pedigree to their more inductive research approach.

[33] I am grateful to Professor Martin Daunton for drawing my attention to this controversy.
[34] For further details see (Cunningham, 1892a, 1892b; Marshall, 1892).
[35] Clapham (1922, p. 306) for example queried what use notions like "the law of diminishing returns" could be for the real world if they didn't apply to mines for example at a time when coal was a staple for all industry.

3.3. In contrast, the 1930s national accountants reinterpreted Petty as an emblem for new economic methodology, thought and policy

1930s economists, linked to innovations in national accounting, developed a pedigree for their work looking back to William Petty. The 1930s found in Petty a figure that they could develop a contrasting pedigree that could support new approaches in economics. The authors advanced a triptych representation of Petty: as a major figure of science, as a major figure in economics and as a policy maker. Researchers ultimately used Petty as a rhetorical figure that could be used to advance a different concept of economics.[36]

3.3.1. Economic methodology: Petty the scientist

Several narratives in the 1930s drew on the same underlying historical records about Petty's scientific contributions as those seen in Hull's collection of Petty's work in the 1900s. Both Hogben (1938), and Clark (1940), for example used Hull's 1900 collection of Petty. In contrast to Hull, however, Clark and Hogben used Petty's background to discuss the nature of the economics discipline. Hogben (1938) for example argued that Petty's economic writings were better *because* Petty was a scientist. In this sense, as shall be shown below, Petty's scientific background became rhetorically important to the 1930s.

In his *Conditions of Economic Progress*,[37] Clark presented Petty as part of a broader scientific movement in the seventeenth century: 'economics was started on the right lines by Gregory King and William Petty at the time of that astonishing flowering of the English scientific spirit in the later seventeenth century' (Clark, 1940, p. ix). This passage is argued by Castles (2014, p. 274) to be a self-projection of what good economics should be: Clark felt that economics should have a stronger scientific basis. Importantly it also located the Political Arithmetic followed by King and Petty within a scientific tradition, and particularly within a Baconian one.

Clark's use of a historic character like Petty is at slightly at odds with his early research agenda, which largely consisted of the generation of data series which could test economic theories. A former chemist turned economist, Clark's typical enquiries were not deep interrogations of historical

[36] This section does not pass comment on the appropriateness of the 1930s call for economic induction. Instead it identifies the discussions on the potential contribution of interpretations of Petty's thinking to economic thought as a contextual factor shaping the meaning of national accounting studies. As highlighted to me by Professor Simon Schaffer, Petty is a pre-Scottish Enlightenment figure who was not aware of Hume's guillotine. Seemingly unaware of the difficulties of deriving "ought" statements from "is" statements, Petty advances observation-based policy prescriptions. Petty works from a more nominalist approach where numbers are designed to structure reality. Thinkers from the 1930s appear to have not noticed the conflation between observation and prescription in Petty's work.

[37] Colin Clark started work on Conditions in 1935 in Cambridge prior to his departure for Australia (Clark, 1940, p. x).

economics but an attempt to use data to evaluate economic performance across time and space. For example, Clark (1932) drew across multiple data series to generate the data which will explain real income per capita. The prices, money and savings data thus generated could then be used to empirically contrast Keynes's variables and insights from the *Treatise on Money* against the arguments of the Cowles Commission.[38] In the case of Clark (1937), data series were generated and explained at length, to construct an estimation of the rate of economic progress. Clark appears to not have been motivated by a search for growth but by efforts to understand whether the Great Depression had reduced income levels to historic lows. Clark used historic data series to identify historic income levels and used these figures to test differing theories of capital. Clark (1940) copied this – data generation to test economic theories – approach by generating an international data set which can be used to verify or falsify theoretical insights.

Clark's attempt to scientifically test theories against data unites his major early books. It is perhaps one reason why he drew so heavily upon Petty and sought to portray him as a scientist (Clark 1940). In a parallel to Petty,[39] Clark portrays his own work as an act of Baconian science by quoting Bacon on the title page of *Conditions of Economic Progress* '"It cannot be that axioms established by argumentation can suffice for the discovery of new works, for the subtilty of Nature exceedeth many times over the subtilty of argument. BACON *Novum Organon*"'(Clark 1940).

Clark's foray into discussions on the history of economic though were largely confined to his use of Petty in *Conditions of Economic Progress*.[40] Yet in it, he portrays Petty as a major figure of science. In one specific instance, Clark tests the universality of Petty's observations against new data series.[41] Clark's analysis was informed not by Petty's theoretically derived deductive abstractions but instead by Petty's generalisations informed by scant data available at the time (Clark, 1940, chap. 5). Clark's so-called "Petty's Law" observed that economic development is related to the movement of people from agriculture to manufacturing industries, and from the manufacturing industries to the services industries (Clark, 1940, p. 177). Yet it is not just the testing of a theory that is of significance here. Clark's also chose to elevate Petty's generalised observation to the level of an empirical law. The

[38] The Cowles Commission was founded in 1932 in response to the Great Crash and popularised the use of mathematics in economics. For further details see Dimand (2019).
[39] Some authors on Petty highlight the Baconian aspect of Petty's thinking including Hogben (1938, pp. 13–14), Seager (1900) and Hull (1899b). McCormick however highlights that this narrative of Petty is a distortion of Petty which was started by Davenant but endured through the ages.
[40] In Clark (1932) he furthered national income studies beyond Bowley, Stamp and Flux, and chose to present the figures using definitions from Keynes's *Treatise on Money*. In Clark (1937) he drew upon some figures by Gregory King labelling him the father of economic statistics. In Clark (1942) there were relatively few references to historical economics.
[41] The implications of Clark's analysis for development thinking is discussed in detail by Goodacre (2019).

framing of Petty's work as "Petty's Law" is suggestive of the high esteem that the 1930s Colin Clark had for Petty and Petty's work as an act of science.

3.3.2. Economic thought: Petty the economist

The 1930s saw a reappraisal of Petty's contributions to economics. Whilst for Keynes, Malthus may have been a more useful thinker to draw on, Keynes also emphasised the role of Petty in economic thought. In private Keynes articulated a narrative that Petty was a highly significant figure for economists. This can be seen inscribed in a copy of Petty's Political Arithmetic that Keynes gave as a wedding present to William Beveridge:[42]

> 'To Sir William Beveridge this work by the founder of his (and my) craft. On the occasion of his contriving social security for the rest of us and not forgetting himself. Keynes 15 Dec.r 1942.' (De Vivo et al., 2014, p. 458)

Whilst this dedication was written in 1942, it demonstrates Keynes' enduring interest in Petty, and, an expectation that Beveridge would agree with the sentiment that Petty was the founder of economics.[43] Whether the "craft" Keynes references is economics or the empirical and statistical type of economics that Beveridge was pursuing is beside the point. This is a stronger articulation of Petty's contribution as an illustrious historic figure that contrasts with the attitude articulated by Keynes's father only a generation before. It also contrasts with Marshall who placed a stronger emphasis as an economic *statistician*: a technician, rather than a thinker.

Keynes's *General Theory* provides more evidence of Keynes's appreciation of Petty's contribution to economics. In Chapter 23, Keynes tests the generality of his new theory against prior examples of economic thinking as a figure who could be used to oppose the classics. Drawing heavily on the recently published text by Heckscher (Keynes, 2012a [1936], pp.340-358) he classifies Petty as a Mercantilist before testing a particular account of Petty's argument that there is no self-adjusting rate of interest (Keynes, 2012a [1936] p.341). By treating Petty this way, Keynes presents Petty as a precursor authority figure alongside Smith and others such as Munn, Malynes and Locke, whose economic thought should be engaged with, revered and challenged.

This is perhaps not surprising given how Petty was used in economic discussions during the 1930s. Keynes appealed to Petty as the earliest point of intellectual lineage for the foundation of the

[42] Held in the Sraffa Collection of Trinity College Cambridge.

[43] This chapter has not focused on Beveridge as a figure, however in his critique of the Vienna School and the London School Hogben (1938, p. 45) argued that 'Beveridge subscribed to Petty's plea for the association of naturalistic research with social enquiries.'

"Cambridge" Quantity Equation (Keynes, 2012b [1930], p.205).[44] Keynes argued that this approach was regularly used in lectures by Marshall and Pigou but that it had an intellectual lineage which could be traced back through the works of 'Petty, Locke, Cantillon and Adam Smith' (Keynes, 2012b [1930], p.205). Quoting Marshall, Keynes argued 'Petty thought that the "money sufficient" for the nation is "so much as pay half a year's rent for all the lands of England and a quarter's rent of the House for a week's expense of all the people, and about a quarter of all the exported commodities"' (Keynes, 2012b [1930] p.6 footnote). Similarly, as private correspondence between Dennis Robertson[45] and Keynes shows, it is apparent that William Petty was a figure whose works were known and identified as an early economics *theorist* by people in the 1930s. Dennis Robertson writing to Keynes on 21 June 1932 invoked Petty when providing thoughts on the General Theory: 'The essence of the matter is that he is hoarding who is contributing to decreasing "the number of times a representative piece of money becomes income"…I am simply trying to express that very definite and clear concept into the Petty-Marshall language of proportion"' (Keynes, 2012c, p. 301).[46]

Evidently, the 1930s Cambridge economists, educated through a Marshallian tradition of economics, were developing new accounts of the contribution of Petty to the economics discipline. Petty's contributions to early economic thinking on income were also an important backdrop to 1930s conversations on the monetary flow implications of government spending. For example Keynes presents Petty as an early theorist on the circulation of money in *The Treatise on Money* (2012d [1930], p.22 footnote). Whilst Petty is invoked by Keynes less frequently than Malthus,[47] he appreciated Petty's works, and presented Petty as the founder of economics. Whilst other figures such as Malthus may have been more important in justifying Keynes's notion of effective demand, Petty was one of a range of alternative economic figures that Keynes drew on, such as Munn, Malynes and Locke, as alternative to escape the economics of Ricardo and Smith.

3.3.3. Economic policy: Petty's economics as the basis of policy

In the work of Keynes in the 1930s, Petty was also portrayed as a figure who may have accidentally stumbled on economic policy insights and as a practitioner from a time period that spoke to the

[44] The Quantity Equation adopts a premise that people save a fraction of the balance of their wealth in currency. The Quantity Equation can then be used to analyse the implications of this.
[45] For more details on Dennis Robertson see Chapter 4.
[46] The reference relates to Petty's Quantulumcumque which was a method for estimating the total amount stock in the economy. For further details see Giffen (1889, pp. 82–83).
[47] See Kelly (2019) for further details on Keynes's sustained use of Malthus. There is also a detailed literature on the way Keynes 'discovered' the principle of effective demand in the works of Malthus for further details see Skidelsky (2004).

1930s. From this 1930s anachronistic argumentation we can see a broader attempt to use Petty as a justification for new types of policy.

Keynes's treatment of Petty is consistent with his thinking more broadly on economists from the distant past. As he argued in the *General Theory* 'The early pioneers of economic thinking may have hit upon their maxims of practical wisdom without having had much cognisance of the underlying theoretical grounds' (Keynes, 2012a [1936], p.340). Keynes's decision to treat Petty like a mercantilist then enables him to use Petty to support his own arguments on government spending. Quoting Petty, he argues that 'entertainments, magnificent shews, triumphal arches, etc.' could be justified because public expenditure would circulate into the hands of private individuals (Keynes, 2012a [1936], p.359). This is then later used as a contrast to the Gladstonian view that argued that the state couldn't afford to spend beyond its means (Keynes, 2012a [1936], p.362).[48] In doing this Keynes has replicated the methodology he used with Malthus, whereby he argued that an observation of how the economy operates in the 1930s could be grounded in the notion of effective demand 'discovered by Malthus.'

Keynes's portrayal of Petty, and the other "mercantilists" that he labelled, was severely critiqued by Heckscher, the author of the volume he drew on for his insights. Heckscher published a second edition in 1956, adding new material in the form of a chapter on 'Mr Keynes and Mercantilism.' In it Heckscher demonstrates that Keynes's use of his first edition misconstrued the past by presenting it from the perspective of the present. For example, he accused Keynes of drawing parallels on the hoarding of funds but this had an extremely different meaning in the 1690s from the 1930s because it was a different economic system (Berrill, 1957). Accurate or not, it remains the case that in a limited number of cases Keynes used Petty like other historical figures as a justification for his own 1930s thinking.

The appeal of using Petty in particular to support policy claims may be influenced by the wide consensus on him as a person of practicality. Both in contemporary texts from the 1930s such as Hogben and in earlier texts like Hull, Petty was presented as a practitioner. Hull (1899b) the author of the key textbook of the day on Petty, portrayed Petty as a figure characterised by his long life of contributions to government.[49] Elsewhere, Hull (1900, pp. 311–12) noted that Petty's enquiries were 'subordinated to a political purpose.' The politicisation of economic measurement was a natural extension for founder of political arithmetic who drew on his time as a colonial administrator in

[48] This discussion on Petty as a supporter of government spending is then discussed later in the Stone (1978) British Academy lecture *Keynes, Political Arithmetic and Econometrics*.
[49] Though as Bonar (1900) and Selligman (1899) note Hull's account drew heavily on the account provided by Fitzmaurice.

Ireland (Hull, 1900, pp. 311–312). But, in contrast, by the 1930s these historical accounts were accentuated. Hogben (1938, p. 23) emphasises a heroic image of Petty as of 'a pioneer and man of affairs.' For him, Petty was a figure whose zest for real life meant that he was a model for applied economic thinking (Hogben, 1938).

In sum, we see 1930s national accounting economists had developed a historical narrative which could further justify the new type of economics they wanted to advance. Petty found a new relevance for the 1930s: for Clark, Petty was a figure to support a greater use of economic statistics, for Keynes, Petty was a figure who could be used to inform policy. For both, a distant forbear of economic thinking that could help to justify a different type of economic thinking. The final section of this chapter now moves to consider why there was a need to appeal to this authority, and why deviate from the more traditional narrative forged by Adam Smith which critiqued mercantilism.

3.4. William Petty, advancing national accounts as a 1930s poster boy for an empirical, interventionist economics

This section argues that the Petty triptych helped to advance the national account projects within a distinctive tradition of applied, empirical economics consciously designed to support practical economic management. By examining 1930s accounts of Petty, and the wider scholarly reception to new publications on Petty such as Heckscher (1955 [1935]) and Johnson (1937), this section shows that the growing attention to Petty was linked to the wider trend of using mercantilist thought in rebutting Adam Smith and *laissez-faire* economics. Thus, there were efforts to overturn the economic consensus by appealing to an earlier loosely defined notion of economic science. This new "scientific" economics could help to redefine both economics and policy.

One of the clearest articulations of this view comes from the national income researcher Colin Clark. Clark provides a clear explanation why Petty should be adopted as a key economic thinker: to redirect the field of economics away from the influence of laissez-faire. By returning to Petty, he wanted to replace existing 'heroes' with other, more useful thinkers. Whereas economics had been 'started on the right lines by Gregory King and Sir William Petty…the slow growing science was twisted out of shape by Adam Smith and Ricardo, the argumentative Scot and the "stupid bothering stockbroker."… In the field of economics, too, ….I think we need to return to the tradition of these two brilliant pioneers [Petty and King], from whom even now we have much to learn.' (Clark, 1940,

p. x).'[50] In making this argument Clark was actively arguing to push beyond conventional wisdom in economics and Petty and Gregory King could be used as rhetorical buttresses for this argument. He did so actively drawing parallels to Keynes's efforts to use Malthus to bypass a Ricardian consensus on trade (Clark, 1940, p. x).

Clark was symptomatic of wider efforts to reform economics in the light of the turbulent 1930s. Much conventional wisdom had been upended by circumstances such as, the collapse of the gold standard, World War I and the Great Depression. These events critically challenged laissez-faire doctrine and shifted focus away from the thinking of Ricardo (Goswami, 2018, pp. 23, 28–9). Goswami argues thinkers such as Keynes were seeking new paths to help administer an economic landscape that focused less on the international and more on the national (Goswami, 2018, p. 18). The notion of interventionism was introduced as a means to stabilise the ravages of the market and found a new social capitalism (Goswami, 2018, p. 23). Goswami (2018, p. 26) argues these changes in economic thought, and shifts towards a more nation-centric way of thinking, were linked to the broader crisis of capitalism which had gripped society and challenged 'a Britain-centred world economy.'

In view of the profound changes in the British economy at the time, the rhetorical power of selective historical accounts offered liberation from the shackles of the main economic theories of the time. Such arguments gain support from Grampp (1952) who notes parallels were regularly being drawn between the interventionist policies of the 1930s and the mercantilist school of economics. For example, Keynes argued that laissez-faire doctrine had a significant framing effect upon the economics discipline (Keynes, 2012a [1936], p.339). Instead the distant past could offer new alternative insights into the management of the state; Keynes (2012a [1936], p.340) argued:

> 'Nevertheless, as a contribution to statecraft, which is concerned with the economic system as a whole and with securing optimum employment of the system's entire resources, the methods of the early pioneers of economic thinking in the sixteenth and seventeenth centuries may have attained to fragments of practical wisdom which the unrealistic abstractions of Ricardo first forgot and then obliterated.'

Clark and Keynes were not alone in pushing beyond Smith and Ricardo to earlier thinkers like Petty. In the United States, E.A.J. Johnson (1937) *Predecessors of Adam Smith*, sought to justify the new

[50] Though the work is published in 1940 it was started in 1935 therefore prior to Clark's departure to Australia and providing some insight into the ongoing discussions into Petty underway in Cambridge. For more on Clark's early life see Peters (2001) or Arndt (1988).

spirit of interventionism by developing new historical accounts. Johnson argued that economics did not start with Adam Smith, and nor should economists fully subscribe to Adam Smith's critique of the Mercantile system. Johnson (1937, p. 4) argued the "mercantilist" label is vague and "a great many persons with widely differing training, interests, and prejudices published books and pamphlets on economic topic before 1776.' In short, the fertile grounds of the pre-Smithian environment could offer insights into the changing political economy landscape of the 1930s.

The 1930s was recognised as a time where many thinkers were seeking to revise economic theory and move it onto a new footing (Donaldson, 1939). As the Cambridge economist Robertson (1950, pp. 11–12) later noted 'even before the Great Depression, even before the First World War, the problems of the age called for a certain shift of emphasis in the presentation of economic doctrine.' By appealing to the distant past, to Petty and Mercantilism, a new generation of scholars were actively trying to forge new economic arguments which pushed beyond the neoclassical conventional wisdom of the day – seen in Marshall's support for Smith and Ricardo.[51] The theme of appealing to the past to better escape the present is also present in Viner (1935, p. 100) an *Economic History Review* article on Heckscher which argued 'much of what the author has to say has immediate relevance for an understanding of present-day currents of thought and of the problems which result from such thinking.' A similar view is reflected in Halley (1936, p. 351) an *Economic Quarterly Review* article which argued that Heckscher's Mercantilism was relevant to 'present-day problems and currents of thought.' The potential of Mercantilism to provide new avenues of economic enquiry served 'both as a foundation and as an historical parallel, to render more profound our insight into the economic problems of the present and future.' The Johnson (1936, p. 307) review of Heckscher suggested that the reason for this was that the Mercantilist period offered 'a vantage point from which to appraise the frantic efforts now being made to mold new economic policy which will replace the crumbling ruins of laissez-faire.'

An alternative approach favoured by some economists was an appeal to a greater use of inductivism as a more *scientific* way of advancing economics. For example in their support for Petty both Hogben (1938) and Clark (1940) argued that there was a need to follow a different type of method: instead of using abstract reasoning to identify relationships which could be tested empirically, one should undertake observations from which generalisations can be arrived at. The Marshallian synthesis brought the two accounts together, but others such as the Vienna Circle and the London School were more strongly emphasising deduction (Hogben, 1938).

[51] See section 3.2. above.

The British emphasis on deductive research alone was critiqued by Hogben as being unscientific. The account of the scientific method forwarded by Hogben, in particular, is one where "applied research" and "research" were seen as mutually reinforcing – 'the pure scientist knows that he has everything to gain from the encouragement of applied research' (Hogben, 1938, p. 28). Hogben, instead, appealed to the training approach for economists adopted during Petty's day. Petty is held up as a student of current affairs who 'had the first desideratum of a genuine man of science – the itch to discover things for himself' (Hogben, 1938, p. 23). This more applied engagement with social phenomena differed significantly from the 1930s attitudes of professors of British economics, who, Hogben disparagingly noted, focused on metaphysical research interests (Hogben, 1938, p. 20). In contrast, American economists were presented more favourably as applied economists who were researching current affairs (Hogben, 1938, p. 20). Hogben's concept of science, as a process derived from observation and applicable in reality, is repeatedly emphasised as an important feature missing from British economics (Hogben, 1938, pp. 20, 23, 27–29).

Petty's scientific pedigree offered important historical precedence for those seeking new approaches to economics during the 1930s. In addition to being a broad and deep thinker, argued by some such as Johnson (1937, p. 93), to be comparable to Galileo or Bacon, Petty's method was also deemed to be scientific. Petty's mind was characterised as 'one of science, of induction, of experiment' which brought 'to the study of economic questions … a scientific insight and an inductive approach that were essentially new' (Johnson, 1937, p. 93). Petty's sustained contributions to the founding of the Royal Society also gave him a credibility which could help to counteract the dominant economic narrative in the 1930s.

In conclusion, economists in the 1930s could use Petty as a basis to justify new economic methodologies. This protean thinker was used in opposition to conventional economic approaches which had developed a historical pedigree back to Smith and Ricardo. In their place a historical figure was suggested that seemingly offered new perspectives on economic thought, methodology and policy which could be used to reform the economics discipline. This wider debate on the nature of the economics discipline influenced thinking on national income accounting and helped it to develop a pedigree of empirical thinking which could both inform observation of, and intervention in, the economy.

3.5. Conclusion

This chapter started by asking how did 1930s economists view the past? Using a history in economics approach the case was advanced that 1930s national income was shaped by more than the

immediate past. The chapter suggested that in addition that there was some limited engagement with the works of William Petty as shown by some economists linked to national income enquiries such as Clark and Keynes. For these and other authors, a long pedigree narrative was created which used Petty to advance a new type of economics. This narrative could rhetorically help to overturn neoclassical conventions and could claim economics to be an empirical, policy-oriented, "scientific" discipline. By defining Petty and his approach in this manner, these economists suggestively linked their work to this new type of economic thinking.

Whilst the level of engagement with Petty's work was less for Keynes than say Malthus, the way he was invoked, shows researchers linked to national accounts developed an intellectual lineage which could be used rhetorically to support their work. The significance of this interpretation is twofold. Firstly, it provides some insight into the way the empirical estimates of national income were in a sense seen as being in contrast to neoclassical economics. National income in this sense may have been linked to a deeper questioning about the nature of economics and the economics profession. The 1930s Pettyian pedigree could be used to support questions about economic methodology, economic thought and economic policy. These questions may have in part been shaped by the considerable changes underway in the wider 1930s economy.

Secondly, this chapter has added to the wider thesis argument by suggesting that the notion of national income may have been influenced by interpretations of the past. These interpretations came from a significantly earlier time period and, in part, reflected the contemporary 1930s problems facing the economics discipline. Therefore, we can see that the way national income queries were understood may have been shaped by thinking beyond the immediate past. This conclusion matters for the wider thesis as it opens up the potential to discuss alternative contextual factors which may have shaped the national income queries and national income accounting queries that emerged in the 1930s-1950s. Having established the need to contextualise more broadly in this chapter, Chapter 4 considers the impact of international institutional contexts upon national income enquiries. By considering this international institutional dimension, we see that the empirical, policy-oriented and "scientific" themes discussed in this chapter were patronised by international bodies under the banner of a "realistic" research agenda. This "realistic" research agenda led to an increasing literacy and legitimacy in economic statistics which in part, as we will see in Chapter 5, enabled the emergence of national income accounting.

Chapter 4: Realistic economics – British norms of empirical research influenced by international institutions

4.1. Introduction

4.1.1. Locating the chapter argument within the wider thesis

The last chapter advanced the case that 1930s national income thinking was influenced by more than just the immediate past. Chapter 4 extends this discussion by asking "how were 1930s British economists engaging with international ideas?". In response the chapter looks at the way international institutions shaped national income research in the 1930s and how this created an amenable environment for national income accounting in the 1940s. It does this by performing a Hodgson-type institutional analysis of international institutions to examine the way they provided the support to a new empirical approach to economics. In so doing the chapter demonstrates that an empirical zeitgeist of the 1930s - termed "realistic" economics - shaped and was supported by international bodies. This support helped to change the production of economic statistics creating an amenable environment for national income studies. In turn, this new empirical economics may have helped to legitimise the adoption of new national income accounts during the 1940s. Whilst Tily (2009, p. 356) supports the claim that econometrics 'may have been a critical factor in the *official* endorsement of National Income Accounting in the U.K.' this chapter extends this argument further by suggesting that a broader empirical mood in the 1930s, including econometrics, may have done this. The chapter outlines one aspect of the contextual environment which enabled the emergence of national income accounting seen in Chapter 5.

4.1.2. Literature gap

The 1930s is recognised as a time of innovation in income studies in Britain. Tily (2009, pp. 343-7) shows that national income in Britain advanced through a series of estimates by researchers such as Bowley Flux, Stamp and Colin Clark. Yet in the British context, development of national income estimates was also closely related to issues with the availability of statistics. Suzuki (2003, p. 15) gained valuable insights into this from an interview with Cairncross in 1997. In it Cairncross explained that despite a near flood of official statistics underway prior to 1939, trade and employment statistics particularly '"were not put together, added up, adapted for use, intended for use and published so as to invite use."' Suzuki (2003, p. 15) also notes that prior to the 1940s this research was undertaken by individuals.

The 1930s were also a period of significant national income research in many countries internationally. Often however, the literature focuses on national income research from specific

countries e.g. Britain, USA, Germany, Norway.[52] Some accounts have drawn attention to the remarkable simultaneous emergence of these measures internationally (Studenski, 1958). The simultaneity of this emergence of new national income research matters because it established the research centres and research agendas which would aid international standardisation after World War II. Despite this, few histories of national income accounts narratives consider how national income thinking was influenced across international borders during the interwar period.

One school of thought attributes aspects of this simultaneous emergence to wider contextual factors impacting all countries. One major change was the emergence of new statistics and new attitudes towards economic statistics. Tooze (2001) provides a detailed account of the German institutional environment showing how the legacies of poor administration in World War I, and the Great Depression, led to the political will to reform German Statistics. In a US context Palmer (1966, p. 31) highlights the Great Depression was a motivating factor for the emergence of new institutes[53] that went on to measure new economic statistics in the 1930s. As Backhouse (2017, p. 24) notes, these bodies greatly supported the development of economic statistics. This chapter concurs with the arguments that both World War I and the Great Depression were events impacting this moment. It also argues that non-state actors such as the Rockefeller Foundation significantly impacted the way empirical economics developed by financing new economic statistics institutes. Whilst some authors have noted the impact this funding had on European economics (Craver, 1986), and its impact on economic research in British universities (Backhouse, 2010, p. 46), there remains further scope to understand the Foundation's motives for doing this.

Notable in the literature from this time is also an increase in macro-level empirical economic enquiries. Research centres emerged internationally which aimed to use quantitative approaches to better understand the economy and inform theory through econometric research (Bjerkholt, 1995). Other centres followed business cycle research (Morgan, 1990; Stapleford, 2017; Tinbergen, 1940). Some pursued new national economic barometer work bodies (Cord, 2017). Hirschmann (2016, p. 24) argues that unemployment, business cycles and inflation were widespread research topics during the 1920s, which later came to impact macroeconomic thinking. Business cycle research had existed prior to this period, as Hirschmann (2016, p. 70) notes in works of Wesley Mitchell (1913), an emphasis was placed on the national money economy. Hirschmann (2016, p. 71) also noted the Harvard Economic Service, the Index Number Institute and other economic forecasters as informing business opinion on general economic conditions. While as a collective body they failed to predict

[52] See Chapter 1.
[53] Such as such as the Division of Economic Research in the Department of Commerce, the Brookings Institute, the National Bureau of Economic Research.

the Great Crash (Hirschman, 2016, p. 75) they did produce volumes of economic data which increased general literacy on the macroeconomy.

Often the literature focuses on the support of Rockefeller Foundation funding for business cycle work. Yet business cycle bodies such as the NBER expanded to examine national income (Rutherford and Desroches, 2008, p.31). In this sense, the wide literacy of business cycle approaches may have helped the rise of national income by the time of the 1940s. The literature can be further developed by noting the wider empirical spirit at this time. The chapter adds to this by arguing 1930s economists held the view that a more "realistic" approach to economics would result in a better understanding of the economy which would improve policy making.

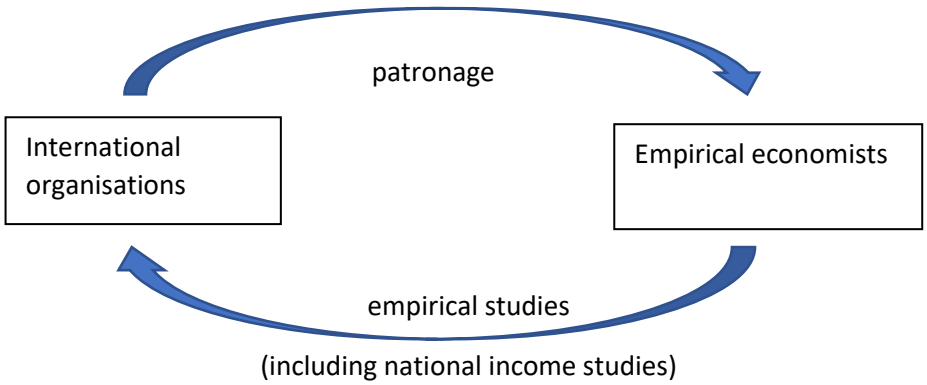
The chapter does this by drawing on literature relating to the empirical work of Cambridge linked bodies (Cord, 2017), the work of Colin Clark (Tribe, 2005) and Rockefeller Foundation-funded bodies in the UK such as the NIESR, the University of Manchester Economics Research Section and the University of Oxford Institute of Statistics (Backhouse, 2010, p. 46; Young and Lee, 1993, chap. 5). It also focuses on institutions working across national borders which impacted this empirical spirit such as the League of Nations (Clavin, 2013) and the Rockefeller Foundation (Craver, 1986; Palmer, 1966; Seim, 2013).

This chapter contributes to the wider thesis by showing the institutional environment in which British national income accounts were emerging. It helps to show the purposes it met and the "realistic" meaning that was ascribed to economic statistics outputs at this time. They were seen as an important tool of government, they were not simply an abstract way of measuring "growth".

4.1.3. Chapter outline

Chapter 4 performs a Hodgson institutional analysis of the 1930s institutional context which supported an empirical attitude that was amenable to national income research. It does so by examining the institutions which shaped the intellectual climate in which new national income estimates were being produced. International organisations such as the Rockefeller Foundation and the League of Nations were keen to engage with empirical data, and did so through an explicit move to provide support for empirical economists. The research centres generated in the course of this support provided the base from which economists could launch new empirical studies, among which, National Income featured prominently (Figure 4.1.).

Figure 4.1. An institutional approach for analysing the influence of international organisations



The chapter adopts a similar contextualising approach to Tooze (2001) by locating changes in economic thinking within the broader institutional settings in which this new empirical thinking emerged. Whilst Tooze (1998) highlights there was an international dimension to these changes, which was in part fuelled by the League of Nations, Tooze does not explore the influence this had upon Britain. In contrast to Tooze, the chapter analyses how international institutions such as the League of Nations and Rockefeller Foundation shaped this empirical thinking. The chapter does this by tracing their influence upon British institutions and researchers. In so doing it explains that national income enquiries were influenced by broader support for empirical economics.

After defining "realistic" economics, the chapter argument progresses in Section 4.2 by describing how a campaign for realistic economic data informed the drive to reform economic statistics in Britain. The new institutions that resulted, in turn, supported new empirical research and national income studies. This mattered because poor quality data had been a hindrance to national income researchers such as Colin Clark. Efforts to reform economic measurement gained support from international bodies. Section 4.3 explores the international networks of researchers and funders who looked to strengthen empirical, realistic economics. The last section, 4.4, traces this thinking to various academic bodies in Britain including the Faculty of Economics and Politics at the University of Cambridge. This canon of realistic research came to inform interwar changes to economic thinking on national income estimation. The role that this new "realistic" economics played in wartime economic administration is discussed in Chapter 5.

4.1.4. 'Realistic' economics was a 1930s term used by advocates for empirical data

The chapter adopts the term "realistic" economics because it was a term commonly used by 1930s economists and funders alike to define their actions. By preserving the context in which it was used we can better understand what it meant to economists during the 1930s.

The closest articulation of realistic economics comes from a publication in the news section of the multidisciplinary science journal *Nature* in 1938. In it a broad notion of realistic *social studies* was advocated. As with other 1930s deployments of the term "realistic", it was defined more in the opposition to conventional norms rather articulating a clear account of what "realistic" research was. Realistic social studies was argued in *Nature* to be in opposition to the 'dreary and barren dialectic tradition of deductive economics'("Realistic Social Studies," 1938). The article lamented the deterioration of scientific thinking since the observations of Beatrice and Sidney Webb[54] and drew on many analogies to the past to account for the step-change needed in economic science. The answer the article argued was to draw on the pioneers of British demographic studies, Graunt, William Petty and Halley. Scientific thinking and scientific economic practitioners, it argued, could make a contribution to the social sciences. These sentiments mirror the questioning of deductive economics seen in Chapter 3.

Yet 'realistic' economics was a fuzzy term even when used during the 1930s; it was used synonymously with inductivism and "empirical" economics. This can be clearly seen in the writings of Joseph Willets, the Director of Social Sciences Funding at the Rockefeller Foundation, who juxtaposed logical economic analysis with 'a new approach to the study of economic problems. (call it 'inductive', 'empirical', 'realistic' or what you will).'[55] A precursor to the notion of applied economics, realistic economics doesn't necessarily seek to verify a deduced theory against data, often because the data doesn't exist.[56] It also aims to picture an economic phenomenon to allow a clearer understanding of the economy (often at a national level) to be inferred. Realistic research saw the social sciences as a way of informing current affairs.[57] Such improved *scientific* knowledge

[54] Two of the founders of the London School of Economics and advocates of '"scientific research into social institutions"' (Simey, 1961, p. 107).
[55] RAC Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 – letter by Willets 22 November 1944.
[56] Applied economics is similarly a loosely defined term taking in a variety of different types of economic enquiry (Begg and Henry, 1998).
[57] 'a more complete knowledge of the working of our present economic system e.g. of conditions as revealed by realistic, statistical studies of unemployment ... complex forces operating in a competitive society in a number of specific situations - must supply the necessary basis for planning an effective economic organization' Rockefeller Foundation Annual Report 1932 p.275 available at: https://assets.rockefellerfoundation.org/app/uploads/20150530122117/Annual-Report-1932.pdf

was then argued as a route to better public policy.[58] This notion of economic realism has parallels to the emerging school of political realism[59] and differs significantly from what heterodox economists would today term critical realism.[60]

Defining realistic economics any more precisely than this would be counter-productive as it would not preserve the meaning it had in the 1930s. It was a vague term. This does not however detract from this chapter's argument – that the realistic trope can be used to describe a new economic norm that can be seen in the language of 1930s economists and funders. Their aim was a more data-centric, applied economics. This demand for data, in turn, became a catalyst for the advancement of national income studies.

4.2. The spirit of 'realistic' economics shaped British attitudes to economic statistics

The emergence of a "realistic" economics as an emphasis on economic statistics can be seen in the attitudes and actions of individuals during the 1930s in Britain. While economic data had influenced economic thinking prior to the 1930s, as noted in Chapter 3, a renewed emphasis occurred which saw the foundation of new empirical institutions alongside researchers such as Colin Clark publishing work which focused on observation, induction and attempting to picture the economy. This drive for better statistics occurred at the same time as lively public criticism of British national statistics.

Criticisms of British national statistics had been underway for over a decade. Ward and Doggett (1991, pp. 20–22) show internal government reviews dating back to 1915 considering the need for better statistics. From the 1920s into the 1930s the Balfour Committee and Macmillan Committee lobbied for better statistics, in addition to learned bodies such as the Royal Statistical Society (Ward and Doggett, 1991, p. 21). For economists, volumes of official publications both enabled and hindered new ways of economic research. Despite efforts by some government economists to improve the quality and frequency of data series,[61] the new statistical bodies remained extremely critical of official data series. Sir Arthur Bowley in 1930, for example, raised concerns about official economic statistics when submitting evidence to the economic advisory council of Ramsay

[58] In response to the Great Depression the 1932 Rockefeller Foundation Annual Report p.275 for example identifies 'the opportunity and need for a scientific attack on the problem of economic maladjustment are unmistakable' https://assets.rockefellerfoundation.org/app/uploads/20150530122117/Annual-Report-1932.pdf

[59] As Strange (1996, p. 32) explains the nation centric and 'rational' visions of International Relations emerged in response to war. Guilhot (2011, pp. 12–13) illustrates the significant role that the Rockefeller Foundation had in shaping this thinking.

[60] For more on the social ontological and critical realism perspectives see Lawson (2003, 2015).

[61] For example Robert Giffen's efforts to improve statistics through the Board of Trade (Ward and Doggett, 1991, pp. 14–18).

Macdonald.[62] In his original letter Bowley suggested an acceleration of the publication of statistical reports through new staff and additional machinery, a reprioritisation of the order of calculation of districts when compiling national figures and a greater level of uniformity across the terms used in calculating national totals.[63]

These criticisms were most notably referenced in the Macmillan Committee on Public Finance which devoted the final section of the report proposals to the need to improve information on statistics. The report called for exact quantitative knowledge of the monetary and financial system and preferably in the form of an inventory which could be cross-checked,[64] suggested the publication of various monetary data series and critiqued the severe delays to publication of the Census of production. So delayed was the data series, the committee scathingly said 'when they are available, [they] will be of comparatively little value except to the economic historian.'[65] Finally the committee found there was a considerable need for a greater of coordination of statistical work across the four government departments responsible for industrial data series ('the Registrar General, the Board of Trade, the Inland Revenue and the Ministry of Labour').[66] The authors explicitly emphasised the importance they attached to all their statistical reforms being carried out in full as:

> 'to put on a more scientific basis our acquaintance with the fundamental facts and trends of our economic life, and to replace empiricism by ordered knowledge, might prove to be the greatest step forward that it lies within our power to take towards raising the economic well-being of our country to the level which the technique of production would allow.'[67]

The themes advanced above – the need for a quantitative knowledge of key economic variables, the need for a centralisation and coordination of public data, the need for faster data series, and data collected to help improve scientific knowledge – can be seen in the arguments justifying the launch of the National Institute of Economic and Social Research (NIESR). The chapter starts by exploring this and the spirit of "realistic" economics that was evident in the founding of the NIESR. The chapter then considers the arguments of Colin Clark whose national income publications make clear the

[62] Colin Clark archive UQFL87, Box 13, Folder 2, Doc 14 Report by the Permanent Consultative Committee on Official Statistics on Professor Bowley's letter to the Secretary.
[63] Colin Clark archive UQFL87, Box 13, Folder 2, Doc 2 - Letter from Professor Bowley to Henderson Nov 28th, 1930.
[64] It specifically wanted ways to check the information 'by being able to work up to the final totals from more than one direction' implying the type of double entry system we see in the National Accounts. See page 174 of the Committee Report for further details.
[65] Macmillan Committee on Finance and Industry Report, 1931, p.181.
[66] *ibid*., p.184.
[67] *ibid*., p.185.

difficulties facing individual national income researchers as they collated and drew across multiple data sources to arrive at their empirical outputs.

4.2.1 Realistic economics shaped debates on the need for better economic statistics: justifying the foundation of the NIESR

Realistic economics was an important feature of thinking on both the need for and use of economic statistics. This can be seen in the Halley Stewart Review, a document which synthesised concerns about how the economy was being managed and highlighted the need for greater observations of the economy including national income. This section will show that realistic, data-driven economics, shaped economic thinking in the UK. The archival documents surrounding the launch of the NIESR show both the efforts of data-minded economists to develop new data series and the contextual setting that shaped them. Through their efforts this enabled an environment which would be productive for national income.

This spirit can also be seen in the foundation of the NIESR, was the result of recommendations of a review undertaken by the Halley Stewart Trust conducted in 1935. This 1935 review illustrates several themes argued in this section namely a change to economic thinking influenced by a changing demand for economic statistics. From an institutional economics perspective - these motives helped to justify the establishment of a new institution to address economic issues of national importance.

The Halley Stewart Review advanced a detailed argument which illustrated why new economic statistics were needed during the 1930s. It started by positioning economic research as being dependent upon the informational by-products of administration. It then argued that informational sources had until recently been relatively sparse; the informational framework required to administer the state had not kept up with the changing functions of British government and business. In doing so the authors of the Review advanced a relationship between administration, information, government decision making and the economics discipline. For the reviewers, the source of the problems with national economic debate was a legacy of laissez-faire thinking.

'The traditionally deductive character of English economics and the absence of organised marketing research by industry was the counterpart of the laisser-faire character of government.'[68]

But this doctrine was seen to be ill-suited to the requirements of the 1930s. Changed circumstances such as the need for greater government intervention during the Great War 'drove home the lesson

[68] RAC – Record Group 1.1, Series 401.s, FA 386, Box 68, Folder 900. Economic Research in Great Britain: A Report by the Committee on Economic Research (Halley Stewart Trust 1935) p.6.

that the economic problem had a national aspect, and was not merely one of concern to individuals.'[69]

A doctrine which had empowered the ascendancy of haute finance through unregulated markets was ill-suited to an economy in which the role of government had expanded. Given the amount of work required to better understand the economic situation, a more coordinated approach to research would be required. The authors of the Halley Stewart Trust report linked the notion of laissez-faire economics to a lack of coordinated research in economics which had left important empirical questions unanswered.[70] The conclusions of the report made clear that an intellectual hole had appeared in public life, one which needed to be filled through empirical, realistic research:

> 'We therefore attach the utmost importance to the establishment of a central Institution devoted to realistic and quantitative economic research. It should lead to an enrichment of the intellectual and public life of the country, and to an enlargement of the opportunities for the resolution of urgent contemporary problems. It represents one of the most conspicuous and urgent of the hitherto neglected needs of British public life.'[71]

The reviewers saw realistic economics as a way of informing public debate and decision making in the public and private sectors. The current disorganised approach to economic research was leading to poor decisions:

> 'Recent history, no less than present events, have shown clearly that the statistician and the economist, as well as the technician, have their contribution to make… Statesmen, industrialists, administrator, traders are alike dependent on the collection and collation of economic "facts" on the interpretations put on them, and on the conclusions based on them.'[72]

This culture of empirical realistic economics proved to be a catalyst for the development of national income studies. National income studies were the highest priority item on the Halley Stewart Review's research agenda.[73] National income figures were seen to fall within a larger stream of thinking on the demand for the products of industry. While the authors were satisfied with the discussions which had been ongoing in the Journal of the Royal Statistical Society and the

[69] *ibid*., pp.6-7.
[70] *ibid*., pp.6-7.
[71] *ibid*., p.9.
[72] *ibid*., pp.1-2.
[73] *ibid*., p.14.

contributions of Bowley, Stamp, Flux, Coates and Clark there was still scope to uncover better data sources in order to improve the accuracy of their estimates.[74]

In this sense national income studies were, for the Halley Stewart Trust, part of a wider realistic approach to economic research. While this didn't result in research which significantly changed national income it helped to sustain discussions on national income. Notable outputs from this time include a work by Bowley (and others) on the varying definitions of national income between the 1920s and 1930s (Bowley, 1942), and, Keynes and Bowley's joint publication on the measurement of real income (Bowley and Keynes, 1940). Later, during the 1940s Phyllis Deane worked on a research project estimating national income for developing countries under the direction of Austin Robinson, Richard Stone and Arthur Lewis at the instigation at the NIESR. The institute also encouraged studies on a range of linked realistic studies which would further enable national income estimation such as prices, capital and population estimates.

The virtues of realistic research advanced by the Halley Stewart report were echoed in the views of the committee of the NIESR and also influenced its early institutional trajectory. Not only did the committee of management call for 'the continuous and realistic study of the conditions of national economic life,'[75] but "realistic" research also informed the funding strategy of the foundation. In its statement of intention sent through to the Rockefeller Foundation, it for example, calls for realistic enquiries into contemporary economic problems as cannot be adequately studied by individuals.'[76] The aim of the first committee was clear, echoing the sentiments of the Halley Stewart report; there was a pressing national need for a body which could improve the quality of research contributions to current problems, to coordinate researchers and to administer funds which would bring about 'statistical and other indispensable information.'[77]

What is not remarkable about the argument advanced here is that an institute founded to focus on national issues which was committed to the notion of economic statistical observation would act as a catalyst for national income studies. With hindsight they share similar practices. But what is more notable is that advocates for the nascent NIESR were not alone in undergoing this transformation of thought. The same language was commonly used by bodies seeking and gaining financial assistance from the Rockefeller Foundation. This is discussed in section 4.3. The next section looks to the data-frustrations of Colin Clark as an example of a national income researcher working at this time. Clark

[74] *ibid*. p.9.
[75] RAC – Record Group 1.1, Series 401.s, FA 386, Box 68 - NIESR founding committee minutes 1935.
[76] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 – The proposed Institute of Economic Research 20 May 1936, Appendix 1 p.2.
[77] *ibid*., p.1.

is argued to share some of the NIESR's concerns about the empirical situation in Britain during the 1930s.

4.2.2. The frustrating effects of poor British economic statistics on Colin Clark's national income research

On a practical level, issues with the availability of regular economic statistics impacted the national income field, most vociferously noted by Colin Clark. Clark's frustrations demonstrate the significant barriers to advancing national income accounting when pursued as a private enterprise and are indicative of the barriers to empirical work more broadly which existed at this time. The frustrating effects of data on national income enquiries in this period and the 1920s is a matter reflected noted by Tribe (2005, pp. 46–49) who explains the difficulties facing Bowley, Stamp and Flux in using the Census of Production and later income tax figures to generate a national income figure.

Clark is a particularly relevant figure for this discussion because of the importance of his national income calculations. Like Flux, Bowley and Stamp, Clark made many advances to national income research prior to World War II (Tily, 2009). Maddison (2003, pp. 13–16) argues Clark's 1932 estimations sought to account for intertemporal change. Maddison (2003, pp. 13–16) further argues that Clark's 1937 estimations demonstrated that national accounts could be used as a tool of public policy and Clark's 1940 work made significant advances for standardised international economic comparison. Several histories of national income highlight Clark's economic estimates were used in Keynes's analysis in the *General Theory* (Keynes, 2012a [1936]). Clark's estimates were later critiqued by Keynes which led to Keynes developing a different estimate of national income in the Appendix to *How to Pay for the War* (Keynes, 2012e [1940]). Clark, to this end is presented as an instrumental figure that enabled the emergence of the national income measures we use today.[78]

Some authors have already highlighted Clark's advocacy for better national statistics and the frustrations he faced but, for example Lepenies (2016, pp. 39–40) treats him in isolation separate from other economists such as Bowley. Tribe (2005, pp. 8–11) explains the limitations with data that Clark faced and the critical reviews he received of his attempts to use estimates to supplement weak official publications. Both authors, like the argument here, allude to the wider limitations imposed on national income research by poor official statistics. The argument here however helps to identify Clark's frustrations within a broader realistic intellectual climate which sought to bring greater science into economics.

[78] See for example Lepenies (2016, p. 39), Coyle (2015, p. 17) or Mitra-Kahn (2011, chaps. 7–8).

Clark was explicit about the many frustrations he faced while generating his national income estimates. To this end, Clark provides a useful example of the nature of national income estimation at this time – an enquiry which as Studenski (1958, p. 149) argues was largely carried by individuals 'willing to contribute of their time and effort beyond any recompense.' National income enquiries at the time required the synthesis of a disparate range of data sources Clark (1932, p. 16), for example, draws upon a number of new and emerging data series from this time such as Health Insurance Statistics produced by the Royal Statistical Society. He also drew on Stamp's entries in the journal of the Royal Statistical Society, Board of Trade publications and the Economist. Clark also drew attention to the publicly available data on income-tax derived income figures.[79]

Frustrations with the availability of relevant data are evident in his early work. Clark (1932, p. 5) makes clear that most statistical publications were out of date. He relied upon the census of production for 1924 which took eight years to become available. Clark (1932, p. vi) critiqued the 'leisurely publication' of the censuses of production and population: 'in many ways it has been a weary business attempting to make bricks without straw, and I think it is quite time a little plain speaking was done about the disgraceful condition of British official statistics.' Further to these critiques Appendix VI was devoted to the differences in classification between the census of production, the census of population and unemployment statistics. In light of these deficiencies, and supporting the Macmillan Report, Clark (1932, p. vii) argued for an urgent need for centralisation of government data collection to help improve data quality. The many obstacles to analysis ultimately served to hamper the timeliness of work by Clark and other researchers at this time.

Whilst in some respects the situation had improved by the publication of Clark (1937) there remained several frustrations. Clark (1937) was originally intended as an update to the first book 'but so many sources of information have become available that It was decided that the book should be enlarged and completely rewritten' (Clark, 1937, p. v). New data sources included: 'the Occupation and Industry volumes of the 1931 Census of population (published in 1934) and the various volumes of the Reports on the 1930 Census of Production, published between 1932 and 1935' (Clark, 1937, p. v). These chances are attributed by Clark to efforts by the Board of Trade which had exercised new powers from the Import Duties Act of 1932 to perform what Clark felt was tantamount to a census of production and 'put statisticians very much in their debt' (Clark, 1937, p. vi).

[79] I'm grateful to Adam Tooze for drawing my attention to this and the wider institutional changes from the increased role of government after the People's budget. This concurs with Studenski (1958, p. 159).

Whilst welcoming these improvements on pages vi-vii, Clark raised three complaints about the barriers hindering those seeking to undertake experimental economic work on a par with the natural sciences. Firstly, Clark critiqued the tardy release of meaningful official data: the Cost of Living Index was to be delayed by five years, the Macmillan Committee's recommendations in relation to industrial data returns had not been implemented and wage statistics were not comprehensive enough. Secondly, Clark argued that Britain was culturally less about having figures on income data in the public domain unlike the USA and Norway. Thirdly, Clark raised several financial concerns about the 'considerable expenditure in the provision of both academic and clerical assistance' that national income enquiries of this sort required, but crucially were missing in Britain (Clark, 1937, p. vii). In the specific instance of the financing for his *Conditions of Economic Progress* Clark said he had to self-finance clerical support and performed all the research himself. Without the scale of financial support seen in America and Germany, Clark (1937, p. vii) argued economic research would lag behind: 'it must be equipped not only with the scientific spirit, but also with the financial resource, of the older sciences.'

In these comments, Clark shares an affinity to the type of thinking underway in the Halley Stewart Committee in pushing for better publicly available statistics. More than this however it also highlights the significant role that financial support played in the development of empirical estimation at this time. Similar sentiments are found in the Halley Stewart Trust report.[80] The report highlighted several institutions that were undertaking systematic empirical research such as the League of Nations Secretariat, the US NBER, the Brookings Institute, and the IFKs of both Austria and Germany. Common to several of these bodies was both an agreement on the need for empirical estimation but also frequently the financial patronage of the Rockefeller Foundation. The next section considers this in greater detail arguing that a wider empirical turn was underway internationally, not just Britain, which was enabled by institutional support from bodies such as the League of Nations and the Rockefeller Foundation.

4.3. International bodies promoted international debates in empirical economics

Till now the chapter has focused on the "realistic" discussions in Britain which motivated efforts to improve the access to data for economic research and decision making. This attitude was not exclusively British however, it was part of a wider empirical turn in economics underway around the world. This section argues that the simultaneous emergence of both national income studies and

[80] Economic Research in Great Britain: A Report by the Committee on Economic Research (Halley Stewart Trust 1935) p.3.

empirical economics more broadly was shaped through an international network of researchers. Crucial in supporting this were the efforts of bodies such as the League of Nations and large financial support by the Rockefeller Foundation.

The significance of the simultaneous and international emergence of national income estimates during the interwar period is under-represented in contemporary national income historiography. As Studenski (1958) noted the interwar period saw an extraordinary international flourishing of national income estimates.[81] But little explanation is provided as to why this happened. These statistics predate Keynes's *How to Pay for the War* and show that the decision to enumerate a national income figure is not a uniquely British phenomenon.

Countries throughout the world despite their diverse varieties of capitalism[82] were normalising the process of national income measurement. In Oslo, Ragnar Frisch's Ecocirc model was being used to consider the economy in terms of macroeconomic flows,[83] in America National Income enquiries had been regularly pursued from the 1920s under the influence of Wesley Mitchell and later Simon Kuznets.[84] With the advocacy of Kuznets, American research bodies made multiple contributions to the debate (Fogel et al., 2013). Elsewhere; in Germany Ernst Wagemann came up with new macroeconomic framings for economic data (Tooze, 2001), in Sweden researchers such as Gunnar Myrdal were contributing to estimates of Wages, the Cost of Living and National Income between 1860-1930 (Högskolan, 1933), in addition to contributions from Lindahl (1937). Holland notably saw contributions from Tinbergen in the central policy planning department and in Denmark, Viggo Kampmann started a national income project in 1935 (Vanoli, 2005, p. 18).

What is more notable is the commonly shared views of these researchers. As Dupont-Kieffer (2012) has highlighted Lindahl and Frisch shared similar views on the need for empirical investigation and the role of national accounts in helping to inform policy. This Nordic approach to macroeconomics developed in response to the American institutionalism adopted by Wesley Mitchell (Dupont-Kieffer, 2012, pp. 157–158). The Oslo school of Ragnar Frisch developed an ecocirc accounting model, which monitored the flows of funds throughout the economy and could be used to aid state planning and inform economic policy.

[81] For more on the different schools of thought, see Ruggles and Ruggles (1999, p. 452).
[82] See Hall and Soskice (2001) for more on the different institutional capitalistic structures facing countries.
[83] Several authors discuss this (Aukrust et al., 1949; Bjerkholt, 1995; Bjerkholt and Kurz, 2006; Kurabayashi, 1994).
[84] See Mitchell et al. (1921), see also (Fogel et al., 2013).

A further common thread to some of the pre-great depression researchers was an interest in the business cycle. Writing in the 1920s the NBER's Wesley Mitchell (1927, p. IX) observed an increasing number of people were involved in business cycle research:

> "Albert Aftalion and Jean Lescure in France; Mentor Bouniatian and S. A. Pervushin in Russia; Gustav Cassel in Sweden; John Maurice Clark, William T. Foster, Waddill Catchings, Alvin H. Hansen, and Henry L. Moore in America; R. H. Hawtrey, John A. lobson, A. C. Pigou, and Dennis H. Robertson in England; Emil Lederer, Joseph Schumpeter and Arthur Spiethoff in Germany, to name but a few."

This interest, strongly influenced by the need to understand the Great Depression, culminated in the publication by Ohlin in 1931 which lay the foundations for Haberler (1934), a publication on the business cycle produced at the encouragement of the League of Nations (Boianovsky and Trautwein, 2006). Common to these authors was a shared consensus on the need to structure data into meaningful observations on the economy. While researchers may have had methodological differences between whether to follow a business cycle approach or not, they had a shared purpose in the construction of new macro-level data series. These data series could in turn help national income estimation which could help to inform policy making.

This new consensus on economic statistics and the role that economic data could play in informing economic policy was itself shaped by larger institutional support. One institution highlighted by Campion (1949) was the League of Nations Economic and Financial section which, he argued, significantly advanced statistical thinking. Such thinking gains support from Clavin (2013). Another significant institution was the Rockefeller Foundation which is highlighted by Craver (1986) as having supported international empirical research. The thesis now moves to consider both of these institutions which were helping to support this international, "realistic", consensus.

4.3.1. The League of Nations was a user and promoter of empirical economics

Throughout the 1930s the Economic and Financial Section (EFS) of the League of Nations (LoN) acted as a major patron of rigorous economic statistics at an international level. In part their decision was shaped by a view that *science* could help to solve the global downturn, but to do this required new data series on issues from trade to unemployment at a macroeconomic level. To collect this data the EFS supported and sustained networks of quantitative researchers engaged largely in business cycle research. The LoN also helped to shape the economic norms necessary for good national statistics. This has bearing on the argument of this chapter because it illustrates the way international institutions enabled a wider statistical environment among the network of quantitative researchers

at this time. This section progresses by outlining the EFS's mandate from the LoN General Assembly and how this was exercised.

Soft intervention in national economic administration had always been part of the EFS's mandate.[85] The League publicly noted that Secretariat was intended to have considerable influence in the steering of international financial operations (League of Nations, 1935, p. 35). The League Secretariat saw its technical assistance as an essential way of fostering international cooperation during the volatile economic times of the post-World War I consensus (League of Nations, 1930, p. 179).

These efforts hardened however in response to the great depression. In September 1930 the LoN passed a resolution calling on the EFS to improve the quality of national statistics. The EFS was to:

> 'undertake the study of the course and phases of the present depression and the circumstances that led up to it, and for this purpose it should collect the information compiled by institutions already in existence in different countries, centralise such information and, where necessary, fill up any gaps that exist.'[86]

The Assembly also instructed the section to co-ordinate research in these areas across the range of institutions and national organisations looking into economic depression. Despite budget limitations a new series of world-wide information was gathered and published including:

> 'the monthly bulleting of statistics, an annual Review of World Trade, Memorandum on World Production, Memorandum on Balance of Payment, International Trade Statistics, Memorandum on Commercial Banks Memorandum on Public Finance, the International Statistical Year Book and the World Economic Survey.'[87]

In many cases as J. B. Condliffe highlighted in his correspondence with the Rockefeller Foundation these were new data series where new estimates had been made or new information requested from national bodies.[88] Particular examples Condliffe drew attention to included the Balance of Payments memorandum which, before starting, only two countries had estimates of their balances.[89] Similarly Condliffe explains that the Statistical Year-Book had increased information and

[85] In a letter to the economist Layton on 9th September 1920, the head of the EFS Alexander Loveday explained the need to collect a range of information which was 'not merely statistical, [it] will be required in preparation for eventual action. For this reason, the power to obtain information to enable the League to carry out its obligations must be exercised through the Secretariat.' Loveday Archive Box 3 Doc 3/92, p.2.
[86] RAC – Record Group 1.2, Series 100.s, FA 386, Box 18, Folder 148 – Memorandum on the enquiry into economic depression. Memorandum dated 5-4-31.
[87] RAC – Record Group 1.2, Series 100.s, FA 386, Box 18, Folder 148 – Memorandum on the enquiry into economic depression. Letter to Edmund Day dated November 16th 1931.
[88] *ibid*., Confidential memo to Mr Gunn dated June 16th 1932.
[89] *ibid*., Confidential memo to Mr Gunn dated June 16th 1932.

was becoming more accurate and up to date.[90] These new data series could help to provide the informational basis for a more realistic enquiry in economics.[91]

The EFS's impact upon economics was not restricted to producing new data series and the detailed enquiries this implied with governments.[92] Instead as Clavin (2013, pp. 4–6) notes the EFS performed a multi-faceted role. Firstly, it was a home to economists who went on to have high impact careers such as James Meade and Jan Tinbergen (Clavin, 2013, p. 5) meaning the section functioned like a meeting house for new ideas across the world. Secondly, its role transformed from one of collating global intelligence to active interventions in the management of League Countries (Clavin, 2013, p. 6). Thirdly, they were the watch-people to turbulent economic times (Clavin, 2013, pp. 5–6). This multi-facetted role helped the LoN bring together an otherwise disparate network of researchers and, ultimately, help promulgate empirical economics and data around the world.

One way this was achieved was through conferences run which enabled researchers to share research methods and develop common perspectives.[93] The March 1931 Geneva economic conference, for example, brought together worldwide representatives from statistical institutes across fourteen European countries and the US Committee on Recent Economic Changes in response to what they saw as the "business depression." Attendees at the conference were chosen on the basis that they either "interpret facts" or came from bodies whose job it is to "alter facts."[94] These conferences became a forum for bodies like the NBER to present its research[95] and influence other similarly minded bodies such as London Cambridge Economic Service, the German IFK, the ILO, the international Institute of Agriculture and several other bodies.[96] In some respects these conferences

[90] *ibid*., Confidential memo to Mr Gunn dated June 16th 1932.
[91] As seen in the case of Clark (1937) discussed below which relied on the League of Nations figures to generate his Conditions of Economic Progress.
[92] As Alexander Loveday noted he still had to 'hammer' governments 'to produce basic data.' Loveday Archive, Nuffield College Oxford, Box 39 "Notes for Chapter on EIS"
[93] Discussed in greater length in Clavin (2013, chap. 3) "Conferences and their discontent."
[94] RAC – Record Group 1.2, Series 100.s, FA 386, Box 18, Folder 148 – The business depression: memorandum of the meetings of representatives of economic councils and research institutes.
[95] *ibid*.
[96] Full bodies in attendance included: the International Institute of Agriculture, the ILO The Economic Aadvisory Council of Czechoslovakia, the Economic Advisory Council of Great Britain, the London Cambridge Economic Service, the Statistical Institute of Paris (M. L. March), the Hungarian Institute of Economic Research (Varga), The Statistical Institute of the University of Rome (Prof Gini), Economic Institute of the Netherlands (Dr Valk), the Poland Institute of Economic Research (Prof Lipinski), a representative from the Institute of Economic and Financial Sciences of Lisbon (Prof Mensabat), the German Institute for Business Cycle Research (Dr Bramstedt), the Institute for Business Cycle Research Austria (Dr Hayek, Dr Morgenstern), the Belgium Institute of Economic Sciences (Prof Dupries), the Denmark Institute of Economic Sciences and History (Dr Pedersen). In addition there were representatives from Spain and from the economic advisory councils from many countries including Finland. RAC – Record Group 1.2, Series 100.s, FA 386, Box 18, Folder 148 – The business depression: memorandum of the meetings of representatives of economic councils and research institutes.

could have a strong group-think, as one US attendee of the Geneva conference noted, a common theme across the presentations from all countries was the underlying work of Wesley Mitchell.[97]

The enduring legacies from these efforts and conferences can be seen in the publications produced by the League. These publications were may have helped to shape and inform debate on how to respond to the Global Depression. The most prominent example of this was *Statistical Testing of Business Cycles* (Tinbergen, 1939). Commissioned by the League – after the support of Ohlin and Rockefeller Foundation funding (Clavin, 2013, pp. 202–3) – this study sought to apply new statistical techniques to test the different "macro-economic approach(es)" which were being postulated to account for irregular investment activity in the USA. What distinguishes this study is not the methodological controversy[98] but the rich use of data which was compiled with the assistance of Dennis Robertson of Cambridge. The study drew on four countries (The UK, the US, France and Germany) over a 40-50 year period. Building upon the work of statistical agencies and authors in the field, careful data series of profits, capital goods prices, interest rates and profit margins were collated and constructed.

This section has highlighted a range of mechanisms used by the LoN to bring researchers together and encourage economic statistics. In so doing the LoN helped to sustain and develop a network of empirical researchers which in turn would aid national income research. The LoN did not act alone in doing this and shared a common perspective with the Rockefeller Foundation and from launch in Geneva through to its move to America, provided important support. Clavin (2013) argues that the Rockefeller Foundation was instrumental in facilitating the LoN EFS: in addition to providing the funds to purchase a library for the LoN, it also provided occasional funding to specific pieces of work, spending more than $10 million between 1930 and 1940 (Clavin, 2013, pp. 36–37, 74). The Foundation also made a notable intervention during World War II by facilitating the emergency extraction of the EFS from Geneva to the Institute of Advanced Studies in Princeton New Jersey (Clavin, 2013, chap. 7). This institutional support emanating from the Rockefeller Foundation is indicative of the wider efforts the Foundation was pursuing in enabling new "realistic" empirical economic research, which in turn created new data series which could aid national income research. This desire to promulgate realistic research is considered in the next section.

[97] *ibid*.

[98] After the strong rebuke to Tinbergen 1939 Keynes became portrayed as a theorist and anti-empiricist. This became a source of major disagreement between Don Patinkin and Richard Stone in private correspondence where Stone argued that Keynes wasn't antithetical to forms of econometrics citing Keynes's interest in national income as a form of his interest in economic data. For more details visit JRNS 3/1/98.

4.3.2. The Rockefeller Foundation was a financier of "realistic" research

This section argues that the Rockefeller Foundation played an instrumental role in supporting empirical economics and openly advocated for "realistic" economics. The argument supports the Craver (1986) position that Rockefeller patronage had a significant impact upon empirical research in Europe. Concurring with Craver, it advances the case that Rockefeller Foundation funding philosophy changed specifically at the point the Social Sciences division of the Rockefeller Foundation was subsumed within the wider Rockefeller Foundation. Both prior to the incorporation and afterwards, Rockefeller funds patronised empirical economics by financing the expensive data collection and collation required for empirical analysis. The chapter extends Craver's argument by using new archival materials to note that the Rockefeller Foundation was motivated by a broader emphasis on scientific, realistic research, and that this helped to create the conditions for national income research.

Throughout the 1930s the Rockefeller Foundation was a major patron of social sciences research and its shift in funding philosophy sought to actively encourage empirical research. The types of empirical research encouraged were wide ranging and seen as a way of helping to solve social ills. The clearest account of empirical patronage and the notion of the social sciences can be seen in the pleas of the 1939 Annual Report which observed:

> 'We have created a society so interdependent that issues are no longer simple, individual and local; they are complex, social and worldwide. And they are beyond the experience of most of us. Money and credit, fiscal policy, international relations, international trade and finance, national income and its distribution, … social justice in an interdependent world - here is merely a brief list of some of the urgent issues. How can tanks and bayonets hope to solve such problems as these?'[99]

Rockefeller thinking on the potential contributions of empirical research went through phases. This section of the chapter will outline why and how the Rockefeller Foundation's views on realistic research influenced the economics discipline.

The Rockefeller Foundation was founded on a mix of religious zeal to reform the world (Schenkel, 1995; Seim, 2013) and a support for science. Like many large American industrialists the Rockefellers transferred some of the wealth they developed through monopolistic industrial structure into a

[99] Raymond Fosdick, President of the Rockefeller Foundation discussing "the Claim of the Social Sciences" in the 1939 Annual report - Rockefeller Annual Report 1939 pp.45-46.

charitable institution which could result in social transformation.[100] At its most extreme this led to support for social engineering (Jordan, 2009). The funds the Foundation marshalled sought to address the significant issues of the day through a better understanding of the world: quoting the emblem carved above the entrance to the Foundation 'let wisdom and knowledge be the stability of thy times.'

Until the emergence of World War II Rockefeller social sciences philanthropy was guided by two contrasting philosophies; the first directed funds to institutions whilst the second allocated funding thematically (Craver 1986, p.211). Prior to 1930, funding was targeted towards institutional support and specific support. The Rockefeller institutional grants saw large funds sent to the LSE, Stockholm and Copenhagen, alongside smaller grants to empirical research institutes in Oslo, Rotterdam, Kiel, Bucharest and Heidelberg. Early engagements also began with the University of Oxford and the 'Institut scientifique de recherches économiques et sociales directed by Charles Rist' (Craver, 1986, p. 211). Full details of this spending approach is shown in Figure 4.2.

[100] As Galbraith (1977, p. 77) notes Carnegie captured the spirit of this age with his Gospel of Wealth which said that to die rich is to die a failure.

Figure 4.2. Social Sciences General Support review of previous Foundation commitments as of 1935[101]

Organisation	Annual grant received under the LSRM "institutional approach"
Columbia University	$50,000 unconditional, $19,000 condition annually for 9-10 years
Harvard University	$50,000 unconditional, $25,000 conditional annually for 2 years
University of Chicago	$50,000 unconditional, $25,000 conditional annually for 2 years
Brookings Institution	$75,000 unconditional annually for 3.5 years
London School of Economics	$10,000 unconditional, $37,000 conditional annually for 7 years
Stanford University	Tapered grant over 5 years totalling $75,000
University of California	$30,000 unconditional annually
University of North Carolina	$30,000 unconditional annually
University of Virginia	A five-year grant of an unknown amount
University of Texas	$25,000 annually on a matching basis
McGill University	$25,000 annually
American University of Beirut	$16,000 annually
University of Stockholm	$9,000 annually
Institute of Economics, Copenhagen	$6,000 annually
University of Oslo (Ragnar Frisch)	$5,000 unconditional, $5,000 conditional
Rumanian Institute of Social Sciences, Bucharest	$5,000 unconditional, $2,500 conditional
University of Paris	Initial grant of 300,000 francs followed by $25,000 annual support
Yenching University	$15,000 annually
Nankai University	$15,000 annually plus a one off $7,500 grant

By the 1930s the Rockefeller Foundation approach to the funding of research had grown to maturity. There had previously been a crisis in confidence in the foundation as to the correct direction for the Social Sciences division. The Social Sciences division entered the Rockefeller Foundation having previously been housed within the Laura Spelman Rockefeller Memorial (LSRM), a body which had provided considerable unconditional funds to the budgets of academic institutions around the world. This is not to say there wasn't a strategy to institutional funding; John Van Sickle, the director of the social sciences division in Europe, actively sought out Henry Clay to get advice on the Rockefeller spending approach. His view was that 'modest support of certain provincial universities

[101] RAC – Record Group 3, Series 910, FA 112, Box 1, Folder 1 – Social Sciences General Support resolution 35099.

might lead indirectly to a change of attitude at the old universities of Cambridge and Oxford and that in time something could be done there.'[102]

But a change in governance also saw a new research director which enabled a new research focus. Now, a third of all grants supported research into 'industrial hazards and economic stabilisation' (Craver, 1986, p. 211). Under this new research focus considerable financial support was given to the NBER and to the Harvard Economic Service which in turn helped to support the Austrian IFK and the London and Cambridge Economic Service. Other beneficiaries of this new research approach included figures such as Ragnar Frisch, Ersnt Wagemann, Jan Tibergen, and Bertil Ohlin, all of whom were involved with rethinking national income estimation in their respective countries.[103]

Whilst the Craver (1986) provides a detailed account of the emergence and influence of the Rockefeller Foundation's funding philosophy, further analysis of the archival records show that this shift was in part shaped by internal discussions in the Rockefeller Foundation directed by the Board on the correct funding philosophy for the foundation. Most notably in 1934, the foundation officers' proposals for new projects were refused during a Board Meeting in Williamsburg, with the Board saying radical changes were needed in the social sciences.[104] The Board Minutes noted 'we recommend a frank shift of emphasis to concrete fields of application'.[105] Whilst this proposal met with confusion from some officers such as the European division of the Rockefeller Foundation,[106] a more applied approach to research was returned to the Board. The 1935 Board resolution noted:

> "The general field of the work of the Social Sciences is social structure and functioning. Support is given to realistic studies of importance pursued in an objective manner, and by the aid of those specially trained in the appropriate techniques. Such problems press in from every side, and those now under way – international relations, economic security, public administration – are of paramount importance to-day'.[107]

[102] RAC – Record Group 1.1, Series 700.s, FA 386, Box 022A, Folder 164 – Social Science Projects in Europe 10-3-32.
[103] A full list of recipients noted by Craver (1986, p. 213) includes: 'in Berlin under the direction of Ernst Wagemann, in Louvain under León Dupriez, in Rotterdam under Peter Lieftinck and Jan Tinbergen, then at the Central Bureau of Statistics, in Budapest under Stephen Varga, in Sofia under Oskar Anderson, in Oslo under Ragner Frisch, in Stockholm under Bertil Ohlin, in Paris under Charles Rist, in Cracow under Adam Hey del, in Bonn under Artur Spiethoff, and in Bucharest under Dimitrie Gusti.'
[104] RAC – Record Group 1.1, Series 700.s, FA 386, Box 022A, Folder 164 – letter to Kittridge dated January 17, 1935.
[105] RAC – Record Group 3 series 910 FA#112 Box 4 Folder 1.
[106] The head of the European office of the Rockefeller Foundation felt that the bulk of the institutional support was on applied projects, see RAC – Record Group 1.1, Series 700.s, FA 386, Box 022A, Folder 164 – letter to Sydnor Walker dated January 14, 1935.
[107] RAC – Record Group 3 series 910 FA#112 Box 4 Folder 1.

The social sciences division's new investment approach changed how funds were distributed. With a lack of rationale for unconditional grant-in-aid transfers to universities, now, instead, funds were to be distributed to overarching themes which could be allocated to specific research projects. One major theme for the Rockefeller Foundation board was "the development and maintenance of minimum standards of security and decency in the living standards of the mass of people."[108] To that end, Business Cycle research was recommended to the Board as a way of advancing 'scientific study' which in the view of the foundation officers 'represented a promising opportunity to deal constructively with the preventative side of economic instability.'[109] It was the promise of stability, of balance in a changing world that encouraged the foundation to intensify its support to the scientific understanding of business cycles as way of moderating the extreme cycles that had been seen in the Great Depression.[110]

The linkage of social security to "science" in economics at the Board level led to a similar linkage at the investment documentation prepared by the Foundation officers under the direction of Joseph Willets. One such example is the Oxford University funding which saw a clear articulation that business cycle research was a subset of the social security field, and, represented a major Foundation interest. Such investments could, the funding officers hoped, lead to 'the development of more realistic research and teaching at Oxford.'[111]

By 1938, funds allocated to organisations devoted to researching and analysing economic changes of a cyclical and structural nature had led to a much more international focused investment portfolio as shown below in Figure 4.3.

[108] RAC – Record Group 3, Series 910, FA 112, Box 5, Folder 46 – Trustee's meeting April 10, 1935 'Economic Security' p.16.
[109] *ibid*. p.18.
[110] *ibid*. p.17.
[111] RAC – Record Group 1.1, Series 401.s, FA 386, Box 75, Folder 985 – Resolution 37015 p.2.

Figure 4.3. Organisations Receiving Financial Support in 1938 Under the New Funding Approach

Organisation	Total Grants as of 1938 in $s
NBER	352,500
Harvard University Department of Economics	30,000
American Statistical Association	22,500
British NIESR	150,000
London and Cambridge Economic Service	15,000
Oxford University – Business cycle research (Phelps-Brown)	17,000
Institute of Economic and Social Research – Paris	350,000
University of Louvain – Institut des sciences economiques	8,000
Dutch Economic Institute – University of Commerce – Rotterdam	16,800
Austrian Institute for Trade Research – Vienna	18,000
University of Sofia – Statistical Institute of Economic Research	15,000
League of Nation – Financial Section and Economic Intelligence Service	125,000

In addition to how Board direction was shaping the Foundation's funding philosophy, the research direction was also shaped by advice from unofficial referees that was used to inform the merits of research proposals. Frequently Wesley Mitchel and Simon Kuznets would be asked their opinions on the quality of a piece of work. This communication between American academics and key administration officials may have led to influence over the Foundation's thinking. This system was partly replicated with their English investments where figures such as Henry Clay would be used as gatekeepers to funding.[112] This had some influence upon what type of data research would receive funds. This may have contributed to the prioritisation of research projects which shared similar approaches to the American Institutional School.

Section 4.3. has shown that the wider norms of realistic research were shaped by institutions such as the LoN and Rockefeller Foundation. In the case of the former, the League Secretariat fostered an interest in business cycle research which was premised upon macro-level indicators. In the case of the latter the Rockefeller Foundation made an active decision to intensify an interest in "science" in economics. There is an identifiable shift in thinking by 1934 as the Foundation Board sought to stabilise the economy in order to promote social harmony. To that end, national income and the work of the NBER became a desirable outcome because it could identify the movements which were occurring.

[112] In the case of the founding of the Cambridge Department of Applied Economics in the 1940s, as discussed in Chapter 6, Joe Willets sought out the advice of Simon Kuznets. See: RAC – Record Group 1.1, Series 401.s, FA386, Box 81, Folder 1053 – letter dated 19 December 1945.

The wider norm of "realistic" empirical economics supported by the Foundation came to impact, what Studenski (1958, p. 149) termed, the "extraordinary flourishing" of interwar national income estimates. Whilst Studenski goes some way towards identifying private institutional research supplementing individual effort, and mention is made of Rockefeller support to the University of Stockholm, the wider influence of the Rockefeller Foundation support is understated. Studenski also does not acknowledge the emergence of realistic thinking as an environmental factor. In the next section, the Rockefeller Foundation's patronage of realistic research is traced to Britain by firstly providing the financial support for new institutions such as the Oxford Institute of Statistics, and secondly, through indirect influences upon Cambridge University. The next section shows that these international, empirical influences came to support empirical economic thinking in Britain.

4.4. International empirical economics influenced British empirical economic thinking

This chapter opened by arguing new norms supporting an empirical, realistic, economics were underway in Britain. It then showed that these conversations were supported through international networks of researchers and funders that sought to advance broadly defined realistic economic research. Attention now returns to the British context to show the way this research agenda was supported by international bodies. It outlines how institutions such as the Rockefeller Foundation came to influence the intellectual climate in Britain by providing the resourcing that influenced empirical changes in Britain. It then furthers this argument by looking at the way notions of realistic, empirical research came to influence economics in Cambridge. Until the mid-1930s, when a joint Cambridge London Research venture received a financial bailout, it had not received direct Rockefeller Funds. Yet, Rockefeller and League of Nations research can be seen informing national income thinking in Cambridge. More broadly it adds to the thesis argument by suggesting we can better understand the meaning of national income measurement through a broader institutional context which shows how important "realistic" economics was for changes in national income thinking both inside Cambridge and internationally.

4.4.1. The Rockefeller Foundation's "realistic" agenda financed British empirical economics institutions

Despite the two different funding philosophies (institutional support under the LSRM, then thematic support for empirical science under Joseph Willets), throughout the 1930s the Rockefeller Foundation supported scientific, "realistic" economics in Britain.[113] The Rockefeller Foundation had

[113] For more on Rockefeller Foundation support for 'realistic' social sciences see Turner (2015, pp. 695–700).

from 1930 been aware of 'the great need of stimulating research in economics in England.'[114] The widespread influence in Britain can be seen in the endorsement of 'realistic' statistical observation in three academic centres: the University of Manchester, the University of Oxford and the NIESR which will be discussed below.

Under the LSRM, Manchester University received an institutional grant to enable realistic economic research. This grant would later enable empirical observation of the Lancashire economy[115] which was then a global centre of cotton manufacturing (Amdekar, 2018). This concept of "realistic research" can be seen in the Board Resolutions justifying payment to Manchester in 1933 – The Rockefeller funding authorisation notes that Manchester's Department of Economics and Commerce's Research section "was established in 1931. Its purpose was the Promotion of Detailed Realistic Economic and Social Research in order to permit sound generalizations on which alone public and private policy can be based."[116] The funding authorisation note later argues "The Work of the Section falls clearly within a field of recognized Foundation interest."[117] The presence of two former Rockefeller fellows helped to further justify the spending.

In 1939, the Rockefeller Foundation circulated a Trustee Confidential Bulletin which portrayed the work of Manchester University as "realistic". Under the title 'England's Realistic Economic Research' the bulletin described a visit by the Director of the Manchester Economics Research section Professor John Jewkes and the research he had enabled.[118] The Manchester team's studies on local unemployment in response to the Depression are characterised as being objective and focused on the Lancashire area.[119] Importantly for the argument of this chapter, the Bulletin concludes by showing 'National income and the effects of taxation on the distribution of income' as the primary focus out of 6 research strands.[120] In so doing it provides a direct example of the way new realistic empirical institutes helped to support national income studies.

Similarly, despite the new "empirical" philosophy of the Rockefeller Foundation after it had absorbed the LSRM, both the Oxford Institute of Statistics and the NIESR proved to be important institutes for realistic research in the UK. The primary purpose at establishment was educational, to enhance the capabilities of researchers and their research:

[114] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 – SMG diary September 29, 1930.
[115] RAC – Record Group 12, Series 401.s, FA 386, Box 82, Folder 1074 - Research Aid Grant p.3.
[116] RAC – Record Group 12, Series 401.s, FA 386, Box 82, Folder 1074 - Research Aid Grant p.3.
[117] *ibid*., p.4.
[118] RAC – Record Group 12, Series 401.s, FA 386, Box 82, Folder 1076 – 'England's Realistic Economic Research' p.6.
[119] *ibid*., p.7.
[120] *ibid*., p.9.

'It was felt, at the very beginning of the activities of the Social Studies Research Committee, that further development of empirical economic research in Oxford urgently required the organization of an easily accessible library, coupled with some guidance on the use of statistical sources, and with the teaching of statistical methods.'[121]

The Institute received a series of Rockefeller grants during the early years, firstly a five-year $5,000 grant to support social sciences research in 1934. This grant, as the accounts in Figure 4.4. show, financed the majority (approximately 93.0 per cent) of the initial setup costs for the new statistical institute. This approximately £94,000 grant in 2019 prices,[122] would be used to cover almost all costs from library resources to rent, from furniture to calculating machines.

Figure 4.4. Accounts of the Oxford Institute of Statistics for the ten months ending 31.7.1936

Receipts		Payments		Of which	
				Capital Expenditure	Current Expenditure
University Chest:	Printing, Stationary,				
Allocation from Rockefeller	Postage, Telephones,		86.1.9.	11.12.4.	74.9.5.
Benefaction under Decree	Departmental				
(3)b of June 4, 1935	Maintenance		70.4.2.		70.4.2.
	Travelling Expenses	4.16.10.			
Grant from York Trust	Library: Books	375.11.7.		285.0.5.	90.11.2.
	Periodicals	24.8.10.			24.8.10.
	Binding	48.17.9.			48.17.9.
	Sundries	12.15.11.	466.10.11.		12.15.11.
	Carriage & Sundries		25.13.10.	10.6.8.	15.7.2.
Rent receivable	Heat, Light & Water	29.11.5.			
	Repairs & Cleaning	25.10.7.	55.2.0.		55.2.0.
	Furniture; Carpets etc.	319.4.5.		319.4.5.	
	Equipment:	272.1.11.		272.1.11	
	Calculating Machines etc.				
	Electric Fittings	34.9.0.	625.15.4	34.9.0.	
	Sundries		47.17.11.		
	Stencilling		15.18.4.		
	Total Expenditure		1350.4.3.	932.14.9.	417.9.6.
	Balance carried forward being:				
	Cash in hand	10.11.2.			
	Cash at bank	41.5.1.			
	Amount held by Chest	28.15.7.			
	Sundry Drs	88.12.7.			
		159.4.5.			
	Less Sundry Crs	24.8.8.	144.15.9.		
	Less Grant Paid in advance		75.0.0.		
1420.0.0.			1420.0.0.		

Source: *Oxford Institute of Statistics First Annual Report 1935-1936 (Bodleian Library)*

In additional to being heavily dependent on Rockefeller Foundation to cover initial running costs, the Institute gained additional Rockefeller funds. In 1937 the Institute gained a three-year $3,400 grant

[121] Oxford Institute of Statistics Annual Report 1936/37.
[122] Calculated using the Bank of England inflation calculator tool.

to support research into business cycles, this was later supplemented with an additional $4,250 grant to complete the work in 1939.[123] This trade cycle research was intended to focus on 'fundamental statistical investigation and ...empirical studies of the actual behavior of entrepreneurs at different phases of the trade cycle.'[124]

From its early launch in 1935 the Oxford Institute of Statistics was designed to promote 'empirical and quantitative' social research and soon came to be characterised for 'statistics in application to social science and studies in theoretical and applied economics.'[125] In its initial years it coordinated researchers and assisted with the Oxford Social Survey.[126] By its third year, alongside the Rockefeller projects on the trade cycle, it had sourced funding to commission its own research into Labour mobility, the capital market, monetary circulation, the relation between public works and the trade cycle and a study of company accounts.[127]

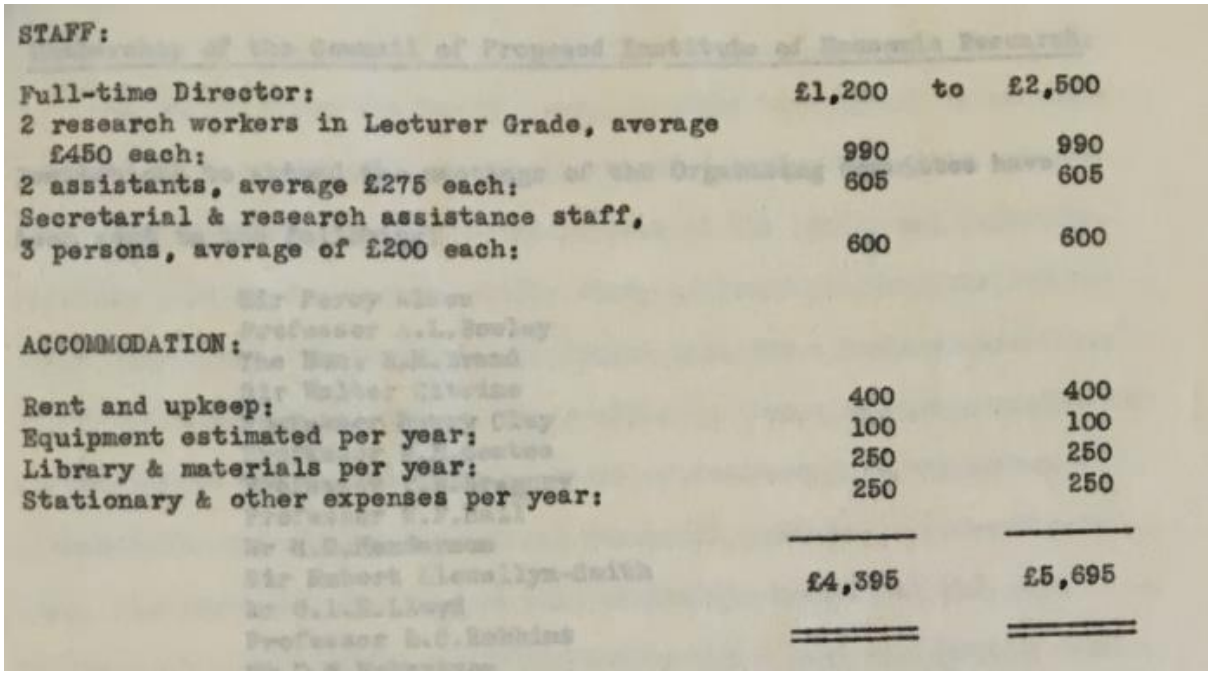
In addition to enabling research agendas the funding also provided an institutional base for high ranking economists to develop their empirical work. The Committee of the Institute was first comprised of: Sir Richard Livingstone, Sir William Beveridge, E.H. Phelps Brown, G.D. Cole, Roy Harrod, H.D. Henderson, Professor Macgregor, Professor Sir Arthur Salter, Marshak as Chair and H.E. Caustin as Secretary and Librarian.[128][129] Later the prominent national income researcher Sir Arthur Bowley became chair of the institute.[130] As shown in the next chapter, with both suitable financial resourcing and high quality researchers, the Oxford Institute became a source of economic research which could aid government during the war.

In contrast the Rockefeller Foundation saw the NIESR in a similar vein to their American NBER and the Brookings Institute funding. It offered the chance to shape ongoing discussions among English Economists to develop a British Institute of economic research.[131] In addition to undertaking research its objective was 'to provide assistance and facilities to members of university staff and others working on projects within the Institute's programme', and, to collaborate with international

[123] RAC – Record Group 1.1, Series 401.s, FA 386, Box 75, Folder 985 'Rockefeller Foundation Board resolution 39060' 5/19/39.
[124] *ibid*.
[125] RAC – Record Group 12, Series 401.s, FA 401, Box 77, Folder 997 'Notes on the development of the Institute of Statistics and its relation to Nuffield College'.
[126] *ibid*.
[127] *ibid*.
[128] Oxford Institute of Statistics First Annual Report.
[129] Yet the early days of this institute also created a home for people such as James Meade. Bowley only had to take the role because the prior chair was called to the United States to complete work there.
[130] During this time Bowley was providing advice to Stamp on the Income and Fiscal Potential of Great Britain as shown in the Stamp Committee Minutes of 24th January 1940 – Austin Robinson Archives ROBN 1/1/1.
[131] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 - Research Aid Grant p.1.

research bodies to help advance comparative studies.[132] The initial decision saw a £30,000 sum split over five years which added to a consortium of other sponsors (such as the Leverhulme Trust and the Pilgrim Trust) on a 1:1 basis.[133] Officers were reluctant to pay a large sum which would lead to an overburdensome body, instead a leaner body which could facilitate more engagement would be a better suited investment.[134] Adjusting for inflation these sums were substantial,[135] and as shown in Figure 4.5. could cover the majority of the costs required by the nascent NIESR for several years.

Figure 4.5. Two scenarios for the running cost of the NIESR as at 20 May 1936[136]



STAFF:			
Full-time Director:	£1,200	to	£2,500
2 research workers in Lecturer Grade, average £450 each:	990		990
2 assistants, average £275 each:	605		605
Secretarial & research assistance staff, 3 persons, average of £200 each:	600		600
ACCOMMODATION:			
Rent and upkeep:	400		400
Equipment estimated per year:	100		100
Library & materials per year:	250		250
Stationary & other expenses per year:	250		250
	£4,395		£5,695

In common with other Rockefeller grantees like the University of Manchester, the Rockefeller Foundation Board funding resolution drew attention to the observation: 'the program of the Institute would be concerned with the realistic study of the facts and problems of contemporary society.'[137] The desire for this 'realistic' research was made more explicit in a memorandum prepared by John Van Sickle the Rockefeller Foundation Europe head the NIESR 'is being organized to make possible continuous and realistic study of the fundamental conditions of national economic life.'[138]

[132] *ibid*., p.1.
[133] *ibid*., p.1.
[134] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 - JVS Memorandum p.2.
[135] Using the estimates in Figure 4.4. and using the Bank of England Inflation calculator, the NIESR annual running costs was estimated to be between £312,000-£405,000 in 2019 figures.
[136] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 – The Proposed Institute of Economic Research p.2.
[137] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 - Research Aid Grant p.4.
[138] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 883 - JVS Memorandum p.2.

What we can see in these three instances is that seemingly separate institutions were connected financially to the Rockefeller Foundation. Whilst not always the sole financier, of these bodies, the Foundation was seeking to impact the way in which economic research was being pursued in the UK. Common across all three examples is the belief that British economics required a new empirical dimension. This happened despite the changes in Rockefeller funding philosophy. In two cases, the University of Manchester and NIESR, this was phrased in the language of realistic research. In all cases statistical bodies were supported which could advance a statistical agenda and change economics and reflected the broader empirical turn underway internationally. The next section now considers the impact this had upon thinking in another University, one which at the time was home to several people closely linked to the development of national income accounting.

4.4.2. International empirical research shaped Cambridge economic thinking

The argument so far has been that international thinking on the need for realistic empirical economics led to the patronage of new empirical research agendas in the Britain. This, in part, helped to influence economic thinking on the role of empirical data. This final section of the chapter develops the case that this wider realistic, empirical mood can be traced to Cambridge. It does so by showing the influence of international empirical texts on the Cambridge economic thinking. Moreover, it highlights that within Cambridge some economists proclaimed their research was realistic. Finally, in some instances of the work of Colin Clark, the chapter shows that national income studies were shaped by the wider international trend to "realistic" research.

Cambridge's engagement with empirical thinking provides an interesting example in contrast to the institutions discussed above, which engaged with the Rockefeller Foundation at an early stage of their development. In contrast efforts to found a Cambridge "realistic" research institution did not truly prosper until after World War II.[139] It has previously indirectly received funds through the Harvard Economic Service when it set up the London and Cambridge Economic Service (LCES) and more directly received Foundation funding when it was bailed out in 1937. As Cord explains the origins of this London-based institution date back to the 1920s but drew on Cambridge insights alongside the LSE (Cord, 2017, p. 307). During these early years the LCES was underwritten by the Rockefeller-funded Harvard Economics Service but Cord (2017, p. 308) argues these funds were not used. From the mid-1930s onwards however the LCES drew on Rockefeller Foundation funding to support its finances as its business subscriber base declined (Cord, 2017, p. 312).

[139] See chapter 6.

It is perhaps this LCES link that may explain why at Cambridge, the economics department was updated with many new data series and new publications coming in from around the world.[140] The first Marshall library catalogue, compiled in 1927 attests to a volume of data available to Cambridge economists. Not only is the collection rich in the works of international publications such as Kuznets (1926) *Cyclical Fluctuations*, A. P. Andrew's *Statistics for the USA*, and Mitchell et al. (1921) *Income in the United States*, it had subscriptions to the League of Nations publications such as proceedings of conferences and the statistical yearbook, the U.S. Census, the Bureau of Labor, the Harvard Economic Survey, and many others.[141]

The impact of these works was significant in helping empirical economics in centres such as Cambridge. In the theses of both V.K.R.V. Rao[142] and Alec Cairncross,[143] the first economics PhD theses of the Faculty of Economics and Politics, we can see a rich array of international empirical economists referenced. In the influence of authors such as W.I. King's work on National Income and the work of Simon Kuznets is evident in the work of Rao (1936). Similarly for Cairncross (1936) we see use of an international array of authors such as Haberler, Hayey, Leontief and Mitchell in addition to various statistical tables. As he observed in the foreword 'Chapter IV and Appendix A are permeated with the ideas of Mr. Harrod, Professor Ohlin, and the Harvard Economists'(Cairncross, 1936).

Geographical distance may have meant that scholars such as Cairncross were largely exposed to these foreign texts through the written word, most likely via the Marshall library. Yet as the acknowledgements of the published thesis show, Cairncross (1953) paid thanks to several Cambridge-based scholars such as Dennis Robertson,[144] Colin Clark, John Maynard Keynes and Arthur Pigou, for their direct input. Mentors such as Robertson, Clark and Keynes were themselves engaged in international conferences, consultancy work and correspondence which exposed them

[140] Given the emphasis of Keynes within the new History of National Accounts literature it is apt to better describe the learning environment in which he was engaged.
[141] See the Marshall Library 1927 Catalogue. Though Dennis Robertson was the librarian at the time the book was largely compiled by Mrs Marshall and Mr D. Barber.
[142] Supervised by Colin Clark (Bauer et al., 1984), Rao after his studies went on to establish the Delhi School of Economics and several other empirical bodies in India. In 1949 Rao was appointed to the National Planning Committee of India and encouraged improvements to the statistical architecture of the plans including national income. For more on this please visit Fennell (2019).
[143] As noted in Wilson and Hopkin (2000, p. 341), Cairncross was supervised by Dennis Robertson and afterwards made significant contributions to public life both in war and outside eventually ending up as Master of St Peter's College Oxford and Chancellor of Glasgow University for more details please see Budd (1998) Cairncross's thesis went on to provide the foundations for Charles Feinstein's later investigations into capital formation, for more on Feinstein's extension to this work see Offer (2008, p. 5).
[144] Dennis Robertson, alongside Piero Sraffa was thanked in Rao (1936) for 'kindly looking through parts of my manuscript and making suggestions'. Robertson himself was a major international empiricist engaging with Tinbergen for example on the League of Nations research into Business cycle research.

periodically to the international empirical network which was establishing in America and the continent.

This vibrant empirical conversation is most apparent in the works of Rao's supervisor Colin Clark. In the acknowledgements section to his *Conditions of Economic Progress*[145] thanks were given to Kuznets in America, Frisch in Oslo, Keynes, Cole and Pigou in England, Lindahl and Myrdal in Sweden and Rao in India (Clark, 1940).[146] Clark then further develops the work of *Conditions* in his 1942 publication *the Economics of 1960* which draws on the League of Nations *Yearbook 1938-1939* (Clark, 1942, p. 7).

The argument made in this section is that the broader intellectual environment came to influence economic thinking in Cambridge. Whilst Clark's *Conditions* and *Economics* were both influenced, arguably these come from a relatively mature scholar on national income. Yet the national income contributions which established his name came from an earlier date.[147] We also cannot attribute the strong emphasis on science found in his work to the wider drive for economic empiricism because Clark himself was a chemist by training (Maddison, 2003; Peters, 2001). However it is clear that Clark was aware of the wider empirical debates as of 1936; as discussed in Section 4.2, Clark opens National Income and Outlay with reference to the quality of investigations underway in America and Germany (Clark, 1937, p. vii).[148]

Yet Clark's mentor in Cambridge, Keynes, was also strongly motivated by the new approaches coming out of America. In the 1930s Keynes (2012a [1936] pp.102-4) greatly supported the new quantitative American research and his *General Theory* and buttressed new theoretical insights with empirical data which had been supplied from overseas by Kuznets. Years before in 1930 he went further calling for new quantitative knowledge and celebrating the research at the NBER, Federal Reserve and Harvard research institutes in the *Treatise on Money* (Keynes, 2012d [1930] pp.365-6).

[145] While *Conditions of Economic Progress* was published in 1940, after Clark's move to Australia in 1938, the acknowledgements written in March 1939 thank his wife who encouraged him to 'embark on this ambitious project four years ago'. The bulk of the research on the book was therefore during his time at Cambridge.
[146] Despite the increasingly critical reviews of Clark's method as seen firstly in Rothbarth (1941) then in Deane (1951, 1958), *The Conditions of Economic Progress* was an influential text and the first edition was well received. The most notable influence was upon Angus Maddison who records that having followed up a reference to Clark's national income estimates in Keynes's *How to Pay for the War* whilst a teenager coming to Clark's *Conditions* which inspired him to become a "chiffrephile". Maddison, the founder of the Maddison data series – one of three main data series used for international economic analysis – 'was fascinated at the way in which it [Clark's book] quantified what was going on in many countries' (Maddison, 1994, pp. 123–4).
[147] See Clark (1932, 1933, 1934, 1937). For more on the contributions of Clark see Tily (2009).
[148] Clark (1932) *The National Income 1924-1931* however shows no engagement with international empirical debates and instead engages more closely with the works of Bowley, Stamp and Flux.

This helps to illustrate the engagement that Cambridge scholars were having with the international empirical discussions which were picturing the economy at a macro-level.[149]

To some degree Cambridge economists that were interested in empirical economics gained support from the LCES. Despite being based in London during its early years, it provided a link between the LSE and enabled prominent economists such as Bowley, Beveridge and Keynes to advance a common interest in empirical economics.[150] Despite being involved in the LCES, even by the 1940s Cambridge was not regarded as a home for empirical economics by bodies like the Rockefeller Foundation. Instead it was seen as a centre of 'logical analysis' rather than centre of realistic economic science.[151] Although the University managed to succeed in attracting high calibre empiricists such as Alexander Loveday,[152] Colin Clark[153] and Edwin Rothbarth,[154] there was not a defined centre of economics devoted to realistic research in Cambridge. In addition, self-defined realists such as Dennis Robertson felt isolated.

The 1930s Cambridge saw close alignment in particular between the work of Colin Clark and Dennis Robertson. Robertson, a figure who features less prominently in accounts of famous Cambridge Economists acted as an important node in the international economics network and aided empirically minded students in Cambridge such as Rao and Cairncross. Robertson was also strongly aligned with the League of Nations empirical networks above working with Tinbergen on the measurement of business cycles.[155] Robertson's support of the international business cycle research agenda can also be seen in correspondence in 1936 between Robertson and Clark in which he mentions a discussion with Lionel Robbins of the LSE that the LCES would bid for some

[149] Whilst Keynes can be seen here endorsing greater quantitative empirical knowledge, it should be noted that this does not necessarily mean Keynes endorsed the theories which underpinned these quantitative authors.
[150] In later years the LCES had notable contributions from Charles Feinstein, Austin Robinson, Alec Cairncross, Brian Reddaway, Richard Stone and others (Cord, 2017, p. 311).
[151] RAC – Record Group England, Series 401.s, FA 386, Box 83, Folder 1096. Letter from Joseph Willets to Raymond Fosdick, November 27, 1944. p.11.
[152] Loveday remains a relatively unknown figure in economic history beyond Clavin's work and doesn't have an entry in the Dictionary of National Biography. Early in his career he started as a lecturer in Economics at Leipzig University between 1911-1912 before returning to his alma mater Cambridge to lecture in Economics in 1913. After working in the war office he joined the League of Nations secretariat (see RAC – Record Group 1.2, Series 100.s, FA 386, Box 18, Folder 148. 'Member of the Financial Section and Economic Intelligence Service). Later, having run the EFS both in Geneva and in Princeton, and after a long career of public service he eventually become Master of Nuffield College Oxford - an institution which in part shares a legacy with the Rockefeller Foundation-founded Oxford Institute of Statistics.
[153] Clark was encouraged to become a lecturer in Cambridge after Keynes saw his statistical skills working on the 1930 National Economic Advisory Committee (Maddison, 2003, p. 9).
[154] Rothbarth made substantive contributions to Keynes's considerations on the definition of national income (Cuyvers, 1983a, 1983b).
[155] See for example Tinbergen (1939). Given later antipathies amongst some Keynesians to business cycle research this could be a factor in Robinson's marginalisation.

'conjuncture'[156] work from the Rockefeller Foundation and they hoped Clark would be able to do the work.[157,158] Correspondence with Clark shows Robertson had been attempting to secure research funds within Cambridge and the NIESR to support Clark's research agenda.[159] The risk to Robertson's 'realistic' research agenda was something he was aware of himself. The letter talks of the appointment of Champernowne as the successor to Clark and that "Champ":

> 'realises fully that he has much to learn on the realistic side, and I'm sure he will set about doing it to the best of his ability. Meanwhile Austin has, I am glad to say, postponed his visit to E. Africa, and I hope will be able to excogitate some scheme of enquiry for which we shall be able to let him help in finance and personnel. So while realistic research in Cambridge has suffered a severe blow from your departure. I think there is hope that it is not permanently dead.'[160]

The isolation of Dennis Robertson matters because while on the one hand he is the most integrated in the international realistic empirical discussions it shows that this was not fully endorsed within Cambridge. Possibly, it is because of wider ideological differences inherent in his business cycle research compared with the emerging *General Theory* of Keynes.[161] But Robertson still had scope to influence others such as Rao, Cairncross and Clark. And, alongside Keynes, as will be seen in Chapter 6, was part of the call to set up a Department of Applied Economics in Cambridge.

What this section has shown is that the wider emerging, international discussions on realistic economics came to influence Cambridge. At the most extreme, researchers such as Robertson were happy to use the term to label their own research agenda. Similarly, thinkers such as Keynes were calling for more quantitative works in economics. It is apparent that this term is meaningful in a Cambridge context even though the University of Cambridge did not have a strong reputation for empirical work. This matters for several reasons: firstly, it provided the training environment for economists who would go on to have a major impact on government and development thinking, such as Cairncross and Rao. Secondly, it is also significant that within the "realistic" quantitative research approach, outputs such as the *Conditions of Economic Progress* could emerge, further sustaining the conversations on National Income which were underway in organisations such as in

[156] In one part 'conjuncture' is an anglicisation of the German term 'Konjunkturforschung' meaning cycle research, but English definition means union or combination of circumstances typically linked to crisis. This allusion to joint phenomena and its linked effect to crisis is indicative of the type of work high on the research agenda at this time.
[157] UQFL – Clark – Box 11 – Folder 1 – Economics Correspondence – File 69.
[158] For more on the motives for Clark's departure visit Peters (2001), Maddison (2003) or Milmow (2012).
[159] UQFL – Clark – Box 11 – Folder 1 – Economics Correspondence – File 68.
[160] *ibid*.
[161] See Robertson and Keynes: Parallels and Differences in Fletcher and Thirwall (2008, pp. 171–178).

the NIESR. As noted at the start of the section, we cannot fully infer a causal relationship from the realistic research in Cambridge upon the early work in Clark. However, we can say that the national income publications of Clark's later work was of this time period, and in some cases, shown to be directly influenced by national income estimates from around the world. Some of these estimates were sustained by League of Nations outputs, some via Rockefeller Foundation funding.

4.5. Conclusion

This chapter argued that national income accounts were influenced by a wider 1930s empirical sentiment, underway internationally, which was loosely known as "realistic" economics. This sentiment was supported and sustained by large international bodies which came to influence thinking on empirical work around Britain and in Cambridge. The argument was advanced by firstly outlining "realistic economics", a fuzzy term which was used by advocates for greater use of statistical data in economic thinking. The realistic economics campaign was afoot in the UK and led to new bodies such as the NIESR being established in an effort to counter the issues with poor quality national statistics. This mattered for national income studies as lacklustre official statistics proved to hinder the work of economists such as Colin Clark. The drive for empirical observation in economics was underway in universities around the world and was in part aided by patronage from international networks. These networks received patronage from bodies such as the Rockefeller Foundation whose zeal for "realistic" economics saw funds allocated to a large number of organisations. The vibrant conversations among newly establishing data institutes came to influence thinking on empirical economics and national income, in Britain and in Universities like Cambridge.

The significance of this argument is twofold. Firstly, it contributes to the wider literature by providing a better rounded account of the influence of international bodies on the emergence of national income research in the 1930s. Whilst Studenski (1958, p. 160), has advocated bodies such as the UN and OEEC influenced the emergence of national income, the Studenski account only analyses "interwar influences" in a post-World War II setting. The account forwarded in this chapter suggests an earlier interwar international influence. This international support came via the League of Nations and Rockefeller Foundation whose patronage enabled the emergence of bodies which themselves commissioned national income related studies. The intellectual and financial support these international bodies provided, not only increased the legitimacy of empirical economics but also enabled a supportive environment for national income research. This may in part account for the "extraordinary flourishing" of interwar national income estimates observed by Studenksi (1958, p. 149).

Secondly, through the patronage of "realistic" economics, bodies like the Rockefeller Foundation enabled economic statistics-intensive approaches such as business cycle research and econometrics, which increased the overall availability of economic data. This lends some support to Tily (2009 p.356) who argues that the increasing literacy and legitimacy of econometrics may have helped convince official bodies to adopt national income studies during World War II. The significance of this for the wider thesis is that the chapter suggests by looking at the wider contextual environment we can identify factors which influenced the emergence of national income research. This further confirms the argument advanced in Chapter 3 that we need a more rounded account on the origins of national income. Precisely by examining the wider interventionist empirical language of "realistic" economics we can better understand how national income *accounting* rose to prominence alongside other empirical applied economics approaches seen in World War II. Chapter 5 considers this in more detail by examining the way that national income accounting emerged as one among many approaches to managing the wartime economy. Chapter 5 further contextualises the emergence of national income accounting by examining why the government changed its approach to fiscal management and adopted national income accounting as a macroeconomic government budgeting tool.

Chapter 5: Wartime budgeting – economists' inflation concerns enabling national income accounting as a tool of public finance

5.1. Introduction

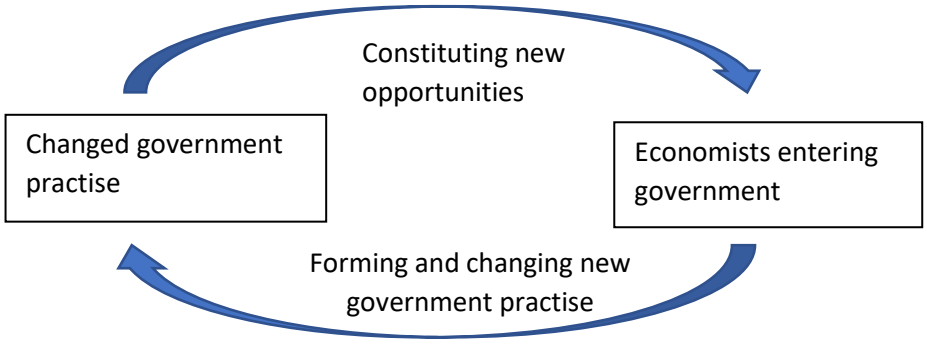
5.1.1. Locating the chapter argument within the wider thesis

The previous chapter used a Hodgson-style institutional analysis to examine how 1930s economists engaged with international ideas. It showed that international institutions such as the League of Nations and the Rockefeller Foundation were part of, and aided, a "realistic" economics which enabled increasing volumes of economic statistics. This led to an environment that was amenable to national income studies.

Chapter 5 considers how and why national income research shifted from being estimates taken by private individuals to become an official government set of regularly published national income accounts. As the literature review in Chapter 1 discussed, the 1941 publication of the White Paper on the wartime sources of finance and national income and expenditure was a critical juncture for national income accounting. This has been extensively discussed in Mitra-Kahn (2011, chap. 8) which outlines a narrative that Keynes lobbied widely in Whitehall for the publication of national income figures. The narrative suggests that Keynes's actions were the principal reason for the official publication of national income figures in 1941. The chapter extends the Mitra-Kahn (2011) account by discussing the emergence of national income *accounts* within the broader institutional changes which made the British state receptive to Keynes's suggestions.

This chapter performs a Hodgson-style institutional analysis of the wartime institutional factors shaping the emergence of national income *accounts*. Shown below in Figure 5.1, it does so by considering how changed institutional practise enabled new opportunities for empirical economists to enter government and shape new government practise. It shifts the focus on the adoption of national income accounting from the individual researchers to government as an institution by asking what contextual factors during wartime shaped the emergence of national income accounting.

Figure 5.1. Institutional approach for analysing change in government practise



Yet the publication of national income accounts was by no means the only end that Keynes or the government sought from national income accounting. It was one part of a much larger and significant shift in public finance doctrine. This new budgeting approach differed significantly from prior government finance doctrines. This chapter unpacks this radical change, and argues that by adopting a history in economics approach we can better understand both why the government adopted a new radical financial budgeting approach and why this enabled new national income accounts.

5.1.2. Literature gap

There remains a literature gap in our understanding as to why the British government decided that national accounts should be measured to inform government budgeting decisions in the Twentieth Century. Two bodies of literature come close to describing this 'revolutionary' change. The first, an economics literature which provides a twenty-first century historiographical account of national income. This literature emphasises the differences in national income definitions between the national income as measured by Colin Clark's method and John Maynard Keynes's definition. The second set of scholarship relating to this decision comes from historical literature – both on the role of war in budgeting and on the role of budgets in war. These two spheres of historical literature look at changes to budgetary finance during the 1940s. This chapter seeks to bring the economic and historical literature more closely together in order to more fully show the role that national income played within a wider mechanistic budgeting strategy that used data to inform wartime strategy. The narrative advanced in this chapter – that 1940s British national income was purposed as a tool of public finance – concurs with a third type of writing undertaken in the 1950s. Often written as first-hand accounts by prominent participants in the development of national accounts, these writings lend limited support to the argument of the chapter. As they were written almost a decade after the

original events, we cannot fully rely on them to explain the situation. This means to make a claim about why this decision took place, further corroboration though primary evidence is needed. To this end, this chapter draws on a mix of historical accounts and archival materials.

To date the literature on the history of national income has emphasised changes in the terms used in national income definition during the 1940s. The 1940s, notably, saw Keynes publish national income estimates which estimated national income differently from Colin Clark (Mitra-Kahn, 2011). This national income literature suggests the 1941 official publication of national income figures in the White Paper (cmd 6261) and also in the National Income Appendix of *How to Pay for the War* are a critical juncture in the development of the notion of national income because it was the first time government published official estimates of national income. Yet there remains scope to identify why the government chose to measure national income and publish an official national income data series. To this end, the chapter focuses on the first half of the White Paper and the bulk of *How to Pay for the War*, and their relationship to the national income figures that accompanies them. Some scholars do pay attention to aspects of the inflation accounting (Coyle, 2015; Kenessy, 1994; Tomlinson, 2017; Tribe, 2005) but detailed evidence for the link between the two is thin, and there remains scope for a stronger link to be established to the transformative role of national income estimation within the broader government budgetary transformations of the 1940s.

A contrasting framing that emphasises changes to the broader government machine comes from historians contributing to our understanding of Twentieth Century British history (Agar, 2003; Daunton, 2008; Edgerton, 2012; Tomlinson, 2017). These authors identify the changes to national income estimation within a broader sweep of administrative changes which were underway during World War II as the British State mobilised to respond to global and industrial-scale war. This literature also provides strong accounts of the anti-inflationary role of the 1941 budget, but only a couple of cases link back to the national income measures underpinning this. The change to budget approach was a revolutionary step change from the Gladstonian thinking and McKenna-rule budgetary thinking which preceded it. While this can provide some insights into the budgetary transformations underway, they under emphasise the changes to national income measurement.

One of the most detailed accounts of the financial challenges facing decision-makers comes from Skidelsky (2004). In it Skidelsky extends a similar discussion by Robbins (1947) by outlining in detail, two different wartime planning doctrines: the "production theory of war" and the "fiscal theory of war" (Skidelsky, 2004, p. 595).[162] The former was extremely influential in informing decisions and

[162] See Skidelsky (2004, p. 595), quoting Lionel Robbins' terminology to label the new budgetary philosophy 'More importantly, he invented the fiscal theory, precisely in order to avoid "totalitarian" planning. He did not

the latter helps to explain the relationship between national income thinking and wider financial issues during war. These are elaborated on in further detail below.

The first approach highlighted by Skidelsky, the production theory of war, focuses upon the resourcing needs of the economy and whether there are the people, raw materials, intermediate and finished goods (from weaponry to transporters) that are necessary to fulfil the national need.[163] Some accounts from economists engaged in war management emphasise how crucial the production theory of war was. The war planning effort 'was done almost wholly in terms of the physical resources, and to an increasing extent as the war went on it was done in terms of manpower' (Robinson, 1951, p. 40).

The second war management approach highlighted by Skidelsky addresses the financing of this expanding war machine in a way that doesn't run out of money. Skidelsky and Robbins term this the fiscal theory of war. Skidelsky argues Keynes framed World War II as a problem of excess purchasing power in the economy – in order to prevent it from overheating macroeconomic demand management was needed in addition to planning, price fixing and rationing (Skidelsky, 2004, p. 595). Keynes's argument, Skidelsky argues, framed wartime management in fiscal theory of war terms. Yet questions over the extent to which fiscal planning drove the overall planning effort of the economy can be seen in Robinson (1951, p. 40). While it may not have been the primary focus of central wartime planners, important changes in government finance strategy occurred which saw national income becoming a tool of public finance. Similar questions over what economic doctrines and data should inform war planning were also underway in the USA (Lacey, 2011, chap. 4).

The argument advanced in this Chapter therefore is not that "Keynesians won the war," nor is it that inflation management or that the fiscal theory of war won the war. Tomlinson (2017) for example clearly identifies the importance of manpower for wartime administration. In addition to Tomlinson, several other historians have emphasised the primary importance of resources, production and mobilisation to the economic management and outcomes of the war (Kennedy pp.374-5, 441, 458; Edgerton 2012, p.205; Harrison, 2000 pp.22-4). Rather, this chapter's contribution to scholarship is to show *how* concerns about inflation provided a catalyst for changes to government's budgeting algorithm. These changes saw the incorporation of national income as a tool of anti-inflation budget finance, and helped to provide an enduring link between national income and public finance. These

see demand management as a useful adjunct to planning, price fixing, rationing, bureaucratic controls and so on, but as an alternative to them in war and peace' and Skidelsky (2004, pp. 610–11) for the impact this had upon budgeting.

[163] ROBN/1/1/4: Quarterly General Survey of the General Economic Position, and, E.C.(S.) (41) 29 "General Economic Policy" by John Jewkes which discusses man power, raw materials and civilian standard of living.

changes occurred as part of a wider change in the government wartime machinery (Agar, 2003; Edgerton, 2012). To that end, we may better understand the 1950s comments by Austin Robinson that 'in the planning of the British war economy (Keynesian) national income calculations had a very important but, in some senses, a limited function' (Robinson, 1951, p. 40). Such accounts also gain support from the Daunton (2008) history of UK taxation and the Tomlinson (2017) history of manpower planning, both of which discuss national income change among other changes to wartime administration.

The argument of this chapter – that national income accounting was intended as a tool of public finance – supports the immediate post-war literature covering the purpose of national income measurement (Stone (1951, p. 86)), Jackson (1951, p. 152), Deane (1953, pp. 1–2), Prest and Stewart (1953, pp. 1–3)). The argument in this chapter has also been strongly influenced by the account forwarded by Hawtrey (1947),[164] a document which emphasises the important financial role that national accounts played in war. These authors put forward a widespread understanding that the intention of national income estimation was as a part of a wider financial philosophy, one which contained a macroeconomic shift in thinking that linked national income estimates to government budgeting. While these accord with the discussion above, and are informed by agents at the heart of change in the case of Stone and Jackson, these narratives are not contemporaneous to the moment of change. There remains scope for actors from the 1940s to say in their own voices why government budgeting needed to change and what this meant for national income estimation. These voices form another key piece of evidence for the argument put forward in this chapter. Voices such as Keynes's 1940s correspondence which argues this new budgeting approach was a 'revolutionary' change from the past.[165] The account forwarded in this chapter draws upon a range of historical accounts (official and non-official) and archival sources.

The chapter aims to fill this gap by bringing together both the recent national income historiography with the discussions on budget finance and national "Keynesian" wartime management historiography. By drawing on these literatures, a clearer understanding of the purpose of wartime finance emerges, which in turn helps to more fully explain the origins of the publication of national

[164] The Hawtrey Financial History of the War is a Cabinet Office history file previously held at "secret" in the national archives. Archival records date the document from 1947. The first page of the file notes: 'These are narrative written by Mr Hawtrey for the Treasury. Mr Hawtrey was a Treasury civil servant and his narratives were not written under Professor Hancock's direction nor were they necessarily intended for publication. Later Professor Sayers was commissioned to write a history of financial policy for publication under Professor Hancock's direction. Mr Hawtrey's studies are factually reliable.' TNA T208/204.

[165] See section 5.4.2. on Keynes's attribution on the logical structure and method of wartime finance which alongside the White Paper he argued was 'really a revolution in public finance.'

income measurement in the 1940s. Moreover, it provides some context to help make sense of the theories of scientific state management discussed in subsequent chapters.

5.1.3. Chapter outline

The argument progresses in section 5.2. by first laying out some of the considerable institutional changes underway during war. The mobilisation of resources and the machinery of the administrative state required bureaucrats, and drew from learned bodies such as the economics community. They entered government mindful of the inflation and debt burdens which followed the last industrial-scale war. One suggested way forward that is considered in section 5.3., was the notion of the "theory of the gap". The theory of the gap was aired in *How to Pay for the War* and used to argue that overconsumption of goods alongside wartime mobilisation would push purchasing power beyond the capacity of the economy leading to inflation. Instead, consumption and public finance had to be managed. One of the measures which the government launched to help inform their understanding of the gap were the national accounts. Section 5.4. shows that national accounting was intertwined with, and part of, the wider finance questions central to both Keynes's How to Pay for the War and the resulting White Papers. As discussed earlier, these two publications are part of a critical juncture, identified in national income literature as a moment of conceptual change to national income. However, the larger more significant change underway, presented in this chapter, was an institutional one. These new figures enabled a new form of rationalistic approach to computing government budgets, one which sought to manage both government and the economy to temper the dangers of inflation. This new type of taxable capacity defined a limit of budgetary spend (as opposed to seeing the willingness of the tax payers as a limit, or using some notion of balanced budgets across tax revenue or expenditure). It is this institutional change that helped to form part of the intellectual basis of the post-war managed economy. Such changes were reliant upon an official, regularly measured and published data series such as the national accounts produced by the recently created central statistical office. The chapter concludes by reflecting on this notion of national income and how it was used to inform a scientifically and mathematically justified budget. This lays the foundation for looking at how this new national income approach evolved in post-war settings such as academia (Chapter 6) and colonial settings (Chapter 7).

5.2. Institutional changes in government led to opportunities for new economic thinking as economists mobilised for war

This section explains that with the outbreak of war, economists entered government and with them came new ideas. Both inside and outside government there was an increasing emphasis upon

gathering information that could help inform the war effort. The wartime centralisation of both resources and people that this implied, led to economists filling influential positions in government. This is seen most notably in the case of the Stamp Survey[166] which played an important role reviewing economic plans across government and later evolving into what would be the Central Statistical Office. Bodies like this, and the new economists filling them, enabled new ways of thinking which could help inform wider government thinking about how to finance the war without overheating the economy, as discussed in section 5.3. below.

5.2.1. Outside government, economists mobilised for war providing information for the state

Alongside the significant mobilisation of resources to fight the war, citizens mustered to support the war. As this section will detail, outside government many economists focused their research on applied topics which would help inform the government machine. The nation-centric information they prepared could help to inform centralised decisions underway in Whitehall.

Outside government many economists were publishing on matters directly relevant to public affairs. Their applied, 'realistic,' economic thinking helped to inform practices inside government, and provided a channel through which wider intellectual issues were seen by economists inside government. This can be seen in the ongoing debates in the Journal of the Royal Economic Society. The Journal was edited by two prominent economists within the British war machine – Austin Robinson and Maynard Keynes. While some economics journals didn't comment directly on wartime management,[167] the December issue of the Economic Journal focused on wartime management.[168] Other journals had several contributions by individuals throughout the war in journals such as the Manchester School[169] and the Review of Economic Studies at Oxford.[170]

The transition to wartime thinking can also be seen in the mobilisation of a "realistic" economic community in academic centres around the UK.[171] Applied economics thinking became increasingly

[166] The Stamp Survey was a permanent body established in June 1939 after successful completion of the survey of War Plans in the Economic and Financial Sphere (Ward and Doggett, 1991, p. 24).
[167] Economica for example has a limited contribution from Hillmann (1940) and some book reviews but publications notably focus on less relevant issues to the war effort.
[168] Starting with an editorial from Keynes and Robinson (1939) on war economics and war potential it included contributions from Rothbarth (1939) on the income and fiscal potential of Great Britain, Robinson (1939) on the problem of wage policy in war-time, Makower and Robinson (1939) on labour potential in war time Bowen (1939) on the building industry in war time, Einzig (1939) on the unofficial market in sterling and Kindersley (1939) on British Overseas investments in 1938.
[169] See for example the discussions by Stafford (1940a) on war finance, Stafford (1940b) on British War Controls or Hans Singer (1944) on the effectiveness of the National Savings movement
[170] See for example Gilbert (1940) on Anglo-French financial cooperation during World War I, Hicks (1941) on the impact of lags in tax collection on war finance, Rothbarth (1941) on the difficulties of real income measurement under rationing and a response by Kaldor (1941).
[171] Note several of these research centres were newly founded using Rockefeller Foundation funds – see Chapter 4 for further details.

important, and would ultimately feed into decision making inside government. Quantitative-minded economists recognised that there were important questions facing government 'which involve an accurate quantitative knowledge of existing conditions which no one at present possesses.'[172] Whilst universities did see a brain-drain of economists to wartime administrative posts, the remaining staff in the academic centres they had left, adjusted their research agendas around wartime concerns. This move to wartime-focused research gained support from the NIESR.

The NIESR was widely seen as a coordinating body outside government for strengthening the informational basis of war.[173] A wide-ranging wartime programme of research was devised to direct economists to address wartime concerns as shown in a 1940 NIESR memo summarised in Figure 5.2. below.

[172] Henry Clay quoted in correspondence, RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 885 – Tracey Kitteridge correspondence 6 December 1939.

[173] Tracey Kitteridge notes unanimity among a range of economists 'Carr Saunders, Harold Butler, Jewkes, Beveridge and F. S. Mc Dougall' agreed on the 'extraordinary useful role which the Institute may play during the war period' RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 885 – Tracey Kitteridge correspondence 13 November 1939

Figure 5.2. The NIESR funding programme in response to World War II[174]

Research category	Research Topic	Research body
General investigation	A summary weekly diary of economic and social events	NIESR
	Observation of Wartime Economic Trends in Germany	Oxford Institute of Statistics
	Observation of Wartime Economic Trends in Russia	Oxford Institute of Statistics
Finance	Monetary Policy and the Banking System	NIESR
	Banking Policy and War Finance	Oxford Institute of Statistics
	Taxation of War Wealth	Manchester
	Effects of War on Municipal Finance in Coventry	Deputy Treasurer of Coventry
National Income	n/a	Manchester / LSE
Exchange Control and Foreign Trade	Descriptive and analytical account of the British Exchange Control and its Effects	Oxford Institute of Statistics
	Foreign Trade and Exchange Control in Russia	Oxford Institute of Statistics
	Interpretation of Foreign Trade and Shipping Statistics	NIESR
Labour	The source of recruited labour in Coventry, and economic and social adjustment in wartime	n/a
Savings and Consumption	An investigation into spending and saving habits in wartime	NIESR
Regional problems	Coventry as a specially stimulated area	n/a
	Bristol as a specially stimulated area	NIESR
	Economic and Social Conditions in the Highlands	University of Glasgow
Social problems	The social consequences of evacuations in S. W. Scotland	University of Glasgow
	An enquiry into the effects of the war on Juvenile Employment and Welfare in Glasgow	Various
	An enquiry into the Impact of the war on Juvenile Employment and Welfare in Manchester	Economic Research Section of the University of Manchester

This information was used, and of use, during wartime e.g. a survey was conducted on attitudes towards saving which proved to be instrumental to thinking on the limit to the savings movement in war.[175]

Looking at the case of the Oxford Institute of Statistics under the direction of Bowley, its 1939-1940 annual report provides multiple examples where research agendas on regular market functions, like

[174] RAC – Record Group 1.1, Series 401.s, FA 386, Box 67, Folder 886 – NIESR Wartime Programme of Research In progress.

[175] Keynes made reference to this work in a draft statement he wrote for the Chancellor. TNA T172/356 Vol II

balance sheets, were put on hold to address more pressing wartime concerns. This included prioritising 'the preparation of memoranda on specific current problems' and 'a three-monthly investigation into retail prices and the effect of war upon them and upon the purchasing power of the population.'[176] Those within the Institute understood these figures to be useful for government. An examination of the records of the Stamp Survey illustrate the way the Oxford Institute provided briefings, on government request, on matters such as the preliminary findings on a report into the engineering and foundry firms in Birmingham.[177] Commissioning research in this way, particularly on detailed technical matters like the coordination of local business in areas important to the war machine,[178] the British government could use resources in academia to provide an important record of the economic situation.

In the University of Manchester, the Economic Research Section had been undertaking research since early 1939 on the industrial changes underway since World War I.[179] The Economic Research Section also had an ambitious agenda which would study the types of State control of industry prior to war. The outbreak of war saw academics in Manchester decide to continue this work but expanded the scope of their enquiry to consider the effects of World War II.[180] 'Realistic' studies were launched into the Lancashire economic and social situation and the changes brought about by the war.[181] This research agenda came after discussions between Jewkes and the head of the NIESR's war and post-war research agenda divisions.[182] The University also secured additional funds to 'analyze the effects of war on certain sections of British economic life.'[183]

These universities and institutes intended this mobilisation of academic time and effort to help inform national conversations on wartime administration. The national-scale data and analysis helped to inform the increasingly centralised Whitehall war machine.

[176] Bodleian library, University of Oxford Annual Report for the academic year 1939-1940 pp. 4-5.
[177] ROBN/1/1/4/ Folder 7 Oxford Survey of Statistics dated 14/06/40.
[178] See ROBN/1/1/4 Stamp Survey minutes 73rd meeting 22 July 1940.
[179] RAC – Record Group 1.2, Series 401.s, FA 386, Box 82, Folder 1076 – A programme for the study of changes in the economic structure of Great Britain since war.
[180] *ibid*., A programme of research during the war, p.3.
[181] RAC – Record Group 1.2, Series 401.s, FA 386, Box 82, Folder 1077 – Economics Research Section – University of Manchester Feb 20 1940.
[182] RAC – Record Group 1.2, Series 401.s, FA 386, Box 82, Folder 1076 – letter from Kitteridge to Willets 6th November 1939.
[183] RAC – Record Group 1.2, Series 401.s, FA 386, Box 82, Folder 1077 – University of Manchester Economic Research Department July 8 1941.

5.2.2. The technocratic state: a centralising wartime government drew economists into Whitehall

Inside government new opportunities for innovations in administration emerged as the state vastly expanded in the run up to war. These new responsibilities saw increasing centralisation and the need for new informational processes.

Effective centralisation of the twentieth century industrial state posed considerable difficulties for decision making during the war. As further discussed in 5.3.1. World War I had an important framing effect upon the conceptualisation of war (Hancock and Gowing, 1949, 1949). Early efforts of coordination emerging towards the end of World War I saw, for example, the Board of Trade using data on a range of food and pricing information. The resource-focused data series could be used to support administrators following a production theory or war.[184] A standardised systematic measurement approach, the Consumer Price Index, also originated from this time (Beveridge, 1928). Similar lessons had been learnt in Germany during the interwar years, and had led to significant change to economic measurement (Tooze, 2001). In the U.K. coordination challenges were compounded by the expansion of the state into a wider range of welfare activities, alongside new forms of data such as income tax (Clark, 1932, p. vi). These increasing challenges of managing a complex industrial society at the start of World War II saw government ever more operating in a mechanistic fashion driven through notions of technocratic "science" (Agar, 2003; Edgerton, 2012).

Credible, accurate and timely information was recognised in the early years of World War II to be critical to running a wartime economy. This is clearly articulated within "Britain's War-time Economic Organisation" - a document prepared in response to Colonel Rutherford, the Director of the Planning Branch of the US War Resources Board. Prepared on behalf of the Minister without Portfolio,[185] and reviewed by the Stamp Committee on 7 October 1940, it explained the government's approach in response to all-out-war. Section IV outlined the "Collection of Statistics and the Planning of War activity" which suggested Britain had learnt lessons on information management from the early years of the war. For example, early on in the war, data collection suffered as civil servants were reprioritised towards other pressing tasks. This however led to 'serious gaps in knowledge' regarding the momentum of the war effort. As a result, there was a prompt reversal of the decision and the restoration of data collection posts. Having learnt these lessons on the importance of statistics for the war machine, the document argues this led to more economic variables and more statistical enquiries being undertaken. The report also prescribed a series of essential statistics to the USA that it needed for the outset of war e.g. employment; machine and tool operation; factory

[184] See Skidelsky's differentiation between the production theory of war and financial theory of war in Section 5.1.2.

[185] Churchill College Archives ROBN 1/1/4, Britain's War-Time Economic Organisation.

accommodation; stocks, consumption, production and imports of raw materials. An increasing reliance on these data series would require the establishment of a new cadre of officials to prepare and review these figures.

Wartime saw the mobilisation of resources and people, among them economists, to the core of government. A Central Register Branch at the Ministry of Labour sought to draw scientific talent into government to help inform the war effort (Hennessy, 2001, pp. 88–92). In particular there was a pressing need for numerically-minded people such as statisticians (Hennessy, 2001, p. 102). In part, this was a natural response to an increasing acceptance of the potential contribution of economic thinking to the matters of coordination of resources (Agar, 2003; Peden, 1996). With this mobilisation of academics into government, the result would be many more economists within government than in the previous World War. Whilst the economic dimensions of WWI had been fought with the involvement of four economists of note (John Maynard Keynes, Walter Leyton, Henry Clary and Hubert Henderson), Cairncross (2002, p. 33) identifies around 50 economists with this role during World War II.

This post-General Theory generation of economists had intellectually matured alongside the increasing prominence of data within the economics discipline. Several were themselves former Rockefeller Foundation Scholars who had visited America and had engaged with those at the forefront of American debates on newly emerging economic statistics. In 1944, Joseph Willets the Director of the Rockefeller Foundation Social Sciences reflected on:

> "the brilliant record which former SS (Social Sciences) fellows have been making during the war. Examples are Robbins and Meade in the War Cabinet, Jewkes in the Ministry of Reconstruction, Campion who has organized the Central Statistical Office."[186]

Economists who previously worked in data-intensive roles were thrust into the centre of government, bringing with them, most likely, a 'realistic' approach to economic management – as has been explained in section 4.1.2. Several prominent figures during the war came from centres which had been beneficiaries of Rockefeller patronage of knowledge production such as Devons and Jewkes from the University of Manchester. Some such as Robertson and Meade had also developed empirical insights via engagement with the League of Nations (discussed in Chapter 4).

Access to Whitehall's corridors of power would provide an increasing opportunity for these economists to influence government thinking on war administration. Economic planning prior to the outbreak of war had been largely the remit of a subdivision within the Committee on Imperial

[186] RAC – Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 – letter by Willets 27 November 1944 p.1.

Defence (Hancock and Gowing, 1949) and there had been limited efforts to draw in economists prior to the declaration of war (Cairncross, 2002, p. 34). This volume of new entries to government in World War II meant an exposure to new ways of thinking, often within newly set up centralising bodies. These central bodies provided the scope for economists to exercise considerable influence, the clearest example of this can be seen in the Stamp Committee.

5.2.3. The Stamp Survey as an example of influential newly mobilised economists within the technocratic state

The Stamp Survey emerged as a by-product of the centralising pressures of World War II; it also demonstrates how economists came to have a greater influence within government during this time. At the outbreak of war considerable influence was given to Sir Josiah Stamp to evaluate government policies, a task which required a support team of economists. When he died unexpectedly in 1941, the economists, who he had employed, filled the new Central Statistical Office – a body that became essential for the measurement of national accounts.

Hawtrey (1947, Ch.6) notes Lord Stamp was called to review the economic and financial situation of the country on 12 June. Stamp was assisted in this task by Hubert Henderson, Henry Clay and Francis Hemming (Hawtrey, 1946, Ch.6). Hawtrey notes a preliminary survey was conducted based upon interviews across Whitehall and was paused due to personal commitments by Stamp between August and the outbreak of war. Nonetheless, the growing influence and integration of economists by Stamp continued to be evident. By October, Hawtrey records an interdepartmental committee on economic policy was founded 'to keep under review and to co-ordinate the functioning of the Departments concerns with the various aspects of economic policy in relation to the economic effort of the country as a whole' (Hawtrey, 1947, Ch.6).

The government laid the responsibility for reviewing all economic information upon the shoulders of one central committee. This is in part a reflection of a delayed understanding of the role that information would play in the war ahead. Prior to World War II there had been significant resistance to the creation of a central informational hub in government. Some felt it intruded into the role of the Treasury or Board of Trade (Ward and Doggett, 1991, chaps. 2–3). Others raised concerns about the influence of technocrats in the government machine (Agar, 2003). Still, new institutional processes strengthened and deepened throughout war, in part due to the exigency of war and patronage from figures such as Winston Churchill.[187] The main legacies of the economists' roles

[187] Hennessy (2001, p. 102) notes the importance of Churchill in the Admiralty as a patron of statistics,

could be seen in 'the Economic Section of the War Cabinet Offices and the Central Statistical Office' (Caincross, 2002, p.34).

Lord Josiah Stamp, the man chosen with the blessing of the Cabinet to head up this review function, was part of a generation that helped to open the door to an increasingly technocratic government (Ward and Doggett, 1991, p. 24). Until his untimely death on 16 April 1941, Stamp headed up the Committee (Bowley, 1941). A bulwark of the British economic establishment[188] yet as Ward and Doggett (1991, p. 24) note 'an archetypal self-made man,' he was tasked with reviewing the wartime economic plans of bodies ranging from the Ministry of Agriculture to the Ministry of Labour.[189]

Stamp, and the committee which evolved around him, quickly became an entry point for economists having an intimate influence on government decision making. The economists that supported him in this role were names such as Harry Henderson, P. K. Debenham, James Meade, Alec Cairncross, H Clay, Dennis Robertson, Harry Campion, Francis Hemming, Austin Robinson, Lionel Robbins.[190] The majority of these names have been strongly associated with the bodies outside government seeking to engage with realistic economic thinking – the notion that scientific economic data should inform decision making. It is perhaps unsurprising that these types of attitudes would feed through into a technocratic body at the heart of government.

The role that this committee filled also expanded over time. The Stamp committee sought to improve the information on which central government decisions were made during World War II. The role was multifaceted and wide ranging. One of the primary functions was to be the data equivalent of a telephone exchange receiving informational signals from departments across Whitehall. This information coming before the committee was on a range of topics, including resources (labour, raw materials, factory capacity, machinery and plant), manpower figures and export figures. The committee also scrutinised and evaluated the quality of the information.

In part driven by the broader centralising trends seen with the emergence of the modern war machine, bodies like the Stamp Committee elevated economists who had come from academic

[188] Sir Josiah Stamp (1880-1941) was well-suited for the role with a background spanning from Assistant Secretary of the Inland Revenue to active engagement with the NIESR, the Royal Statistical Society, the British Association (Bowley, 1941), a Governor of the Bank of England "and one of the busiest men in London" (Cairncross, 2002, p. 34). Incidentally during his lifetime he also made several estimates of national income which have gained increasing recognition in contemporary national income debates (Mitra-Kahn, 2011; Tily, 2009).

[189] Churchill College Archives ROBN 1/1/4.

[190] The Central Statistical Office which the successor body to the Stamp Committee had a similar collection of luminaries under the direction of Harry Campion including: Meade, Devons, Fowler, Stone, Joan Morley and Sally Chiler (Ward and Doggett, 1991, p. 32).

centres which were specialising in data measurements. They, like several economists who remained outside government, were turning their attention to the key economic challenges facing government entering war. The next section of the chapter now focuses on a specific concern that influenced economic thinking in the Stamp Committee and other economic bodies in government.

5.3. The Economists' concerns about inflation management

This section considers a specific wartime administration concern and the role it played as a catalyst for changing government finance. As highlighted in the literature review at the start of the chapter, the question of how to finance the war was secondary to many pressing resourcing questions on manpower and raw materials. Manpower budgeting itself continued to be a dominant source of concern in the immediate post-war years.[191] Yet the changes to public finance, which were ushered in as a result of inflation concerns, led to a need for government to measure national income figures.

The section advances by firstly explaining the theoretical landscape economists and administrators faced in the run up to World War II. These concerns are reflected in discussions held by the Stamp Survey. However, as Hancock and Gowing (1949) argue, the absence of a clear doctrine of financial war meant ad hoc responses. As a result, economic administrators in important central positions were mindful of a need for change but lacked a comprehensive framework to respond. This section concludes by looking at the 'theory of the gap': a form of applied Keynesianism that outlined a suite of potential responses, which could be used to bring the economy back into equilibrium. This new fiscal approach is then shown in section 5.4 to have been important to the motive for government to measure national accounts.

5.3.1. Starting World War II by fighting the last fiscal war: how to mobilise using debt finance without inflation

The return to industrial-scale warfare posed significant challenges to twentieth century governments and, in the case of Britain, its early planning was significantly impacted by the legacies of World War I. The official history narrative, as advanced by Hancock and Gowing (1949), is of a country that entered war conscious of the errors of the past. Specifically, they argue the World War II government was aware of the financing errors of World War I which saw an overreliance on short-term finance basis. The planning for World War I was previously based on the assumption of a smaller Crimean-scale, rather than Napoleonic-scale war; this assumption encouraged the state to finance using short-term debts. Yet Hancock and Gowing argue the lived experience of World War I

[191] JRNS/6/2 – outputs of NARU (2 of 2) Correspondence between CSO and Richard Stone 28 May 1951 attachment "National Income Forecasting in the United Kingdom."

showed this approach led to inflation. The interwar years led to deep reflection by government and economists on the need for new ways to approach debt management in a time of war, but to no real avail. Hancock and Gowing (1949) argue that at the beginning of World War II, the British government was aware that a new concept of fiscal management would be needed, though exactly what remained unclear. However, they argued, researchers at that time saw the need for a debt strategy on a long-term footing as important.

Prior to World War I the government still operated with a Gladstonian notion of "sound finance:" expenditure that had to be paid for through taxation (Daunton, 2008, p. 42). Yet, as Middleton (2004, p. 462) shows, often expenditure and taxes were not necessarily equal. The notion of sound finance was fatally challenged upon entry to World War I with the need for 'an unprecedented commitment to a large continental Army' (Sloman, 2015, p. 36). A new fiscal rule emerged in World War I, which was implemented in June 1915. This remained in place throughout the interwar period (Nason and Vahey, 2007, p. 290). Under the new McKenna rule the government was supposed to not borrow 'without imposing new taxation sufficient to provide for interest and a sinking fund on the new loans' (Morgan, 1952, p. 371).

Morgan (1952) characterises this attempt to rely on laissez-faire ideology entering World War I as having hampered mobilisation and forcing the government to rely upon inflation and debt as sources of war finance (Morgan, 1952, p. 369). Whilst some of the expansion of prices had been tempered by large levels of voluntary savings (Morgan, 1952, p. 375), the end of World War I saw an indebted nation with a reliance upon short term borrowing (Morgan, 1952, p. 379).

This narrative of the weakness of British Wartime financial strategy is supported by other authors recently, such as Tooze (2015) who highlights the considerable levels of borrowing undertaken by the British state and its heavy reliance upon American finance. The dangers of recent experience were even more exacerbated abroad as Kennedy (1989, p. 362) notes non-British and USA belligerents during World War I heavily relied on debt to finance war which led to significant inflation. This concern about finance remained an important framing device throughout the war. For example, as seen in the opening remarks of the Chancellor's budget speech in 1941, which commented on the need for less grievous debt burdens and highly priced borrowing burdens of the last war.[192]

This narrative is also reflected in the secret official financial history of the war written by Hawtrey. With the outbreak of war, Hawtrey (1947 pp.4-6) notes both the Chancellor of the Exchequer and

[192] Chancellor Kingsley Wood 'Financial Statement' Parliamentary Session 1941 Hansard Vol 370 Column 1297-300, 07/04/1941.

the Governor of the Bank of England were concerned about an upper limit to the resources the government could muster without inflation. Tacitly acknowledging the absence of such an organisation, and the absence of a plan, the only way to understand this limit was, the Governor argued, to have a body systematically review the "country's resources, financial and industrial" (Hawtrey, 1947 pp. 5). By June 30th 1949, Hawtrey (1947, pp.7) notes the government's Committee on Savings and Investments raised concerns about the "utilisation of a mass of money which has hitherto lain idle will have inflationary effects upon prices, costs and profit." This was deemed to be inevitable given the increases to government expenditure. Hawtrey notes that these concerns endured as government increased spending into 1940 and 1941.

Literature both from immediately after the war and contemporary accounts show the British state and its administrators entered World War II believing there had been financial mismanagement during the Great War. This, it was believed, exposed the country to destabilising inflation, a lack of coordination and had saddled the country with high-cost short term debt. This trilemma of government debt, inflation and mobilisation was a powerful framing and opened a discussion about how a government should plan its debt strategy and its relationship with the wider economy in wartime. The next subsection considers the framing effect these concerns had upon the central hub of economic analysis in government, the Stamp Committee.

5.3.2. The Stamp Survey's consensus on the need for *a* response to inflation

The concerns raised by the Chancellor, Governor and committee on Savings and Investment can be seen among the issues examined by the Stamp Committee. It had been considered been before the Economic Advisory Council chaired by Stamp in the weeks preceding the declaration of war (Hawtrey 1947, pp.7). Similar concerns on how to manage the risks of inflation came before the Stamp Committee, and were raised several times during the early stages of the war (and before Stamp's untimely death).

Prior to its transformation into the Central Statistical Office (CSO) and Economic Service (ES) on 27 January 1941, the Stamp Committee examined inflationary concerns (both current and forecast). It received two briefings on the control of inflation, a separate note on inflation and several comments on the Keynes's Plan articulated in *How to Pay for the War*. As commented earlier, given the volume of issues brought before the committee, this in itself was not particularly novel. What is more important here however is the ad hoc nature of the proposals forwarded to the committee as to how to prevent inflation. These mattered because the balance of policy arrangements would determine what the safe limit to government expenditure should be. The range of policy suggestions

coming before the committee meant there was no one clear strategy on how best to prevent inflation.

For example, as Dennis Robertson argued in a note submitted to the Stamp Committee on the economic position of the country with special reference to coordination, in addition to concerns about the budget deficit and the slowness of war production expansion, there was a tendency for 'income inflation especially in the field of wages.'[193] The sources of this income inflation was argued to be threefold: 'increased demand in the war sector,' 'rises in the cost of living' and 'a failure to curtail spending by fiscal or other devices.' [194] Robertson argued for thinking that went beyond normal labour policy in order to coordinate the consumption and production sides of labour markets.

An earlier submission by Stamp grappled both with the question of observability of inflation and the types of proposals that could temper inflationary pressures. On 17 June 1940, Stamp argued that the changed tempo of wartime production required a new form of financial strategy.[195] The basis for this argument was that the government sector and private sector had to be kept in relative balance to prevent inflation. Whilst it was difficult to fully determine the extent of the problem, Stamp argued that some inflation-leading statistical measures could be used to suggest whether there is inflation e.g. banking circulation figures, figures on prices sales and stocks, and, increases in the total payroll. These inflation-indicators were not however considered to be conclusive, and notably the briefing note argued in intuitionist terms regarding Stamp's 'feeling' on the inflationary situation.[196]

Stamp suggested a range of measures to prevent excess spending power. A heavy emphasis upon taxation was made, and in particular levied a strong defence of expenditure taxes because it had a faster impact than income. Stamp also placed a strong emphasis upon voluntary savings and encouraging an environment where there was a small increase in the cost if purchasable goods for the duration of the war.[197] Crucially however there was no clear limit to the amount of each policy that should be followed to help return equilibrium to the private and public sectors.

Similarities can be seen in the opposition to the "evil consequences" of excessive monetary demand in a Stamp Committee note on 12 July 1940 titled 'the dangers of inflation.' The underlying causes of inflation were identified as being attributable to six factors: disruption to normal market flows, short-termism in profit seeking, depletion of national capital, wage price spirals, a reduction in the

[193] Churchill College Archives ROBN 1/1/3 E.C.(S)(41) p.3.
[194] *ibid*., p.4.
[195] Churchill College Archives ROBN 1/1/4, document titled: Inflation, 17/06/1940.
[196] *ibid*., p.6.
[197] *ibid*., p.7.

real value of financial instruments, and, a relative depreciation of the currency on the international markets.[198] There appears to be little uniting these six factors apart from perhaps a Fisher-style monetary theory of the economy.[199] The paper used these framings to argue that pent-up demand will lead to inflation meaning that at least one of three actions should be considered: taxation, wage policy and the control of prices and rationing.[200] Again, however, there was an absence of quantifiable policy prescription which would suggest the level of action that the state needed to take.

A hindsight account might identify this as an absence of a systematic understanding of government finance's inflationary impact and this could in part explain the absence of a clearly quantified anti-inflationary fiscal finance strategy. Given the volume of estimates, and policy areas reviewed by the Stamp Committee, it would arguably be foolish to expect a new approach to government finance to emerge from these quarters. Still, this mindfulness of the risks of the current approach may in part go some way towards explaining the receptiveness of government institutions to new approaches to government finance such as the theory of the gap.

5.3.3. Accepting the "theory of the gap" as *the* methodology for measuring and responding to inflation

The "gap" was most publicly identified with the work of John Maynard Keynes who at the time of publication of his *How to Pay for the War* in 1940, was an outsider to government. It argued that beyond a level of spending there would be inflationary increases. *How to Pay* and the underlying notion of the theory of the gap became an important new method of public finance which was used to prevent inflation within government. Importantly it argued for a limit to expenditure beyond which inflation would result and identified calculable policies which, it argued, would help to manage inflationary increases. This changed public finance into an actively understood way of changing economic performance through managing the economy.

Early thinking on the theory of the gap and the war finance situation was presented at the Cambridge Marshall Society lecture on 20 October 1939 (Howson, 2017, p. 732). Though it had influential consequences – namely, inspiring Austin Robinson to lobby the government to start measuring national income[201] – it proved to be the start of Keynes's public campaign for the notion

[198] Churchill College Archives ROBN 1/1/4, document titled: The Control of Inflation, 03/06/1940.
[199] Fisher (1920 [1911]) outlined the Quantity Theory of Money.
[200] Churchill College Archives ROBN 1/1/4, document titled: The Control of Inflation, 03/06/1940.
[201] Cairncross (2016, pp. 78–9) argues that in the lecture Keynes aired materials which would ultimately form *How to Pay*. The lecture convinced Robinson of the need to understand the parameters of the war effort. Pesaran and Harcourt (2000, p. 148) argue this led Robinson to request the hiring of two people to measure national accounts, the posts were filled by James Meade and Richard Stone. See Suzuki (2003, p. 480) for

of “deferred pay”. The argument was that to prevent additional purchasing power developing in the economy and reduce the inflationary risks from government expenditure, pay should be taken from the public and returned at a later date.[202] This campaign started with three articles in the Times newspaper in November 1939.[203] It also saw the publication of his 1940 pamphlet “How to Pay for the War”. Some of the proposals were initially thought of as impractical, for example the proposal of a deferred income lending scheme[204] which faced criticism from the Inland Revenue.[205] Still, among the economics members of the Stamp committee such as H D Henderson[206] and Stamp,[207] it was believed it would pose considerable but not insurmountable problems. Though the line of causation is difficult to trace, the policy did eventually make it into the Chancellor’s speech. Importantly the underlying thesis of the work, the notion of the “gap,” tallied to the thinking inside government and was not criticised by the Stamp Review.

Increasingly after this point discussions in government use the language of the theory of the gap. The gap was most clearly outlined in a briefing note relayed to the chancellor by Herbert Wilson Smith and a paper titled ‘The Theory of the “Gap”’ written by Keynes. The language of the theory of the gap went on to be paralleled in the 1941 budget speech, a speech of particular salience because it launched the national accounts as a publicly available data series. The briefing note explained the “gap” emerged with an excess of purchasing power circulating in the economy. Government inaction would see the excess purchasing power lead to a deterioration in the value of money.

The briefing note argued that closing the “gap” would not be a simple matter of checking the government deficit, it would require a clearer understanding of the relative magnitude of economic flows. The note outlined two methods of calculation. The first, the budget approach, was arrived at by analysing ‘extra budgetary receipts of government departments, the liquidation of domestic

---

further details of the work they performed.[202] For a full exposition of the efforts by Keynes to convince the Labour Party to adopt this policy see Toye (1999).

[202] For a full exposition of the efforts by Keynes to convince the Labour Party to adopt this policy see Toye (1999).

[203] In the *Collected Writings of John Maynard Keynes*, Johnson and Moggridge arrange a series of Keynes’s publications that show the development of Keynes’s thought on How to Pay for the War. It traces Keynes’s thinking from articles in *The Times* through to ‘the Economic and Fiscal potential of Great Britain’ written in the December issue of the Economic Journal. For further details see Keynes (2012f, chap. 2).

[204] A core tenant of *How to Pay* was that the inflation risks from higher incomes could be fully removed by removing the surplus income for repayment after completion of hostilities (Keynes, 2012e [1940] p.391).

[205] See for example TNA IR 40/6602 – a correspondence file from the Inland Revenue outlining pragmatic concerns about the proposals such as how to adequately record who the money has come from, how this would interact with the voluntary savings movement and other concerns.

[206] Churchill College Archives ROBN 1/1/4 War Cabinet Survey of Economic and Financial Plans: the Principles of the Keynes Plan, Henderson, 10 April 1940.

[207] Churchill College Archives ROBN 1/1/4 War Cabinet Survey of Economic and Financial Plans: the Keynes Plan, Henderson, Stamp, 5 April 1940.

capital assets and current savings.'[208] The first approached looked at the difference between (i) the total expenditure in the economy and (ii) the combined sum of factors which remove purchasing power including taxation and current savings. The second approach evaluated the supply of goods available against the purchasing power for those goods.[209] This method was intended as a cross check against the first.[210] What the briefing note helps to show is that the government had started to apply the theory of the gap and was using it to evaluate the relative size of potential policy instruments. The view of the briefing note's author was that 'the gap must be filled either by savings, or by taxation, or by inflation.'[211]

In his March 1941 'Theory of the "Gap"' briefing paper, Keynes outlined the problems and risks of estimating the inflation gap more clearly in response; 'The idea that the Government can borrow funds "created by inflation" which have not been saved by the public is a delusion.'[212] To justify this, Keynes used an economic model that applied the theory of the gap to explain the inflationary effects of government spending. Keynes started with the accounting definitions that 1. public income equals the sum of consumption taxation and savings, and, 2. for government accounts any spending equals receipts from overseas resources, tax revenue and public savings.[213] Additionally Keynes added an assumption that the economy was in an equilibrium which would be maintained through price changes and saving habits. Having defined these interlocking income and expenditure relations Keynes then analysed the financial flows that could generate inflation.

Keynes did this by considering a scenario where government spending increased by £500 millions using debt to finance this expenditure i.e. it would not see an accompanying increase in taxation revenue. The increase in spending Keynes argued would be attributable to employment of new people (costing £200 millions), diverted people to munitions (£150 millions) and a reduction in the amount available for civilian consumption over the exports that are being produced (£150 millions). Keynes then posed two questions: what does this mean for inflation, and what has happened to macroeconomic value? Whilst the income of the public would increase by £200 millions, the value of goods they will have to purchase would have gone down by £300 millions. This would leave a gap of £500 millions. To quote Keynes, 'That is to say, there is a "gap" of £m500 between the disposable purchasing power and the value (at the old prices) of the goods available in the market.'[214]

[208] TNA T172/356 "The Size of the Gap" Herbert Wilson Smith 28/02/1941 p.1.
[209] *ibid*., p.1.
[210] *ibid*., p.2.
[211] *ibid*., p.2.
[212] TNA T172/356 "The Theory of the Gap", Keynes 03/03/1941 p.1.
[213] *ibid*., p.1.
[214] *ibid*., p.2.

Keynes's analysis identified excess purchasing power which risked increases to prices, and the damaging effects of inflation.[215] These risks could be compounded by: consumption multipliers, increasing profits and calls for higher wages which lead to an 'unbounded' wage price spiral. [216] While there could beneficial implications for government finances (through increased taxation, increased savings and reduced relative value of debt) Keynes shows this was a risky strategy for government. [217] Due to time lags, Keynes argued there was always the threat that pent up demand would come to the fore.

Such thinking proved to be extremely influential in informing the wartime budget under the new Chancellor Kingsley Wood. As Hawtrey (1947, Ch.3, Section C, p.4) argues, the Chancellor of the Exchequer had been struggling to identify an underlying thesis which could be used to finance the war and a break from previous thinking was needed. The theory of the gap became an important framing device in the thinking of the wider government. Evidencing this, the Chancellor referenced the theory in Parliament as the explanation for the fiscal strategy he had adopted:

> 'This necessarily takes me to a discussion of what has begun to be called the "gap,"… What is of the first importance is the avoidance of any inflationary gap, by which I mean any inadequacy in our financial measures below what is required to enable us to avoid serious and continuing inflation.'[218]

The point of significance here is not one of intellectual ownership, but it is one about the role that anti-inflation thinking played in changing the government's fiscal policy making. This saw a change to the fiscal budgeting approach which helped to lay the foundations for the managed economy after World War II. This is discussed further in the next section.

5.4. National income becomes a tool of public finance

This section further unpacks this new anti-inflation management approach to government budgeting by considering its relationship to national income. It starts by providing an overview of the changes to national income measurement that were underway during the war. The section then goes on to show the new national income approach was understood to be intrinsically linked to the new approach to government finance. It concludes by explaining how and why these national income

[215] *ibid*., p.3.
[216] *ibid*., pp.4-6.
[217] *ibid*., pp.4-6.
[218] Chancellor Kingsley Wood 'The New Financial White Paper' Parliamentary Session 1941 Hansard Vol 370 Column 1304-8, 07/04/1941.

figures, and the wider government fiscal approach, were published before Parliament. Doing so it provides further detail to the account forwarded by Mitra-Kahn (2011, chap, 8.) which argues these figures entered the public domain because Keynes lobbied for them. This chapter extends this discussion by considering the institutional factors shaping the government's need to publish in the public domain.

5.4.1. *How to Pay for the War*: a change to government budgeting with a redefined national income concept

Alongside the changes to the developments in wartime financial strategy, the measurement of national income changed. Contemporary accounts of national income historiography emphasise that the 1940s saw developments to the definition of national income and the movement to a double entry system, a system which endures to this day. Recent work by Mitra-Kahn (2011) has strengthened the case articulated in Tily (2009) that Keynes had significant authorship over the development of national accounts through a detailed analysis of 1940s materials. Suzuki (2003) has shown that the underlying the national accounts framework is a Keynesian macroeconomic structure.[219]

This more recent historical scholarship, drawing upon the archival materials of Keynes, emphasises that Rothbarth[220] corresponded with Keynes in order to redefine national income, away from the approach advanced by Colin Clark.[221] These new national income figures would be incorporated into a statistical appendix to *How to Pay for the War* (Keynes, 2012e [1940]). This new net national income figure, unlike Clark's did not double count inflation (Tily, 2009, p. 350). These thoughts were indicative of wider discussions on national income which were underway in the 1940s. For example, in 1940 Keynes repeatedly corresponded with Kaldor on different definitions of national income. In this correspondence, Keynes argued that the gross national income definition was closest to the effective demand measurement he was seeking.[222] Other collaborations by Keynes from this time include a joint paper on national income measurement with Arthur Bowley, a significant previous figure on national income (Bowley and Keynes, 1940).

[219] Such arguments, in particular Mitra-Kahn (2011, chap. 8) have changed the emphasis on the contribution of Meade and Stone by arguing ultimate intellectual ownership lies with Keynes. This is in contrast to several earlier authors e.g. Deaton (2008), Pesaran and Harcourt (2000), and Stone (1984).
[220] For more on Rothbarth's life and contributions see Cuyvers (1983a, 1983b).
[221] For further details see Mitra-Kahn (2011, chap. 8).
[222] Kaldor had for example suggested three different definitions of national income which would potentially be of use to Keynes. For further details see the Keynes Archive – Kings College JMK/W/4 'Papers concerning the 1940 budget and research thereafter for the compilation of national income statistics.'

Definitional changes alone, while important, are less significant if they are not widely used. It can explain the supply of new figures but provides little insight into the demand side for new figures. Also identifying definition changes does not provide insight into the *need* for new estimations, as well as why the figures were calculated and why government instituted a new process for the measurement of national income. Addressing these questions therefore provides crucial insights into why and how changes emerged and became established. During the 1940s a perhaps more significant change emerged with the official publication of national income data series by the British government. The time and labour allocated to measurement, the resources put into new measurement approaches such as triple entry accounting (Stone et al., 1942), and the changed informational management approaches indicate a significant change in the *purpose* of national income from the start of the century. This renewed purpose for national income, and its role as a tool of public finance is discussed below.

5.4.2. Measuring national income accounts to inform the government's budget

This section advances an argument that both internal and external to government we can see national income becoming framed as part of a pre-emptive solution to the inflationary risks posed by wartime mobilisation. It firstly outlines that the use of national income figures within the budget was understood by its principal architect to be a revolution in public finance. This section then moves to explore the White Papers on finance and national income, and then considers an unauthored document from the archives of Richard Stone. Stone's archives provide a basis from which to understand the purpose and composition of the White Papers and the national income figures contained within them. In so doing they illustrate how national thinking became part of the public finance question.

In one sense the decision to use national accounts to inform budgeting can be understood as one of many transformations in wartime administration.[223] Yet in another sense, there were considerable ramifications. As later texts on public finance attest, the macroeconomic treatment of the government budget is a marked change from the economic approaches to economic thinking before it. [224] Keynes was aware of the significance of the changes to government budgeting that had been brought about with the White Paper. On 14 April 1941, in a personal correspondence to his mother, Florence Keynes, Keynes (2012f [1941], pp.353-4) noted:

> "the two points I attached most importance to and where I played a part were the stabilisation of prices, for which I have been fighting very hard, and the logical structure, and

[223] See for example Edgerton (2012) or Agar (2003).
[224] See for example Prest (1960) or Musgrave (1959).

method of a wartime Budget which, together with the White Paper, is really a revolution in public finance."

Recent scholarship on the history of national income emphasises the importance of the White Papers, published from 1941 onwards (Mitra-Kahn, 2011, chap 8). The underlying framework for these figures is based upon the logic of Keynes's How to Pay for the War (Mitra-Kahn, 2011, chap 8). Yet typically the discussions only focus on the half of the White Papers that contained the official estimates of national income. But, as Keynes implies above, the revolution implied by the White Paper is at a deeper level – a revolution in public finance through the combination of the wartime budget methodology alongside the White Paper.

The 1941 White Paper, like the later White Papers, is a paper of two halves. The first addresses the different sources of finance which were used to pay for the first year of the war as well as from 1 September 1940 to 28 February 1941. The second half of the 1941 Paper explains the economic performance of the economy along similar time periods. What unites the first half and second half of the White Paper, is the way that the two halves draw explicitly on the national income figures in the discussion of government finance. To illustrate, in the 1942 White paper, one table (Table E) examines the proportion of national income devoted to taxation and another (Table F) provides the distribution of personal incomes by ranges of gross income. The total income on each of these tables matches the totals provided in the national accounts estimates at the end of the Paper, where details are given on the sectors of the economy, the income deficit and expenditure of government. These figures then all carry through to the table provided in the paper on the sources of War Finance (Table A), which in turn provides a forecast for the upcoming year on expenditure and finance.[225] These cross references and continuities across these tables clearly illustrate a view on the part of government that figures should not be left independent from each other. The interlinkages within the paper suggest that the budget problem of government, and the budget problem of the economy, were seen as related problems that needed be accounted for simultaneously.[226]

Internal documentary records help to reveal a clearer explanation of the purpose of national income measures. This can be seen in the way measures of the economy played an increasingly important

[225] It is worth noting that this reconciliation is less clear in the first White Paper because the figures were presented on two different time periods one on an annual year starting from the start of hostilities the other on the basis of the financial year. The national income figures and expenditure figures however reconcile to the 1942 paper which show the interrelated nature of these figures in the government's financing strategy.
[226] Or put more technically there was a need to present the double entry – both the credit of government income via taxation and the debit of personal incomes, both the debit of government expenditure and the credit of personal income. At an underlying accounting level public and private sectors were being linked and government was accounting for its impact upon the private sector. Both would be needed in the British vision of the managed war economy.

role in the internal discussions on the government budget. For example, after having returned to government as a policy advisor, Keynes drafted notes for the Chancellor's budget speech. In them Keynes suggested the Chancellor should argue the benefits from the national accounts were: to aid Parliament's understanding of the financial situation beyond the government's revenue and expenditure figures along and, the demands of war required a more comprehensive knowledge of the economy.[227] Estimating these figures were also, in a sense, easier than normal because 'a much larger part of the national economic life falls within the purview of Government Departments.'[228] Keynes's arguments therefore suggest that in order to understand the war finance strategy a new type of data series beyond the normal tax and spend figures was needed and national income accounts could help with this. These phrases and this thinking were influential and can be seen directly copied through to the Chancellor's 7 April 1941 Budget speech.[229]

One of the clearest illustrations at the time of the view of national income as a tool of fiscal policy is found in an unauthored and undated wartime document in the archives of Richard Stone. Titled the Financial Aspects of the War Economy,[230] the document's introduction explains that it aims to illustrate a method of analysis and provide a comprehensive listing of all data which should be used even where such data was not fully available. This indicates its intention to provide a fully articulated and ideal account of what the author views war finance estimation should be. Looking to what this was, the methodology employed in the body of the document mirrors the theory of the gap above. For example, it provides an overview of the three different sources for funding government expenditure, which consist of: first "The ultimate sources" of government finance made of up sums which can be raised by government on its own (taxation, personal and institutional savings, the sale of assets abroad), second, sums which can be borrowed (monetary and banking problems of financing war) and third, inflation. The key distinction made between "ultimate" sources of war finance and borrowable sums is that taking action on the former released employment from the civilian economy for redirection towards the military economy and simultaneously helped to provide the funds for defence expenditure.

Fitting with its intention to articulate an ideal account of war finance, the document makes a substantial effort to provide an account of the different potential sources of income, as well as the inflationary impact they would have. The decision as to the correct policy balance would be shaped by the 'social and political effects of inflation and upon the degree to which real scarcities of labour,

[227] TNA T171/356, Pre-Budget Papers II, 1. The Speech, ii) Draft Budget Statement by a) Keynes, p.3.
[228] *ibid*., p.3.
[229] Chancellor Kingsley Wood 'The New Financial White Paper' Parliamentary Session 1941 Hansard Vol 370 Column 1304-8, 07/04/1941.
[230] King's College Archive JRNS/3/3/2(1) Financial Aspects of the War Economy.

equipment and raw materials exist.'[231] A key calculation table in the document is the one which describes total savings and investment. This table suggests that if savings exceed investment then the permitted level of inflation would continue. However, if savings were to fall below inflation, then there would be inflationary effects.[232]

In addition to elaborating a tabulated mathematical process for calculating the inflationary effects of the current finance strategy, the document also identifies and explains which data sources should be used to fill the table. After a six-page theoretical discussion, the document outlines over seventeen pages of Appendices, several detailed proforma tables ready to be filled in. By providing data and a suggested approach to processing it, the document enables a lay reader to calculate the overall financial position of the government, any inflationary consequences, and ultimately whether the country can afford to pay for the war.

This manual of budget finance also establishes a clear relationship between national income estimation and the sources of revenue that government could raise: 'For the purpose of analysing the "ultimate sources" of Government finance it is necessary to estimate the magnitude of certain national "income and outlay" figures.' This document assigns an importance to both sides of the accounts: both outlay (expenditure) and income matter for government in order to calculate the maximum feasible taxable sources. Moreover, it elaborates other non-taxed based sources of government finance, including: an increase in gross institutional savings, an increase in personal savings, and an increase in an unfavourable balance of payments. Again, there is evidence of harmonisation and cross over in approach. Each of these items correspond to specific elements of the "national income" estimates which feature in the White Papers.

The reason for the slightly counterintuitive presentation of an increase in savings by consumers as a source of public finance is made clear by the author of the manual:

> 'The problem of financing the ultimate sources" for the finance of the deficit must, therefore, be posed in the following way. A decision must be taken as to the extent to which an inflation of money incomes should be permitted – a decision which in present conditions must be based chiefly upon considerations of the social and political effects of inflation, and upon the degree to which real scarcities of labour, equipment and raw materials exist'

The anonymous author of the Financial Aspects of the War Economy manual makes clear that, for wartime Britain, national income accounts were only useful to the degree to which they could

[231] *ibid*., p.3.
[232] *ibid*., p.3.

prevent the debilitating effects of inflation. According to this manual, 'if the "ultimate sources" of government finance, discussed in section I, are not sufficient to cover the planned expenditure on Defence, an inflation of the national income must be expected.'[233]

This underlying conceptual framework *is* the "inflationary gap" discussed above. There is a striking similarity between these sources of finance that goes beyond the theory of the gap advanced by Keynes. They align in their separation of the two categories of savings that can be used to finance the war, and also in how they articulate the inflationary implications. The reference to aggregate savings and investment also adhere to some form of Keynesian framework.

By tracing the intellectual linkages from the "theory of the gap" through the "financial aspects of the war economy" into the White Papers, this chapter contributes a new perspective on national accounts: specifically, helping to locate national income within wider efforts at the time to account for the inflationary aspects of the war machine. Moreover, through this wider situation, this chapter helps to explain why national income data series became a matter of government measurement rather than private research. It shows this was because it had become one of the urgent data series needed to inform the government's inflation-debt strategy. It also provides a plausible basis from which to make sense of Keynes's correspondence with his mother in which he claimed intellectual responsibility for the "revolution" in public finance of 1941. As the date of this correspondence remains unconfirmed, this conclusion is only suggestive, though it does reveal one possible justification for his claim.[234] The inability to firmly identify authorship or specific year of authorship are tangential to the case advanced here: namely, that national income was clearly one of the methods intended to calculate a non-inflationary government finance strategy. In so doing national income became a tool of public finance.

5.4.3. Publishing the national accounts in public before Parliament – a revolution in public finance

Wartime British finance saw an intertwined transformation in the measurement of national income and government budgeting strategies. This subsection begins by considering the absence of government demand for national income statistics prior to World War II, before outlining why national accounts were published in the public domain. The account forwarded here is in contrast to other histories, notably Mitra-Kahn (2011), who argued that Keynes was a major driving force internally in government. In contrast to the "heroic Keynes" narrative the chapter argued that

[233] *ibid*., p.6.

[234] Page 6 makes reference to the hypothetical debate of a 100 per cent Excess Profit Tax, an instrument widely discussed in the 1940-1941 period but again, this is suggestive only.

external factors – the pressure of Parliamentary scrutiny – drove government to publish these otherwise internal estimates.

Prior to the publication of the 1941 White Paper "An Analysis of the Source of War Finance and an Estimate of the National Income and Expenditure in 1938 and 1940", there had been no publicly available official national income data series in Britain. Previous twentieth century estimates had not been used to inform government spending. In 1916, for example, in discussion with the American government over the British external debt position, the Chancellor expressed a desire to send through an estimate of National Income. In the absence of any recent official estimates, "expert statisticians" were asked to generate an estimate.[235] Similarly in 1929 further estimates of national income were calculated but not for the purpose of informing the budget. Rather, in some cases, figures produced by economics researchers such as Flux, Bowley and Marshall, were evaluated to arrive at an estimate of net national income, which could be used to inform discussions on the levels of pre- and post- Great War levels of production and consumption.[236] The absence of regular national income series can also be seen in major government reviews prior to World War II.[237] Government saw little need to generate such figures for government budgeting precisely because, as observed above, under the McKenna rule the government would only borrow up to a level where taxation could finance the debt serviced on the interest.[238] With the emphasis on expenditure financed through tax revenues or borrowing, a cash-based concept of government finance, there was less of a need to generate a national income estimate to inform government thinking let alone publishing one in the public domain.

One of the reasons for the *need* to present the House of Commons with national income estimates was to correct an alternative national income figure put forward by *the Economist* using Colin Clark's national income definition. *The Economist* figures came from an article that had cross referenced the Pigou (1940a) estimates of national income and used them as a basis for analysing the funding gap in expenditure. Following arguments forwarded in Pigou (1940b) on the risks of inflation, *The Economist* article ("The future of spending," 1941, p. 139) in turn argued that there were only three ways to reduce the £150 million per month shortfall in funding: 'increased taxation, by induced or

[235] The exchange is recorded in TNA T172/322.
[236] See the UK Memorandum on National Income 1927-1929 in TNA T208/127. These appear to be the estimates which Clark (1932, p. vii) claimed were suppressed by the Federation of British Industry. These were later published by the Department of Applied Economics in Cambridge with a foreword by Richard Stone (Board of Inland Revenue and Stone, 1977).
[237] See for example page 613 of the Report of the Committee on National Debt and Taxation (1927) which draws on figures from Layton. Alternatively, see page 235 of the Committee on National Expenditure Report (1931) which uses national income as a base to evaluate whether expenditure and debt are too high as a percentage of national income.
[238] See section 5.3.1. above

compulsory savings -or by inflation.' *The Economist* published this position the day before the launch of the Wartime Budget, which proposed to solve the funding shortfall through increased taxation ("Before the Budget," 1941, p. 441).

Alternative – publicly available – figures posed considerable risks to the legitimacy of the government's finance strategy.[239] They had been seen and referenced in the House of Commons by the influential William Pethick-Lawrence, former Financial Secretary to the Treasury and current Chair of the public expenditure scrutiny body the Public Accounts Committee. Importantly, Pethick-Lawrence used this to suggest that the inflationary gap was being mismanaged.[240] As Keynes observed in correspondence to Sir Richard Hopkins and Sir H J Wilson (7.2.41):

> 'You may have seen the article in last week's Economist on "The Future of Spending", which included a number of fabulous figures, in particular an estimate of £m8120 for national income at the present time and "at least £m9000 for the national income, on the average, of the next financial year." In yesterday's Vote of Credit debate Pethick Lawrence quoted £m8000 as an authentic estimate of national income to-day, doubtless drawn from the Economist article. Lord Balfour told me that, if the debate in the House of Lords had taken place on Wednesday, he had originally intended to base his speech on the Economist figures.'[241]

Some historical narratives, such as Mitra-Kahn (2011, chap. 8), locate this correspondence within a wider effort by Keynes to get his national income definition published. However, such a narrative does not fully account for the change in position of the UK government. Instead a moment of reflection on the wider circumstances of the situation, suggests that the government was also pushed into publication.

Triggered by comments by two senior ranking politicians, serious debate took place within the Treasury on the correct manner of explaining these new estimates to the British public. Members of the government were facing increasing criticism in light of these figures 'Lord Catto … says that he has been attacked in all quarters on the basis of the Economist article, which everyone outside takes

[239] For more on tax legitimacy see Daunton (2008, 2001) or Di John (2010).
[240] Pethick-Lawrence was also influential in the Labour Party as the unofficial deputy of Lees-Smith. As Harrison (2004) notes: 'All-party government in 1940 separated the roles of Labour Party leader and leader of the opposition, a role assumed by H. B. Lees-Smith with Pethick-Lawrence as his unofficial deputy and chairman of the public accounts committee. Then, on Lees-Smith's death, Labour unanimously elected Pethick-Lawrence as his successor until departure from the cabinet soon freed Arthur Greenwood to assume the role.'
[241] Kings College Archive JRNS/3/3/2 "Correspondence between the Central Statistical Office of Offices of the War Cabinet and JRNS" Envelope 1.

quite seriously.'[242] The solution was to present the figures within a financial strategy supplement, which would accompany the new Chancellor Kingsley Wood's statement on the budget before the Commons committee on Ways and Means. They determined that a separate publication to the budget would help to overcome some of the concerns that insufficient scrutiny would be provided to the figures.

The publication of these figures also helps to show that the government actually needed the figures in public. In his statement to the House, Kingsley Wood justified publishing 'in time of war fuller information than in time of peace' on two bases:

> 'for one thing our tasks require a more comprehensive knowledge, and secondly we do know more because a much larger part of the national economic life falls within the purview of Government Departments.'[243]

There was an institutional need to justify the anti-inflationary approach, particularly in the light of the perception of misadministration of World War I's finances. This meant a clear account of the government's actions had to be provided to Parliament. As the Chancellor acknowledged, this was a technical matter which required more scrutiny, not less. Second, the national income figures had become deeply entwined in the war strategy. This meant their publication became necessary as part of an explanation about whether or not the government was pursuing an inflationary approach to war finance:

> 'Nor do I believe that the difference between total expenditure and Budget revenue has so far introduced inflationary dangers into our system... my judgment seems to be fortified by the results of a number of difficult and complicated statistical calculations which have been made available for my consideration… [on] the sources of war finance and in part of tables of national income and expenditure'[244]

Publication of these figures by the government led the Economist to capitulate on national income estimation. It accepted the government's argument that the Clark account of national income double counts depreciation.[245]

---

[242] *ibid*., Letter from Keynes to Sir R Hopkins 12.2.41.
[243] Chancellor Kingsley Wood 'The New Financial White Paper' Parliamentary Session 1941 Hansard Vol 370 Column 1304-8, 07/04/1941.
[244] *ibid*.
[245] 'The Economist has sinned, with other, in this respect. The figures of national income that have been used in these columns since the beginning of the war have been based, rather roughly, on Mr Colin Clark's definition of gross national income' ("The National Income," 1941, p. 490).

In summary, this subsection has shown that the publication of national accounts was a marked change from the approach adopted prior to war. Previously an academic exercise, it was now part of an official data series, reportable to Parliament, which helped to explain how the government had an appropriate anti-inflationary strategy. These events came about because an alternative account of national income based on the works of Colin Clark had been published by the Economist and had started to influence prominent politicians. To help explain the technical features of the strategy, and to account for its actions in steering the economy, the government made these figures public. The narrative forwarded here adds to the narrative developed by Mitra-Kahn (2011) which instead emphasised the role of Keynes lobbying inside government for the publication of national income figures. The narrative also contrasts with the Mitra-Kahn (2011) narrative by emphasising the need by Parliament to understand the basis of fiscal policy. It is most likely for this reason that the national income and expenditure accounts became a regularly published data series.

5.5. Conclusion

The final chapter of Part 1 argued that the emergence of national income accounting in World War II was linked to broader institutional shifts in government fiscal doctrine. After discussing the changes to economic thinking on the role of data in informing decisions, discussion focused on the search for fiscal-theory of war which could prevent a recurrence of the errors of World War I. The solution found was a doctrine which sought to control the economy to prevent inflation from damaging the war effort – a notion that sought to limit inflationary gaps which would otherwise undermine the war effort. This doctrine linked the inflationary limit of the wider economy to the actions of the government budget. This link, between the economy and the government finance helped the government became a patron of national income. Through Parliamentary pressure these figures were brought into the public domain.

There are several implications arising from this. The first relates to the mode of national income production. In Britain, as shown in Chapter 4, national income was largely a private interest with bodies like the NIESR and Colin Clark commissioning and producing figures. Yet by the end of war, government needed these figures to be published on a regular basis. Whilst several authors[246] have identified this shift to government patronage there remains scope to provide a more rounded account as to why government needed these figures.

[246] Such as Mitra-Kahn (2011), Coyle (2014), Suzuki (2003).

The second implication arising from the Chapter helps to explain why government needed these figures – they had become a core component of the government's financing decisions. This was a significant shift from previous budgeting approaches. This institutional change matters because this use of national income differs substantially from a national income research agenda which focuses on welfare, and history of national income accounts which focuses on growthmanship. Instead, drawing on the scientific notion of the economy, it is a national accounting research agenda designed to *account* for broadly defined economic flows in the economy. It has a complex relationship with the national accounting research agenda of the interwar period, it shares a common premise on the notion of scientific observation and applied ('realistic') economics. It distances itself from the notion of national income as a welfare exercise but has some parallels to the more rationalistic approach to national income underway in the USA. In a marked departure from American approaches, and earlier notions of national income as a taxable base,[247] this was a concept of national income where, alongside other measures, it would help to justify the state budgeting calculation, a calculation intended to shape the overall performance of the national economy. In so doing it has parallels to the purpose of national accounts in the Scandinavian and Dutch schools of national accounting.

Finally, the chapter has significance for the wider thesis by showing that the 1940s wartime context shaped the emergence of national income accounts. The chapter provides insights into the broader purpose of national income accounts as a fiscal financial planning approach that linked the spending of government to a wider macroeconomic framing. This fusion of national income estimates in an accounting format and government budgeting changed both economics research and government practise. Through the use of calculational tables and the doctrine that government spending should be linked to the wider economy, national income became a tool of fiscal planning. This new approach to the treatment of national income figures came to define the trajectory of the development of the notion of national income in the immediate aftermath of the war.

Part 2 of the thesis considers the application of this new approach to national accounts in different institutional settings. Chapter 6 looks to Cambridge and the Department of Applied Economics, founded by Keynes and Directed by Richard Stone, as a centre for the advancement of national income research. Chapter 7 looks at the way the British government encouraged colonialised administrations to adopt British-style national income-led fiscal planning and how, in the case of Nigeria, a team from Cambridge's DAE was commissioned to measure national accounts to resolve a fiscal crisis.

[247] The notion of national income as a guide to the tax base can be seen in Davenant (1698) for example.

Chapter 6: A case study in national income accounting research at the Cambridge Department of Applied Economics

6.1. Introduction[248]

This case study chapter will examine the embedding of the new national income accounting approach in an academic setting, how it was enabled by the creation of a new realistic economics centre, its competition with other research agendas and how it evolved into new research approaches. It does so by applying the history of economics approach advanced in Chapter 2 by considering how ideas shaped the creation of an institution, and how this institution came to help the embedding of a new doctrine emerging from the war. It also considers how the development of this idea system was shaped by the politics at its foundation and by the evolution of the department. The chief contributions of this chapter are twofold. Firstly, it provides the first detailed account of the origins of the Department of Applied Economics (DAE) in Cambridge. Secondly, it traces the evolution of the national income accounting agenda by senior national income researchers in the aftermath of World War II. Central to the narrative of this chapter is both the relationships between the first funder of the DAE, the Rockefeller Foundation, the grantee the Faculty of Economics and Politics (hereafter Faculty of Economics) at Cambridge University, and the first Director to fill the post, Richard Stone.

The chapter starts with a literature review which highlights the limitations to the extant literature, specifically how DAE historiography has been shaped by a generation of former researchers from the 1980s. It seeks to contextualise these changes within broader transformations in applied economics as "scientific" narratives started to be applied to a society in the Cold War. Building on Fright (2016),[249] the chapter advances in three sections.

The first section describes the coalition of interests which met to found the DAE. These interests coalesced around an empirical research agenda which prioritised national income studies. The founding discussions show that the principal funder, the Rockefeller Foundation, wanted an empirical institute which could change what they perceived to be a theory-heavy centre like Cambridge. Keynes agreed and wanted a realistic centre. There is some evidence that the Faculty of

[248] I am grateful to Alan Shipman for providing me with further insights on the progression of the DAE in its latter years.

[249] Fright (2016) is a paper presented at the CJE 40th Anniversary Conference and was a precursor to this chapter. Though the paper was not itself published it was subsequently made available online at http://www.cpes.org.uk/40cje-papers/. Fright (2016) uses Figures 6.2-6.5 and some of the other content of this chapter. The conference text makes up approximately 8 pages of material across this 40-page chapter. Footnotes have been used to identify content which contain material presented in the 2016 paper.

Economics may have seen it as a way to increase funding to aid teaching and further their own research agenda.

The second section of the chapter examines the influence that the first director had upon the research agenda. The Faculty's choice of Director, Richard Stone, reflected the desire for more empirical research. He brought his own research agenda, one which aligned closely with the Rockefeller Foundation. With the death of Stone's patron, Keynes, Stone could use this position of influence to further his own agenda which was rich in national income related research.[250] By the mid to late 1950s this research agenda was opposed within Cambridge. This led to what appears to be an offer he could not refuse, a promotion, but one which would see him cede his formal influence over the DAE. The accounts of this situation differ, but led to a more pluralist approach to research under a new director Brian Reddaway.

The final section of the chapter examines the durability of Stone's research agenda. It shows that aspects endured as a subset of the DAE under Reddaway (and future Directors) as the department developed in new directions influenced by a changing funding landscape, new research agendas and new technologies. Four specific legacies of national accounting research from Stone's time and within the Reddaway directorship are discussed. These include: the OEEC national accounts research unit at Cambridge, which standardised national accounts measures across Europe; the Cambridge Growth Project, which used national accounts estimates to inform government and investment decisions; and, work linked to the research of Phyllis Deane, a researcher persuaded to join Cambridge by Stone. Her work in particular assisted Kuznets's attempts to provide long term national accounts estimates and also contributed significantly to the International Association of Income and Wealth. The legacies of these research strands had and continue to this day to have a significant influence.

6.2. The DAE literature gap and contributions

This chapter makes two principal contributions. The first, is a contribution to the history of the origins of the Department of Applied Economics in Cambridge; the second, is to the argument of the thesis by explaining how the national income accounting agenda evolved in an academic setting after World War II.

[250] As discussion minutes between the top researchers (Gilbert, Clark, Stone, Perroux, Lieu, Divisia, Tinbergen, Kuznets, Smithies, Shirras and MacGregor) at this time from 1949 show there were limitations to both concepts and data both from an economic research and governmental planning perspective. For more details see Gilbert et al. (1949).

With regard to the first contribution of the DAE, it is noteworthy that despite being a research centre of significant international heft,[251] there is scant literature on the origins of the DAE. The most detailed history is Pesaran and Harcourt (2000) in a biographical article on the first Director; the discussion is limited to a few pages and explains how Richard Stone joined the DAE and some of the early dynamics of the Department. Another contribution is Schmelzer (2016) which explains that significant changes to national income standardisation and harmonisation were carried out in the National Accounts Research Unit of the OEEC (now OECD) which was based in the DAE. Comin (2000) shows that the DAE's empirical economics research helped to enable economic growth analysis. Finally, in a book celebrating the 50th anniversary of the DAE, the then Director David Newberry wrote a foreword which explained in a few pages the start of the department. Such narratives however do not discuss in depth the underlying ideological and institutional factors shaping the emergence of the department.

In seeking to fill this research gap, this thesis has chosen to make an active decision to focus on the formation of the department and the relationship of the research agenda of the first Director. It does not analyse from the Directorship of Wynne Godley onwards.[252] This decision is in part because the addition of Godley's directorship, risks in bringing is events that might be too tangential to the thesis. It also avoids this time period because of the challenges of historical analysis of the DAE. Often historical narratives on the DAE are shaped by the perspectives of former DAE staff, these staff were largely siloed into specific research seams which to a degree shaped how they saw the purpose and contributions of the DAE. For example extremely different accounts of the quality of the empirical contributions by the first director (Richard Stone) and the second director (Brian Reddaway) can be read across Singh (2006, 2017) and Barker (2017).[253] Other accounts from this time contain strong claims about historical events such as Deaton (2008) or Pesaran and Harcourt (2000) which say Stone was removed from his Directorship. To sidestep such framings, the chapter avoids discussions on the recent past of the DAE and focuses on the distant past of the DAE – principally the discussions surrounding its framing and the continuity of the national accounting research agenda during and after the first directorship. Yet, as this draws heavily on the archival account of Richard Stone it does emphasise narratives apparent in the archival record such as

[251] Pesaran and Harcourt (2000) argue that '1945-1955 was a remarkable 10-year period and established the DAE as an international centre for economic research on par with the Cowles Commission.' Whether Pesaran and Harcourt are correct, that DAE was on par with Cowles, is difficult to assess. But as shown in section 6.4.3. it was an internationally prominent research centre hosting a range of leading economic thinkers.
[252] For a biography of Wynne Godley see Shipman (2019) which also provides insights into the latter DAE.
[253] For mentions of the different "factions" of the latter DAE and Faculty of Economics Cord Eds. (2017) and other authors (Comim, 2000; Deaton, 2008; Pesaran and Harcourt, 2000).

Stone's argument that Keynes was an empiricist. It also remains a partial picture of the whole empirical agenda underway in Cambridge.

The narrative developed in this chapter differs from the recent Palgrave Companion to Cambridge Economics. Whilst it traced aspects of econometric history (Thomas, 2017) and accounting history accounting (Meeks, 2017), it did not fully link this back to the Rockefeller Foundation and the attitudes of those developing this new research centre. It also did not fully present the first Director as a cosmopolitan intellectual who was implementing a research agenda along similar lines to those potentially intended by Keynes. Further whilst it may have identified some contributions to development thinking (Amdekar and Singh, 2017), it did not cover the economic measurement approaches underway in Cambridge which impacted development thinking.

The second contribution of the chapter provides an account of how the national accounting research agenda was implemented and evolved after the war as a result of wider factors such as technology, internal politics and funding. Some insight into how changing technology impacted the evolution of national income can be read across several recent histories. Backhouse and Cherrier (2014, 2016) for example show a revolution in computing had a significant impact upon the nature of the type of empirical economics carried out in the DAE. Specifically, they argue that the roots of this revolution date from the 1970s. This chapter suggests that the roots run longer than that. Both the desire for automated calculation and the empirical research agendas launched by researchers at this time come from earlier periods as shown in this chapter. This does not suggest that computing itself did not change or shape how such research was carried out; earlier empirical research was carried out manually on calculators, or as shown later in the chapter, handed to human computers (Ceruzzi, 2012). The DAE was also influenced in later years by the introduction of American computers such as ENIACs.[254] Yet some tasks, for example the creation of historic data series, were extremely manual in nature.[255] But the *demand* for such calculations predated had earlier roots, and was influenced by the wider empirical "realistic" research agenda seen in Chapter 4, and, a desire to better inform public decision making as seen in Chapter 5. The chapter now advances by considering the coalition of interests that came together to found a "realistic" research institute in Cambridge.

[254] The ENIAC (Electronic Numerical Integrator And Computer) was from the 1940s a commercially available IBM American computer machine that could undertake calculational problems (Ceruzzi, 2003).

[255] The Deaton (2015) online Nobel Prize biographical section details Deaton's work for his college economics tutor Jack Revell on a DAE project: 'I spent several months in dusty archives, copying down information on the assets of friendly societies; I did not mind the work, and sometimes even regret today's easy availability of data. It is impossible not to think about the numbers, however dusty, to wonder what they mean, to look for patterns, even to test half formed hypotheses, and when they are assembled into something that can be analyzed, I am protected from some of the stupider mistakes that are all too easy when I know nothing about the data.'

6.3. A coalition of interests established an internationally-renowned "realistic" research institute

This section describes how the foundation of the DAE impacted the further development and transmission of the National Income Accounts public policy doctrine. It does this by describing the coalition of vested interests which met to found a new Department of Applied Economics in Cambridge. These vested interests coalesced around an empirical research agenda which prioritised national income studies. The founding discussions show that the principal funder – the Rockefeller Foundation wanted an empirical institute which could change what they perceived to be a theory-heavy centre like Cambridge but had doubts over Cambridge's level of commitment. Cambridge helped to reassure the Foundation by selecting an economist who could follow an independent-minded empirical agenda. Whilst the evidence suggests the first Director, Richard Stone, followed the type of empirical economics Keynes thought, alternative accounts suggest the Faculty was only wanting extra funding to pay for teaching staff and support to the Faculty of Economics' own research agenda. Finally, the section concludes by drawing attention to a governance arrangement that saw the new Director setting the agenda with the permission of the Faculty, which as shown in 6.4., became a source of misunderstanding between the Director and the Faculty. The resulting disagreements over the national income focus of DAE would lead to a change in research agenda.

6.3.1. Cambridge University's impetus for a "realistic" economics department halted by war

Mirroring other universities in the UK in the 1930s, discussed in Chapter 4, the University of Cambridge committed itself to the creation of a research institute of applied economics. This body, the DAE, had earlier roots in the Cambridge Research Scheme of the NIESR according to an undated account of the origins of the DAE in Richard Stone's papers.[256] Their work intended to examine processes of economic change in the United Kingdom at the behest of Keynes and sought to develop the research of Kalecki.[257] The author of the undated paper, Richard Stone, notes that the Cambridge Research Scheme was highly informal, econometric in nature, and largely administered by Austin Robinson.[258] Yet as the first annual report of the DAE noted there was a 'realization that there existed in Cambridge no provision for systematic applied research in economics, at a time when a rapid development of studies in this field was taking place.'[259] As Austin Robinson informed the Rockefeller Foundation in November 1939 that due the outbreak of war Keynes and Pigou to commission a Department of Economic Research to investigate issues of national importance.[260]

[256] Stone (date unknown), *The Department of Applied Economics in Cambridge*, p.1. Stone private papers (subsequently donated to Kings College Archives).
[257] *ibid*., p.1.
[258] *ibid*., p.2.
[259] DAE First Annual Report 1946 to 1948 p.6.
[260] RAC – Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1052 – dictated minute to Willets from Kitteridge 13th November 1939. The minute went on to comment on Keynes's "profound interest…in the

A relative latecomer to the "realistic" economics revolution discussed in Chapter 4, Cambridge's plans were immature by the outbreak of war. Efforts to establish a committee of management that would hone a research agenda and secure funding only cleared the University Senate by late 1939. On 2 December 1939, the University Senate established the management committee of the Department of Applied Economics:

> '5. Subject to the powers of the Financial Board, the General Board and the Faculty Board, the duties of the Committee shall be as follows:
>
> a. To co-operate with outside bodies interested in the encouragement of research in applied economics;
> b. To administer funds received for this purpose from any source;
> c. To receive reports on research, whether individual or collective, conducted with the aid of such funds;
> d. To assist members of the Faculty of Economics and Politics in the collection and tabulation of data relating to current economic conditions;
> e. To appoint and supervise any necessary staff
> f. Such duties as are specified in Statute C, II,3'[261]

The business of committee was delayed, however, when wartime proceedings saw many members of the Faculty move to government positions; 'it was felt to be better to postpone its effective start until after the war rather than to begin with possibly second-rate staff and insufficient supervision.'[262] Additionally at the outbreak of war the DAE lacked funding, in 1941 Cambridge submitted a bid for Rockefeller Foundation funding however this proved to be unsuccessful. This meant the University was unable to provide data and advice to government on a par with the Rockefeller funded research centres (seen in Chapter 5). It also meant Cambridge's wartime research contributions were limited to the work of the London and Cambridge Economic Service then based in the Marshall Library of Economics on Downing Street.

Counterintuitively, the delayed launch to the DAE proved to be one of the greatest sources of stimulation for the department, as prominent members of the Faculty of Economics such as Keynes and Austin Robinson were exposed to the wartime empirical needs of government. As Keynes observed in correspondence with Kitteridge (the Rockefeller Foundation Officer in Europe) in 1941

National Institute [of Economic and Social Research], and to intimate that the Trustees of the Foundation may seek research into post-war reconstruction."

[261] JRNS 4/10 Letter to Richard Stone from Pierro Sraffa Attachment 2 – Memorandum on the Establishment of the DAE. Part of this paragraph was presented in Fright (2016).

[262] *ibid*. Fright (2016) uses this quote.

'Practically all promising young economists and statisticians are, of course, working for the Government.'[263] This however also presented an opportunity:

> 'Austin Robinson is in the Offices of the War Cabinet. I have returned to my old haunts in the Treasury, where I spent the last war. From these vantage points both of us are in a good position for judging the quality and enterprise of the work of the younger men. They are separating themselves out before our eyes into the truly promising and the less so.'[264]

This also meant Cambridge Economists were well placed to select a Director of the right empirical standing to lead the DAE when the Committee of Management met in 1944 to consider how to launch the DAE.[265]

Whilst wartime may have frustrated the immediate emergence of the department by drawing many of the economists needed to staff the department into government, it also gave time for the committee to source funds and plan the launch of the Department after the war. Much of the negotiation over the funding of the Department of Applied Economics was shaped by the wartime backdrop to financial negotiations. In some examples, as with Keynes, Cambridge economists negotiated with the Rockefeller Foundation to secure funds alongside their pressing war duties; Keynes, for example wrote to Kitteridge at the Foundation on 28 January 1941 to further discuss 'the establishment of a Department of statistical and realistic field research in economics at the University of Cambridge.'[266]

6.3.2. Rockefeller Foundations doubts over the Faculty of Economics' commitment to its "realistic" research agenda

The launch of the Department of Applied Economics after the war, brought together two vested institutional players. The first, the Rockefeller Foundation, was a body which as shown in Chapter 4, was seeking to further empirical research in universities. The second, the Cambridge Faculty of Economics, was a body that prior to this was more commonly associated with theory. It is difficult to assess the extent to which Cambridge fully supported this new approach and the degree to which the language of realism was adopted only to secure Rockefeller funding. This has significance for

[263] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1052 – letter by Keynes 28 January 1941.
[264] *ibid.*
[265] Stone (date unknown), *The Department of Applied Economics in Cambridge*, p.3. Stone private papers (subsequently donated to Kings College Archives).
[266] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1052 – letter by Keynes 28 January 1941.

later debates in the Faculty over whether the DAE was intended to have its own self-directed research agenda.

In the latter years of the department there were conflicting accounts as to the purpose of the foundation (see 6.4.3. below). The earlier archival record mirrors both narratives and is not fully conclusive. One narrative is that the university was seeking additional funds which could be used to support teaching and empirical research which would supply the figures for the Faculty of Economics. Another narrative is that Keynes had intended an empirical "realistic" research institute. Some archival materials would suggest that the latter case would be true and that the Faculty of Economics had recognised the need for a new research approach. Whilst suggestive it cannot be fully conclusive, for example, "realistic" economics may have been understood differently from a Cambridge context than the type of economics suggested by Rockefeller patronage.

Cambridge's folklore on the launch of the department suggests that the Faculty of Economics was only seeking financial support for their own research and teaching, rather than intending to use the finances to launch a new research agenda.[267] This is partly borne by suspicions documented in the archival record of one of the large patrons of the DAE – the Rockefeller Foundation. As the largest funder in the field, the Rockefeller Foundation was a natural choice as a potential patron for the DAE (Pesaran, 1991; Thomas, 2017, p. 104). The Rockefeller Foundation however doubted the conviction of Cambridge in establishing a proper realistic research centre. Rockefeller Foundation internal correspondence shows some concerns were starting over Cambridge's true commitment to empirical research:

> 'It was obvious in the conversation, later confirmed by N F Hall, that Keynes is still thinking not so much of concrete programs of empirical research as of adding a certain number of lecturers and teachers to the Cambridge faculty. Keynes obviously has no specific program of research in mind at the moment, but expects that the individuals who might be invited to the position to be created would necessarily go on with whatever personal research projects they might feel to be of greatest importance.'[268]

Quite how much of a concern this posed to the foundation is difficult to assess. Archival evidence suggests that this was a significant concern for the Rockefeller Foundation while negotiations continued into 1942 when the DAE committee requested £2,500. This doesn't appear to have been a significant obstacle as what ultimately paused the release of funds was the war, which led the

[267] Geoff Harcourt. Personal interview. 21 July 2017.
[268] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1052 – note by Kitteridge 12 June 1941.

Foundation to scale back new investments in the face of latent uncertainty. [269] The Foundation left proceedings in polite terms and the officers suggested a preferential treatment for any application which would be received after the war.[270] Embedding a research institute in an influential university like Cambridge, which was a bastion of theory, would be a significant achievement. Quite how aware Cambridge was that the Foundation wanted this new research approach, or indeed whether they endorsed this research approach is unclear from the archival record. What is clear however, is that there has been a sustained effort to attract Rockefeller funding over many years.

Much of the groundwork for the meeting of minds had been undertaken by the Faculty of Economics over a number of years. From 1939 onwards the Faculty of Economics had adopted the language of "realism" in its correspondence with the foundation. In an attempt to woo the foundation in 1939, Austin Robinson argued the case that the war had thrown up a variety of questions of national importance which needed investigation by an economics research department.[271]

Chaired by Shove (in Keynes's absence) alongside Professor Robertson, Mrs Robinson, Mr Champernowne and Mr Sraffa,[272] concerns over funding were high on the agenda of the First Committee of Management of the DAE in November 1944. In their attempt to secure the Rockefeller Foundation funding a preliminary bid was agreed which outlined a sample research agenda. This research agenda suggested an emphasis upon empirical work and notably had studies in national income as its highest priority:[273]

> 'Studies in National Income (e.g. changes in the value and quantity of output of particular industries, or changes in the division of national income between profits, rents and wages).
>
> Pricing policies (e.g. methods by which overhead costs are allocated between different products)
>
> International comparisons of productive efficiency
>
> Foreign Trade (e.g. Problems of the balance of payments of various countries).

[269] A hand written note by the Director of Social Sciences instructed the head of the European division to 'wait till end of war, then make decision in light of funds available and other claims.' Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1052 note stamped 24 February 1941.
[270] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053
[271] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1052 – memo by Kitteridge 13 November 1939.
[272] Austin Robinson, though a member of the committee, was also in America with Keynes at the time.
[273] Parts of the paragraph and the ensuing quote were presented in Fright (2016).

Population problems (e.g. estimation of the distribution of families according to number of children)

Social Surveys (e.g. the social and economic structure of a small country town).'

Source: DAE Committee Meeting Minutes.[274]

Establishing whether this sample agenda was merely acting as bait for the Foundation is difficulty to assess. After all, many of these formal documents were submitted to the Rockefeller Foundation and may have been written specifically to demonstrate a commitment to empirical research. But based upon private correspondence it is apparent that members of the Faculty of Economics were keen to create an institute of realistic economics. The first DAE annual report, written whilst Keynes was still Chair of the Committee of Management, referenced the need for "realistic" work: 'the theoretical achievements of Cambridge economics required the testing that could be conducted only by *realistic* studies.'[275,276]

There is also ample evidence in exchanges that suggest some degree of commitment on Cambridge's part to a realistic research agenda. For example in 1944 Dennis Robertson, writing in the absence of Keynes and on behalf of the Committee of Management, corresponded with Joseph Willets, the head of the Social Sciences division of the Foundation, asking the Foundation to consider 'Cambridge's plans and hopes in the way of realistic economic and social research.'[277] This philosophy was recognised by the Foundation to be at the heart of the proposal and writing to Keynes. Joseph Willets welcomed that 'Cambridge has decided to supplement her already great strength in "logical analysis" by undertaking a new approach to the study of economic problems. (call it "inductive", "empirical", "realistic" or what you will).'[278]

In a memorandum on the constitution of the DAE composed after World War II, it was clear that the Faculty of Economics considered these new economics approaches as complementary to its existing specialisms. Articulating a case for applied economics it said there was a need to:

[274] University Library, Min.V.391 and 397.
[275] DAE First Annual Report p.6.
[276] Parts of this paragraph were presented in Fright (2016).
[277] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 – letter by DH Robertson 9 October 1944.
[278] This quote is used and analysed in Chapter 4 section 4.1.4. The source is: Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 – letter by Willets 22 November 1944.

> ‘make more effective provision for certain types of economic research. The Progress of economics follows two separate but interdependent channels. It depends in part on the continued development and refinement of the logic of economic analysis; in part on the measurement and recording of economic phenomena, and the testing of economic theories by statistical and other methods.’[279]

Whilst the committee argued it had a dominant position in the first research category thanks to its Marshallian heritage,[280] the Faculty felt further action was required to catch-up with the work of the Rockefeller-funded centres: ‘Cambridge has on the whole been lagging behind other universities, and it is very strongly felt that the time is overdue when provision for research in Applied Economics should be greatly strengthened. Oxford, Manchester, London, all have markedly superior funds and facilities.’ [281] The Faculty went further to note that economics was now a discipline that needed both arms to work together in order to advance knowledge.[282] This may suggest that within the Faculty of Economics there was a recognition that research with many properties of “realistic” research would be needed to help economics advance in Cambridge. The constitution of a Department of *Applied* Economics was potentially one mechanism for formalising this research strand.

From the perspective of the Rockefeller Foundation, the final investment decision granted by the board of trustees was into ‘purely a research body.’[283] The Foundation also accepted Cambridge’s argument that ‘the ultimate aim of applied economics is to increase human welfare by the investigation and analysis of economic problems in the real world.’[284] Finally the Foundation Board noted:

> ‘Although there are distinguished examples to the contrary, the emphasis in British Economics has not been upon the observation of concrete reality or upon the careful inductive measurement of the phenomena with which it deals. The establishment of a Department of Applied Economics at Cambridge will aid this influential center to supplement its existing deductive approach with attention to empirical methods.’ [285]

---

[279] JRNS 4/10 Letter to Richard Stone from Pierro Sraffa Attachment 2 – Memorandum on the Establishment of the DAE.
[280] *ibid*.
[281] *ibid*.
[282] *ibid*.
[283] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053, *Minutes of the Rockefeller Foundation Board 1/18/46*.
[284] *ibid*.
[285] *ibid*.

Yet questions over Cambridge's commitment to the new research approach seem to have motivated two other areas of discussion with the Foundation prior to the granting of funds. The first area related to the person selected to fill the post of Director and the second area related to governance concerns over the role of the post of Director in the Faculty of Economics. These questions have a bearing on the overall thesis as they affected the ability of the DAE to develop new national income research lines. As will be seen in response to the first question, the Faculty selected an economist with strong empirical credentials which persuaded the Foundation that Cambridge could be a site for realistic research to prosper. This Director would go on to nurture a national income research agenda within Cambridge. In answer to the second however, a middle ground was struck which empowered the Director to choose the research agenda but it was to be approved by the Faculty.

6.3.3. Keynes's anointed Director to pursue an empirical agenda – Richard Stone

The selection of the DAE's Director was an important decision not only in order to 1. satisfy the Rockefeller Foundation's needs but also 2., as a reflection of the Faculty of Economics' intended research agenda. On the first point – the selection of the Director - it appears that the Rockefeller Foundation required further assurance on the future research direction of the DAE. While not being able to directly instruct Cambridge to release the name of the intended Director, it did repeatedly raise the matter and also emphasised to Cambridge the hope for an 'independent-minded' person. Whilst respecting that it was for the DAE committee of management to make this call, the Foundation highlighted that if an independent-minded Director was hired they would in all likelihood want input into the research agenda of the Department.[286] This correspondence is suggestive of the Foundation's hesitancy to fully back the proposal at this stage.[287] It indicates however that the onus was on Cambridge to select an independent-minded Director who could advance their own research agenda.

The response from Keynes on 4th December 1944 naming Richard Stone as the intended Director appears to have allayed the Foundation's concerns. In later correspondence Keynes emphasised that Stone was indeed the person he had his eye on from the start of the war. If this is true, then it may indicate the type of research agenda that Keynes had intended after the war and would suggest Stone and Keynes's research agendas were aligned. Keynes's insistence that Stone had always been the intended director has some credibility. Not only was Keynes instrumental in the selection of the

[286] Rockefeller Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053.

[287] Even at a late stage, when the Foundation sent out the DAE research agenda to Arthur Burns and Simon Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 Kuznets at the NBER, there were concerns about the large research agenda, naivety, and the UK focus of the DAE.

first Director of the centre but from an early stage DAE correspondence shows that 'We have a man in mind who is not at present in Cambridge.'[288] Richard Stone, a close aide to Keynes, who he met three to four times per week during wartime (Harrod, 1951) was unanimously appointed as the Director of the Department by the DAE Committee of Management.[289] The delay in naming Stone was explained to the Foundation to be largely the result of the logistics of filling a post which hadn't been formally announced by the University.

Part of the case forwarded by Keynes was the strength of Stone's empirical credentials: he 'has been primarily responsible for a revolution in our official statistics, and is the main author of the famous Budget White Paper on national income and finance.'[290] Stone's empirical calibre preceded him and met with strong approval from Wesley C. Mitchell who had been providing advice to the Foundation.[291] In a letter to Henry Clay, Joseph Willets observed his approval of the situation writing 'I suggested that with Richard Stone in charge and Austin Robinson to help guide, it sounded as if some good empirical work would be accomplished.'[292] This close knit network of American researchers appear to have provided their blessing to this new research centre under Stone and in turn this helped to shape Rockefeller sentiment on the topic.

On the second point – the selection of a Director that could satisfy the needs of the Faculty – this requires further analysis of the intention of Keynes, as the Chair of the Committee of Management. Both his wider support for earlier Cambridge empirical bodies like the LCES (Cord, 2017, p. 310), and his self-reported choice of DAE Director, suggest a patronage of a realistic research agenda (even if, as the Rockefeller Foundation suspected, he had not prepared a fully developed plan). The influence of Keynes upon this agenda and the formative days of the department was pronounced and notably emphasised quantitative themes such as national income well in advance of the selection of Richard Stone as a Director. The DAE project received very active support from Keynes. Not only did he help underwrite its finances,[293] but even after the appointment of the new Director, Keynes was noted as the point of reference with regard to finances.[294] Despite some authors arguments on Keynes's dislike of econometrics,[295] Keynes's active interest in founding the DAE is certainly not surprising

[288] UL, Min.V.391- 397: DAE Committee of Management 1st Meeting Minutes, letter to Rockefeller Foundation 4 November 1944.
[289] The last two sentences of this paragraph were presented in Fright (2016).
[290] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 – letter by Keynes 4 December 1944.
[291] *ibid*., letter by Mitchell 7 December 1944.
[292] *ibid*., letter extract by Willets 9 May 1945.
[293] UL, Min.V.391- 397: DAE Committee of Management 6th Meeting Minutes, 16 June 1945.
[294] *ibid*.
[295] Patinkin (1976) notably adopted a position which caricatured Keynes as being relatively unsupportive to empirically orientated analysis based upon the Keynes (1939) review of Tinbergen's work. Not only was this

when a broader perspective is taken of Keynes's drive for a more rigorous empirical form of economics.[296]

Correspondence between Keynes and Geoffrey Crowther from April 1940 suggests Keynes was an active supporter of realistic economics work. In the correspondence Keynes suggested that Crowther's contact, Charles Madge,[297] could consider affiliating his 'economico-scientific' work with the 'Department of Realistic Economics at Cambridge' (Keynes, 2012g, p. 813). Whilst there may have been changes in terminology from *realistic* economics to *applied* economics, it is apparent that as a leading founder of the DAE, Keynes was incurring the terminology of the international empirical research centres that he admired in the 1930s.[298] In other correspondence, as Castles (2014, p. 280) notes, Keynes had encouraged Colin Clark to return to Cambridge as they were preparing 'the foundation for a proper department of *statistical realistic economics.'* But Keynes's use of "realistic", and his favourable mentions of international empirical centres cannot be taken as endorsement of the later DAE. Arguably Keynes's advocacy for *a* DAE might have been an endorsement of greater quantitative work. It certainly does not imply that he supported business cycle approach, or its market-clearing assumption found among some empirical economic researchers.

As shown in section 6.3.1., in spite of pressing wartime demands Keynes had been an active correspondent on behalf of the Faculty of Economics with the Rockefeller Foundation.[299] Quite possibly driven by the growing realisation of the need for a data intensive war effort instead of the type of research underway in Cambridge, Keynes was keen for Cambridge to catch up with the rest of the empirical field. Keynes's correspondence with Jan Tinbergen, Richard Stone and Colin Clark illustrates this ongoing commitment to an empirical Cambridge. Colin Clark, an innovator in social accounting then based in Australia was informed of the aspiration to create the DAE in 1942, and he expressed an interest in a potential professorship.[300] Further it is clear in Keynes's response to a query from Tinbergen at the Central Planning Bureau in Holland[301] that the generation of empirical

---

hotly contested at the time by Stone (1978) but recent authors (Tily, 2009; Vanoli, 2005) have acknowledged Keynes's contribution to the development of National Income for example and broadened discussion of Keynes's empirical contributions illustrating the limitations of the Patinkin narrative.

[296] See Chapter 4 section 4.4.2. Parts of this paragraph were presented in Fright (2016).

[297] Alongside Tom Harrison he was a founder of Mass Observation, for more details of the correspondence see Keynes (2012g, pp.810-829).

[298] See back to Chapter 4, section 4.4.2. for Keynes's appeal for more research similar to that of the Harvard Economics department and the NBER.

[299] Parts of this paragraph were presented in Fright (2016).

[300] Keynes Archive w/4/220 – w/4/222.

[301] Tinbergen had been 'charged with an investigation on the long run development of the Rotterdam harbour' and required data on Allied intentions and business cycle policy information. In his reply of 15 June 1945 Keynes noted 'in Cambridge we are setting up a new Department of Applied Economics, which will devote itself particularly to the subjects you are interested in, and you will be interested to know that Stone has been appointed the Director.' w/4/236.

studies to help inform policy analysis was one of his aspirations for the Department.[302] Even at the height of war the chronic issues with data preparation and use was seen as an important issue which required addressing.

Yet whether Richard Stone the incoming Director of the DAE shared these views warrants consideration. Certainly, Keynes knew Stone well. Stone had been in post at the Treasury since 1941 as Keynes's personal assistant[303] and as Harrod (1951, p. 503) notes 'three or four times each week Mr. Stone visited Keynes' to discuss the national accounts. With Keynes's active involvement in the selection of the Director, it is understandable that he would opt for someone with whom he shared a close working relationship. This doesn't however guarantee full ideological alignment.

Reflecting on differences in personality between Stone and Keynes after a lunch in Washington on 29 October 1945 Joseph Willets observed:

> 'I felt the contrast between the type which is Keynes and the type which is Stone. Keynes is superbly, surpassingly brilliant. You feel that he is an artist, playing to produce a powerful effect in you. You feel about Stone that he has an honest mind and is trying to meet you in clear understanding. Alas, Keynes is more inclined to dazzle. I feel that Stone has the possibility of building in time something new in Cambridge that is very much needed. Through him we can build for the future, especially since Keynes is so preoccupied with public affairs and since his state of health will probably mean that he will not for too long be an active participant. I think there are promising possibilities here.' [304]

With the death of Keynes this left Richard Stone much greater scope to implement his own vision of economics informed by his time at the Central Statistical Office.[305] Despite later controversy, Stone felt his empirical vision accorded with Keynes's as can be seen in Stone's obituary of Keynes written on 11 June 1946[306] and sent to Joseph Willets in New York. Stone observed:

---

[302] Keynes Archive w/4/236. This was in response to a post-war letter from Tinbergen who, in his capacity as Director of the Netherlands Economic Institute, was attempting to measure the long run development of Rotterdam Harbour. Struggling to access data on the intention of the Allies with respect to Germany. Evidence of the collaboration between data specialists can be seen in efforts to exchange data as Tinbergen suggested 'I could provide you, if you should want, with a set of estimates I have about war damage, incl. deferred reinvestments, national income and outlay, public finance and credit creation in the Netherlands. Please let me know if you attach some importance to them.' See Keynes Archive w/4/235 for further details. This exchange was then further continued by Stone who was 'anxious to have a good contact with you as soon as opportunity permits' - see Keynes Archive w/4/236 for further details.

[303] The Department of Applied Economics in Cambridge, Stone (date unknown), page 4. Stone private papers.

[304] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053.

[305] This sentence was presented in Fright (2016).

[306] In the Dutch Offprint of Economic Statistics 17 July 1946 No. 1523.

> 'he (Keynes) never lost sight of the importance of quantitative economics and insisted on all occasions that economic policy must be based on a solid foundation of numerical observations and estimates. It was largely to his persuasive genius that we owe the origin and acceptance in official circles of the work on national income and expenditure which has appeared each year at Budget time since 1941. In official circles in Britain the war period saw virtually a revolution in the extent to which reliance is place on quantitative data, a development of which Keynes at the Treasury was perhaps the most powerful advocate. Even in statistical economics and econometrics he would often show the warmth of his encouragement and approval to a degree which might not be expected on the evidence of his published utterances.'[307]

This account of Keynes's philosophy mirrors Stone's own views as set out in earlier correspondence with Director of Social Sciences at the Rockefeller Foundation: 'So far as the work of the Department is concerned there is I think no need to emphasise how great is the importance, especially in this country, of rapidly increasing our stock of factual data.'[308] Further Stone noted that 'I think that a strong observational basis for the work of the Department supported by close contact with the real world of economic activity, can and will be developed.'[309,310] It is apparent in this, and his later British Academy lecture arguing Keynes was a political arithmetician, that Stone understood Keynes to be a supporter of empirical economics as well as theory (Stone, 1978). The account documented in the first annual report of the DAE, presumably under Stone's authorship, reflects this narrative:

> 'It was largely owing to his [Keynes's] profound conviction that the theoretical achievements of Cambridge economics required the testing that could be provided only by realistic studies, that the new department was brought into existence.'[311]

This account of Keynes appears to be consistent with Keynes's efforts to launch the DAE. That Keynes was the driving force for the new centre accords with several accounts of the origins of the DAE and the extensive correspondence that Keynes had with the Rockefeller Foundation to help launch the DAE. This in turn suggests that as a choice of a realistic-Director, Stone was not only instrumentally useful to Keynes's intended research agenda – as a figure who could reassure the Rockefeller Foundation – but also, Stone was intrinsically useful as someone who may have shared common research interests.

---

[307] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1055.
[308] JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.
[309] *ibid.*
[310] Parts of this paragraph and the ensuing quote were presented in Fright (2016).
[311] DAE First Annual Report. p.6.

6.3.4. An ambiguous middle ground solution on the direction of the DAE's research agenda

Installing a new, independent-minded director, however would have little impact if constitutionally the post Stone took up had little influence over the direction of the Department. Whilst the language in the assurances provided to the Rockefeller Foundation was one stressing independence, and through the selection of an independent Director, that jars with the understanding of some of the later participants (see 6.3.2. above). Importantly however the constitutional arrangements put in place contained an important ambiguity over the control of the research agenda, and ultimately the purpose of the DAE.

The Faculty of Economics had sought to reassure the Rockefeller Foundation that the DAE would not be subservient to the Faculty of Economics. Dennis Robertson, on behalf of the committee of the DAE, wrote saying that the primary purpose of the Department will be its 'own research programme.' [312] Robertson went on to say it would be down to the DAE to decide if any of its staff were used for teaching purposes, moreover it would not use them for cheap statistical labour as the Faculty already had an Assistant in Statistical research. [313] Put simply, 'it is not the intention that the Department should devil for member of the teaching staff.'[314] Yet in the same letter the Faculty also emphasised the need for close cooperation with the Faculty and enabling the Faculty 'the opportunity to suggest problems for enquiry to the Department [of Applied Economics].'[315]

The contradictions on the ability of the DAE to define its own research agenda were also apparent in disagreements over the governance structure between Stone and the Committee of Management. Before taking up the Directorship there was repeated correspondence over who controlled the research agenda. Several rounds of correspondence were exchanged in Cambridge which ultimately left the final say over the research direction with the Committee of Management but empowered the Director to run day to day operations acting as a forwarding mechanism for proposals to the Committee of Management.[316] Correspondence in the Stone Archives between Stone and Shove (the Management representative on this) illustrate the concerns Stone had with this uneasy arrangement from the outset.[317,318]

---

[312] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 - Response to the Rockefeller Foundation from the DAE Board of Management 6th November 1944.
[313] *ibid.*
[314] *ibid.*
[315] *ibid.*
[316] Correspondence between Shove and Stone in the Stone archive in JRNS/4/10.
[317] *ibid.*
[318] This episode does not however feature strongly in Stone's own account of this moment. Instead, Stone emphasised that he was "surprised and delighted" by the offer but that securing his release from the Civil Service and that there were multiple administrative hurdles imposed by the University. Stone (date unknown),

The 1944 memorandum on the constitution of the department (sent to Stone before he signed up as Director), provides clear evidence on ambiguity on the role that the DAE would perform. To one reader it could suggest a role for the DAE to improve the capacity of the Faculty of Economics. To another reader there is scope to suggest it could pursue its own research agenda:

> 'There are two separate, but closely connected, improvements that are required. First, there is needed better provision of facilities for research by ordinary members of the teaching staff of the Faculty and above all by research students in the Faculty. Second, it is desirable to have a small body of whole-time research workers engaged in this type of research, including (it is hoped) a number of junior Fellows of Colleges on their way to teaching posts. These two needs are best met by a single organisation.' [319]

Unclear governance however presented an opportunity for conflict which would mature in later years, in particular over what the function of the department should have – whether it was a department designed to further the aims of the Faculty, or whether it should undertake a different research direction at the behest of the director. This fault line was perhaps one of the contributory factors which contributed to the disagreements which demoted national income research in the department in the 1950s.[320]

To sum up, across section 6.3.1 to 6.3.4. there is seen a common language of realistic economics, something that would later evolve into "applied economics". This was shaped and influenced by the wider empirical landscape of the pre-war period. But there remained elements of suspicion over the level of commitment by Cambridge. While there is some evidence to suggest that Keynes's intention had been to further realistic research this is difficult to fully conclude. Certainly, his choice of Director for the DAE suggested support for this agenda. Yet in the years that followed groups within Cambridge developed contrary views over the intention of the department and one of the main sources of disagreement was over the question of whether the Director could have a research agenda which differed from the Faculty. As shown below this difference of perspective culminated in disagreements over whether the DAE should prioritise national income-related research.

The Department of Applied Economics in Cambridge p.6. Stone private papers (subsequently donated to Kings College Archives).

[319] JRNS 4/10 Letter to Richard Stone from Pierro Sraffa Attachment 2 – Memorandum on the Establishment of the DAE.

[320] Full details are provided in section 6.4.3.

6.4. The waxing and waning influence of Richard Stone's research agenda within the DAE

The next section of the chapter examines the influence of the new DAE director on the department's research agenda. It firstly considers the consensus between Stone and the Rockefeller Foundation on the purpose of a graduate research centre and the type of work it should undertake. It then looks in more detail at Stone's reasons for measuring national accounts. Finally, it looks at how this research agenda was applied by Stone and the opposition Stone received to the National Accounting research that was being followed. This culminated in Stone being promoted to a Professorship, a promotion that would quietly see him cede his formal influence over the whole DAE research agenda. Stone was permitted to further his research within an empirical DAE which developed a more pluralist approach to applied economics.

Stone's role is particularly important during the early years of the Department. Previously Keynes as Chair of the Faculty of Economics had played a prominent role in setting up the department, but Keynes's death severely impacted the DAE:

> 'While no formal record can justly explain all that is lost to Cambridge by the death of Maynard Keynes, his friends and colleagues forming the Committee of this Department desired to have recorded in these minutes their sense of the great loss the Department has suffered in the death of its first Chairman. He had its foundation and future always at heart and no more severe blow could have befallen it.' 5th May 1946.[321,322]

With the death of Stone's patron, Keynes, Stone had a window of opportunity to define his own vision for the Department's research agenda. The agenda he chose was one which aligned with the Rockefeller Foundation and was rich in national income related research.

6.4.1. Stone – A Cambridge economist the Rockefeller Foundation could work with

Whilst Stone's empirical credentials met with Rockefeller Foundation approval (section 6.3.3.) the connection ran deeper. The correspondence by Stone as the incoming chair and Joseph Willets, head of the Social Sciences division of the Foundation, suggests a common purpose and shared opinions on the direction needed for economics. It also provides further insights into Stone's concept of the DAE as an institution.[323]

Stone's desire for new data matched well with the wider environment facing economists. In his correspondence, Stone noted the influence of the changed environment; 'The whole atmosphere has changed during the war; there are now enough enlightened business men who know that all

[321] UL, Min.V.391- 397: DAE Committee of Management Minutes, 21 April 1946.
[322] This quote and part of the previous paragraph were presented in Fright (2016).
[323] Fright (2016) the remaining paragraphs until the end of the section.

academics have not got their heads in the clouds, and enough academics who realise that all business men are not just "economic men," to make practical co-operation feasible.'[324] These new demands changed the type of work which was required in the profession: 'In the next ten years in England we shall have to try to close the gap between the requirements of industry and administration and purely theoretical economics.'[325] This also mirrored the perspective of the Rockefeller Foundation which, when it decided to invest in Cambridge in 1945, discussed the increasing importance of applied economics for business and government in the light of the war.[326]

Stone hoped this new environment would help bring about more practically-minded economists. The start of the war had seen economists drawn into active service, but their abstract skill sets fell well behind the skills of the Americans although doing 'as best we could…the academic economists and others, had to acquire piece-meal by direct experience the outlook and techniques which the situation demanded.'[327] Stone recognised the pedagogical benefits of the work of an applied research centre:

> 'There is no school of training I think to compare with that which an active research unit can provide, and I believe that a solid research centre devoted to applied economics can have an influence not only on the trend of economic thought through its own results, but also through shaping the outlook and equipment of young graduates.'[328]

Not only does the Rockefeller correspondence illustrate the pressing need to produce figures of how the economy was performing for the purpose of business, and the benefits for economists in getting their hands dirty with the data, it also demonstrates Stone's deeply ingrained empirical mind honed during his years as the editor of the data journal *Trends*. As Stone later noted in an interview:

> 'it seems to me that the development of a science requires attention to both facts and theories and I agree with Marshall that economic theory is as mischievous an imposter when it claims to be economics proper as is mere crude unanalysed history' (Pesaran, 1991, p. 89).

[324] JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.
[325] Stone also notes: 'I have no doubt that much can be done to break down the reserve of the business community and to bring together those who possess the facts and those who want to use them for the advancement of knowledge' JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.
[326] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053, *Minutes of the Rockefeller Foundation Board 1/18/46*. 'the study of applied economics has been gaining ground in England and for the past five or six years, largely as a result of wartime policy and experience, research in this field has developed rapidly and the value attached to it in government circles and industry has greatly increased.'
[327] JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.
[328] *ibid.*

The apotheosis of Stone's vision of empirical economics is best captured in the first DAE annual report, written in 1948. Reflecting on the first years of operations it outlines a similar vision of applied economic in its research policy by noting:

> 'Through the process of observation and testing it should develop economic theories so that they stand established as applicable to the actual world, and on these foundations it should seek to provide the basis for making reliable predictions.'[329]

Testing economics in this manner required considerable work, with the restructuring of data along economic theoretical lines which would need the collection, collation and construction of a range of data sources. Stone therefore, in his own words 'set up an econometric program which would embrace work on facts, work on theories, and work on econometric and statistics methods needed to analyse the facts in the light of theories' (Pesaran, 1991).[330] As Pesaran and Harcourt (2000) note however, Stone's "econometrics" was defined more broadly than its current meaning today.

Such views gained support from funders such as the Rockefeller Foundation. As Joseph Willets, the then Director of the Social Sciences at the Foundation observed on 18 July 1945:

> '[formulating theoretical questions in a testable manner] is a hard task but it is an extremely important one, and I am much glad that your research is looking in that direction. It is so much less burdensome not to have to test our notions against the facts. I am sure your Department of Applied Economics would have important influence on the teaching of students. It always seemed to me that if each of them could learn in their graduate training what a difficult task it was to establish a firm conclusion to even a modest question they would understand better the difference between a theoretical opinion and a tested conclusion.'[331]

What we therefore see is the first Director of the DAE, Richard Stone, as someone with views which align to the wider empirical research agenda, underway thanks in part to Rockefeller funding. The ideological alignment between both Stone and the Director of the Social Sciences division was possible through a common interest in the role of data in policy making. This in turn suited the aims of the Rockefeller Foundation because of their desire to move Cambridge to a less theoretical intellectual space. Whilst the transition to a new figurehead – Richard Stone – helped to strengthen

[329] Department of Applied Economics first annual report p.3.
[330] It is important to note here that the vision of economics does not fully stress the manner in which work upon "facts" ultimately helps to rewrite theory i.e. data have a purpose beyond empirically falsifying theory.
[331] JRNS 5/1 Rockefeller Foundation Correspondence – Stone Archive.

this bond with the Foundation, as shown below it enabled a national income research agenda which was opposed within Cambridge.

6.4.2. The ideas of the new Director – Richard Stone's reasons for measuring national accounts

Post-war Stone was an advocate of national income, and applied economics more broadly, as a tool of government policy and planning. In correspondence with the Rockefeller Foundation, newly in post he said he believed 'the next decade may see great changes in economics as a social science with a real practical contribution to many contemporary problems.'[332] Whether Stone was right in his assessment of the efficacy of applied economics or not, the next decade, a time he was director at the DAE, did see a marked transformation in the scope and potential of applied economics. As Offer and Söderberg (2016, p. 155) observe, national accounts helped to provide the services wanted by voters and became 'the core tool of Social Democracy.' Like many at the time, Stone was influenced by the notion that science and rationality could be used to help direct and manage the social economy.[333]

For 1940s researchers, and Stone in particular, as a major contributor to the development of national accounts, the national accounting framework was a potential way of using social science to aid economic management. It was seen to offer much more than a technical calculation of national income. It was part of a wider political economic rejection of non-interventionism by the state. For Stone technocracy offered an alternative to extreme political ideologies:

> 'Anyone who believes in the maintenance of a social economy and the avoidance of the totalitarian direction of all aspects of economic life must be concerned at the present time with the creation of an institutional framework which will permit a social economy, with the essential features of free markets, free choice of occupations and free choice in the spending of disposable income, to function in accordance with contemporary social ideals.'

For Stone, the national income research agenda could help find a middle ground between laissez-faire and overall economic control (socialism), to that end, Stone argued: "national income and expenditure studies and their extension to the technique of national budgeting have, I believe, a great deal to offer" (Stone, 1951a, p. 94).[334] In particular it would potentially help combat issues with cyclical fluctuations, socially unacceptable levels of income distribution and economic management.

[332] JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.
[333] For more on the rationalistic approach to economic management see Danby (2017).
[334] This line echoes views raised in Keynes's January 1939 interview in the New Statesman which argued for a midway point between private capitalism and socialism see Keynes (2012h, pp. 491–3).

With a more accurate view of magnitudes in the economy, objectives can be specified which in turn can be combined with national budgeting to help steer the economy (Stone, 1951a, pp. 96–97).

Perhaps for this reason, Stone during this time took on a social advocacy role both in lectures and through the press. In one notable lecture Stone delivered a series of lectures in Greece at a crucial moment in the Cold War. In approximately 1953,[335] Stone was invited to deliver a four-day lecture series at the University of Athens. Initially invited by Mr Pesmazoglu to consult with the Ministry of Coordination,[336] Professor Zolotas of the University of Athens[337] requested he present lectures on the construction of national accounts and their use in economic policy. Coming at the height of cold war tensions in Greece,[338] Stone was making an important contribution to discussions on the coordination of government. Over a process of four lectures the attendees were taken from the construction of simple national accounts, to how to translate data into national flows of funds through to how government budgets can be prepared one year in advance to ensure an appropriate balance in the economy and prevent against inflation (Stone, 1953, pp. 42–47).

Despite not being as successful an entrant into public debate as Keynes,[339] there were some attempts at influencing public opinion on the importance of these new techniques in the administration of public finance. Notably after World War II, letters were written to the Times emphasising the potential for national accounts to scientifically inform public finance.[340] In these articles, Stone advocated for the contribution of national accounts and mechanised decision making in steering the economy. At his most extreme Stone commented that soon with the evolution of computers there would be a reduced role for Ministers in the Cabinet. In advocating for national accounts as a mechanism of policy Stone was helping to realise pre-war aspirations which could see national accounts as an economic statistical series help to improve decision making.

Mirroring the transformations observed in Chapter 4 which saw the increased demands for state created economic figures, pre-war Stone had been a strong advocate for considerable improvement

[335] Though the precise date of this talk is unknown, a copy of the lecture is held in Cambridge University Library (9001.b.9891) and thought to be from 1953. The data in the tables of the talk relate to 1950 so the Cambridge University Library estimate of 1953 is likely to be correct.
[336] John Pesmaglu was a recent Cambridge graduate and according to an oral history interview held by the Truman library, worked closely as a Director General of the Greek Ministry of Coordination in charge of planning economic development working closely with the American mission and the American Embassy. See https://www.trumanlibrary.org/oralhist/pesmazog.htm for further details.
[337] A significant figure, for a few months at the end of 1944 and from 1955-1967, Professor Zolotas was Director of the Bank of Greece, and in 1989-1990 served as interim Prime Minister for under 5 months.
[338] As Ward (2004, pp. 19–20) notes part of the global drive for national income figures was in part informed by the global contestation between capitalism and communism.
[339] See the comments by Joseph Willets on the differences between the two earlier in the chapter.
[340] See for example Stone (1946, 1947a, 1947b) and further examples in Baranzini and Marangoni (2014).

in statistics which reflected 'the individual through the community by their influence on public welfare..[e.g.] statistics of National income and its distribution, consumption, saving and investment, employment and unemployment, production, the foreign trade balance, the exchanges, and so on. By far the most important of these influences is that combination of circumstances we call the Trade Cycle.'[341] Like the Halley Stewart Trust review which led to the NIESR (as discussed in Chapter 4), Stone felt these figures were lacking in England[342] arguing that the doctrine of laissez-faire had led government to 'leave business and economic processes as severely alone as possible. In consequence it had little information.'[343] But new macroeconomic theory, the pressure of unemployment,[344] a fear of economic depression, and demands from the business community had changed demand for such figures Stone noted.

This however left a gap between practice and demand, one which Stone anticipated would call for new economic statistics in the near future.[345] The first type of work Stone wanted was comprehensive surveys covering proportions and magnitudes of factors affecting the everyday economy. He also wanted to see these enquiries extended over a historical time period. These would be modelled on the Bulletins of the NBER such as National Income Surveys, Gross Capital Formation, Consumption, or Tinbergen's business cycle studies for Holland.[346] The second type of work would be times series based, which while not as comprehensive, would be more timely and accurate such as the construction of the Board of Trade Indices of Production.

In these early thoughts, it is apparent that the language of science is being used to counter the philosophy of laissez-faire and enable a new data-environment of inductive policy making. Laissez-faire philosophy was being deeply critiqued in Cambridge during the formative years of Stone's education and his experience in government and close working relationship with Keynes had helped to fuel sentiments calling for a more activist government. This activist government would need data and in turn this required research to help inform state decision making. After having completed his

[341] JRNS 7/1/1 'Fundamental Statistics in the Light of Modern Economic Theory' Richard Stone 8 January 1938.
[342] As correspondence in the Stone Archive illustrates Alexander Loveday encouraged Stone to look at the national income estimates coming out of Holland (see JRNS 5/1 letter to Stone at the NIESR dated 10 July 1945) who in turn recruited G. Stuvel from Tinbergen's Planning Bureau at the Hague to come to Cambridge on comparative analysis on income elasticities across different countries (see Stone's letter to Colin Clark dated 4 September 1946 in JRNS/3/1/25). Such exchanges were also facilitated through a vibrant exchange of scholars such as Dr R Geary (from the Department of Industry in Dublin), Agatha Chapman (recruited from the Bank of Canada), Professor Tinter (from Iowa State University) as highlighted in the First Annual Report.
[343] *ibid*.
[344] Famously attempts at understanding unemployment and it relationship to the wider economy were captured in the Philips Machine, a hydraulic computer which embodied the IS-LM model and could be used to forecast different scenarios for the economy. For further details see Danby (2017, p. 56) or https://sms.cam.ac.uk/media/1094078 for a demonstration of the Cambridge Philips machine used in 2011.
[345] *ibid*. pp.3-4.
[346] *ibid*. pp.3-4.

work in the CSO, Stone would be able to go some way towards implementing this vision of data enhanced state decision making. What with the considerable advances in the measurement of economic statistics and the emergence of econometric capabilities with new computing, by the time Stone presented his Newmarch lecture in 1949 in addition to improvements in measurement he sought empirical research into hypothesis testing, estimation of variables and prediction (Stone, 1951b [1949]).

6.4.3. The application and opposition to Stone's research agenda, and, Stone's pyrrhic promotion

During the large 1940s and early 1950s senior academics, for example directors of academic departments, had considerable influence inside and outside the academy. As Shields (2016) demonstrates with a case study of Richard Courant[347] senior academics could be a major force informing government policy domestically and internationally through formal and informal processes. For the Director of the DAE – someone constitutionally empowered with steering the research agenda – both the political and academic knowledge creation potential meant Richard Stone was an influential figure and so this section starts by considering the application of Richard Stone's research agenda before he secured a promotion which removed his control of the DAE research agenda. This led to a reduction in the national income focus of the DAE.

The Stone directorship offered an opportunity to strengthen academic and cultural bonds within the international national accounting community. For example, the DAE played host to a variety of leading academics such as Richard Ruggles, Wassily Leontief,[348] Harold Hotelling, Kenneth Arrow[349] and many other prominent names.[350] Similarly, the academic freedom of the Directorship meant Stone could undertake trips to attempt to strengthen national accounting internationally. Notably an American trip offered Stone a chance to further integrate into the international empirical networks by conducting his famous United Nations work in Princeton, and speaking with: Alexander Loveday (Carson, 1999), practitioners at the Department of Commerce National Income Unit, the NBER and the Rockefeller Foundation. In a report to his funders for the trip the Rockefeller Foundation, Richard and Feodorra (the Secretary of the NIESR and his wife), emphasised that a common language had started to develop in economics which had enabled a much faster and richer development of economic thought. The note concluded 'without the development of fundamental knowledge in applied economics, tools that enable there is little hope that the stupendous economic

[347] an American mathematician linked to the National Academy of Science.
[348] Department of Applied Economics Second annual report.
[349] Department of Applied Economics Third Annual report.
[350] See the annual reports and the Pesaran (1991) interview for further information. This list of names was presented in Fright (2016).

problems of the world can be satisfactorily resolved.'[351] Stone himself therefore acted as a crucial link to the international networks highlighted in Chapter 4. It also gave scope for Stone to attend the nascent IARIW conferences and deliver talks internationally as an international public intellectual. [352] This in turn helped to attract new scholars to the field and shape their thinking. As Mr Beal, the Comptroller of the Rockefeller Foundation, observed after a meeting with Sir Henry Clay: 'Among the younger people in economics, Sir Henry's view is that Richard Stone is rapidly attracting a number of "Followers".'[353]

Stone also influenced thinking in Britain through strong bonds with central government and other research institutes such as the Rockefeller-funded NIESR. As an interview with Harcourt (1995, p. 156) notes 'from the beginning the DAE and the NIESR were deeply entwined.' To a large extent this was because of a similar empirical drive at the two organisations but also 'Stone's second wife Feodora Stone, was the NIESR's secretary and there were constant exchanges between the two, and also between the NIESR and the Treasury' (Harcourt, 1995, p. 155). Stone had previously started research with the NIESR which he brought with him to the DAE for completion.[354] This led to a 5-part series of monographs published by Cambridge University Press edited by Stone on: public authority spending, wage rates and three different reports into historic consumer expenditure.[355]

Within the DAE, as the new Director, Richard Stone could pursue his own research vision checked only by the approval of the Faculty of Economics Committee of Management who could sanction or veto his agenda. As shown in Figure 6.1., this meant an agenda rich in National Income Studies and related empirical enquiries. At the forefront of this research agenda was national income estimation, not only as a data gathering exercise but as a new branch of economic theory. This multifaceted research agenda sought to improve the national accounts, apply them to new settings and gather new forms of data, particularly on pre-war conditions which could help steer the post war environment. The research agenda below demonstrates an effort to extend the national accounting system historically, internationally and at a sub-national level.

[351] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1055.
[352] The first four annual reports of the DAE, spanning the time that Stone was in office detail multiple international conferences that Stone presented at including: the OECD in Paris, the IARIW, the International Statistics Institute at Berne, the United Nations Statistical Commission, the Econometric Society in Varese in Italy, the Newmarch lectures at UCL, acted as an adviser to the National Income Committee of the National Government of India,
[353] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1055.
[354] DAE second annual report p.12.
[355] *ibid.,* p.31.

Figure 6.1: National Income Accounting, taxonomic and data-gathering related research in the early DAE

Annual Report	1st 1946-1948	2nd 1948-1951	3rd 1951-1953	4th 1954-1957
Directorship	Stone	Stone	Stone	Stone/Reddaway
Fields of Interest				
National Income	> Expenditure, Product and Income of the UK before 1920 (NIESR) > The product of Different Branches of Activity in the United Kingdom 1920-1938 > Regional Income and income-generating activity > a New Index of Industrial Production (LCES)	> National Income of Nigeria (Colonial Office) > Indexes of Production (continued and expanded)	> National Income of Nigeria (Colonial Office) > Real Product of the UK (formely called Indexes of Production in collaboration with the CSO)	> Long-Term Economic Growth in the United Kingdom > Quarterly Product and Expenditure Estimates
Social Accounting	> Social Accounting (IARIW) > The Social Accounts of Cambridgeshire	> Social Accounting (IARIW continued) > The Social Accounts of Cambridgeshire (continued) > Regional Social Accounting	> Social Accounting (IARIW continued) > The Social Accounts of Cambridgeshire (continued) > Regional Social Accounting (continued)	> Regional Social Accounts (completed) > Social Accounts of Cambridgeshire (final stages)
Wealth	> Measurment of profit	> Domestic Asset Formation in the United Kingdom 1920-1938	> Domestic Asset Formation in the United Kingdom 1920-1938 (continued)	> Domestic Capital Formation in the United Kingdom 1920-1938 (continued) > A Study of National Capital > The finance of small Companies > Forward business Orders
International Comparisons		> International Comparisons of Real Income	> International Comparisons of Real Income (IARIW and OEEC continued)	> International Comparisons of Real Income (combined with OEEC project)
Consumer income and expenditure		> Consumers' Expenditure in the United Kingdom 1900-19 (NIESR) > Wages and Salaries in the United Kingdom 1920-38 (NIESR)		> The Dynamics of Demand > The Analysis of family budgets
Refining measurement of macroeconomic identities		> The Balance of Payments of the United Kingdom 1920-38 (NIESR)	> The Balance of Payments of the United Kingdom 1920-38 (NIESR)	
Modelling			> Models of the Economic Process (IARIW) > Interindustry Relationships in the United Kingdom 1948 (for Input Output Tables)	> Interindustry Relationships in the United Kingdom 1948 (continued) > Input-Output Tabulation and Model Building
Other				> Forward Business Orders > Integration in British Industry > The economic circumstances of old people

Stone most clearly articulated his research agenda across 5 key areas in a letter to the Rockefeller Foundation in 1945. The first research line sought to extend the national income studies historically to help inform notions of development.[356] Stone was particularly concerned at the role the rate of private savings in the 1920s had upon the reduction in savings during World War II. The concerns about permanent shifts in savings and the impact this had upon wartime management Stone argues warranted further investigation.[357]

In the second research area, Stone also wanted to bring an NIESR project with him looking at the output from different industries in the UK to overcome the major issues with 'systematic information available on the true net output of different industries and its division of factors of production.'[358] Of the remaining three main areas Stone wanted to research, one was to be a direct response to Frisch, Tinbergen and Koopmans looking at the 'testing and quantification of theories of output as a whole.' He disagreed with the theoretical basis and the observational quality. Without a clearer knowledge of the economy rudimentary calculation of the marginal propensity to consume would be grossly inaccurate. Both the second and third key areas became his own personal focus in the early DAE.[359]

In these and the other key areas we can see a scholar who was aware of, and integrated into, the network of econometrically minded scholars internationally. This is particularly the case with the fourth project, intended to build on work coming out of Princeton on "Money-Flow systems (how we account for national income and expenditure)", and, his fifth project on statistical supply and demand functions, which drew upon similar work underway in America.[360]

Notably, these five research angles bore some similarities but many differences from an earlier, unsuccessful Rockefeller bid prepared by the 1941 DAE Committee of Management.[361] Chaired by Keynes, the 1941 Committee suggested consideration of topics such as population studies. This realisation of the Stone research agenda however jarred with the Faculty of Economics management committee in particular those "Keynesians"[362] purporting to be the heirs to Keynes who had been linked the 1941 DAE committee. Pesaran and Harcourt note that Kahn and Joan Robinson were antithetic to econometrics (Pesaran and Harcourt, 2000, p. 157). Stone accounted for this in later

[356] This is discussed in greater depth in Section 6.5.
[357] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 Stone 1 July 1945 'University of Cambridge DAE Outline of a research program.'
[358] *ibid.*
[359] *ibid.*
[360] *ibid.*
[361] See section 6.3.1. for details of the unsuccessful 1941 bid for Rockefeller funds.
[362] Former members of the Cambridge Circus such as Joan Robinson, Nicholas Kaldor and Pierro Sraffa.

years in an interview with Geoff Harcourt[363] saying that the Cambridge Keynesians had created a narrative where Keynes was antithetic to data.[364] Further, and notably in opposition to the Rockefeller intentions, 'they thought that the DAE had strayed too far from its original intention which was to provide, in effect, the labour for the research projects of the teaching members of the Faculty.' Stone had faced increasing opposition from members in the Faculty such as Richard Kahn and Joan Robinson. It was supposedly felt that the more econometric focus to his research, particularly his demand analysis, was not in the tradition of Keynes (Pesaran and Harcourt, 2000). Whether Stone's account of Keynes's thinking as an empiricist, most notably articulated in Stone (1978) *Keynes, Political Arithmetic and Econometrics* is solely self-justification of Stone's own research or a valid account of Keynes as an empiricist is tangential to this discussion.[365] What matters however is that the clash of cultures significantly altered the running of the Department.

This conflict of ideas becomes particularly relevant when consideration is given to the work of Kahn and Sraffa both of whom had a significant impact upon the work of Keynes. They made rigorous use of data in their work and Kahn himself acted as a confidant on the development of the national accounts in private correspondence with Keynes and Rothbarth.[366] The conflicting visions on the methods and subject-matter of economics escalated.[367]

Murmurings of discontent were first delivered to the Rockefeller Foundation by Austin Robinson a long-term supporter of empirical economics in Cambridge,[368] in a brief conversation with the Rockefeller Comptroller George Beal on 21 September 1949. Beal noted that Robinson 'feels they have done excellent work, but that perhaps there is a slight danger that they may get too highly specialised on national income and national accounting problems.'[369] That the comments were coming from EAG Robinson was significant because, as outside voices would later observe, Cambridge was 'badly split…between Keynesians (R.F. Kahn, Mrs. Joan Robinson, and Nicky Kaldor)

[363] See Harcourt (1995, pp. 153–159) *Political Arithmetic in Cambridge – Talking to Richard Stone*
[364] Stone's frustration at this narrative can be seen in exchanges between Stone and Patinkin in King's College archives JRNS 3/1/98.
[365] It is worth noting however the patronage of the DAE as an empirical body demonstrated in this chapter and the narrative of Keynes as a patron of national income seen in Tily (2009) and Mitra-Kahn (2011) lend some support to Stone's interpretation on the importance of mathematics to Keynes (see footnote 295 for the contrasting narratives on Keynes and mathematics advanced by Stone (1978) and Patinkin (1976)). Indeed, it is entirely possible that by supporting the creation of *a* DAE, and patronising National Income, Keynes showed a commitment to data in economics even if he opposed the theoretical assumptions in Tinbergen's work.
[366] See the Keynes archives and Mitra-Kahn (2011). Rothbarth died in service during 1944 so by the time the DAE became operational was unable to contribute to its research.
[367] There were also other disparities such as heavy teaching loads in the Faculty and some members of staff away such as EAG Robinson.
[368] For further details on his long-term support for applied economics see section 6.3.1. and Chapter 4 section 4.4.2.
[369] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1057.

and non-Keynesians (D.H. Robertson, E.A.G. Robinson, etc.).'[370] For EAG Robinson to be critiquing Stone may have signalled an early ascendancy of the "Keynesian" victory on the DAE Management Committee particularly given Robinson's role as Chair of the Committee.

The governance issues highlighted at the start of the department would now come to the fore – who would hold control over the direction of the DAE research agenda: the Director (Stone) or the (Keynesian) Committee of Management? Despite the backing of the largest funder of the Department – the Rockefeller Foundation[371] – the Cambridge concerns did not go away and Robinson reiterated them to Joseph Willets when he visited Cambridge on 25 June 1951. Emphasis was placed on the need for Stone to diversify away from his national income focus.[372]

These simmering tensions intensified when the University offered Richard Stone the P.D. Leake Chair of Accounting, an offer which, due to administrative rules, would force Stone to choose between his new Professorship and his Directorship. In many respects this promotion should be a cause of celebration Stone became a Professor with the right to draw in resources to continue aspects of his research. But the loss of control of the overall Department's research agenda must also be acknowledged as the recriminations from this promotion still run through to this day. Thomas (2017) highlights the Deaton (1992: 486) view that the Cambridge Keynesians forced Stone out, a view shared by many supporters of Stone who hold the Professorship was a pyrrhic offer designed to force him out of the Directorship.[373] Similarly other commentators argue that Stone was "eased out of the Directorship" (Pesaran and Harcourt, 2000, p. 157)

On the day that the DAE Committee of Management sat to discuss the appointment to the P.D. Leake Chair (few details of which are recorded in the minutes), the first item on the agenda was the relationship with the Faculty of Economics. In the 49th DAE committee meeting Stone had made staff hiring and staff renewal decisions which would help to further his social accounting research agenda.[374] The committee which oversaw the DAE, the Faculty of Economics Board however objected to this strand of empirical research and wanted a change of direction. Given the

[370] These "non-Keynesians" are, it is interesting to note, the same empiricists who were heavily integrated into the international empirical research networks highlighted in Chapter 3. Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1057 Excerpt from JHW's Diary Tuesday, June 12, 1951 following a conversation with Clay in Oxford.

[371] 'Stone is doing a first-class job in empirical research…It is fortunate that this inductive, empirical, realistic venture is stationed in this center of deductive, logical analysis' Willets Diary 25 June 1951 Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1057.

[372] *ibid.*

[373] This paragraph and the ensuing three paragraphs were presented in Fright (2016).

[374] Focusing upon: The Social Accounts of Cambridgeshire, Input-output analysis, Capital formation, Consumers' Behaviour, Regional Social Accounts, Economic Growth and Mathematical Statistics see DAE Committee 50th Meeting Minutes 6 February 1954.

governance structures which left the Director with ultimate say over day to day matters – this would place the DAE in confrontation with the Faculty.

The Directorship remained in dispute for several weeks and months. A solution came about on 18th November 1954 when Professor Robinson wrote a letter providing reassurances that in the event that Stone stepped down from the Directorship there would be limited security for some of the research projects which had created his reputation. It was suggested 'that the Leake Professor should have a professional research staff of six. This group would need accommodation, the usual clerical and computing services, and other normal facilities such as a library, working equipment and travel.'[375] Whilst not wanting to bind Stone's successor's research agenda, Stone was permitted to continue two preferred projects 'the existing projects which you wish to continue under your supervision on that basis are those concerned with demand analysis and input-output.'[376] Recognising the projects' importance to Stone, Robinson observed 'their early termination is neither feasible nor desirable.'[377] To enable this Stone was permitted up to six staff, use of ancillary computers and staff.[378]

Though this agreement removed Stone from the helm it still provided some freedom and ultimately the resources and authority for Stone to form the Cambridge Growth Project.[379] A consequence of this was that whilst it enabled Stone the resources and staff to extend national accounts to incorporate input-output analysis (Offer, 2008, p. 21) it also demoted the social accounting research agenda of Stone to a subset within the department. As Pesaran and Harcourt (2000, p. 157) note 'it is indeed a sad comment on how econometrics was received in Cambridge, and in particular, on a lack of appreciation of Dick's contribution to the subject.' The removal of Stone also marked a lull in the drive to collect data for the purpose of economic recording (as opposed to using data for the purpose of testing theories).

With a change of leadership of the DAE a plurality of research approaches in Applied Economics developed (Comim, 2000, p. 170). As Singh (2006) notes despite reservations about econometrics, Brian Reddaway 'was a liberal academic in the best sense of the term and let a hundred flowers bloom.' It was precisely these contrasting and divergent methodological approaches to applied

[375] UL, Min.V.399: DAE Committee 53rd Meeting Minutes 8 December 1954 – attachments.
[376] *ibid.*
[377] *ibid.*
[378] 4th DAE annual report 1954 to 1957 p.12.
[379] The Cambridge Growth Project was a large computational multisectoral dynamic equation model which could be used for sectoral scenario analysis. For more on the evolution of the Cambridge Growth project, its purpose and the contribution it made to government and business decision making visit Barker et al. (2003) and Barker (2017).

economics which Singh argues led the department to flourish.[380] The next section considers how national income thinking developed in the department, and contextualises these developments within the wider changes in funding, technology and practises in the DAE.

6.5. Enduring research strands from the early National Income accounting agenda in a changing DAE landscape

In the final section a brief overview is provided of the institutional development of the DAE under Stone and subsequent directors outlining some of the wider environmental factors shaping the DAE. It provides the context to the shift from a large focus on national income under Stone to national income related studies becoming one of many research strands within the DAE. The section then considers 4 specific national accounting strands from both during and after Stone's directorship. These include: the OEEC national accounts research unit at Cambridge, which standardised national accounts measures across Europe; the Cambridge Growth Project, which used national accounts estimates to inform government and investment decisions; and, work linked to the research of Phyllis Deane, a researcher recruited by Stone.[381] Her work in particular contributed to Kuznets's attempts to provide long term national accounts estimates and also contributed significantly to the International Association of Income and Wealth. The legacies of these research strands had, and to this day continue to have, a significant influence upon national accounting.

6.5.1. The changing institutional landscape: the finance, research, staffing and technological influences on the post-Stone directorship research agenda

This section of the chapter examines the durability of Stone's research agenda under successive Directors. It shows that aspects endured as a subset of the DAE's overall research agenda but as the department developed in new directions influenced by a changing funding landscape, new research agendas and new technologies, national accounting related research also changed.

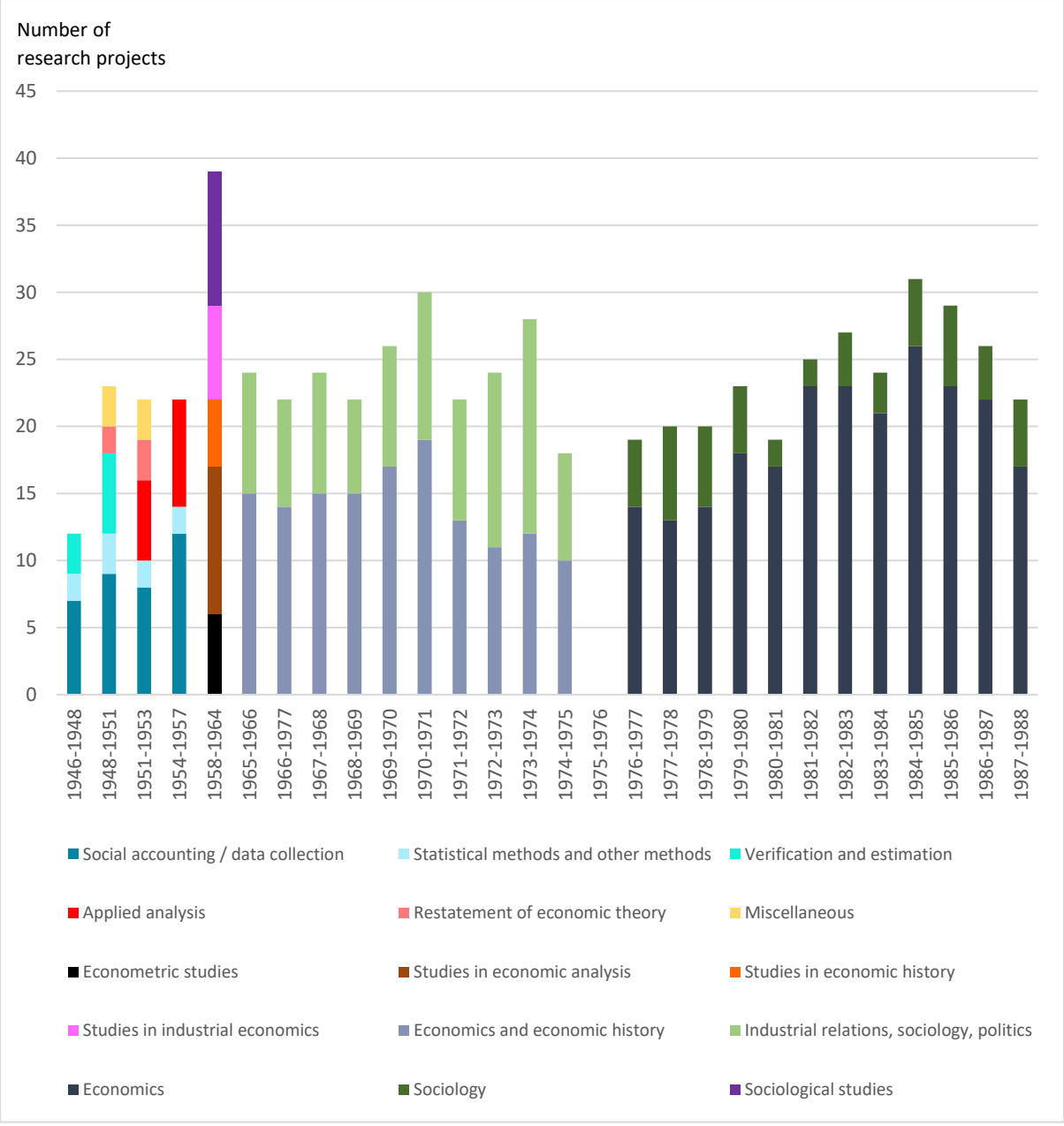
In the early years of the DAE as discussed above, Stone was able to implement a research agenda with a pronounced separate space for the measurement of social accounts and national income. At this time, as shown in Figure 6.2, social accounting was being conceptualised as a theoretical enquiry which required refining. With the progression of time and Directors in the DAE these sub-disciplinary

[380] Parts of this paragraph were presented in Fright (2016).

[381] Deane had been reluctant to leave London for Cambridge but disliked her work at the Colonial Office. After a job offer from Richard Stone to work at the Department of Applied Economics she started on January 1st 1950. Phyllis Deane: oral history by Nigely Harte, 19 September 2002. Archived at the LSE filed as "Phyllis Deane Interview for EHS 18/12/2010" (Accessed 24.08.16).

boundaries were redefined and priorities shifted in the organisation as shown in the diagram below.[382]

Figure 6.2: DAE Annual Report Research Project Categorisations 1946-1988



Fright (2016), *Source: DAE Annual Report data. Note, the years 1946-1964 are on a multi-period, not an annual basis.*

[382] There is however a high level of aggregation to the diagram which means important qualitative features such as Wynne Godley's Policy Group do not appear as a separate entity.

The terms agreed when Stone relinquished the Directorship empowered Stone to recruit a few researchers to execute his vision. The product of this agreement helped to form the Cambridge Growth Project which remained a significant financial commitment for the Department over the lifetime of the project.

Yet as Figure 6.3 shows the funding streams were significantly impacted by the differing philosophies of the directors and the funding environment of the time. The Stone Directorship saw an effort to create an international profile for the DAE attracting considerable American funding. The early years of the Reddaway Directorship saw the sourcing of funds from more domestic private sector organisations in addition to a diverse range of government departments.[383] The early years also show a greater reliance upon government funding for research which most likely reflects the strong links that the early staff had developed during their Whitehall wartime experience. Figure 6.3 also shows that University funding was well below the level of expenditure for the DAE meaning a heavy reliance upon the ESRC which proved to be problematic when their funding reduced.[384]

[383] It should be noted however that once Cambridge Econometrics was founded a subscription service enabled the research project to secure funding from business which does not feature in the figures above because Cambridge Econometrics had become a separate entity.
[384] Parts of this paragraph were presented in Fright (2016).

Figure 6.3: New funds entering the DAE and expenditure in £'s 1946-1988

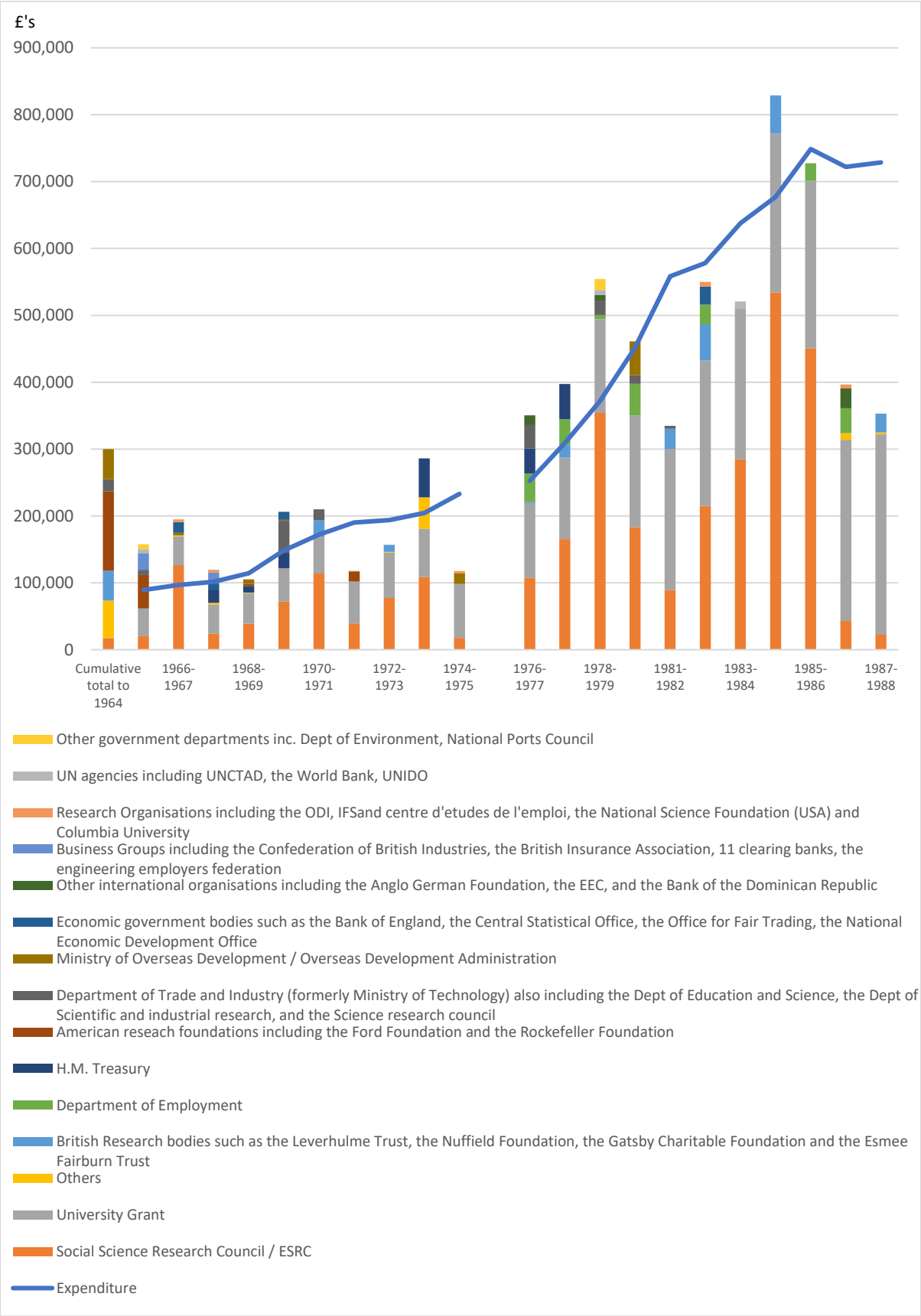


Diagram source: Fright (2016)*, Data Source: DAE Annual Report data*

What this diagram also illustrates is the ownership of different forms of knowledge. By the final years of the DAE, we see a shift towards the use of public sector funds. Throughout the DAE had been commissioned to provide research for governmental bodies such as the Treasury and other departments. In this sense University research with its new computational approaches towards economic management could be used to aid the public sector. It also illustrates a significant aspect of the culture of an organisation whose first two Directors had been involved in the war effort who could tailor academic research to meet government needs. Reliance upon the public sector also signifies a reluctance on the part of private funds to engage with the academic sector in as active a way as the Rockefeller Foundation had in the early 1930s. Interest over the national knowledge of the economy had abated from the private sector and after the nationalisation of national income research in the 1930s – government had become the forum for such research.

Yet the increasing reliance upon ESRC funding illustrates an increasing professionalisation of academic knowledge production and increasing regulation. No longer could the networks which operated previously with staff drawing upon their former work colleagues in government help to secure funding. External funds were the lifeblood of the graduate research institute (which remains to this day a confusing matter for the University of Cambridge which places a heavy reliance upon undergraduate teaching).[385]

Throughout, and particularly during the early years the largest expenditure was spent upon salaries. The most telling point about the DAE, is the relatively few researchers it had during its early years compared with its later years.[386] As in Figure 6.4, until the 1970s there were only approximately 30-35 researchers.[387]

[385] It should be noted that the DAE operated a large funding reserve pot which would be used to help pay for researchers in the gap between one project and another to ensure that talent was retained. This financial innovation introduced by Brian Reddaway means money in doesn't necessarily represent money spent during that time period.
[386] It had far fewer researcher than the IFK in Germany during the 1930s detailed in Tooze (2001)
[387] Past the 1970s there was an increasing pressure for the DAE to demonstrate its impact and so increasing numbers of "research associates" were recorded.

Figure 6.4: DAE Research Staff 1946-1987

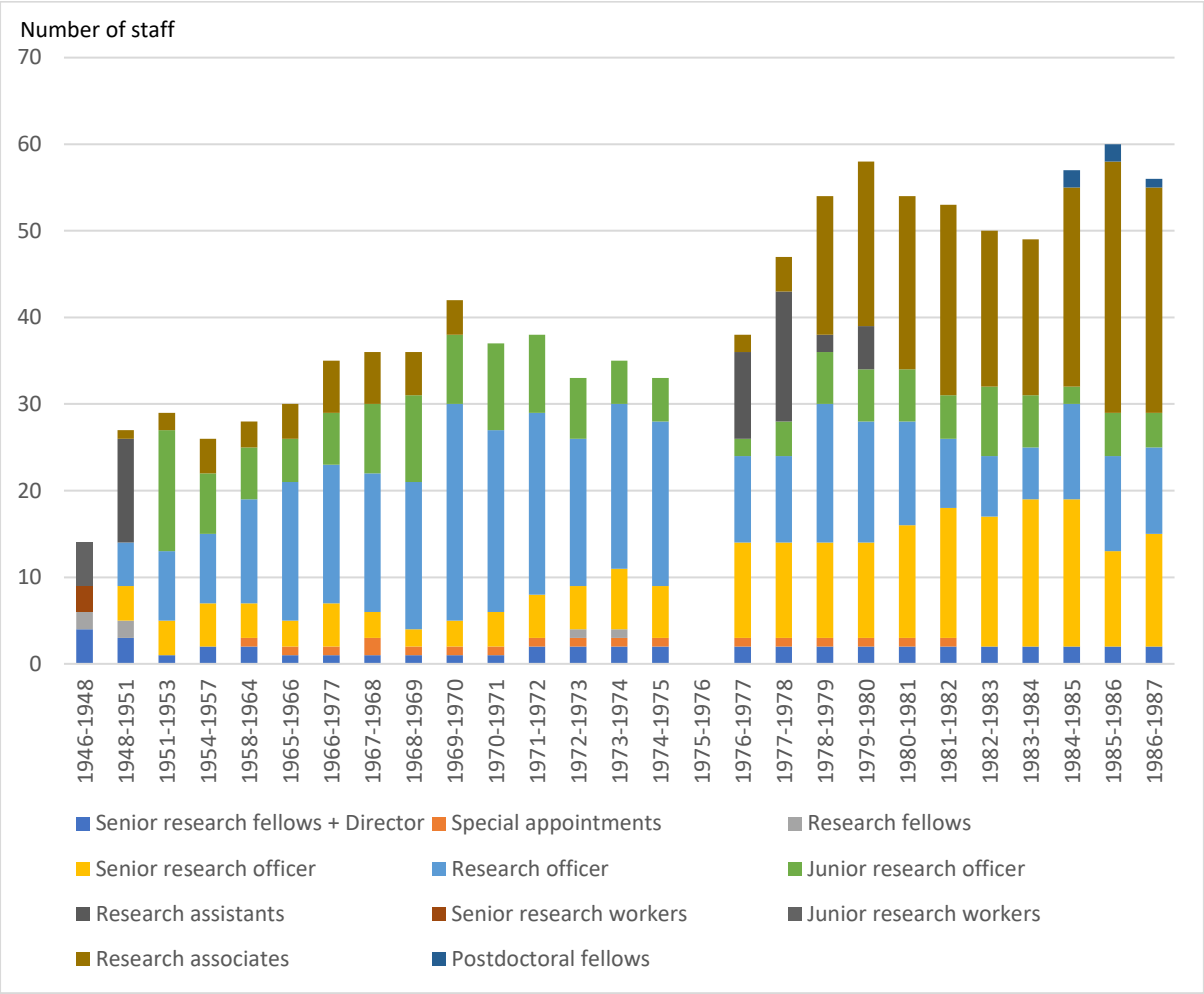


Diagram source: Fright (2016)*, Data Source: DAE Annual Report data. Note, the years 1946-1964 are on a multi-period, not an annual basis. Further note, the number of 'research consultants' are missing from the analysis above.*

A key aspect of the knowledge production in the DAE can be seen however in the work performed by the largely female assistant staff. For such a data intensive process and for the field to advance so fast required scores of highly skilled staff to do the brunt of the calculations.

> 'There was no computing room in the economics department, except for the inevitable woman room – a room full of about ten or twelve women, all desperately churning away on ordinary Marchant calculators. It was to get [the economics department's] data ready' (Slater and Abbate, 2001).

Until largely the 1960s the computing and clerical team were entirely female and it was only at the time that "statistical" work needed completion that the hiring of men started, even by the mid-

1960s, 72 per cent of the computing staff were female.[388] Though often thanks are acknowledged at the start of publications for the hard work of these staff, it underrepresents the complex technical nature of the work they were performing from creating new data series for the first time on topics such as capital formation through to correlation calculations. Even in later years efforts by figures such as Lucy Slater – someone who taught soldiers trigonometry during World War II who became the Assistant Director of the DAE - helped to drive the discipline[389] behind the scenes through her innovations with the EDSAC machine by for example.[390]

Reliance upon hidden female labour in this way has a long history (Abbate, 2003) and was a regular feature of the type of knowledge production during this time. To be able to calculate a correlation required manual computation until the arrival of mechanical alternatives. Even then people were needed to help punch the cards for the Hollerith machines which predated electronic computation.

Figure 6.5: Total DAE assistant staff 1946 - 1987

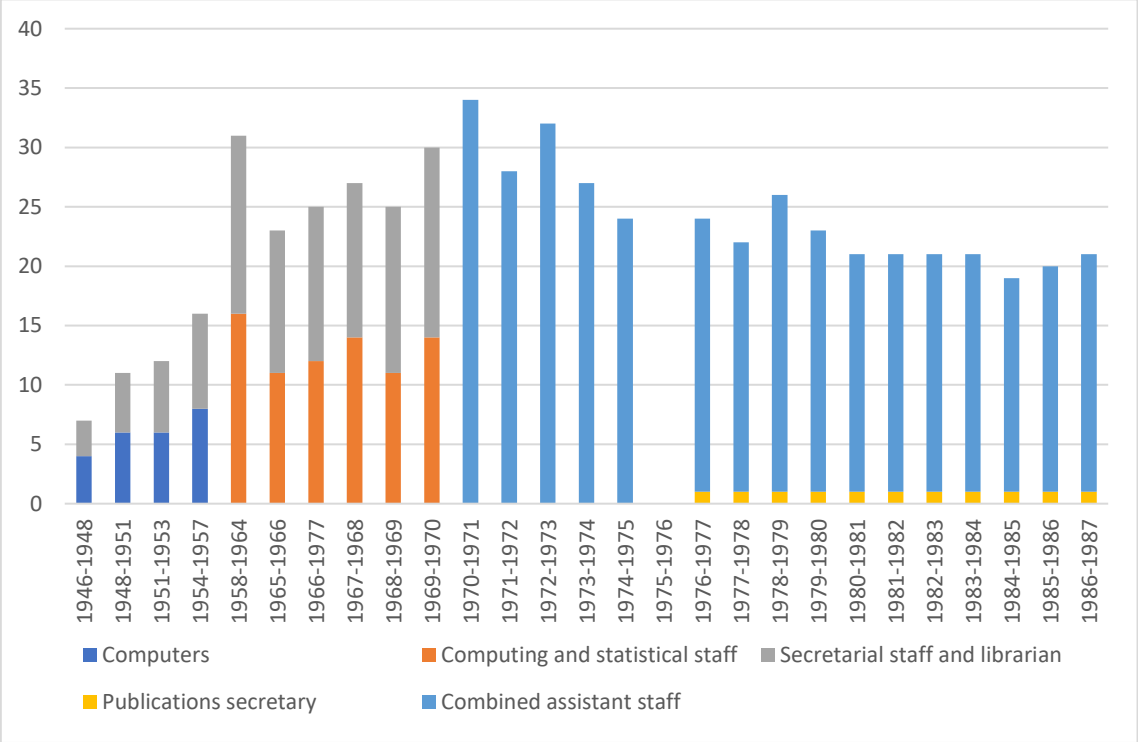


Diagram source: Fright (2016)*, Data Source: DAE Annual Report data. Note, the years 1946-1964 are on a multi-period, not an annual basis. Further note, the number of 'research consultants' are missing from the analysis above.*

[388] DAE annual reports.
[389] See Slater (2004) for example.
[390] For discussions on the obstacles facing women academics in early post-war Cambridge, including, for example, a lack of provision of basic facilities such as female toilets in the Faculty of Economics, please see Slater and Abbate (2001) http://ethw.org/Oral-History:Lucy_Slater

Figure 6.5 shows the shift from human "computers" to technical statistical assistants as the technology of numerical estimate shifted with the emergence of faster computing. The Department started with a mix of calculating machines such as Marchants, Monroes and Madrases.[391] The Department also requested and received on loan computing machinery designed by Edward Shire from his time working in the Army's Radar Research and Development Establishment during World War II. This could be used for autoregression, time series correlograms and lagged correlogram analysis.[392, 393] The department also supported researchers to develop calculational machines such as an electronic regression analyser invented by G. Orcutt formerly of MIT.[394]

But by the turn of the mid-50s use was made of the Department of Mathematics' EDSAC and by the mid-60s the DAE had purchased its own Hollerith card punching and verifying machine.[395] As time evolved increasing use was made of the University computing facilities such as those in the Astronomy laboratory. By the mid-1970s increasingly visual display units were being purchased. Increased computing power not only enabled increasingly technical calculations but meant improved data storage with faster turnaround of calculations. This increased computational power helped to facilitate the increasingly complex computational requirements of systems such as the multisectoral dynamic growth project which had over 4,000 equations.

The move to electronic computing, supplanted the manual human computing that preceded it and brought a further air of scientific legitimacy to the work of the economic forecasters. As Danby (2017) highlights equipment such as the Philips Machine, which used hydraulics to model the flow of funds around the economy, were early attempts at devising hypothesis testing mechanisms which could be calibrated to understand the operation of the economy. The next step on from this encapsulated Stone's vision of evidence-based policy – the Cambridge Growth Project. With the advancement of computing this could enable "scientific" future scenario analysis. As the Times newspaper put it on a special trip to Cambridge in 1965 'The idea of a cabinet minister who is

[391] DAE annual reports. Parts of this paragraph were presented in Fright (2016).
[392] JRNS/4/12 – Machine Purchases 1: Letter from Richard Stone to Brigadier Hickman 14.05.1947. Brig. Hickman later replied in the affirmative permitting the machine to be lent out. This episode is also discussed in Pesaran and Harcourt (2000, pp. 8–9).
[393] In correspondence sent through to the Cavendish laboratories, Hugh Young at the Ministry of Supply recommended that Stone talk with Alan Turing (also at Stone's Cambridge college) at the N.P.L. and Tommy Flowers at the Post Office. This episode is also discussed in Pesaran and Harcourt (2000, pp. 8–9).
[394] JRNS/4/12 – Machine Purchases 2: 15 January 1947 Invitation circulated to see an electronic regression analyser. Invitees included: the Engineering laboratory, lecturers in Mathematics, and members of the Faculty of Economics. This episode is also discussed in Pesaran and Harcourt (2000, pp. 8–9).
[395] For further information see Slater (2004). Parts of this paragraph were presented in Fright (2016).

actually a cabinet of electronic machinery may seem ludicrous but it is dimly feasible – in the mechanical sense' (The Times, 1964).[396]

Yet at the same time this transformation in public finance administration in the 1960s is illustrative of the direction that research was headed in the preceding decades and how new ideas of public administration were enabled conceptually and through new technology. The drive for computing as a way of informing this decision making ultimately illustrates the next stage of progression in the evolution of national income analysis – using the data for future scenario analysis. Such forecasts themselves would however be contingent upon the data themselves and the conception of how an economy operates in general. This in turn would be informed through comparison both internationally and historically.

6.5.2. Efforts to standardise the national accounts through international bodies

The research agenda of Richard Stone directly and indirectly had a significant role in standardising national income measurement in the 1950s. Schmelzer (2016, pp. 102–116) shows that the National Accounts Research Unit (NARU) and OEEC body established under Richard Stone in the DAE at Cambridge led to a common accepted framework for the administration of Marshall aid funds. In the process of doing this the European National Accounts framework was established which was prepared by the NARU. This also saw a convergence of representatives from across Europe come to Cambridge to undertake National Accounts research.

As Stone later recalled:

> 'For about three years 1949-1952, there was established in Cambridge a part of the OEEC, the National Accounts Research Unit, under my direction. We produced the Simplified, and later the Standardised, System of National Accounts; published country reports for Denmark, France, Netherlands, Norway, Sweden and Switzerland; and a trained a number of statisticians in national accounting mainly through the process of their working with more experienced people and learning on the job. The Unit was eventually absorbed by the Economics and Statistics Division of the Organisation in Paris, by then under my friend Milton Gilbert.'[397]

To arrive at a standardised approach required considerable work to evaluate across multiple different national accounting approaches by countries and translating them into the sector accounts

[396] A copy of this article was sent through to the Rockefeller Foundation as evidence of public engagement and can be found in the Rockefeller Archive Centre Record Group 1.1 Series 401.s FA# 386 Box 81 Folder 1060.
[397] JRNS 3/1/15 Letter to D A R Forrester at the University of Strathclyde 06.05.80

approach which had been adopted by the UK (Studenski, 1958, p. 154). Afterwards it helped to set the standard for discussions on national accounting from an Anglo-American perspective.

As with Stone's prior work for the League of Nations Statistical Experts, the OEEC work had demonstrated the interest in these figures at an international level. In June 1945, for example, Stone had been contacted by the head of the Economic and Financial Section of the League of Nations, Alexander Loveday,[398] to prepare a report on how to measure national accounts working with the Committee of the LoN statistical experts. Stone had been sounded out in particular because 'You have the whole matter at your fingertips, and I am really inclined to doubt whether there would be much purpose in engaging somebody especially to take on the work when you are yourself already so well equipped.'[399]

In this sense the research had followed the individual, Richard Stone, whose affiliation with the DAE helped to raise the profile of the department. As Newberry (1998, p. xx) observed 'Stone's international contacts and reputation rapidly made the Department a natural home for a series of distinguished visitors and collaborators.' The DAE in this sense could house and benefit from the prestigious network that Stone operated in and draw talent from around Europe to Cambridge.

Whilst this research predated the transition to the Reddaway Directorship at the DAE, the UN system of national accounts and the OEEC standardisation work had an impact in many countries around the world (Schmelzer, 2016, pp. 102–116; Studenski, 1958, pp. 154–5).

6.5.3. Using national accounts to inform decision making: from Social Accounting Matrices to the Cambridge Growth Project

Stone had been permitted to undertake two research projects of his choosing when he took up the P.D. Leake Professorship and stepped down as Director. The first in "demand estimation" and the other in combining national accounts with input-output analysis in what became known as Social Accounting Matrices (SAM). This sought to create a computable model of the economy to model economic flows at a sub-national level and understand growth.

This change was influenced by the Harvard Economic research project into the structure of the American economy under Wassily Leontief.[400] Leontief's input-output estimates were a matter of

[398] Loveday felt there was a strong indication that international bodies would start to use national income statistics as a means for basing decisions on allocations. For many countries these did not exist, which posed significant logistical challenges. JRNS 5/1 letter from Alexander Loveday to Richard Stone 14 June 1945.
[399] *ibid.*
[400] Baumol (2000) argues that while most trace Leontief's input-output analysis back through Marx to the Physiocrats, Leontief made a substantial advance on his predecessors. See also Kehoe (1998).

considerable interest to Stone.[401] In 1954 for example Stone presented on "Input-Output and Systems of Social Accounting" at a UN and Harvard Economics sponsored seminar on input-output analysis.[402] This analysis helped to inform the Cambridge Growth Project launched in 1960 with Alan Brown. This Project used the national income estimates and combined them within a Social Accounting Matrix. [403]

The Growth Project model itself was designed to analyse the evolution of the British Economy until 1970. It would incorporate a social accounting matrix using large aggregate level identities across 253 accounts organised into 15 sets or classes. It would then use estimates of behavioural and technological relationships across production, consumption and capital accumulation domestically and internationally. Either by simultaneous equations or iterative process, the computer would then arrive at an estimate of the economy for a given set of assumptions.[404]

The research initially evolved in a multi-stage process. The first stage saw the British Board of Trade finance a large data gathering exercise to help 'construct a 400-industry cross section or matrix of the economy, and the combining of them into a 200-industry table.'[405] The second stage received Rockefeller Foundation financial support to develop a system to analyse what the impact would be of different economic scenarios upon the variables in the table.[406] Doing so posed several theoretical questions including how to introduce 'an input-output table into a recent national income model of the U.K.' [407] The DAE team would have to overcome these theoretical challenges in the course of their research.

Many adaptations were made to the model subsequently to incorporate a variety of new dimensions of analysis such as improved trade analysis and a more sophisticated treatment of dynamic effects (Barker et al., 2003). This detailed model provided disaggregated analysis of medium-term likely effects upon the economy. In 1978 Cambridge Econometrics was founded to enable greater commercial access to the outputs of the model.[408] By the time Cambridge Econometrics took over the Cambridge Growth model in 1987 it was a sophisticated inter-temporal model which

[401] Luigi Pasinetti for example told me after I presented the Fright (2016) conference paper at the 40th Anniversary of the CJE, that Stone was extremely keen to be updated on the developments to Input-Output analysis underway in Harvard.
[402] JRNS 7/1/7 Input output conferences.
[403] JRNS/3/3/2 File 4, letter from Stone to Campion 6 Nov 1962.
[404] Fifth Annual Report.
[405] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053, *Minutes of the Rockefeller Foundation Board 6/21/57*.
[406] *ibid.*
[407] *ibid.*
[408] For further details, visit http://www.camecon.com/AboutUs/origins_ethos.aspx (accessed 08/07/16).

incorporated 5,686 variables in 4,492 equations (Barker et al., 2003), as government research council financial support was removed.[409]

Despite the changed attitudes in funding bodies such as the UK's Social Sciences Research Council during the 1970s towards the value of multi-sector modelling[410] to this day the model still provides commercial services to businesses and government alike on the medium-term prospects of the economy.[411] As Debowicz (2016) argues the SAM methodology, pursued by researchers such as Pyatt who previously worked on the Growth Project (Vanoli, 2005, p. 170) generated an international literature as countries applied these measures to better understand development issues. For example, Pyatt and Round (1977, p. 341) note the significant contribution of the Cambridge Growth Project to their SAM development planning approach.

6.5.4. Historic national accounting estimates within the aegis of the DAE

Historic national accounting estimates were another complementary strand of national income work undertaken in the DAE. These enquiries saw scholars engaging with international efforts to generate long time series of national accounting data to better understand how the economy had evolved over time. The institutional support provided by the DAE provided scope for the furthering of the realist research agenda underway, highlighted in Chapter 4 – practical and realist economics. Institutions acted as a vehicle for devotion of time and resources into longer term historical enquiries which in turn became a precursor to cliometrics studies.[412]

In recent years the analytical basis of cliometrics has led some to start to impute long data series such as the widely acclaimed works of Broadberry et al. (2015) and Crafts (1980, 1983). This retrospective query based upon twentieth century concepts is however a reflection of the current emphasis upon GDP and growth figures. The serendipity of the unknown, and the novelty of the contribution to research was considerably greater when these tools were being fashioned for the first time. Moreover it presented an opportunity to better understand history through the lens of numbers (Offer, 2008, p. 14).

[409] Details of which are described in JRNS/4/15. Parts of this paragraph were presented in Fright (2016).
[410] For more details see JRNS/4/15.
[411] For further details, visit http://www.camecon.com/AboutUs/origins_ethos.aspx (accessed 08/07/16).
[412] Cliometrics is an economic history approach that aims to compile historic data series to test contemporary theories (McCloskey, 1978). Whilst Offer (2008, p. 12) argues the cliometric focus in on rationality and market clearing assumptions is a departure from the more social democratic Keynesian enquiries of the 1950s. Others such as Crafts hold Phyllis Deane's work at the DAE to be a key text in helping to develop cliometrics (Deane and Crafts, 2008).

Cambridge and the DAE were a hotbed of historical enquiry into historical economic trends (Offer, 2008, p. 5).[413] At the time researchers were greatly concerned over multiple different factors namely: how long-term capital was formed, the social accounts of the country, balances of production and consumer expenditure. These types of enquiry reflected both the innovations in macroeconomics stemming from Keynes (2012a [1936]) and the research enquiries that he embodied and contributed towards highlighted in Chapters 4 and 5 (inflation, population and trade). But as Stone explains in his DAE research outline to the Rockefeller Foundation in 1945, the purpose of the historical economic data series enquiries was 'not just an historical enquiry.' Buoyed by the execution of national accounts in the White Papers and convinced of the success of the national accounting methodology, the DAE's intention for its historical enquiries were 'to take the story back still further. The work is needed to enable us to stand back and take a longer-term view of British economic development.'[414] It would notably call for the measurement of long term capital formation which could enable a greater level of understanding of the role of savings and investment in the long run (Offer, 2008).

This research approach – using the wartime anti-inflation tools of national accounts applied historically to understand development – was one which gained international support. As Deane recalled later, her research with Cole between 1951 and 1953[415] was a part of a larger project under the patronage of the American Social Sciences Research Council - another Rockefeller body. Simon Kuznets had worked extensively to attempt to leverage funds to help launch an international growth research agenda (Deane and Crafts, 2008; Harte, 2002). What we therefore see is that early cliometric enquiries were themselves part of the wider zeitgeist of international empiricism.

The original conception of the need for a historical quantified enquiry was extremely different from today and reveals much about the purpose and intention of measurement at that time. By its nature early historical research required extensive archival visits and the numeration of old trade figures from hand written ledgers or access to old corporate accounts. As Deaton (2015) recalls from his earliest time at the DAE 'I spent several months in dusty archives, copying down information on the assets of friendly societies.' Such commitment required strong intention.

This is perhaps best illustrated through a letter written by the influential American national income researcher Simon Kuznets for the Rockefeller Foundation on 17 October 1940 critiquing a report on the Economic History discipline conducted by Herbert Heaton. In it, Kuznets is critical of the

[413] As highlighted in Chapter 3 Phyllis Deane was using the figures of Gregory King in her work.
[414] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.s FA#386 Box 81 Folder 1053 Stone 1 July 1945 'University of Cambridge DAE Outline of a research program.'
[415] Later published in Deane and Cole (1967).

Foundation for a lack of vision for their research agenda and instead articulates an alternative vision whereby:

> 'Economic history is a study of economic change in its chronological succession. The purpose of such study is to reveal the factors that govern economic change and the mechanism by which these factors transmute their effects into the observable fabric of economic life.'[416]

This drive for deeper underlying factors is then used as a premise to argue against small scale sub-sectoral research in understanding the evolution of the American economy. Instead:

> 'It is of prime importance to study the economic development of this country [America]; and with respect to the secular trends and the interrelations of theme in the various aspects of the economy, as well as with respect to the cyclical fluctuations, we should also try to see whether the pattern of temporal changes which this country revealed in the historical past is not similar to the pattern of temporal changes in countries of a similar structure.'[417]

In short, in order to better understand American economic performance this could only be arrived at via a comparison with alternative countries. By comparing like with like, variability could be established which in turn would inform the understanding of change and ultimately inform deeper questions about the operation of a newly conceptualised national *economic system*.

This letter marks the starting point of an international enquiry which would lead to bodies such as the DAE undergoing long term growth analysis and frames economic history as a matter of public policy addressing the contemporary problems of the day. Rightly, Kuznets saw this enquiry as an interdisciplinary issue requiring the insights of historians, economic theorists and statisticians in order to arrive at a correct answer.[418]

Deane and Cole's eventual engagement with this international project through the medium of the DAE not only helped to unearth new perspectives on the industrial revolution which became a major turning point in cliometrics (Deane and Crafts, 2008; Harte, 2002) – it impacted the work which was underway at the DAE. They in turn, alongside a variety of others[419] helped to establish Cambridge as a centre of cliometric work in the UK. This ultimately was an engagement which was in part made possible by Stone's alignment of the DAE to the international national accounting discussions.

---

[416] Rockefeller Archive Centre Foundation Records Record Group 3 Series 910 FA#112 Box 5 Folder 42.
[417] *ibid.*
[418] *ibid.*
[419] For more on the contributions of Charles Feinstein see Offer (2008, 2017), for the contributions of Robin Matthews see Harcourt (2017), and for an overview of contributions by economic historians in Cambridge see Daunton (2017).

6.5.5. The global DAE and the IARIW: engaging and influencing the national income community's discussions on "development"

Through a close engagement with the International Association for the Review of Income and Wealth (IARIW), staff affiliated to the DAE helped to promote national income research as a way of informing discussions on development. Like Schmelzer (2016), which shows that DAE engagement with the OEEC led to international impacts, [420] this section argues that through the IARIW, staff affiliated to the DAE such as Phyllis Deane used national income discussions to inform international thinking on "development". This section therefore shows the way that the DAE provided the base from which staff could normalise and standardise national income accounting in development contexts.

The IARIW was a body designed to develop and spread the national income accounting approach. The organisation had strong links to several leading national accountants and was established by a council of Kuznets, Stone, Rao, Clark, Tinbergen and others (Carson, 1999) under the auspices of the NBER and with Rockefeller Foundation funding.[421] Instigated after meetings of the Conference on Research in Income and Wealth having seen many problems with international comparisons, in 1947 Simon Kuznets sought to encourage and further discussion of national income in countries worldwide. The issue gained greater salience given the increased use of national income figures, the reliance upon national income figures by international institutions, and, the need to coordinate research internationally (both in terms of quality and agenda – historical enquiries and standardisation of measurement approaches).[422]

The IARIW also appears to have been an important relationship for the DAE particularly in relation to development thinking. Not only were several Cambridge and former Cambridge economists on the Council of the IARIW, but additionally the first major conference of the IARIW was hosted in Cambridge. This sustained interest in the IARIW and development is perhaps understandable given the research backgrounds of some affiliated economists. Phyllis Deane, a council member of the IARIW and Secretary of the IARIW for 10 years, later said in interview that she did not see her work as exclusively historic. [423] Rather she regarded the notion of economic change over time to be one of development, in this sense development research was seen as an extension of the historical

[420] For a full discussion of the way the OECD was a major factor in the development of global standards see Schmelzer (2016) Chapter 1. Also see Ruggles and Ruggles (1999, p. 452) who explain that the OECD NARU based in Cambridge performed an important standardisation function by simplifying the League of Nations report on National Accounts prepared in 1945 by Richard Stone.
[421] Rockefeller Archive Centre Foundation Records Record Group 1.2 Series 100.s FA#385 Box 59 Folder 458
[422] *ibid.* Letter from Simon Kuznets to Joseph Willets 18 March 1947.
[423] Phyllis Deane. Oral history by Nigely Harte, 19 September 2002. Archived at the LSE filed as "Phyllis Deane Interview for EHS 18/12/2010" (Accessed 24.08.16).

enquiries she was undertaking. Deane, as noted in Section 7.2.6 in the next chapter, also made many important contributions to colonial social accounting.

After the first IARIW meeting in Cambridge in 1949, members such as Kuznets were extremely pleased and hoped that it would form the basis of a forum for spreading education of the National Income estimation approach particularly given the perception that there was a lack of knowledge of this Anglo-American tool in the non-English speaking world.[424] Given the number of European based researchers in the NIESR, Britain was chosen as a good home for the IARIW. Despite this, the travel costs for researchers behind the Iron Curtain were prohibitive and meant there was limited face to face engagement with Soviet researchers.[425] Intended as a 'clearing house of information and ideas' the Foundation documents of the IARIW suggest that its purpose was the creation of a common language between researchers across countries.[426]

The timing of these discussions mattered for the formulation of the notion of "development". In the post-War environment as Arndt (1987, chap. 2) highlights, the notion of development in countries outside of Europe and America was scant until wartime need drove industrialised countries to reappraise the rest of the world. This idea of development then was significantly driven by national income figures which were used as a means of establishing the extent of the "underdevelopment" problem which had been articulated in the post-war environment (Arndt, 1987, p. 51). As Arndt (1987, p. 52) observes, the drive for growth and improved material standards as the key metric for development was further strengthened by the drive for growth in Western Countries.

Therefore, when researchers such as Phyllis Deane at the DAE helped to run the IARIW conference on Africa,[427] she was greatly shaping policy objectives and transforming the policy elites in foreign countries along the lines of an Anglo-American objective of economic growth. Engagement with other researchers who impacted the DAE such as Austin Robinson, who engaged extensively with the IARIW in the 1950s-1960s further illustrates the way Cambridge-based were engaged with empirical conversations around the world. With such a prominent international profile it is perhaps understandable that for example Dr Taher Hamdi Kanaan, an economic advisor to the Ministry of

[424] Rockefeller Archive Centre Foundation Records Record Group 1.2 Series 100.s FA#385 Box 59 Folder 458. Letter from Simon Kuznets to Joseph Willets 18 October 1949.
[425] *ibid.* Letter from Simon Kuznets to Joseph Willets 18 October 1949.
[426] *ibid.* Application to the Rockefeller Foundation Trustees dates 25 January 1950.
[427] Phyllis Deane was one of the few session coordinators at the IARIW conference in Addis Ababa in 1961 which saw a session discussing the measurements of Pius Okigbo discussed in Chapter 7. Further information available in the Rockefeller Archive Centre Foundation Records Record Group 1.2 Series 100.s FA#385 Box 59 Folder 459.

Planning in Iraq, came to the DAE to generate input-output tables and social accounts of Iraq under the supervision of Phyllis Deane and the critical feedback of Richard Stone. [428]

The contributions of these IARIW national income discussions to the understanding of underdevelopment was an important matter for Richard Stone. In 1953 whilst on a research trip to Johns Hopkins University Stone lobbied Joseph Willets for additional funding for the IARIW to make up for a shortfall in funding from the Nuffield Foundation. Until this point the IARIW had been jointly funded by the Nuffield Foundation and the Rockefeller Foundation (Rockefeller Foundation funds were both directly received from the Foundation and indirectly received through the NBER and NIESR). However, the shortfall of funding from the Nuffield Foundation led to a need for new funding sources. In articulating the case for new funding it is apparent that the IARIW was seen as a development focused organisation – the funds were 'in order to improve the quality of the work in fields in less developed countries.'[429] This would be achieved through, for example the creation of a new bibliography of national income research, which in itself would be a major synthesis of the many national income ideas underway around the world. In the process of doing this it was anticipated that these additional funds would be used to standardise national income terms and concepts across many countries. This in turn helped the IARIW achieve its objective of improving 'technical and analytical methods in this field and to spread knowledge of the best available methods as widely as possible.'[430]

In these examples of international engagement, and, in earlier sections showing the way national income enquiries were applied historically (6.5.4), and in policy settings (6.5.3.), it is apparent that the early DAE was part of a broader international network of similarly minded researchers. Bodies such as the DAE could provide a base from which these researchers could sustain these conversations and new research lines. These developments had international impact as the national income accounts were further refined and applied in new settings. The legacies of this network endure to this day in publications that were produced and the intellectual legacies such as standardised national income accounts, historic data series on economic change and SAM models of the economy.

[428] Preface to Kanaan (1965) Input-Output and Social Accounts of Iraq 1960-1963, stored in the private books of Sir Richard Stone.
[429] Rockefeller Archive Centre Foundation Records Record Group 1.2 Series 100.s FA#385 Box 59 Folder 459 – meeting minutes from 4 March 1953.
[430] *ibid.* Letter from Richard Stone to Joseph Willets 10 March 1953.

6.6. Conclusion

This chapter examined the movement for national accounts within an academic setting which contained some of the principal contributors to the White Paper on National Income from 1940. It did so by showing the formation, operation and legacies of a national income research agenda in the Cambridge Department of Applied Economics.

The chapter showed that a coalition of different interests came together to found, in a short period of time, a research centre of international repute. The Faculty of Economics, seemingly at Keynes's instigation, had pushed for a new empirical research body. This matched with the interests of the Rockefeller Foundation which wanted another "realistic" centre. In their collective choice of first Director they empowered someone with strong empirical credentials with an interest in national income accounting. Differing views on the ultimate purpose of the DAE however led to some ambiguities around whether the Department would follow an independent research agenda from the Faculty.

After the death of Keynes, the independent research agenda followed by the department was that of Richard Stone. His vision of economics and vision for the department was favourable to the Rockefeller Foundation and one which saw the need to measure national accounts in order to aid planning and improve social democracy. This research approach found opposition from within the Faculty of Economics who felt the DAE's research outputs focused too heavily on national income studies. Instead this research agenda was side-lined as Stone accepted a Professorship which saw him cede control of the DAE's research agenda.

In the following years, under successive Directors, Stone developed a research agenda which responded to changing funding and technologies. The legacies from this time saw contributions to discussions on the need to standardise the National Accounts and their extension to Social Accounting Matrices within the Cambridge Growth Project. Work undertaken by Phyllis Deane during this time also saw the DAE generating historic national income data series and engagement with the IARIW. Several important legacies endure from this time across all of these areas.

Empirical estimates of the sort developed in the DAE and other organisations were in demand by a range of business and government bodies (Figure 6.3. above). Such research could promise a more rational "scientific" decision making approach whilst also improving the discipline by funding new avenues of research. The final chapter considers one of these particular research projects, where the interests of Academics to improve development coincided with the British Government's desire for the colonies to administer using British-style national income accounts. This led to the 1951 National Income estimates of Nigeria conducted by the DAE.

Chapter 7: A case study in imperial empiricism: The British Colonial Office's Use of National Income Accounting for Twentieth Century Nation-Building

7.1. Introduction

As Chapter 1 noted, there is a detailed literature on post-war efforts by the UN and the OEEC to standardise national income GDP methodology across countries. Analysis however, remains more scant on other *movements for national accounts* and their attempts to spread national accounts. This case study chapter considers efforts by Britain to encourage national accounting public finance, along Keynesian lines in the British Empire. The discussion focuses on two episodes: the first, in Section 7.2., when in 1949 the Colonial Office issued a circular despatch on National Income and Expenditure Studies, and, the second, discussed in Section 7.3. when in response to the despatch, the Cambridge DAE measured the National Accounts of Nigeria 1950-1951.

Section 7.2. contextualises the institutional motives which influenced the 1949 Colonial Office despatch on national income accounts. It starts by explaining the shifts away from old colonial accountability mechanisms as the Colonial Office moved away from indirect rule. With the end of World War II, a new intellectual climate supported greater colonial interventionism which, as noted by Helen Tilley, led to new scientific measurements being tested in colonial settings. One such system being tested was the national accounts project, which the British Colonial State encouraged to improve what it referred to as "development." The British efforts to export Keynesian-style national accounts differed from UN efforts underway internationally. Instead, British colonial efforts were shaped by new institutional mechanisms such as the Colonial Economic Research Committee and the National Income Advisory Panel. These bodies brought state officials and academics together in specific groups, each with their own distinct agenda for national income measurement which came to inform the 1949 despatch. The final Colonial Office despatch encouraging colonial administrators to adopt the British National-Accounts approach was not, however, universally implemented. In some cases, Colonial Governors challenged the relevance or practicality of such measurements.

Section 7.3. considers the special treatment of the Nigerian response to the 1949 despatch, which led to a Cambridge DAE team measuring the Nigerian national accounts. In contrast with Morgan (2011), this chapter argues we can understand the ensuing measurements, *The National Income of Nigeria 1950*-51, within a broader colonial institutional context. The case of the Nigerian response shows that the country faced, simultaneously, a federal fiscal and constitutional crisis as colonial administrators sought to unify three vastly different regions under one Nigerian flag. In response, an audit of national and regional resources was commissioned. In an attempt to create stability, the

purpose of the national accounts framework transformed into an inter-regional analysis tool intended to inform a Nigerian fiscal tax settlement. In spite of concerns about estimation methods, *The National Income of Nigeria 1950*-51, had a long legacy. Morgan (2011) has covered aspects of this episode in detail. But whilst Morgan focuses on the limitations to measurement approaches adopted by economists measuring national income, the chapter emphasises instead the institutional motives which led to the measures. This case study illustrates that social accounting practitioners contributed to a national accounts project that was deeply entwined with concurrent advances in budgeting, technocracy and "scientific" colonial administration.

This chapter contributes to the thesis by exploring the different motives that supported the imposition of new national accounts measurements. It contributes to the extant literature by supporting the Jerven (2013) argument that institutional pressures lead to measurement without adequate data and supports Jerven's point that colonial institutional legacies shape how national income figures are measured in Africa. It also supports the Morgan (2011) argument that the national accounts system faced difficulties when exported to new contexts. Indeed the chapter follows a similar approach to Tilley (2011) that "scientific" measurement was often exported through the Empire as an experiment in new settings. These points are of significance as they demonstrate the wider point of the thesis that national accounts need to be understood with respect to their historic meaning. As this chapter demonstrates in support of Tily (2015), national income accounts were measured for purposes other than national income-linked "growthmanship."

7.2. The post-war British Colonial Office became a patron of national income accounts

Section 7.2 examines the spatial transfer of an intellectual system over great distances. The argument does not proceed along similar lines to Goodacre (2019), which looks at aspects of "development" thought as an extension of political arithmetic. Nonetheless, some anachronistic parallels can be drawn regarding national income measurement for colonial administration. Whilst Petty did develop his political arithmetic in Ireland as a colonial administrator (McCormick 2009), and whilst this informed taxation decisions (Mitra-Kahn, 2011) the macroeconomic function served by the national accounts movement was a fundamentally different type of public finance approach.[431] Instead, the chapter considers the transfer of the British Colonial Office articulation of national accounts to colonial administrators. As Hodge highlights historians are increasingly understanding the spread of knowledge as an act of colonialism, and that imperial science creation

[431] As text books in public finance both Prest (1960) and Musgrave (1959) highlight the concepts of the Keynesian revolution as a change from prior public finance administrative approaches.

requires a network involving multiple players across multiple dimensions (Hodge, 2011, pp. 4, 17). This can be seen in the way that networks formed in response to the Boer War and World War I through the construction of empire-wide scientific programs for various resources (Bennett, 2011, p. 36). For these reasons this chapter analyses the inter-colonial intellectual transfers between the Colonial Office and administrators in the colonies via networks of civil servants and academics.

This section outlines the institutional arrangements and motives which saw the 1949 colonial office despatch encouraging colonial administrations to adopt British style national accounting finance. For this to occur required a considerable shift in attitudes towards British Colonial management. The section progresses by outlining prior and changing perspectives on the need for colonial information. The argument progresses by exploring how development funding fostered new institutional arrangements to engage with academic bodies and commission new research. One such mechanism was the Colonial Economic Research Committee's National Income Advisory Panel (NIAP). The section shows that these academic bodies and Colonial Office administrators had a common cause for the spread of national accounting abroad. For the Colonial Office, reflecting wide British consensus, the final despatch issued to colonies reflected their interests and articulated a vision for national accounts as a budgeting and planning tool. This contrasts with formal UN efforts to get states to measure national accounts which came after British efforts to undertake colonial national income studies. There was not however a uniform response by the colonies and, whilst spreading the national accounting in new settings, this did not necessarily result in changed institutional practise in all cases.

7.2.1. Shifting from old accountability mechanisms under "indirect rule" to demands for more data under a more centralist colonial approach

This section contextualises the lack of accountability mechanisms in the run up to World War 2, and the shifting perspectives which changed the appetite of the British state for an account of the colonies. For the Colonial Office to patronise national accounting measurements required a shift in colonial management and attitudes towards the colonies. Increasingly in the advent to World War II, the British State moved from a position of indirect rule to wanting a more scientific picture of colonies. Before outlining the move to "scientific" administration, the chapter outlines the attitudes towards the administration of the Empire by the Colonial Office as a central entity with an agenda of its own. As highlighted in the work of Amdekar (2018), using the work of Cain and Hopkins (1993), the British Imperial project can be considered in terms of a core and periphery relationship. London – representing the Whitehall administrators and City of London interests – at the "core", operated a complex mesh of formal and informal, economic and non-economic relationships with "peripheral" colonialised governments around the world. Whilst some authors focus upon legal processes of

colonialization e.g. Mamdani (1996), this chapter will focus on the data collected by the core from peripheral colonial governments, and how it was shaped by broader attitudes to colonialism.

The accountability technologies of Indirect Rule

The national accounts were not the first form of national-scale accounts supported by the Colonial Office. Previously under the system of indirect rule in the British Empire, other forms of accounting had been adopted.

At the turn of the twentieth century the British Empire operated a system of *indirect* rule, which brought efficiency and empowerment on the one hand, and on the other hand an ongoing quest for a reliable, increasingly scientific approach to oversight. Whilst the empire enhanced Britain's resources (Offer, 1993, p. 236), and was sheltered by British military force, the Empire did not operate under central control from London for day-to-day operations. The type and nature of the relationship with London varied considerably across the multiple colonies (Acemoglu et al., 2001; Brendon, 2008). This diversity ultimately empowered local colonial administrators to take decisions but made monitoring of the British Empire a difficult task.

The early twentieth century saw the Colonial Office - the Department tasked with Colonial relations - facilitate a complex web of relationships largely through a process of indirect rule. In many colonies their own domestic central governments administered alongside local governance institutions (which often predated colonialism). Recent tax studies illustrate the depth of these local governance arrangements by showing the large tax and expenditure regimes of local levels in many colonies (Bolt and Gardner, 2016).

This lack of central diktat in part reflected a lack of appetite among the British to spend large amounts in administering the colonies, meaning that colonies were encouraged to be self-funding (Gardner, 2012, p. 3,9). This also reflects the wider laissez-faire approach to British governance which characterised the early twentieth century.

Lack of central instruction did not, however, mean an absence of accountability but what mechanisms that were used were limited by the technology of the day. Examples include letters, despatches or annual reporting mechanisms such as the Blue Book. These informational flows only represent a partial picture, they are shaped through colonialising interest and represent the state house of a colony and not the lived reality of colonised people on the ground. Flawed though it was, this information would enter along with reports, newspaper clippings, letters from missionary societies, traders and residents (Hall, 1937, p. 26). With considerable continuity of service in

individual posts (Constantine, 1984, p. 280), Colonial Office staff then became living repositories of a complex variety of data.

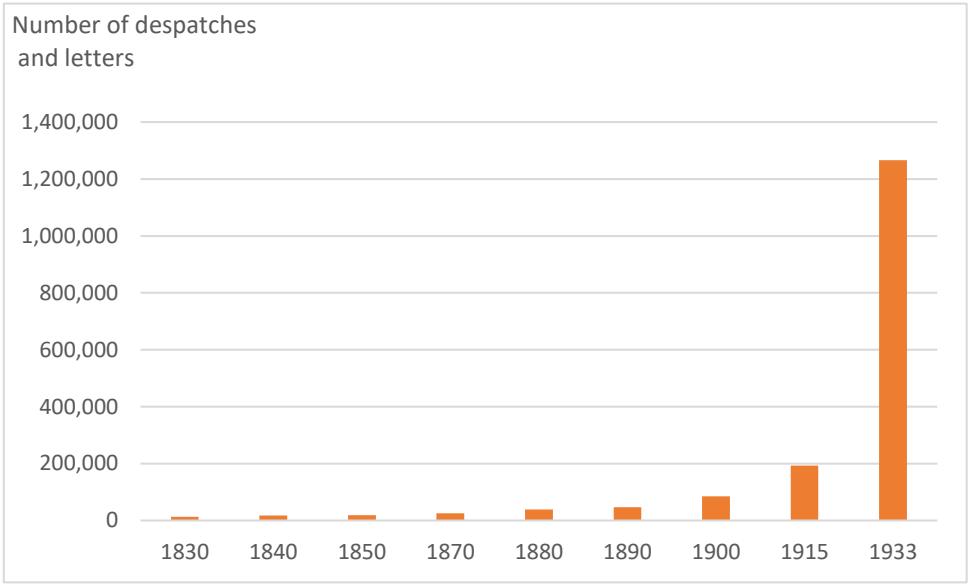
The numbers being captured themselves also embodied many ethical and conceptual connotations. Given the language of "colonialization for economic benefit" it is understandable why the Blue Books mentioned earlier placed such a large emphasis upon the revenue, expenditure and trade figures in their reporting tables. This observation finds support from Helen Tilley who argues that Britain African colonies were seen as producers not actors; London 'from the start was focused on resources, revenue and production rather than political participation' (Tilley, 2011, p. 17).

The Blue Book was a standardised reporting mechanism which could potentially enable greater comparability across colonies. Originating in 1822 statistical returns in the Blue Books started (and though badly compiled at first) by 1837 Governors were expected to regularly inform the Colonial Office on the past, present, and likely outcomes of the state and prospects of the Colony (Pugh, 1967, p. 721). After this date Governors had to relay 'legislative Acts and proceedings, official lists, gazettes and useful books and pamphlets' (Pugh, 1967, p. 721). These were largely stored in the Colonial Office's library, a library which had numerous maps but few staff.

The information contained in the Blue Books was overwhelmingly granular in detail. In 1906 each Blue Book contained thirty-seven sections which needed completing, then in 1920 reductions were made to bring it down to thirty-four. For the 24 Colonies supplying this information for 1906, it would mean 888 returns. Though some sections such as 'political franchise' would yield a 'nil' return for many colonies, sections such as 'Tax duties, and other sources of revenue,' 'revenue and expenditure' and 'population and vital statistics' can lead to tens of pages meaning that for a colony such as Southern Nigeria the 1906 return is several hundred pages long. This surfeit of data would be difficult to process given the computational limitations of the day. By the 1910s, driven by a need for more condensed and scalable information moves were made for annual reports to be laid before Parliament.

The move to annual reporting to Parliament is reflective of a wider change which occurred towards the twentieth century – an increasing interest in the colonial sphere. Despite the deeply flawed nature of information construction, London was showing increasing interest in colonial affairs as shown by the exponential increase in correspondence with the colonies shown below in Figure 7.1.

Figure 7.1: Total Despatches and letters sent and received



Data taken from Hall (1937, p. 26).

Changing perspectives fuelling a drive for new types of colonial information

From the 1880s onwards new perspectives emerged on the economic value of the British Empire; 'colonial markets and sources of raw materials were regarded as valuable assets to help the expansion of the metropolitan economy' (Constantine, 1984, p. 10).[432] This new emphasis on the perceived value of colonies led to a change in the need for data – in time the Colonial Office started to 'think like an Empire' (Tilley, 2011, p. 22).[433] As Tilley (2011) shows academia and scientific organisations helped to change perspectives in London on the colonies. Tilley (2011, p. 33) argues for example from the 1870s onwards the 'scramble for Africa' by European nations led to the commissioning of colonial research by research societies such as the Royal Geographical Society.

New forms of state-level data collection were starting to play more of a role in public affairs by the turn of the twentieth century (Prévost and Beaud, 2012). Coinciding with territorial expansion through colonialism, bodies such as the Royal Statistical Society emerged which refined techniques and increased access to data. The increasing academic interest in data, and empirical approaches came to significantly influence policy. For example, as shown by Fennell (2020), Malthusian empiricism had a marked impact upon Indian planning perspectives.

[432] We now know through the works of Offer (1993) and Gardner (2012) that the Empire was not always necessarily a profitable venture.
[433] For more on the actual value of the British Empirical project to Britain, and the difficulties in calculating such a figure see Offer (1993).

Potential enrichment of the mother country therefore helped to fuel the demand to limit the unknown and this helped to encourage a greater level of intervention in colonial administration at a distance. As Schuknecht argues a transformation in the Colonial project occurred from one of indirect rule and non-interventionism into a more direct approach to administration of colonies through the influences such as the Great Depression illustrated the weakness of rule (Schuknecht, 2010, p. 12). In reality, indirect rule was still an imposition; local administration occurred within country but by externally imposed administrators such as the Indian-born but Worcester-raised Lord Lugard in Nigeria who unified North and South Nigeria with little regard for local opinion.[434] But as Constantine (1984, p. 290) shows, in the 1930s, particularly in relation to development and welfare policy, there was a shift towards limited intervention in local colonial government by the Colonial Office. This tendency towards centralisation was a possible consequence of moves to change the Colonial Service into a "unified system" (Morgan, 1980, p. xviii).

Given the computational difficulties arising from existing accountability approaches it is unsurprising that the Colonial Office was encouraging new economic surveys such as the survey performed by Hailey. As Tilley demonstrates, data gathering was often carried out for the purpose of improving colonial administration 'the [Hailey] African survey was designed to master Africa's environments and its human inhabitants through scientific management and planning' (Tilley, 2011, p. 4). The results of the Hailey survey as Tilley (2011, p. 3) argues were influential and can be seen shaping the 1940 Colonial Development and Welfare Act. The pressures for an overview of the colonial situation therefore illustrate that difficulties with existing accountability approaches were creating the space for new measurement paradigms to enter to aid colonial administration.

7.2.2. British attitudes to "development" enabled new scientific research bodies like the National Income Advisory Panel

The Post-World War II environment saw an increasing focus on colonial statistics including national accounts. As Tilley (2011, p. 11) reminds us, scientific knowledge production is itself related to the social and political structures which underpin its production, and, as this was a moment of particular change for the Empire, it is understandable that scientific measures would change. In addition to the shifts in colonial administrative approach above it was a time of considerable flux for the Empire. Britain faced considerable debt, an ascendant dollar currency and the need for new resources (Nyamunda, 2017). Wider changes such as the election of Labour governments with activist ideologies towards to colonial development for the betterment of Britain saw the publications of the

[434] See Perham (1960, p. 11,13,23) for examples of Lugard's power as an imposed external administrator. See also Mamdani (1996, p. 17) for a more in depth discussion on the difference between direct and indirect rule.

the 1929 Colonial Development Act (Ukelina, 2017, p. 18) and the Colonial Development and Welfare Act 1945 (Seddon, 2008, p. 59). The 1945 act in particular, ushered in new modes of colonial government such as manpower plans and British-style Welfare States (Cooper, 1996; Gardner, 2012).[435] With these new "scientific" administrative approaches available to the Colonial Office, thinking in the Office became increasingly technocratic (Clarke, 2007).

This section argues that a 1940s British notion of "development", [436] that advanced British self-interests, led to the creation of scientific research bodies such as the National Income Advisory Panel. This notion of development was shaped by factors such as: concerns about German military aspirations, Treasury penny-pinching, changing opinions on the independence of colonies, and the increasing prominence of economic advisors all affected the purpose of 'development' in the Colonies (Morgan, 1980, pp. 14, 100, 182). The 1940s notion of development had also been shaped by the earlier Development Act. In the discussions relating to the Act a memorandum was prepared for the Cabinet in 1923 that saw "development" as a way to 'accelerate the development of imperial resources'[437] as ultimately the colonies were being articulated as profit centres. This framing was one way of attempting to convince the Treasury to release funds.[438] The notion of "development" morphed even further by the time the 1940s Development and Welfare Act was being prepared.

By 1944 a cabinet memorandum on "Future provision for colonial development and welfare" was submitted to the British Cabinet. The note forwarded by the Secretary of State the Rt Hon Oliver Stanley MP, cited increased public awareness of Colonial conditions and observed that this was a crucial moment for the future of the Empire. Severe deficiencies in administrative capacity (such as technical skills by staff and staff numbers) had limited the ability of the Empire to coordinate fiscal resources voted on by Parliament. There was a clear need to upgrade the informational architecture of the Colonial Office. The Colonial Office was clear why this mattered, not only would Britain benefit from increased productivity in colonial countries which were forced to export at cheaper prices than those outside the empire, but also:

[435] Morgan (2008, p. 10) for example also highlights that ten year plans had been required by the Development and Welfare acts between 1945-1957. This responsibility had necessitated an increase in quantified knowledge.

[436] As Tilley (2011, p. 17) argues the notion of "development" dates from the early decades of the twentieth century, but much as her point that the expansion of Colonial territories in Africa led to a change in priorities, here I argue that changed colonial pressures led to a new drive for "development."

[437] TNA CAB/24/158, Image Reference:0002, Cabinet Minutes on the Proposal to Accelerate the Development of Imperial Resources. 8th January 1932 Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-24-158-CP-90.pdf

[438] It also in part mirrors some discussions on the direction of development today – investing in development projects which will see a return for Britain.

> ‘in the years to come, without the Commonwealth and Empire, this country will play a small role in world affairs, and that here we have an opportunity which may never recur, at a cost which is not extravagant, of setting the Colonial Empire on lines of development which will keep it in close and loyal contact with us.’[439]

This “colonial development” to help British self-interest framing saw the Secretary for the Colonies advancing an ambitious large-scale ten-year finance package.[440] Despite initial opposition by the Chancellor, when future colonial provisions next came to Cabinet, a sum of £120 million[441] was allocated for colonial spend (Schuknecht, 2010, p. 19). Funding was also structured to enable a more secure cash stream over longer time periods.[442]

With the political support of the Cabinet and the financial support of the Treasury, the Colonial Office had the impetus to vastly expand colonial knowledge.[443] However to develop the frontiers of scientific knowledge would require collaboration between the Colonial Office and academic communities (Tilley). Through a series of advisory bodies,[444] research projects were prioritised amongst the various academic projects. One such body, the Colonial Economics Research Committee (CERC) was tasked with channelling research funds to projects which aided development. As a 1949 CERC Memorandum acknowledged the broader policy of the Colonial Office at this time was ‘on the improvement of the economic position of the colonies.’[445] Assisting the CERC with this was its National Income Advisory Panel (NIAP).

The decision to establish a National Income Advisory Panel was indicative of a broader environment which was formalising a state planning approach based upon the British wartime planning

---

[439] TNA CAB/66/57/43 Image Reference:0001 Briefing Note on Future Provision for Colonial Development and Welfare 1944. Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-66-57-wp-44-643-43.pdf

[440] TNA CAB/65/44/23 Image Reference:0001 War Cabinet Conclusion 1944. Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-65-44-wm-44-152-23.pdf

[441] Approximately £4.9 billion when adjusted for inflation.

[442] Research had been budgeted separately previously which had limited its flexibility. For the first time this included research expenditure as a core part of colonial development spend rather than a separate outlay, this consequently meant more generous research project deadlines. The security of these funds meant more ambitious research projects. See TNA: CAB/65/44/43 Image Reference:0001 War Cabinet Discussion 1944. Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-65-44-wm-44-173-43.pdf

[443] See Tilley (2016) for examples of environmental, medical, racial and anthropological scientific endeavours and how they helped to provide information for scientific bodies which came to inform colonial strategy. A cursory examination of the CERC minutes and agenda also reveals a wide array of commissioned studies from groundnut assessments, to geological surveys and from migrant labour reports to cocoa studies.

[444] Bodies such as: the Colonial Research Council, The Committee for Colonial Agriculture, Animal Health and Forestry Research, the Colonial Medical Research Committee, the Colonial Social Science Research Council, the Colonial Insecticides Committee, the Colonial products Research Committee, the Colonial Economic Research Committee and the Colonial Fisheries Advisory Committee. National Archives TNA CO898/2 CERC papers and minutes 1949.

[445] National Archives TNA CO898/2 CERC papers and minutes 1949.

experience. Throughout 1949 the NIAP, comprised of the British national accounting luminaries of the day,[446] drafted a scientific guidance paper which would encourage colonial governments to enhance national statistical capacity and change their public finance approach. The panel was an interesting allegiance of academic consultants and Colonial Office officials each motivated by different perspectives but sharing a vision of exporting the public finance method of national accounts budget-planning developed during World War II.[447]

7.2.3. Drafting the NIAP's 1949 Colonial Office despatch

Through a despatch drafted on behalf of the NIAP scientific advisory panel, the Colonial Office became a mechanism for the encouragement of national accounts in a colonial context.[448] Research into the applicability of national accounts in non-industrialised countries had already been underway since the 1940s. For example, recalling her time working at the NIESR on a research project overseen by James Meade, Richard Stone and Arthur Lewis,[449] Phyllis Deane[450] recalled meeting Keynes 'because I was involved in a project which he was particularly interested in, in 1941… applying social accounting techniques to developing countries.'[451,452] Whilst there was a recognition that concepts may not fully apply and there may be limited data (Deane, 1948, 1946), the national accounting framework operated as a closed system meaning it was easy to infer estimates when data was missing from one segment of the system (Morgan, 2011, pp. 13–17). This also meant it was possible to generate estimates with relatively little information. As Phyllis Deane recalled in an interview with Nigely Harte, she was previously asked to generate national income figures with only some "ropey" population figures as the clean data – everything else which followed was pure conjecture (Harte, 2002). Yet this academic appetite to estimate national income figures in spite of limitations dovetailed with the broader interest by the Colonial Office in advancing development.

[446] Professors Sir Arnold Plant, A. J. Brown alongside Richard Stone, E. Jackson, and R Tress were on the committee. From the Colonial Office, Phyllis Deane sat as the Secretary.
[447] See Chapter 5 for contrasting political economy management approaches e.g. manpower planning.
[448] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies Minutes dated 16 December 1948.
[449] Rockefeller Archive Centre Foundation Records Record Group 1.1 Series 401.S FA#386 Box 68 Folder 901.
[450] Phyllis Deane wrote several articles and a monograph on social accounting before moving to research historical national income estimates. During this late 1940s/1950s period she was the secretary of the CERC and wrote the first draft on the 1949 National Income despatch.
[451] Phyllis Deane: oral history by Nigely Harte, 19 September 2002. Archived at the LSE filed as "Phyllis Deane Interview for EHS 18/12/2010" (Accessed 24.08.16).
[452] It should be remembered that the 'Father' of national accounts at this time Keynes during his time in the India Office had contributed towards Indian annual report the *Material and Moral Progress and Conditions of India*. And as Cristiano (Cristiano, 2009, pp. 302, 313–4) various authors have conducted analysis on the Colonial Keynes from this we can see how the desire for British stability meant stability of the British Empire

The initial draft had been prepared by the then Colonial Office staffer Phyllis Deane[453] which was evaluated and reviewed by the panel on 16th December 1948. The 1948 draft brought before the panel clearly articulates a vision of a need for new data to inform planning 'the increasing responsibilities of the Colonial Office and of Colonial Governments in the realm of economic planning, have emphasised the need for an improvement in the factual basis on which economic policy decisions can be taken.'[454] Core to the Colonial Office's early thinking on how to improve economics governance was the need for economic plans for the whole economy; this, the drafters argued could not be done effectively without 'the framework of an integrated system of national accounts.'[455]

Yet, the NIAP had many concerns about the plausibility of these aspirations given the state of the statistical architecture of many colonial countries. The academics emphasised 'that the fundamental problem was one of collecting and assessing the value of the basic material for national income estimates, rather than one of computing the national income figure itself.'[456] Minutes of the discussions show the Committee felt the bulk of responsibility lay with the countries themselves to assemble and analyse their own data – this in turn would necessitate some form of training program for administrators.[457]

However, the Colonial Office secretariat drafters also exercised agency in this process and extensively discussed national income measurement and its purpose prior to issuing the despatch.[458] The despatch represented therefore a synthesis of views from the national accounting community and Colonial Office institutional needs. This can be seen in the discussions surrounding the preparation of accounts within the Colonial Office itself. Writing on 25th February 1949 Phyllis Deane argued against a one-size-fits-all national income table:

> 'I think it is undesirable to tie governments down to a more rigid framework than necessary. It may be desirable one day to attempt some standardisation of colonial national income

[453] Phyllis Deane, prior to her engagement at the Cambridge DAE and after her work on Colonial Social Accounting at the NIESR had been working in the Colonial Office.
[454] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies Circular Despatch draft – file reference document 2 p.3.
[455] *ibid.*
[456] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies Minutes dated 16 December 1948.
[457] *ibid.*
[458] These concerns are documented in the case file history notes frontmatter which accompany the National Income file.

accounts, but at this stage I think governments should be encouraged to adapt to local needs.'[459]

Mr Emmanuel, the reviewer of Phyllis's drafts, encouraged less of an emphasis upon the importance of national income studies. Instead, he stressed the draft should contain more on the expansion of government machinery to encourage the provision of 'adequate economic and statistical data on which national income studies could be based.'[460] Emmanuel argued that colonial administrators needed to understand 'the desirability of computing and utilising national income calculations in connection with the formulation of economic policies as is the practice in other countries.'[461] Further that the despatch should 'stress the fact that a prerequisite of the official computations is the strengthening of the statistical and economic machinery' – this could be achieved internally or through the use of external researchers.[462] This was emphasised at a later date by Mr Searle, who emphasised the need, 'to watch carefully how we use our statistical resource – not to think of national income calculations in isolation from the general development of colonial statistics.'[463]

The drive to raise living standards meant many of these intellectual and practical hurdles were not viewed as insurmountable. Instead, they were incorporated into Appendix B to the despatch which could acknowledge the limits to the national income accounts approach. Appendix B would come to reflect the discussions within the NIAP,[464] but also raised by senior economists across government. H.L.H. Hall in the Cabinet Office voiced concerns about the volume of non-monetary activity which would not be measured.[465] Campion, the Head of the CSO aired concerns about national income figures in the absence of accurate production and population estimates, further he highlighted the risk that people would focus on the headline national income figure instead of sectoral revenue and expenditure figures.[466]

Many of the concerns highlighted in Appendix B of the Despatch, mirror contemporary concerns about the abuse of GDP and reflecting an earnest debate to ensure the measures were being used

[459] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies Front of file recorded notes: entry by Mr Emmanuel dated 26.4.49.
[460] *ibid.,* entry by Phyllis Deane dated 25.2.49.
[461] *ibid.,* entry by Phyllis Deane dated 25.2.49.
[462] *ibid.,* entry by Phyllis Deane dated 25.2.49.
[463] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies Front of file recorded notes: entry by Mr Searle dated 15.06.49.
[464] Some of the issues highlighted in advance of the despatch were the informal sector, heterogeneity to the point of rendering "per capita" income meaningless and underlying statistical error and timeliness. TNA CO852/1356/3 CERC Advisory Panel on National Income Studies file Circular Despatch dated 25 July 1949 Appendix B "Some aspects of National Income Calculations on Colonial Conditions"
[465] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies file Extract from letter from L R L Hall in the Cabinet Office 7 January 1949.
[466] *ibid.,* Letter to Emanuel from H. Campion dated 27 May 1949.

appropriately and also a concern about the appropriateness of the measure in different settings. With these considerations taken into account a final document could be issued that reflected the demands of the Colonial Office, other government departments and the British National Income community.

7.2.4. The NIAP's advocacy for National Accounts as an interventionist tool

The concept of national income advanced by the NIAP despatch reflected the broader, more interventionist approaches to economic management seen in Britain at a similar time. The national income paradigm was one of several new approaches[467] which could be experimented with to aid development planning. The power of the national accounts paradigm emerged to a large extend due to a widespread consensus on their ability to guide national finances during World War II (Prest and Stewart, 1953; Van Arkadie and Frank, 1969).

Writing in 1953, Prest and Stewart argued that in the UK particularly, a new public finance consensus had emerged which argued that effective government required future taxation spend to be based upon estimates of feasible future taxable capacity within a Keynesian framework (Prest and Stewart, 1953).[468] A new state financing approach which linked national income estimates to planned budgeting had been created (Stone, 1946). This argument that the budget should be determined technocratically gained support from Sir Stafford Cripps to Mr Gaitskill (Prest and Stewart, 1953, p. 3). As Prest and Stewart note 'a major use of National Income calculations in the "West" is to serve as a basis for projections of National Income into the future and that these projections themselves are the background to budgetary policy' (Prest and Stewart, 1953, p. 3).

Similar sentiments can be seen in the early drafts of the National Income Advisory Panel (NIAP) despatch on national income. Suggestive in one draft is a passage which appears to define national accounts as a tool to overcome allocation problems:

> 'the economic problem of the world today is primarily one of under production. For each country, and even more so for each colony, the starting point in economic policy is that there are not enough of goods and services to go round. If those in need are to have a significantly larger share of the national cake, even a large enough share to permit a

[467] Manpower planning discussed in Chapter 5 was one such alternative paradigm which gained increasing prominence as development focused upon the skills that people would attain through newly instituted national education systems (Voll, 1975).

[468] Morgan (2011, p. 12) highlights the contributions of 'Godfrey Lardner of the Nigerian Secretariat in Nigeria,' and describes the National Income estimations as having three authors. Whilst not wanting to underplay Lardner's contributions I have used the document's published authors - Prest and Stewart - names for ease of reference. This is however potentially a contentious point as it may under attribute the contributions of a third author.

reasonable minimum standard of living, then it must be not only a more evenly distributed cake but also a larger cake. Economic policy, therefore is largely concerned with increasing the absolute size of the national income.'[469]

Though this language didn't make it into the final despatch, the authors clearly articulated the views of the committee that economic policy, facilitated through national income figures would therefore help the flow of goods and services to increase the size of the national pie. This was a marked change from the bygone laissez-faire government doctrine. Instead, the NIAP acknowledged that war had changed the functions of government – no longer could a government's role be restricted to only creating a suitable business environment, instead government had to actively channel funding to more productive industries.[470] To arrive at this "better" allocation of resources, government intervention would be needed.[471] The Committee felt for this new economic approach to be put into practice required national accounting estimation. This approach preceded and contrasted with formal instructions by the UN to measure national accounts.

7.2.5. The 1949 despatch predated formal UN instructions to measure national income

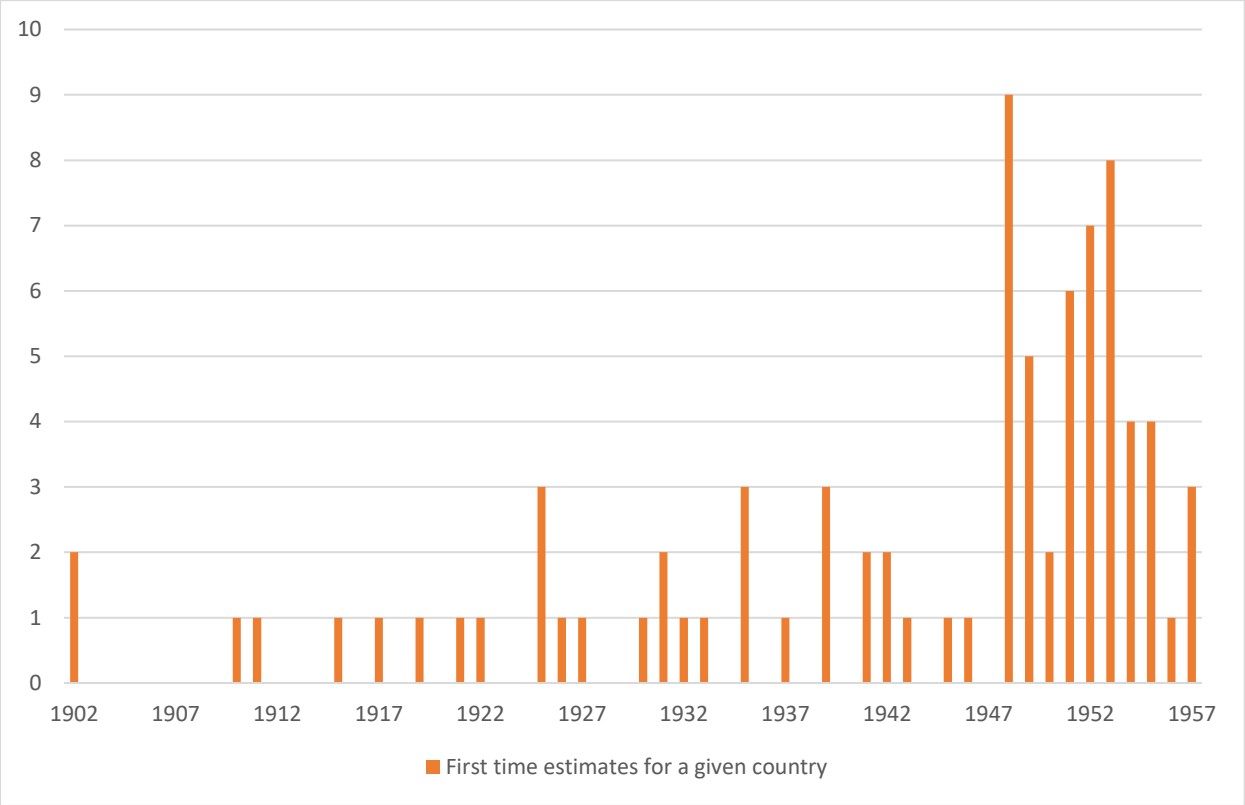
Alongside efforts by the Colonial Office to see national income measurement in the colonies, international bodies such as the OEEC and the UN were supporting national income studies (Schmelzer, 2016; Stone, 1981). As this section argues, formal instruction by the UN to countries requesting the measurement of national income in under-developed countries fell after attempts by the Colonial Office to spread National Accounting methodology.

The UN had been an active player in the development of standardised and harmonised national income measurement.[472] Richard Stone, the then Director of the DAE, had developed a framework in the 1947 Appendix a UN report on national accounts which by 1950 had resulted in the UN Simplified System of National Accounts. These efforts may in part explain the marked shift in demand for national income estimates in the post-war environment. As shown in the diagram below, more countries than ever before had started to calculate their first national income estimates after 1947.[473] By 1957 approximately 50 countries were producing regular national income estimates

[469] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies Circular Despatch draft – file reference document 2 p.3.
[470] *ibid.,* p.3.
[471] *ibid.,* p.3.
[472] For of the UN's patronage of national income as a measure for assessing performance and membership fees see Philipsen (2015, pp. 130–139).
[473] It is important to note that though there exists historical time series for example for Korea which cover historic periods this does not mean that the concept of "national income" was being measured at that time only that enough data was available in later periods for people to retrospectively generate numbers. I am grateful to Albert Sanghoon-Park for drawing my attention to the historical Korean income measurements of Kim and Kim (2015) and Kim (2012).

(Oshima, 1957). Yet adoption of the frameworks was not universal and as Van Arkadie and Frank (1969) shows, there was considerable variation in approaches adopted even after the early publications of the System of National Accounts.[474]

Figure 7.2. Countries calculating National Income estimates for the first time in a given year



Source: data taken from Studenski (1958, pp. 156–157).

By the 1950s the United Nations moved to instruct countries to measure national income. A great impetus for universal coverage of national income estimates came from the 1950s UN Resolution 403 'on Volume and distribution of national income in under-developed countries.' This articulated national income estimates as a way of better identifying improvements to economic performance which would reduce under-development. This in turn built upon the work of the Economic and Social Committee of the UN which had in Resolution 299 called for the development of social accounts. Resolution 403 observed:

[474] As Jerven (2013) highlights there was considerable variation amongst countries adoption of national income measures.

'The General Assembly,

Considering that, in order to mobilize better their resources with a view to accelerating their economic development, it is desirable that the under-developed countries should have knowledge of their national income and its distribution…

1. Recommends that the under-developed countries should devote special attention to studies directed towards the calculation of their national income and their distribution.'[475]

What this resolution shows is that by the 1950s an international consensus on national accounts being used as a way of observing countries through their national income, had been created and one which emphasised this for the purposes of addressing under-development. In particular the U.N. framing stressed misallocation of resources as contributing to this under-development and national accounts became an approach to counter this. The resolution also observed that studies should be focused on income to both understand distribution across groups and to understand how countries are able to finance their international financial commitments such as loans. This emphasis on income and its distribution may have been in part driven by some efforts to reduce the poverty which some in the economics profession felt risked pushing countries towards communism.[476] In addition to instructing the submission of national income figures to the UN Statistical Office a support package of measures was implemented such as assistance with the provision of statistical services, training seminars at a regional level and fellowship programmes.

However, the timing of the 1950 General Assembly resolution matters. It took until 5th February 1951 for the Director of the UN Statistical Office to draw the Colonial Office's attention to UN Assembly Resolutions 403 and 299. By the time the UN Statistical Office requested national income figures for the colonies, the Colonial Office had already instructed colonial administrations to start to measure national accounts through its Colonial Office Despatch on 25th July 1949. The Colonial Office, influenced by the impetus for "development" discussed above, had requested colonial governments to measure national accounts.

In the Colonial Office a greater emphasis was placed on the accounting aspect of the new measure. Instead of just income, both the expenditure side and the income side were accentuated. In further contrast to the UN resolutions a broader notion of the purpose of the measure was articulated:

[475] TNA CO852/1077/2 United Nations: National Income, letter to W.R. Searle Colonial Office Statistics Department from W.R. Leonard Director of the UN Statistical Office dated 5th February 1951.
[476] This concern and appeal to modernism was later captured in the economic work of Rostow (1959) *The Stages of Economic Growth* (later written up into a book subtitled "A Non-Communist Manifesto"). See also Ward (2004, chap. 1)for the anti-communist nature of national accounts.

> 'Official calculations of this kind, by bringing together into one comprehensive picture the main elements of the national economy, are of assistance in putting in proper perspective policies in individual economic fields, e.g. in relation to the planning of the volume of consumption and investment, the assessment of taxable capacity as well as in the measurement of the decree of advance in the economic wellbeing of the community.'[477]

This conceptualisation of national accounts reflected the consensus on national accounting from the British national accounts community in Britain (such as Austin Robinson,[478] Richard Stone, Phyllis Deane, Professor Benham and Professor Frankel) who furthered national accounting research agenda through a range of institutions such as: the National Institute of Economic and Social Research (Prest and Stewart, 1953, p. iii), both the National Income Advisory Panel and the Colonial Economic Research Committee in the Colonial Office,[479] and the Department of Applied Economics in Cambridge.

7.2.6. The Colonial Governors' mixed responses to the 1949 despatch

The Colonial Office Circular Despatch no. 97401/71/49 issued on 25th July 1949 had encouraged colonial governments to adopt the British notion of using national accounts to administer national finance. This met with mixed responses, with some governors questioning the relevance of national accounts. Whilst it may not have been a fully effective mechanism for convincing the new adoption of national accounts, it articulated the combined attitudes towards national accounting of national accountants and the British state.

The final version noted that it had become regular practice in the UK and the value of the figures came from their application to the planning of economic policy.[480] In an attempt at convincing the Governors' to support this move it argued:

> 'though national income calculations are obviously not the only means, they are, if properly used, an important means of checking and verifying the practicability and significance of broad plans of economic development as are at the moment in operation or preparation in the majority of Colonial territories.'[481]

---

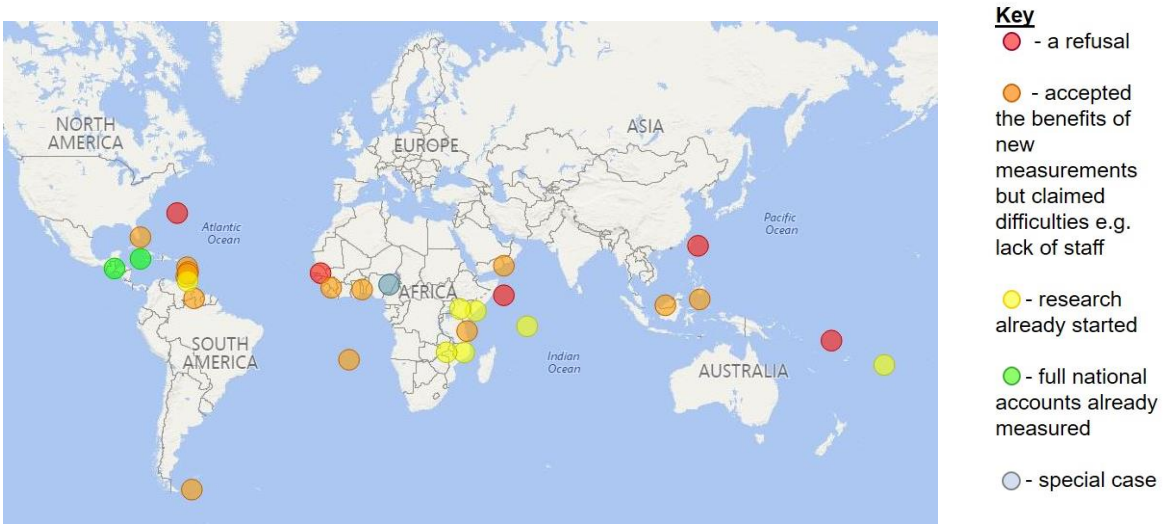
[477] TNA CO852/1356/3 CERC Advisory Panel on National Income Studies, Circular Despatch dated 25 July 1949.
[478] Robinson a figure mentioned briefly earlier had developed his empirical credentials by working on the African Survey of Lord Hailey by conducting a desk-based exercise on figures of capital investment (Cairncross, 2016, p. 73).
[479] TNA CO852/1356/3 CERC Advisory Panel on Colonial National Income Studies Minutes dated 16 December 1948.
[480] TNA CO852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949 - Draft Circular 97401/71/49 "National Income and Expenditure Studies" 25 July 1949.
[481] *ibid.*

High aspirations were checked with pragmatic considerations in the communique. Colonial administrators were to be told that in some cases statistical infrastructure would have to be improved in order to use this technique. The long-term objective was clear – colonies should have annually published national income records within their economic management repertoire. Accompanying the request was a bibliography rich in the works of Richard Stone[482] alongside the works of Deane, Benham, and a few official publications from Rhodesia and Jamaica. It remained, however, a heavily British-influenced approach to income estimation.

In advancing the case for this new British-style of national financial management, the despatch included Appendix B which outlined some of the difficulties that countries may face when using national income accounts. These were not seen as barriers to implementation but phrased instead as warnings surrounding the transformation of this measurement approach. Morgan (2011, p. 49) has identified limitations with national accounts measurement by researchers in the field. However, in the drafting discussions we can clearly see that theoretical questions over the applicability of the tools occurred as they were developed. This drive to measure continued despite the theoretical concerns because the Colonial Office perceived there was too great a need for these measurements. Such measurements could be used to enable 'modern' public finance. Yet the uptake of these measures was far from uniform as shown in Figures 7.3. to 7.6. below.

[482] Stone's writings dominated the Studies of General interest section including the Treasury White papers Cmd. 6261, 6623 and 7649, Meade and Stone (1941, 1944), The report by the UN Sub-Committee on National Income Statistics, and the "National Income Statistics of Various Countries 1938-1947" produced by the Statistical Office of the United Nations and influenced by the world of UN Sub-Committee chaired by Stone.

Figure 7.3. Colonial Government Responses to National Income Adoption Request – World Overview



Data Source: National Archives CO852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949. Diagram software: Microsoft Power BI

Note: due to software limitations responses have been mapped using a contemporary political map not the 1949/1950 political map. This means for example recording only one response for Tanzania when this would have been separately Tanzania and Zanzibar (both of which fortunately gave similar answers).

Figure 7.4. African Regional breakdown

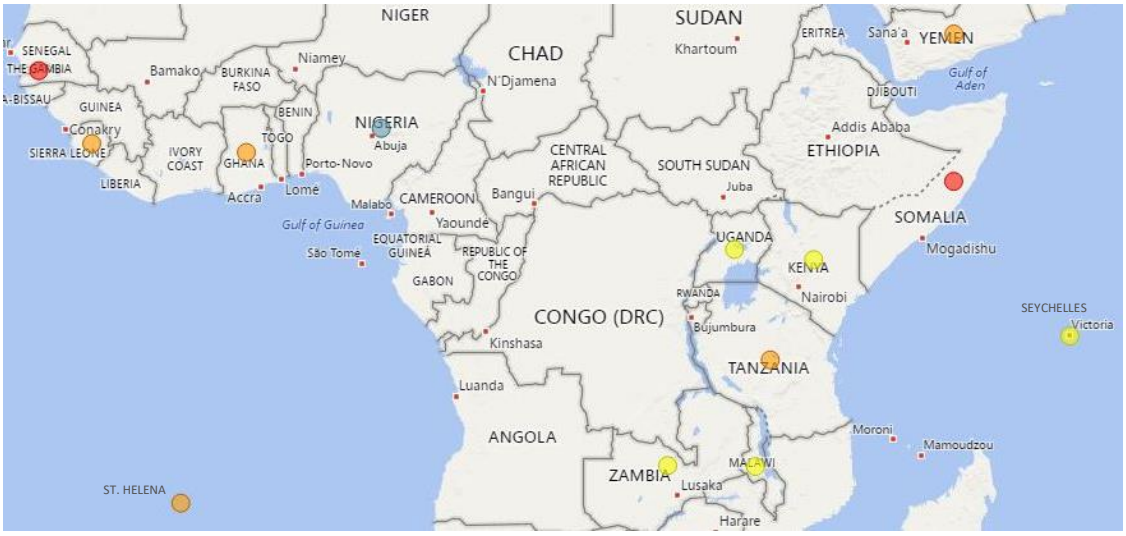


Figure 7.5. The Caribbean and Americas regional breakdown

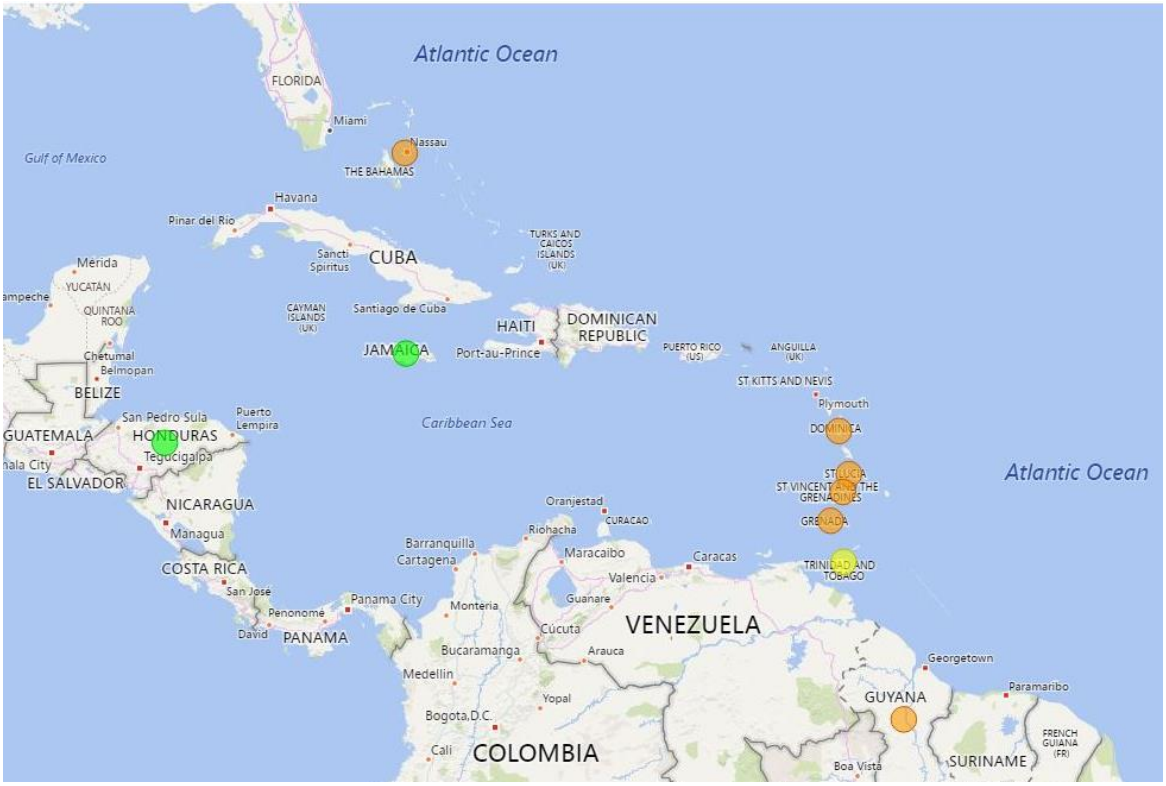
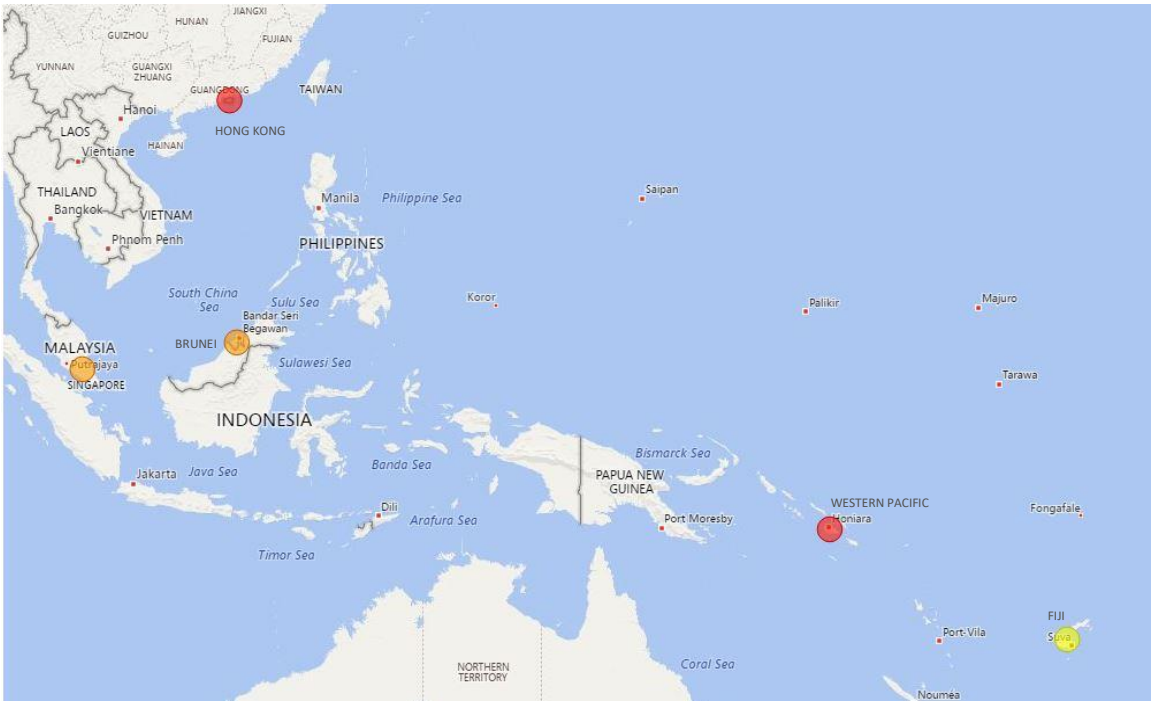


Figure 7.6. East Asian and Pacific Ocean regional breakdown



Given the increasing international drive towards measurement of national income shown in Figure 7.2, and further, the number of green and yellow responses, the number of refusals to adhere to the despatch flies against increasing international demand. The two countries which had accounts were atypical, one had figures created previously by a visiting researcher whilst the other had an activist auditor general who created a set of national accounts for their own auditing purposes.[483]

Responses shown in red would typically observe that a country was too poor, or too small for this to be relevant. Seemingly poverty reduction through growth as articulated in the Colonial Office despatch was not convincing for the colonial administrators to adopt national accounts. Curiously and conversely Hong Kong refused as it said it would be too difficult to observe the economic behaviour there. At the heart of much of the concern was the level of additional investment which would be required to improve human resources for a national income figure. Also, the scale of the accounts may have been too high level and too intricate for the situation facing smaller island-based economies yet this was not an obstacle to Jamaica which had already prepared a set of accounts.

But the Honduran response in itself poses deeper questions. In 1948 the Principal Auditor had estimated a full set of Honduran national accounts for 1946 using the methodology of Deane (1948).[484] Deane's 1948 publication was in fact a development from Deane's 1946 publication (Deane, 1946), a paper which was held to have made 'a valuable additional contribution in developing income estimates of people under diverse conditions' at an NBER conference in 1944 focusing on war problems and the 'problems of post-war readjustments' (Gilbert et al., 1946, p. IX).

Despite the controversy surrounding the margins of estimation in the works of Deane, notably in Denison (1949),[485] the common consensus surrounding the benefits of national income for policy making made Deane (1948) a natural choice. Robinson (1948, p. VII) for example highlighted the tripartite relationship between the income, expenditure and output approach was a particular benefit to the Deane approach.[486] Robinson argued it helped to provide some check on researchers

[483] In the East Coast of Africa several countries had pooled together statistical resources for the purpose of measurement – by the 1950s American hegemonic expansion led to Yale University conducting national accounts research here under the leadership of Simon Kuznets.
[484] TNA CO852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949 - Attachment to letter from Governor of British Honduras dated 17 September 1949 "National Income Survey of British Honduras 1946" prepared by Carey Jones Principal Auditor p.3.
[485] A great barrier to the quality of the work was acknowledged by Robinson (1948) was the limited data due to the outbreak of war. For this reason, Deane went on to conduct her own survey at a later date which became her famous text on colonial accounting Deane (1953).
[486] I am grateful to Mary Morgan of the LSE drawing attention of the significance of this change during questions after a presentation I made at the LSE. The methodology was part of the initial White Paper research as shown in Stone and Meade (1941, p. 231).

given that poor data meant 'one is constantly forced to guess, to improvise to twist information collected for slightly different purposes to one's task' (Robinson, 1948, p. VII).

Yet the actions of an auditor to estimate such figures, despite the difficulties of accessing and processing the relevant data, marks a significant departure from their normal role.[487] In the absence of a use of corroborating materials in Honduras it is difficult to infer intentionality other than to suggest that it was being used to inform accountability approaches. If this is the case it suggests a completely different reason to measure national income accounts.

Despite the many flaws in measurement known at the time (as articulated in (Oshima, 1957)) for many countries the national accounts became a major feature in national planning. They shaped the direction of newly independent countries and later when in the 1950s the UN would re-question regular national accounts figures, countries could build upon the scientific guidance previously circulated by the Colonial Office even if they had refused measurement originally. And for larger resource-valuable colonies, efforts were already underway to have them planning along British lines – regardless of whether it was suited to their particular developmental need.

Overall, this section has shown how the transformation in the purpose of national accounting into a tool of forward planning in Britain had implications beyond its shores. Though conventional narratives focus upon the contributions of Richard Stone at the UN, he also played a role in collaboration with the Colonial Office. Through the work of Colonial Office staff and academics, a Colonial Office articulation of what national income accounts was developed in the 1949 Despatch. This despatch helped to promulgate national income accounting by advocating national income to colonial administrators and emphasising the role that the accounts could play particularly for macroeconomic efficiency planning purposes. This reflected a wider transformation in the colonial project which attempted to increase involvement in administration from London and coordinate the Empire. This chapter now considers a further transformation in the national accounts process, stimulated by the Colonial Office despatch; the measurement of the national and regional accounts of Nigeria.

7.3. The Nigerian National Accounts measured by the Cambridge Department of Applied Economics

Despite institution building, and statistical capacity, being one of the justifications of the despatch, when colonial administrators requested the assistance of expert teams, only one country received a

[487] It is the auditor's task to review the figures of an accountant not to prepare them.

technical team. The CERC chose to support Nigeria because the Nigerian government requested national income accounts to be measured as a matter of urgency. For this reason, the chapter sampled Nigeria separately from the other country responses to better understand why and how this institutional backdrop shaped the national income enquiry that followed.

Section 7.3. starts by outlining the constitutional imbalances across the three regions of Nigeria and why the country was facing a crisis. After outlining the Governor's request that national income figures be measured 'as a matter of urgency,' the chapter considers the deliberations of the NIAP, which seized the urgency of the situation and opted for a team from Cambridge to be sent out to measure national accounts. These accounts were intended to both inform development plans and to inform nation-building efforts by identifying the taxable capacity of the three regions brought together to form Nigeria. Whilst there were some difficulties in the measurement of national income in a different institutional environment, granular details were estimated about the economy at a national and subnational level. The final figures themselves were an acknowledged departure from the Keynesian national accounting framework and instead functioned as a resource audit. The numbers themselves are then shown to have had some limited legacies as a data point in informing later income estimates and development policy. In contrast with Morgan (2011) the Nigerian National Accounts are shown to be intended as part of a state building exercise, one that differed from the original intention of the 1949 despatch and that differed from Keynesian fiscal management.

7.3.1. Why Nigerian national accounts were called for "as a matter of urgency"

Many of the replies to the Colonial Office National Income Despatch stressed under-resourced offices in terms of finance and staff. Some, such as Aden, Mauritius, the Gold Coast and Sierra Leone, expressed an interest in external researchers being sent for which funds would be released.[488] But it was the nature of Nigeria's response, urgently requesting an external team audit their economic resources, which drew the attention of the Colonial Office. This pressing need for national income estimates overcame the institutional reluctance to send national income research teams out to Colonial countries.

Yet there is a deeper question about why measure in the first place? As shown with British Honduras, measures were possible in countries. Further, the limitations of national accounting as a lens had been shown in Deane (1948, 1946)[489] which raised significant questions over the relevance

[488] TNA CO852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949

[489] It should be noted that as Austin Robinson observed on Deane's first major project – distance and war had been a severe limiting factor to the quality of her data.

of this measure as an intellectual exercise in its current form. In spite of this both administrative and academic communities wanted to measure. Regardless of these limitations, action was taken – the numbers *needed* to be measured. Desk-based guesstimates like Phyllis Deane's calculations[490] could no longer suffice.

The Colonial perspective on Nigeria

Nigeria at the time of the Colonial Government's request for measurement was at a crossroads. Decolonialising pressures and changes in Governors had led to instability. The outgoing governor, Governor Richards had sought to placate independence though a new constitutional settlement updating the one devised in 1922 to help reduce the tensions which underlay the "Nigeria" thrust about the inhabitants of the West Coast. Constitutional reform was seen as 'part of a much broader course of political, economic and educational change for the colony being promoted in the years after 1945' (Lynn, 2001a, p. L). An ambitious ten-year plan was proposed.

Piecemeal reforms were not ambitious enough and were slow moving. Anger at the slow moving reforms and lack of engagement with educated Nigerians eventually came to a head through a five week long strike (Lynn, 2001a, p. LI) which then shaped discussions on constitutional reform afterwards. The revised constitution came into force in 1947 and as Lynn (2001a, p. LII) observes the constitution was a failure and greatly shaped the incoming agenda for the new reformist Governor John Macpherson.

The problem facing Macpherson was severe: riots in Accra (Lynn, 2001a, p. LIII), concerns that there would be a spillover effect from the independence movement in the neighbouring Gold Coast (Lynn, 2001, p. LIII), anxiety of Soviet interventions (Lynn, 2001, p. LIII) and increasing fears of domestic militant nationalism (Lynn, 2001a, p. LIV). The solution Lynn (2001a, pp. LV–LVII) notes was to instigate further constitutional reforms; in particular as a commission established by Macpherson found; there was a need for 'increased regional autonomy, increased legislative powers to regional houses, a degree of ministerial responsibility and a commission to examine financial allocations between the centre and the regions' (Lynn, 2001a, p. LVII). In a marked change from his predecessor these conclusions were being arrived at in consultation with Nigerians (Falola and Heaton, 2008, p. 152). In short, perceptions among administrative classes in Lagos, London and educated Nigerians

[490] 'I was once asked to estimate the national income of Nigeria at my desk in London. Nobody had ever tried that before and so I sat down with sandwiches and [got] a colleague to help me, and we worked our way through the reference material that we had. We looked at the ropey population statistics and used them to multiply some very ropey information about income so we came up with a number because it has to be sent in a questionnaire to the United Nations which was basing contributions on the National Income.' Phyllis Deane interview with Nigely Harte (Harte, 2002).

were in accord; constitutional reforms to the regions was needed in order for Nigerianisation to succeed.

The challenge to this project was a deeply divided "nation" which had been constructed by foreign bodies not nation building by "Nigerians." As Brendon (2008, p. 525) observes early Nigeria "was little more than a geographic description" which by the early 1950s with its 60 million inhabitants was 'a third of the Empire's remaining subjects.' With a mix of languages, heritages, religions it was one of 'the most heterogenous countries in Africa' (Brendon, 2008, p. 526). Brendan argues that despite some assertions to the contrary that British Rule helped to unify the country, in fact the structure imposed artificial boundaries and 'sustaining it as a whole by dividing the sum of its parts' (Brendon, 2008, p. 526). In the absence of a well-defined nationalism 'millions lived and died without knowing that they were Nigerian, let alone subjects of the British Empire' (Brendon, 2008, p. 527).

However Nigeria was undergoing radical economic and social change. The 1900s-1930s had been characterised by Imperial preference trade relations and licensing arrangements which led to Nigerians working as labour for the profit of European firms (Ademoyega, 1962, p. 1962; Falola and Heaton, 2008, p. 136). But as Ademoyega (1962) argues the 1940s saw acute unemployment and the drive for industrialisation to overcome this so that by the fifties, with the emergence of major bodies such as the Nigerian National Coal Corporation, and with corporations for electricity, railways, ports and broadcasting established, the 1950s had an air of advancement, modernity and progress.

Resources did not however flow evenly. Ethno-geographical separation remained a dividing factor driving this constitutional crisis period. Quoting a commentator from the time Bourne (2015, p. 78) notes 'The Nigeria of the 1950s has been made unviable by centrifugal regional tendencies, and being held together by British colonial administrative politics.' Significant powers were going to regional administrative units which in turn were splitting along ethnic lines. Moreover as Cooper (2002, p. 69) observes the British had only enabled leadership at the regional level which quickly saw ethnic parties dominate in the Eastern, Northern and Western regions, regional-ethnic-groups which would then have to compete with each other at the Federal level. Yet many powers remained at the federal level in the 1950s and were mediated by colonial administrators who used their role as "technical experts" to argue for scientific solutions to all administrative problems (Cooper, 2002, pp. 88–89, 171).

No constitution could overcome the deep-seated tensions in the creation of a federal Nigeria – disparities in access to resources by different ethnic groups for example led to clashes between regions on constitutional matters (Bourne, 2015, p. 78), and by 1954 a new constitution was needed

to supplant Macpherson's (Meredith, 2011, p. 77). It is this backdrop of fault lines, tensions and concerns over conflict which provide the backdrop to the response from Nigeria to the National Income despatch.

Nigeria at a Crossroads: The response of Nigerian officials

The national accounts Colonial Office despatch therefore arrived during a moment of considerable change for the country struggling to form a Nigerian project with the legacy of constitutional divisions. Given the different development trajectories in three relatively clearly defined territories, and the need for a new constitutional settlement, the response of the Nigerian government to the Colonial Office despatch of 1949 is perhaps unsurprising.

On 1 November 1949 Governor Macpherson responded highlighting 'this Government is very conscious of the need for reliable statistical information to enable it to frame and review its fiscal and economic policies.' Moreover, referring to correspondence from two months earlier, the Governor stated 'I had no hesitation in recommending that, in matters of economic research affecting Nigeria, studies of the national income should take the first place and should be regarded as a matter of urgency.'[491]

The governor highlighted that a new statistical department, and a hoped new Institute of Social and Economic Research at Ibadan University, would be able to make substantial contributions but the task was too great for a lone researcher given the large size of the territory. The Governor therefore wanted assistance from a non-governmental research body and sought the advice of the Advisory Panel on National Income Studies at the Colonial Office to regarding a project lasting around 18 months, with a view to financing half of the project.[492] An external consultant would in turn have an air of greater legitimacy.

As internal documents from the Colonial Office show by May 1949 the question of the allocation of revenue between the regions had become 'one of the most contentious matters connected with the present Constitution.'[493] The Nigerian government resorted to calling for the Colonial Office to send

[491] TNA CO852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949 - Letter from Governor Macpherson to the Secretary of State for the Colonies dated 1 November 1949.

[492] The previous letter by the Governor had already raised it up the priority list of the Colonial Economic Research Committee which though it acknowledged the long term responsibility of the Nigerian Statistics Department, also noted the Nigerian Government's view that "there are not wanting signs that Nigeria is endeavouring to lift a load that may be beyond her capacity to carry" National Archives CO 898/2 Colonial Economic Research Committee Papers and Minutes 1949 – minutes dated 26th October 1949}.

[493] Savingram from H M Foot to Mr Creech Jones 30 May 1949 (Lynn, 2001b, p. 203).

in an expert on Federal Finance.[494] The constitution therefore needed to resolve the issue of how to allocate the Nigerian tax pie. Efforts to do this previously had stumbled:

> 'It was immediately found that no reliable statistical information was available upon which to determine the proportions in which the Regions at that time contributed to Nigerian revenues not declared regional.'[495]

This observation by the committee can be contested as Adebayo (2016, p. 46–69,) highlights that enforcement of ILO regulations required observation of wages across the country from 1930s. Adebayo's study illustrates that alternative measurements of income at a national level were already therefore available for this task even if they were not the new Keynesian approach. Though this wage data would go on to help inform the Prest-Stewart enquiry, that the Keynesian approach was needed for the budget, helps to illustrate the changed measurement demands which had occurred during and since the war.

7.3.2. National Income Advisory Panel (NIAP) discussions over improving statistical capacity or selection of British research institutes

To address these points the National Income Advisory Panel[496] was reassembled for December 1949[497] in order to discuss the shortlist of projects prepared by the Colonial Office which highlighted Nigeria and Mauritius as key projects.[498] For Mauritius and other colonies it was argued resource materials such as guides could be provided. Yet for Nigeria the discussion minutes note: '(i) The urgency of this enquiry was intimately connected with the division of the territory into three regions and the constitutional developments under consideration.'[499] This also reflected the view of the Colonial Economic Research Committee which, despite a large and pressing research agenda,[500] recognised the priority the Nigerian Administrators placed on these new estimates. The CERC had largely arrived at this view after receiving a note from the Phyllis Deane in November 1949 which explained National Income was placed 'first on the [Nigerian government's]...list of priorities';

---

[494] *ibid.*
[495] *ibid.*
[496] Comprised of Sir Arnold Plant (chair), Professor A J Brown, Professor S H Frankel, Richard Stone, Mr E. Jackson, Miss Phyllis Deane (Secretary) with the following present from the Colonial Office – Mr Gordon Barnes, Mr Emanuel, Mr Searle. – National Archives CO852/1356/3 CERC Advisory Panel on National Income Studies file Minutes dated 16 December 1948.
[497] The first meeting was called in order to draft the despatch which was circulated to the colonies. The second meeting relates to the response to Nigeria's response.
[498] See TNA: CO852/1050/2 Colonial Economic Research Committee Advisory Panel on National Income Studies. Minutes & Agenda – Minutes of Second meeting 8 December 1949.
[499] TNA: CO852/1050/2 Colonial Economic Research Committee Advisory Panel on National Income Studies. Minutes & Agenda. Minutes of Second meeting 8 December 1949.
[500] *ibid.*

quoting the Governor General Deane noted 'there are not wanting signs that Nigeria is endeavouring to lift a load which may be beyond her capacity to carry.'[501]

A project of this scale posed difficulties; fully qualified national income investigators were believed to not want to undertake it in a full-time capacity. There were anticipated methodological problems also calling for a highly qualified individual to take charge and they would probably need to visit Nigeria after a desk-based exercise in Britain. The committee were keen to have a Nigerian junior on the project to ensure that institutional memory could be retained within the Nigerian Statistical Service. However, the fastest solution was to put the research project out to tender. The applied economics institutes selected, in London, Manchester, Oxford and Cambridge, were all legacies from the drive for international empiricism highlighted in Chapter 4. Further options considered were using the Fulbright programme under the auspices of the Colonial Office to import an American Professor. Finally, the committee held that a Nigerian would also be an option but they would need to be sufficiently qualified and as eminent as possible. Though expediency won the day that a Nigerian researcher was considered illustrates the British intention to increase statistical capacity to impose British style governance structures.

Of the four British institutions contacted, three replied citing resourcing issues for a project of this nature and the Department of Applied Economics replied in the affirmative and was chosen. Whilst this made sense, as the prominent national income accounting specialist Richard Stone was the Director, the decision-making process was far from an "arms-length transaction." The national accounts committee was small, Manchester was too far from London to be plausible despite Arthur Lewis, a professor at the University, sitting on CERC. The LSE saw James Meade, a former colleague of Richard Stone advising the Colonial Office, saying Stone was better suited. The Oxford Institute of Statistics headed by Champernowne sought the advice of Professor Frankel, an employee of Oxford but also a colleague of Stone's on NIAP. And, finally, the Department of Applied Economics in Cambridge was headed by Richard Stone – a member of the panel which recommended this project to be put out to tender. But the DAE was a sensible choice precisely because it would offer access to Richard Stone – an instrumental figure in the development of the National Accounts in the UK and at the UN. Stone had also overseen the standard of Phyllis Deane's work during wartime on the measurement of colonial national income. Additionally, a DAE-based project would provide access to Austin Robinson who, as well as being a CERC committee member, had experience from the Hailey African survey.

[501] TNA CO898/2 Colonial Economic Research Committee Papers and Minutes 1949 – Attachment to briefing note prepared by Phyllis Deane CERC "Draft Shortlist of Economic Research Subjects" 16 November 1949.

For Cambridge, the project offered a chance to investigate the many issues with colonial national accounts that had been outlined in Appendix B of the 1949 Colonial Office Despatch. As Austin Robinson said in the foreword to the final published DAE piece: though Deane and Benham had helped overcome pitfalls in measurement in underdeveloped countries 'there remained for solution all sorts of difficulties as to what should or should not be included, as to the prices at which goods and services not traded should be valued, and so on' (Robinson in Prest and Stewart, 1953, p. iii). The national income research community wanted to assess the application of the national accounting system in a new environment.

By October 1950 an agreement had been reached between the Colonial Office on the scope, resourcing, timescale and particulars of the project. The project was to last 2 years with a senior officer; Alan Prest,[502] a researcher on a full-time basis; Ian Stewart, and an African Research assistant to be engaged in Nigeria. The whole project would be under the supervision of a DAE committee in Cambridge overseen by Stone, Deane, Austin Robinson and another researcher Mr P.T. Baur. The publication would be by either the Colonial Office or the Government of Nigeria.

The terms of agreement were explicit on the purpose of the figures:[503]

> 'such an enquiry, by assembling the facts relating to the size, sources and distribution of national income, will be of considerable assistance to the local Government in the formation of an economic and developmental policy. In particular it will enable the Government to assess more accurately the ability of the country to bear the financial burdens involved in a policy of active and social development and to discover the means of supplementing available resources, as well as to determine the capacity of the different regions to contribute to the development of the country. Of particular importance in the light of constitutional developments is a study and distribution of national income between the three main regions of Nigeria.'

In one sense the agreement suggests a role for national accounts in line with the overall objective of the colonial office despatch – to measure statistics which can inform allocations decisions to aid

[502] Alan Prest - a researcher at the DAE and later Fellow of Christ's College Cambridge. During his time in Cambridge, according to Brian Reddaway, Prest worked closely with Stone on consumer expenditure in Great Britain focusing upon historical data series going back to 1870 and worked with the London Cambridge Economic Service. During his Cambridge work he secured a Rockefeller Foundation scholarship in social sciences from 1948-1949. After completing his joint survey of Nigerian national income, Prest furthered empirical colonial research by conducting a Fiscal Survey of the British Caribbean. In 1958 Prest received a 6-month Rockefeller travel grant to visit to America to discuss his research on Public Finance. After this trip Prest published his "Public Finance in theory and practice" (1960).

[503] TNA CO852/1076/9 National Income Nigeria - Document reference number 97401/71/5/50 "Enquiry into the National Income of Nigeria."

development. Yet in another sense the emphasis on the need to understand regional financial capacity and the inter-regional distribution of income makes clear that these figures were intended to inform the nation-building and colonialising efforts of Nigeria's administrators.

7.3.3. Difficulties applying the national accounts framework – contrasting the interim and final report

Estimating the accounts proved to be difficult, as Morgan (2011) shows the framework did not fully apply in a fieldwork setting. This is perhaps not surprising, as for example, recent analysis of 1950s Ghanaian household surveys shows the accuracy of empirical research is impacted by local socio-political factors (Serra, 2014). The subjective views of researchers on the ground considerably impact the accuracy of even simple figures, but for National Accounts which aggregate these figures to provide an estimate of overall activity the matter can be even harder.

This section illustrates the many pragmatic and theory-based reasons why the measurements fell short of the high aspirations set for them and how other objectives such as the need for enhancing statistical capacity fell short. The section also illustrates a significant departure from national accounting practice whereby the team sought subnational or regional data – this granular level of detail was an important element of the research exercise as it was designed to directly address the constitutional crisis discussed earlier by explaining which region contributed to the Nigerian national project. The section starts by outlining how the numbers were collected before discussing the difficulties the team observed in the process of writing the interim report before considering the consequences of the presentation of materials in the final report.

The research methodology that Prest and Stewart followed was a mixture of Britain-based desk research and fieldwork visits. Given the number of British companies engaged in investments in Nigeria the desk research was a necessary requirement which sought the engagement of the British corporate community and received a large level of support from many business groups. This is in contrast to efforts by Pius Okigbo almost a decade later, who found that income data was difficult to attain, and had to resort to the production and output approaches to arrive at his national accounts estimates.

Of the British-based organisations supporting the exercise data was supplied from: The Nigerian Trade Commissioner, the Colonial Income Tax Department,[504] United Africa Company (a division of Lever, which became Unilever, primarily focused on palm oil), John Holt and Co in Liverpool (a shipping company involved in the transport of palm oil, palm kernels, rubber, cocoa, textiles from

[504] TNA CO852/1076/9 National Income Nigeria: list of recipients of requests for further information attachment from letter by Prest to Colonial Office 20 October 1950.

Lancashire and bicycles from Birmingham), Rubber and Mining Companies Limited, the Nigeria Produce Marketing Company Limited, and the Colonial Development Corporation.[505]

As observed by Tooze (2001) in relation to Germany, the active support of business groups is crucial to sourcing data but also signifies an interest from the business community in the enhanced statistical capacity of the state. Effective administration needs data. Though such support was not universal, there was resistance from many banking business groups in particular in collecting and collating data on net drafts passing between bank branches on a regional (i.e. subnational) basis from the Bank of British West Africa Limited and Barclays Bank (Dominion, colonial and overseas division).[506] Formal appeals through the Colonial Office to the Bank of England to intercede didn't help leverage this information either.[507]

Unlike many national accounts prepared before and since, this data gathering required extensive fieldwork in country. For the interim tour, from December through to January 1951, Prest and Stewart were due to travel from the UK to Lagos, to Ibadan, Port Harcourt, Calabar, Onitsha, Enugu, Lagos, Kaduna, Zaria, Kano and Jos or Sokoto.[508] Despite the extensive travel around the southern coast and up to Kano, this meant that there was scant observation of economic conditions in the North East or North West of the country, which limited the scope of the conclusions of their findings.

Close engagement with the reality on the ground however helped to further illustrate the conceptual problems with the framework. Now these were not unknown – for example Morgan 2008 makes strong arguments about the way that Phyllis Deane in her "colonial accounting" was identifying the way that the accounts were not applicable for such rural environments at the same time. However, Dr Prest in his interim report included a specific note on conceptual problems which were affecting his findings and raising doubts over the "objective" figures he was producing[509] such as:

---

[505] TNA CO852/1076/9 National Income Nigeria: list of companies supplied by Colonial Office to Prest date 31 October 1950.

[506] TNA CO852/1077/1 National Income Nigeria: draft of a note to Mr Bourdillon at the Bank of England from Mr Richmond at the Colonial Office dated 29.08.51.

[507] TNA CO852/1077/1 National Income Nigeria: letter from statistics office at the Bank of England to the Colonial Office dated 14.08.51.

[508] TNA CO852/1076/9 National Income Nigeria: Itinerary of trip letter to Colonial Office dated 20 November 1950.

[509] These concerns were considered by a meeting of the National Income Committee in Cambridge with mixed responses to the inclusion of transport costs in subsistence economic measurement. The minutes note "there was a most stimulating discussion on the principle of valuing domestic service on the basis of pride price." One member, Professor Fortes argued such a price was on the basis of the estimated fertility of the bride leading to the measurement of the production of children as being classed as economic activity. To prevent against this they recommended measurement of certain aspects of domestic activity on the basis of raw

1) The treatment of dual nationality companies for what is meant to be a domestic product study and further the treatment of colonial government institutions in London.
2) Balance of payments given the complicated relationship with the UK
3) Treatment of Housewives services given the different role of women in Nigerian households with more "commercial relationships in households" – commerce happens inside the family as well as outside of it. Comments on polygamy highlighting disproportionate impact upon the accounts. This makes the case for the inclusion of a greater portion of the subsistence sector in the accounts
4) The absence of subsistence and exchange sectors means subsistence estimates should be included
5) No clear distinction between income and transfers, and comments on the nature of illegality and bribes
6) The boundary between investment and consumption e.g. what is a bicycle?
7) Islamic practice forbidding interest payments.

List taken from the briefing note sent to the review committee[510]

Writing in the 1951 March interim report Prest observed in the short time of the interim field work 160 interviews had been conducted across central and regional official levels, from institutions to small traders. Stewart on the other hand continued to work in Nigeria for a year with the assistance of Mr Lardner from the Lagos Secretariat. The team were to calculate Total Domestic Product and national income, regional domestic product, consolidated government accounts, balance of payments and capital formation and internal trade. This list was considered ambitious by the National Income panel in Cambridge.

Prest hoped that the figures would be ready for 1951 but concerns about access to data and year ends of various organisations meant this could not be certain, there were also concerns about the omission of values from industrial enterprises such as the British American Tobacco factory at Ibadan, the ground-nut oil mill at Kano and the Electricity Corporation. Concerns were also highlighted about whether this exercise would have a statistical legacy. The absence of statistical domestic infrastructure, along with available but non-centralised information sources meant this was unlikely.[511]

materials at the retail price. What can be seen here is that this led to elites who uphold the knowledge basis of the accounts to have to reconsider some assumptions yet still fundamentally entrenched values remained.

[510] TNA CO852/1077/1 National Income Nigeria: Review Committee Circulated note "Conceptual problems in the Measurement of National Income in Nigeria."

[511] Though lessons could be learnt which would help for other similar stage countries Prest however raised concerns about the statistical infrastructure which would impact the ability for the exercise to be repeated annually "it can be said that annual assessment of the National Income are certainly possible in Nigeria. The

Whilst there is validity to the Morgan (2011) argument that Prest and Stewart's figures were seeking a whole picture of the economy but only finding parts, it understates the level of self-awareness that the researchers, and those overseeing the work had of the limitations to the enquiry. As shown above, even at an interim stage the research team were concerned about the applicability of the conceptual framework. To a degree all estimates have an element of uncertainty which are overlooked once a data set is declared complete.[512] But as argued above the primary purpose was not to produce a comprehensive set of macroeconomic indicators. Instead there was an expediency to estimates which meant an account of national and *regional* resources needed to be produced.

7.3.4. The national and *regional* accounts of Nigeria 1950/1951

The final output, the first national accounts of Nigeria were published in 1953 incorporating many of the concerns of the interim report as narrative explaining the limitation of the scope of the work.[513] The report was actively recognised by the DAE and in particular the chair of the oversight committee Austin Robinson as having been an audit of resources which could be used to help aid attempts at social and economic development, 'in particular it was hoped that it would make it possible to asses more accurately the capacity of the country both as a whole and in the different regions to bear the burdens and contribute towards the developments' (Robinson in Prest and Stewart, 1953, p. iii).[514] These figures were only calculable on two of the three approaches to national income estimation – the production and output approach lacking insufficient data to use the "income" method. Given that the income method would typically be used as a check upon the quality of the estimates, this suggests further questions about the accuracy of these figures.

Yet for its limitations it also goes beyond regular national income estimation by illustrating a dense data-rich account of the regions within Nigeria as well as the overall economy. With regional breakdowns and clear guides on the flow of goods and services within the borders the National

major difficulty is not as some suggested, the lack of information about the territory, but rather the collection of all the information that does exist into one centre and the systematic application of modern statistical techniques to combine the strongest elements together to form a unified picture of the working of the whole economy" [TNA CO852/1077/1 National Income Nigeria – interim report p.6] And, ultimately this would require staff something which was lacking at the time.

[512] See Strathern (2000), prior to the data rituals after the completion of a piece of data collection, there is considerable uncertainty surrounding the accuracy and veracity of the methodology and quality of work that is undergone.

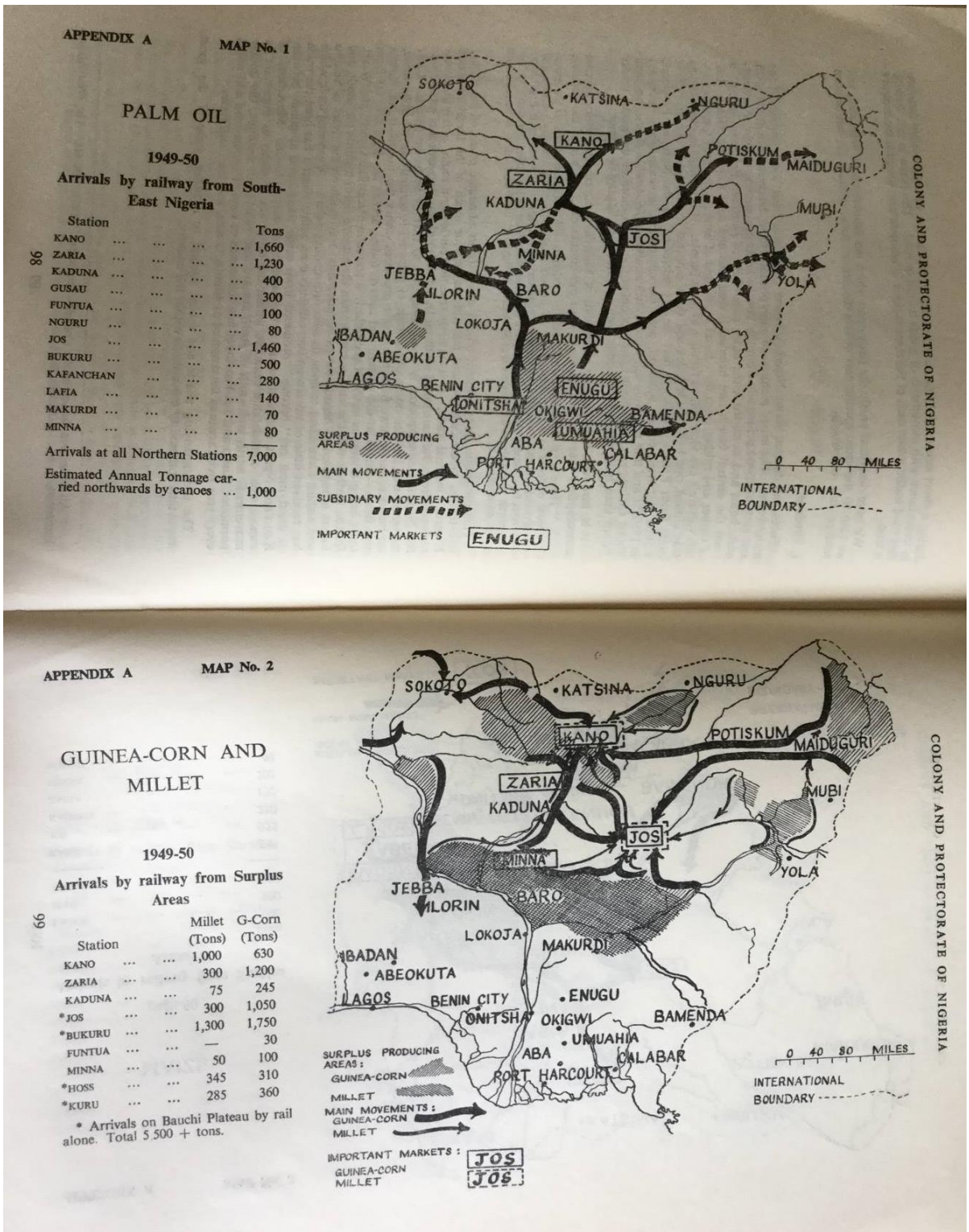
[513] Given the supply of the interim report to the DAE and the Colonial Office it is highly probable that figures generated were circulated prior to this date.

[514] It should be stressed that the actions of researchers at this time was not solely a colonial exercise. Figures such as Austin Robinson had held a long term interest in the development of all statistics – for example as Chairman of the NIESR Robinson would engage extensively with business bodies to secure funding, his work with the Colonial Office Research Committee had also encouraged an interest in development more generally (Cairncross, 2016, p. 124).

Accounts, in the absence of more sophisticated input output tables, provided usable aggregates on market-based activity in the country.[515] Detailed commodity flow maps were generated for palm oil, guinea-corn, millet, maize, rice, yams, gari (cassava flour), beans, onions, kola nuts, fresh fruit, cattle and dried fish (Prest and Stewart, 1953, chap. Appendix A). These estimations of economic activity were designed to simultaneously illustrate the regional differences and specialisms but also the interconnectedness between different areas of the Nigerian project, and by showing this exchange only within country it helped to further the idea that Nigeria was a cohesive unit. As shown in Figure 7.7. below.

[515] As Van Arkadie and Frank (1969, pp. 291–3) observe practitioner-academics disagreed on the best way to present this information for developing countries and was a source of heated discussion in the Review of Economic Studies (Hollinger, 1954; Prest, 1953; Seers, 1953, 1952; Stewart, 1954).

Figure 7.7 Commodity flow diagrams taken from Appendix A of Prest and Stewart (1953)[516]



APPENDIX A MAP No. 1

PALM OIL

1949-50

Arrivals by railway from South-East Nigeria

Station	Tons
KANO	1,660
ZARIA	1,230
KADUNA	400
GUSAU	300
FUNTUA	100
NGURU	80
JOS	1,460
BUKURU	500
KAFANCHAN	280
LAFIA	140
MAKURDI	70
MINNA	80
Arrivals at all Northern Stations	7,000
Estimated Annual Tonnage carried northwards by canoes	1,000

98

APPENDIX A MAP No. 2

GUINEA-CORN AND MILLET

1949-50

Arrivals by railway from Surplus Areas

Station	Millet (Tons)	G-Corn (Tons)
KANO	1,000	630
ZARIA	300	1,200
KADUNA	75	245
*JOS	300	1,050
*BUKURU	1,300	1,750
FUNTUA	—	30
MINNA	50	100
*HOSS	345	310
*KURU	285	360

* Arrivals on Bauchi Plateau by rail alone. Total 5,500 + tons.

99

At the heart of the Prest and Stewart figures is an underacknowledged tension – both the aspiration of a unified nation by auditing national resources and income yet also a recognition of the

[516] Also reproduced in Morgan (2011, p. 54).

differences between regions, measurements performed without reference to the inherent ethnicity-driven tensions. The second chapter of the accounts therefore has a particular importance as the taxable capacity of the three regions was at the heart of the constitutional discussions. The use of national accounting methodology was therefore designed to inform discussions on the different taxable revenues which could be extracted and help 'scientifically' resolve the question on the balance between the different regions.

A further consequence of this document however is a significant transformation in national accounts usage from its original Keynesian anti-inflation demand management purposes. The interpretation advanced by Prest and Stewart (1953, chap. 1) in their historiographical review of national accounts highlights that, thanks to Keynes's innovations, with the shift to using national accounts for macroeconomic management the researchers were no longer seeking a "national dividend" but instead "income potential". This interpretation of the purpose of national accounts is what Prest and Stewart define as the difference between Keynesian national accounts and earlier national income estimates dating back to Petty.

Emphasising these institutional differences between the lens fashioned for the UK and Nigeria, the country it was being used upon, the authors highlight key methodological differences that they used while generating the figures. The methodological differences quoted drew heavily upon the limitations highlighted in the interim report. Given these and other problems with the scope of the project – e.g. difficulties separating consumption from investment along Keynesian lines – the authors argue that the national accounts system is an inappropriate tool to attempt British style public finance budgeting. 'The impossibility given our present degree of ignorance of the economy, of even gauging the character of all the important determinants of economic decisions' meant advanced economic and statistical techniques were inappropriate at the present (Prest and Stewart, 1953, p. 21).

Yet to focus only on the difficulties in applying standardised national accounts[517] significantly overlooks the institutional factors influencing the data production. This was not simply a case of authors adapting national accounting methodology in situ in response to unexpected situations. As highlighted earlier Richard Stone, the international expert on national accounts, had brought this project within the DAE to test the ability of the national accounts and was overseeing their work. Yet more than experimenting with a tool in a new country (Tilley, 2011) the Prest and Stewart figures

[517] see Morgan (2011, 2008) or for discussions on the inherent "western" frame which was being asserted onto a country see Danby (2017).

were a politically driven document that were designed to help impose a new political settlement,[518] one which ultimately was designed to aid the broader colonial project.

This may help to explain why the national income estimates undertaken by Prest and Stewart expanded national income estimation to consider so many extra factors. For academics and colonial administrators alike, there was value to getting a fuller audit of the country's resources. As Jerven (2013, p.39) highlights, later generations of scholars severely critiqued Prest and Stewart's attempts to distinguish between "western" and Nigerian lifestyles, and, how this distinction was used to justify monetary estimates of non-monetary household transactions. Eke (1966), Jerven notes, argues the authors were attempting to capture all aspects of human welfare. As Jerven (2013, p.112-4) shows GDP estimates remain a black box, few people know either the data which enters them or the level of uncertainty surrounding the estimates. Yet despite arbitrary decisions being taken when estimating early national income figures these old statistics endure whilst the difficulties surrounding how they were measured become forgotten.

7.3.5. The economic consequences of the numbers

As mentioned in 7.1., Jerven (2013) argues that numbers have a long legacy and are shaped by institutional practices. The primary purpose of the Nigerian national accounts was to inform a fiscal settlement that might help to unify and define a country. Larger historical forces outside of the control of the national accounts framework meant in the short term this was not achieved; after independence socio-political fractures contributed towards the Biafran war in the 1960s. The second purpose of the national accounts measurements – to increase statistical capacity in the country and inform development planning had mixed results.

Arguably the Colonial Office's attempt to increase statistical capacity in the country also fell short. That it took ten years for another measurement of national income marks a failure to embed the processes and institutions required for national accounting statistics. The expediency of the regional income figures had led to the use of British academics rather than an approach which could have improved Nigerian national accounting capacity.[519] This was a missed opportunity particularly given the rise of the Nigerian National Institute.

With the next measurement of national accounts figures in 1961, the Prest and Stewart (1953) figures gained a renewed purpose. Old numbers are still used years after their initial publication, as

[518] For more on political settlements see Khan (2010) and Di John and Putzel (2009).
[519] Though as Morgan (2011, p. 12) observes a local researcher Godfrey Lardner was used, he was colonial administrator from the Nigerian Secretariat in Lagos.

Phyllis Deane noted with her own Nigerian calculations.[520] As Cooper (2002, pp. 88–89) argues the 1953 accounts provided the starting point for the calculations by Pius Okigbo. Okigbo (1962) was commissioned by the Nigerian government in order to understand the changes that had occurred in Nigeria since the Prest-Stewart enquiry. As a newly independent nation needed numbers to help inform plans.[521] Once updated with several adjustments, the Prest-Stewart figures became a comparator year to the Okigbo figures which could be used to understand trends impacting the post-independence economy (Morgan, 2008, p. 11). In this sense the Prest-Stewart figures took on a new life (once adjusted) and had an impact upon the policy framings of the day.

A large element of the Prest-Stewart methodology was maintained, however, with a more restrictive definition of economic activity to reduce observations of the subsistence economy Okigbo recast Prest's figures reducing them from £600 million to £510 million (Okigbo, 1962, p. 31; Van Arkadie and Frank, 1969, p. 181). This helped to narrow the focus on economic transactions and in turn provided a valuable resource for planning.[522]

The Okigbo figures helped to provide the data for post-independence planners and provided a framing for the Nigerian National Plan of 1962-68. Writing as a former member of the Nigerian National Planning Unit Stolper (1966, pp. 91–3), strongly supported the Okigbo figures commenting on their importance for national planning. Stolper argued in order to plan for the future you needed to understand the past. To that end, further 'planners should first have familiarised themselves with the details of the national accounts calculations for 1950-1957 by Dr. Pius Okigbo and should have brought the estimates up to date' observed (Stolper, 1966, p. 92). It should be acknowledged however, the full strength of the influence of these figures are difficult to determine given the arguments by Morgan (2008, pp. 5, 20–26) that Stolper's unit generated "fictions" upon which to base future decision making. Despite this, there remain legacies of the Prest-Stewart framings which fed through to influence aspects of the planning documentation.[523]

[520] "many years later I found that in the United Nations reports and people doing growth on my imaginary statistics" Phyllis Deane interview with Nigely Harte (Harte, 2002).
[521] Taken from the Okigbo 1961 copy which Okigbo gave to Austin Robinson and drew upon the assistance of Dr Aboyade formerly of Pembroke College Cambridge before he went to University College Ibadan. This book is currently held in the Cambridge Centre for African Studies library.
[522] The Okigbo report's changes to Prest-Stewart methodology came in for some criticism notably in Prest's review for the Economic Journal which critiqued its data collection techniques particularly regarding agricultural estimates. Prest (1963) commenting on his conflict of interest with this review noted that he was 'appraising and revising data for which he was in part responsible.' Prest's appraisal remains critical of the improvement of the framework and further questions the ability of this to be used to enable 'economic policy in Nigeria to be founded on a factual basis rather than on hunch' (Prest, 1963, p. 143).
[523] See the Federation of Nigeria National Development Plan 1962-68.

In sum, the National Accounts of Nigeria were a change from the type of national income estimates that had been called for by the 1949 Colonial Office despatch. They were shaped by a critical moment in "Nigerianisation" which called for new forms of national and regional data which could inform important decisions on the federal fiscal settlement. The need for this sub-national information led to national and *regional* estimates of national income. Whilst the principal aim had been to generate these figures, the secondary aim of developing statistical capacity to aid planning had mixed results. It took several years for new figures to be generated because a British team had been sent out to Nigeria. But through the later work of Pius Okigbo, the original Prest and Stewart figures gained a new life and indirectly helped to inform Nigerian National Planning. This outcome mirrors the initial hopes of the 1949 Colonial Office despatch and reflects the wider movements underway in the 1950s to 1960s as large governments sought to inform planning through mechanisms such as the national accounts. This represents a different approach to national accounts from the British Wartime anti-inflation context to national accounts, and moreover a marked difference from the growthmanship emphasis to national income studies today.

7.4. Conclusion

The chapter argues there was another *movement for national accounts*, one which saw British Colonial interests shaping the broader national accounts movement during the late 1940s to 1950s. This mechanism acted alongside other movements discussed in the national income literature such as the OEEC or the UN (Schmelzer, 2016; Studenski, 1958; Vanoli, 2005; Ward, 2004).

The first section showed, that whilst not fully implemented by all Colonial governments, a Colonial Office despatch was issued in 1949 which encouraged the measurement of national accounts. This effort to encourage colonies to adopt British wartime-style accounting finance, operated separate from, and prior to, formal resolutions by the United Nations that developing countries should measure national accounts. It was itself the result of a remarkable change in the way the empire was being conceptualised and indicative of wider efforts underway to try to increase technocratic and scientific administration. Bodies such as the Colonial Economic Research Committee's National Income Advisory Panel helped in these efforts. The national accounts project itself fed into wider efforts to change economic governance throughout the Empire. The 1949 Colonial Office despatch itself represented a technocratic drive for "development" which, it was believed, would see better allocations of resources that could advance living standards through better planning. This was one of a series of measures intended to improve the administration of colonies and ultimately 'setting the Colonial Empire on lines of development which will keep it in close and loyal contact with us.' The

interests of the research community engaged in these measurements however focused more on the ability to test and extend a public finance approach developed during World War II.

The second section examined the Nigerian government's response to the 1949 despatch which led to a Cambridge DAE team measuring the national accounts of Nigeria. The national accounts figures themselves had an enduring life to them, and were shaped by a need to arrive at a national and regional picture of regional taxable resources. The chapter also showed that even at the interim stage, concerns were raised about the conceptual problems that the measure faced in a different setting. As Morgan (2011) has argued once measurement was undertaken in the field further questions arose over the national income concepts. Yet measurement needed to continue as these measures had been required as a matter of urgency to help inform discussions on the federal fiscal settlement of Nigeria.

Across the two sections a complex interaction of political economy and technocratic aspirations patronised national income studies within the broader British colonial project. This also saw a transformation of the national accounts project from an anti-inflation wartime public finance tool into an early tool of the post war scientific developmental state. National accounting was understood to be a tool that could aid state planning. Within only a few years of the despatch however, by the time of the Nigerian national accounts, national accounting then transformed into a tool to understand inter-regional supply chains which could help to provide a picture of the economy as part of a wider nation-building exercise. What these episodes help to illustrate is that the concept of national accounts extends beyond the conventional notion of national income GDP. Instead the accounts could, and did, evolve around the contexts in which figures were estimates. And, ultimately, the development of national income did not evolve in a strictly linear progression to the present. Instead there may remain other historical episodes of a similar nature where numbers have an enduring impact even though they were not measured for today's GDP purposes.

Chapter 8: Conclusion

The thesis has explored changes in the meaning of national income accounts during the 1930s-1950s, meanings which differed from today. It addresses the research question "what did national income accounts mean to the researchers of 1930s-1950s Britain?" The challenge for such an enquiry is to identify what national accounts meant within earlier historical institutional contexts. One way of illustrating this challenge can be seen by revisiting the *National Income of Nigeria 1950-1951* (Prest and Stewart, 1953) discussed in Chapter 7. The document opens with a potted history of "Western" national income accounts starting by mentioning William Petty and Gregory King, before leaping centuries ahead to discuss the works of Bowley, Flux, Clark and Pigou (Prest and Stewart, 1953, p. 1). The authors argue that the introduction of an accounting framework was a 'significant change' for national income accounting (Prest and Stewart, 1953, p. 2). They further argue that this change was brought about by two causes. The first was Keynes's *General Theory* which they argue 'gave us a much clearer picture of the theory of income-formation' (Prest and Stewart, 1953, p. 3). The second factor they identify 'was the outbreak of war in 1939 which led the British State to understand maximum war potential and the challenge of the inflationary gap (Prest and Stewart, 1953, p. 3).

Upon initial reading this narrative appears to be compatible with our contemporary understanding of the history of national income seen in Studenski (1958) or Mitra-Kahn (2011). Prest and Stewart were simply undertaking a national income enquiry, and chose to provide a historical narrative for the method they are using, a narrative that is extremely recognisable today. But the context matters significantly. Why does Petty matter to researchers measuring national accounts in Nigeria? Why was the introduction of the accounting framework so significant? Why is it relevant to draw attention to the wartime planning attempts to understand maximum war potential?

The argument suggested in this thesis is that we may better understand how these earlier national income accountants understood their craft by exploring the context in which their figures were produced. This position gains support from Tomlinson who argues that the institutional environment in which a policy is made matters; 'economic policy is not just constrained by the "ideology" of the policy makers' (Tomlinson, 1981, p. 4). To better understand earlier economic policies we should consider 'the importance of the institutional arrangements within which policy is made' (Tomlinson, 1981, p. 4). This matters for how we see the history of national income accounts because these figures were defined in response to the problems of the past. In order to therefore understand how and why these figures were measured, we need to consider the 'general social, political and

intellectual climate' of bygone periods to identify what "problems" these figures were responding to (Tomlinson, 1981, pp. 66–7). So we may better understand how and why national income accounting occurred in the past, we therefore need to bring these past voices out of the wilderness in order to understand how earlier economists saw their own enquiries.

The *National Accounts of Nigeria* is an output from the newly founded Rockefeller-funded Cambridge Department of Applied Economics (one of the researchers themselves was a Rockefeller Scholar). The research had been overseen by Phyllis Deane, Austin Robinson and Richard Stone. The authors were explicit on the desire to replicate Britain's wartime national accounts finance approach in a new setting, and, also, to understand taxable incomes (Prest and Stewart, 1953, pp. 2–3). Yet the figures were also a shift; the Nigerian estimates were intended to maintain the Commonwealth. Framed in the language of scientific enquiry, these estimates served a political purpose one which saw regional data become important as a way of aiding the "Nigerianisation" process seen in Chapter 7. It is precisely these institutional contexts and how they shaped the technocratic vision for national accounts that have been central to this thesis. In stark contrast to some contemporary discussions,[524] this was not a case of GDP growthmanship.

This thesis has considered the question; what did national income accounts mean to the researchers of 1930s-1950s Britain? Despite much recent discussion on the origins of both GDP and national income there remains scope to better understand the meaning of the numbers within the institutional context of the time. The thesis adopted an economic history methodology informed by the institutional economics approach of Geoffrey Hodgson and the intellectual history approach of Quentin Skinner. This approach was advocated because it enabled richer contextualisation of the wider environment shaping the emergence of national income accounting. This perspective was applied to a critical juncture in national income development – the publication of the British White Paper on National Income, the first official national income *accounts* – describing how it was influenced by wider intellectual and institutional changes in the 1930s. It then also traced how these ideas were institutionalised in a post-war environment. In additional to chapter-specific contributions the main contribution of the thesis is twofold: 1) showing how context matters to the idea of National Accounts culminating in the 1941 publication; and 2) showing why and how ideas became institutionalised after World War II. By unpacking both, this thesis showed how different bases of thought, rationale and contextual factors informed what National Accounts became in the UK, importantly, in ways that differ from thinking about National Accounts today.

[524] See Chapter 1, Section 1.2.1.

The thesis was split in two parts. In the first Part, the *moments* of National Accounts, three different influences upon British national income accounting thought were outlined. Chapter 3 argued that national income thinking was shaped by more than the just the immediate past. By examining how 1930s economists engaged with the past it was shown they looked back to the bygone economist William Petty. Yet by reinterpreting Petty, 1930s economists developed a grand pedigree for a different style of economics. In contrast to earlier neoclassical periods, Petty was recast by economists such as Keynes and Clark as a scientist, an early economic thinker and as the basis for justifying policy. Petty in this sense could be used to justify a new empirical and interventionist approached to economics. The chapter concluded by saying that, in understanding the emergence of national income accounting, we should be considering other contextual influences.

Chapter 4 performed a Hodgson-type institutional analysis of international organisations to consider their influence on national income thinking. It showed that international bodies such as the League of Nations and Rockefeller Foundation were shaped by and enabled a new "realistic" economics. This new "realistic" empirical economics acted as catalyst for an economic-statistics environment that was amenable to national income accounting. The chapter showed a drive for a "realistic," and a "scientific" approach to economics, saw the foundation of bodies such as the NIESR. This mattered because British national income work, like that performed by Colin Clark was frustrated by funding and data access issues. Influential in shaping these changes were international bodies such as the League of Nations and the Rockefeller Foundation. The chapter concluded by concurring with the Tily (2009, p. 356) point that the spread of econometrics and other similar economic statistical approaches may have been an important factor in legitimising the adoption of national accounts in World War II.

Chapter 5 examined the wartime institutional changes which saw the British State adopting and publishing its first set of national income accounts in 1941. Prior to the start of war there had been infrequent estimates of national income, largely by private researchers. By the end of war, a regular publicly-available data series had been established which would be used to inform a managed economy. The chapter argued that opportunities for new "realistic" economic thought emerged as the state restructured itself in response to war. As economists were brought into government new bodies such as the Stamp Committee provided the platform for economists within Whitehall. At the core of the discussion was the search for a new fiscal-theory of war which could prevent a recurrence of the errors of World War I. The solution found was a doctrine which sought to control the economy to prevent inflation from damaging the war effort – a notion that sought to limit inflationary gaps which would otherwise undermine the war effort. This doctrine linked the inflationary limit of the wider economy to the actions of the government budget. This link, between

the economy and the government finance helped the British government become a patron of national income accounting.

In the second Part of the thesis, the *movements* for National Accounts, examined the institutionalisation of this new, technocratic national accounting approach, through two case studies. The first case study, Chapter 6, considered the way John Maynard Keynes and Richard Stone founded the Cambridge Department of Applied Economics as an attempt to set up a centre with a "realistic" research agenda. National income accounting was seen as an important element of this research agenda and drew the financial support of the Rockefeller Foundation. Such thinking aligned with the views of Richard Stone who sought to use national income accounts to steer the economy in order to improve society. Although Stone's focus on national income faced opposition from within Cambridge, after he stepped down as Director many national accounting legacies endured.

The second case study, Chapter 7, examined how the British State transmitted national accounts abroad in a post-war setting. The chapter considered the Colonial Office's 1949 decision to issue a despatch encouraging colonies to adopt British wartime-style national accounting as a way of developing their economies. It outlined that for this to occur required a shift in colonial mindset which encouraged "development". This enabled new scientific advisory groups such as the Colonial Office's National Income Advisory Panel (NIAP) which acted as a forum between academia and government. It explained that for the NIAP, national accounts were intended as a tool of government intervention. Despite mixed responses from colonial governments, the chapter explains the Colonial Office's decision to encourage national income accounting predated formal requests by the UN.

The chapter also considered how national accounts changed as they were instituted. The Nigerian response to the 1949 despatch led to a Cambridge DAE research team estimating the national accounts of Nigeria. The chapter explored the way that a desire for a national and regional picture of national resources led to an audit of inter and intra-regional resources. Despite well understood limitations with the figures, estimation continued because a picture of regional resources was needed to inform federal fiscal discussions. In addition to suggesting the discussion on the national income accounts of Nigeria was a fiscal discussion, the chapter also showed that in transition the purpose of measurement changed. Whilst the intention had been to spread British wartime-style national accounts, now it had become a regional resource audit.

The narratives advanced across the thesis help to show that our understanding of the history of national income is not complete. Whilst there are extensive historical accounts of the long-origins of national income such as Studenski (1958) or Mitra-Kahn (2011), as others such as Tily (2009), Suzuki

(2003) and Tooze (2001) have shown, there remain fruitful avenues of investigation for us to understand earlier moments of national income accounting and their implications for the present. The moments and movements for national accounting discussed here matter because, as shown by Schmelzer (2016) and Danby (2017), the British approach to national income accounting became influential in informing the UN view of national accounts. But if we are to better understand these episodes, we need to more clearly document the different contexts in which these came. The thesis has drawn attention to national accounts as a government intervention approach and wider spirits of "realistic" research in economics as two notions shaping this British approach to national accounts.

The implications of the limits to our understanding of the history of national income accounting is perhaps best illustrated in contrast to the contemporary discussions on GDP reform and growthmanship. Whilst this thesis has advocated, in broad terms, that national accounting was a technocratic fiscal financial planning approach, this narrative is missing from the national income literature. These earlier discussions on how the state should mobilise both income and expenditure are missing from the GDP reform discussions. If for example we look to the Sustainable Development Goals (SDG),[525] there is a long list of desirable outcomes and indicators of a good society, state-finance is largely absent. Only by SDG 17.1, the 151st SDG target, do we arrive at a discussion on the state and its finances through the need 'to strengthen domestic revenue mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection.' Despite this, clear financial demands are being made on the state both through a need to regulate private provision of goods and services, through the strengthening of domestic institutions, and through direct intervention in market places through the SDGs and other discussions on new metrics for society. This leaves the curious question of how the topic of state finance is missing from these discussions on how to reform national income. If we are to truly engage with the past to understand our future, then the debt-management purposes of the early national income accounting researchers are something we should consider. This does not necessarily mean low debt and small states – several early advocates of national income accounting were seeking a regulated capitalism and welfare states. Falling at a time when countries worldwide face high levels of debt the topic of state finance has particular contemporary relevance. In oversimplified terms, the post-GDP discussions focus on aims, but this thesis has argued prior national income accounting discussions also focused on means. This leaves a large theoretical gap

[525] For more details on how national income accounting started discussions which led to the SDGs see Sen (1985) *Tanner Lecture on the Standard of Living*. Otherwise, for further details on the SDGs see Hák et al. (2016).

between the intention of national accounts as a means of economic management and the contemporary discussions on how to move beyond GDP growthmanship today.

Bibliography

Archives

AUSTRALIA

Fryer Library, University of Queensland, Colin Clark

UQFL87, Box 11, Folder 1 Economics Correspondence, File 68.

UQFL87, Box 11, Folder 1 Economics Correspondence, File 69.

UQFL87, Box 13, Folder 2, Doc 14 Report by the Permanent Consultative Committee on Official Statistics on Professor Bowley's letter to the Secretary.

UQFL87, Box 13, Folder 2, Doc 2 - Letter from Professor Bowley to Henderson Nov 28th, 1930.

UQFL87, Box 16, Folder 2: Clark (1939) *The cost of war.*

UQFL87, Box 16, Folder 2: Clark (1940) *The maximum war effort.*

UQFL87, Box 16, Folder 2: Clark (1941) *The economic balance of power.*

UNITED STATES OF AMERICA

Rockefeller Archive Centre Foundation Records

(Where R.G.1.1, S401.s identifies: Record Group 1.1. and Series 401.s)

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 883 – The proposed Institute of Economic Research 20 May 1936, Appendix 1 p.1.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 883 – SMG diary September 29, 1930.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 883 - Research Aid Grant p.1.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 883 - JVS Memorandum p.2.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 883 – The Proposed Institute of Economic Research p.2.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 883 - Research Aid Grant p.4.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 885 – Tracey Kitteridge correspondence 13 November 1939.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 885 – Tracey Kitteridge correspondence 6 December 1939.

RAC – R.G.1.1, S401.s, FA#386, Box 67, Folder 886 – NIESR Wartime Programme of Research In progress.

RAC – R.G.1.1, S401.s, FA#386, Box 68, Folder 900 - Economic Research in Great Britain: A Report by the Committee on Economic Research (Halley Stewart Trust 1935)

RAC – R.G.1.1, S401.s, FA#386, Box 68, Folder 900 - NIESR founding committee minutes 1935.

RAC – R.G.1.1, S401.s, FA#386, Box 75, Folder 985 – Resolution 37015.

RAC – R.G.1.1, S401.s, FA#386, Box 75, Folder 985 'Rockefeller Foundation Board resolution 39060' 5/19/39.

RAC – R.G.1.1, S401.s FA#386 Box 81 Folder 1052 – dictated minute to Willets from Kitteridge 13th November 1939.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1052 – letter by Keynes 28 January 1941.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1052 – note stamped 24 February 1941.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1052 – note by Kitteridge 12 June 1941.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1052 – memo by Kitteridge 13 November 1939.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – *Minutes of the Rockefeller Foundation Board 1/18/46*.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – *Minutes of the Rockefeller Foundation Board 6/21/57*.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – Stone 1 July 1945 'University of Cambridge DAE Outline of a research program.'

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – letter by DH Robertson 9 October 1944.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – Response to the Rockefeller Foundation from the DAE Board of Management 6th November 1944.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – letter by Willets 22 November 1944.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – letter by Keynes 4 December 1944.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – letter by Mitchell 7 December 1944.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1053 – letter extract by Willets 9 May 1945.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1055.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1057.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1057 Excerpt from JHW's Diary Tuesday, June 12, 1951 following a conversation with Clay in Oxford.

RAC – R.G.1.1, S401.s, FA#386 Box 81 Folder 1057 - Willets Diary 25 June 1951.

RAC – R.G.1.1, S401.s, FA# 386 Box 81 Folder 1060.

RAC – R.G. England, S401.s, FA#386, Box 83, Folder 1096. Letter from Joseph Willets to Raymond Fosdick, November 27, 1944. p.11.

RAC – R.G.1.1, S700.s, FA#386, Box 022A, Folder 164 – Social Science Projects in Europe 10-3-32.

RAC – R.G.1.1, S700.s, FA#386, Box 022A, Folder 164 – letter to Kittridge dated January 17, 1935.

RAC - R.G.1.1, S700.s, FA#386, Box 022A, Folder 164 – letter to Sydnor Walker dated January 14, 1935.

RAC - R.G.1.2 S100.s, FA#385 Box 59 Folder 458 letter from Simon Kuznets to Joseph Willets 18 March 1947.

RAC - R.G.1.2 S100.s, FA#385 Box 59 Folder 458 Letter from Simon Kuznets to Joseph Willets 18 October 1949.

RAC - R.G.1.2, S100.s, FA#385 Box 59 Folder 459.

RAC - R.G.1.2, S100.s, FA#385 Box 59 Folder 459 – meeting minutes from 4 March 1953.

RAC – R.G.1.2, S100.s, FA#386, Box 18, Folder 148 – Memorandum on the enquiry into economic depression. Memorandum dated 5-4-31.

RAC – R.G.1.2, S100.s, FA#386, Box 18, Folder 148 – Memorandum on the enquiry into economic depression. Letter to Edmund Day dated November 16th 1931.

RAC – R.G.1.2, S100.s, FA#386, Box 18, Folder 148 – Memorandum on the enquiry into economic depression. Confidential memo to Mr Gunn dated June 16th 1932.

RAC – R.G.1.2, S100.s, FA#386, Box 18, Folder 148 – The business depression: memorandum of the meetings of representatives of economic councils and research institutes.

RAC – R.G.1.2, S100.s, FA#386, Box 18, Folder 148. 'Member of the Financial Section and Economic Intelligence Service.

RAC – R.G.1.2, S401.s, FA#386, Box 82, Folder 1076 – A programme for the study of changes in the economic structure of Great Britain since war.

RAC – R.G.1.2, S401.s, FA#386, Box 82, Folder 1076 – A programme of research during the war, p.3.

RAC – R.G.1.2, S401.s, FA#386, Box 82, Folder 1076 – letter from Kitteridge to Willets 6th November 1939.

RAC – R.G.1.2, S401.s, FA#386, Box 82, Folder 1077 – Economics Research Section – University of Manchester Feb 20 1940.

RAC – R.G.1.2, S401.s, FA#386, Box 82, Folder 1077 – University of Manchester Economic Research Department July 8 1941.

RAC – R.G.3, S910, FA#112, Box 1, Folder 1 – Social Sciences General Support resolution 35099.

RAC – R.G.3, S910, FA#112, Box 4, Folder 1.

RAC – R.G.3, S910, FA#112, Box 5, Folder 42.

RAC – R.G.3, S910, FA#112, Box 5, Folder 46 – Trustee's meeting April 10, 1935 'Economic Security' p.16.

RAC – R.G.12, S401.s, FA#386, Box 82, Folder 1074 - Research Aid Grant pp.3-4.

RAC – R.G.12, S401.s, FA#386, Box 82, Folder 1076 – 'England's Realistic Economic Research' pp.6-9.

RAC – R.G.12, S401.s, FA#401, Box 77, Folder 997 'Notes on the development of the Institute of Statistics and its relation to Nuffield College'.

UNITED KINGDOM

Churchill College Archive Centre, University of Cambridge, Austin Robinson

ROBN 1/1/1. Stamp Committee Minutes of 24th January 1940.

ROBN 1/1/3 E.C.(S)(41) pp.3-4.

ROBN 1/1/4.

ROBN 1/1/4 War Cabinet Survey of Economic and Financial Plans: the Keynes Plan, Henderson, Stamp, 5 April 1940.

ROBN 1/1/4 War Cabinet Survey of Economic and Financial Plans: the Principles of the Keynes Plan, Henderson, 10 April 1940.

ROBN 1/1/4, document titled: Inflation, 17 June 1940 pp.6-7.

ROBN 1/1/4, document titled: The Control of Inflation, 3 June 1940.

ROBN/1/1/4 Folder 7 Oxford Survey of Statistics dated 14 July 1940.

ROBN/1/1/4 Stamp Survey minutes 73rd meeting 22 July 1940.

ROBN 1/1/4 Britain's War-Time Economic Organisation.

ROBN/1/1/4: Quarterly General Survey of the General Economic Position, and, E.C.(S.) (41) 29 "General Economic Policy" by John Jewkes which discusses man power, raw materials and civilian standard of living.

King's College Archive Centre, University of Cambridge, John Maynard Keynes

JMK/W/4 'Papers concerning the 1940 budget and research thereafter for the compilation of national income statistics'

JMK/W/4/220

JMK/W/4/221

JMK/W/4/222.

JMK/W/4/236.

King's College Archive Centre, University of Cambridge, Richard Stone

JRNS 3/1/15 Letter to D A R Forrester at the University of Strathclyde 06.05.80

JRNS/3/1/25 Stone's letter to Colin Clark dated 4 September 1946 in

JRNS 3/1/98 - exchanges between Stone and Patinkin in King's College archives

JRNS/3/3/2 “Correspondence between the Central Statistical Office of Offices of the War Cabinet and JRNS” Envelope 1.

JRNS/3/3/2 File 4, letter from Stone to Campion 6 Nov 1962.

JRNS/3/3/2 “Correspondence between the Central Statistical Office of Offices of the War Cabinet and JRNS” Envelope 1. Letter from Keynes to Sir R Hopkins 12.2.41.

JRNS/3/3/2(1) Financial Aspects of the War Economy

JRNS 4/10 Letter to Richard Stone from Pierro Sraffa Attachment 2 – Memorandum on the Establishment of the DAE.

JRNS/4/10 Correspondence between Shove and Stone in the Stone archive in.

JRNS/4/12 – Machine Purchases 1: Letter from Richard Stone to Brigadier Hickman 14.05.1947. Brig. Hickman later replied in the affirmative permitting the machine to be lent out.

JRNS/4/12 – Machine Purchases 2: 15 January 1947 Invitation circulated to see an electronic regression analyser. Invitees included: the Engineering laboratory, lecturers in Mathematics, and members of the Faculty of Economics.

JRNS/4/15 - Department of Applied Economics: Growth Project (boxes).

JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.

JRNS 5/1 letter to Rockefeller Foundation 19 June 1945.

JRNS 5/1 Rockefeller Foundation Correspondence – Stone Archive.

JRNS 5/1 letter to Stone at the NIESR dated 10 July 1945

JRNS 5/1 letter from Alexander Loveday to Richard Stone 14 June 1945.

JRNS/6/2 – outputs of NARU (2 of 2) Correspondence between CSO and Richard Stone 28 May 1951 attachment “National Income Forecasting in the United Kingdom.”

JRNS 7/1/1 ‘Fundamental Statistics in the Light of Modern Economic Theory’ Richard Stone 8 January 1938.

JRNS 7/1/7 Input output conferences.

Nuffield College Archive Centre, University of Oxford, Alexander Loveday

Loveday Archive, Box 3 Document 3/92, 9th September 1920, p.2.

The National Archives, Cabinet Office (digitised)

TNA CAB/24/158, Image Reference:0002, Cabinet Minutes on the Proposal to Accelerate the Development of Imperial Resources. 8th January 1932 Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-24-158-CP-90.pdf (accessed 10.05.17).

TNA CAB/66/57/43 Image Reference:0001 Briefing Note on Future Provision for Colonial Development and Welfare 1944. Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-66-57-wp-44-643-43.pdf (accessed 10.05.17).

TNA CAB/65/44/23 Image Reference:0001 War Cabinet Conclusion 1944. Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-65-44-wm-44-152-23.pdf (accessed 10.05.17).

TNA CAB/65/44/43 Image Reference:0001 War Cabinet Discussion 1944. Available at http://filestore.nationalarchives.gov.uk/pdfs/small/cab-65-44-wm-44-173-43.pdf (accessed 10.05.17).

The National Archives, Colonial Office (non-digitised)

TNA: CO 852/1050/2 Colonial Economic Research Committee Advisory Panel on National Income Studies. Minutes & Agenda – Minutes of Second meeting 8 December 1949.

TNA CO 852/1076/9 National Income Nigeria - Document reference number 97401/71/5/50 "Enquiry into the National Income of Nigeria."

TNA CO 852/1076/9 National Income Nigeria: list of recipients of requests for further information attachment from letter by Prest to Colonial Office 20 October 1950.

TNA CO 852/1076/9 National Income Nigeria: list of companies supplied by Colonial Office to Prest date 31 October 1950.

TNA CO 852/1076/9 National Income Nigeria: Itinerary of trip letter to Colonial Office dated 20 November 1950.

TNA CO 852/1077/1 National Income Nigeria: letter from statistics office at the Bank of England to the Colonial Office dated 14 August 1951.

TNA CO 852/1077/1 National Income Nigeria: draft of a note to Mr Bourdillon at the Bank of England from Mr Richmond at the Colonial Office dated 29 August 1951.

TNA CO 852/1077/1 National Income Nigeria: Review Committee Circulated note "Conceptual problems in the Measurement of National Income in Nigeria."

TNA CO 852/1077/1 National Income Nigeria – interim report p.6

TNA CO 852/1077/2 United Nations: National Income, letter to W.R. Searle Colonial Office Statistics Department from W.R. Leonard Director of the UN Statistical Office dated 5th February 1951.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies Circular Despatch draft – file reference document 2 p.3.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies file Extract from letter from L R L Hall in the Cabinet Office 7 January 1949.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies Front of file recorded notes: entry by Phyllis Deane dated 25 February 1949.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies Front of file recorded notes: entry by Mr Emmanuel dated 26 April 1949.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies file Letter to Emanuel from H. Campion dated 27 May 1949.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies Front of file recorded notes: entry by Mr Searle dated 15 June 1949.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies, Circular Despatch dated 25 July 1949.

TNA CO 852/1356/3 CERC Advisory Panel on National Income Studies file Circular Despatch dated 25 July 1949 Appendix B "Some aspects of National Income Calculations on Colonial Conditions".

TNA CO 852/1356/3 CERC Advisory Panel on Colonial National Income Studies Minutes dated 16 December 1948.

TNA CO 852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949 - Draft Circular 97401/71/49 “National Income and Expenditure Studies” 25 July 1949.

TNA CO 852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949 - Attachment to letter from Governor of British Honduras dated 17 September 1949 “National Income Survey of British Honduras 1946” prepared by Carey Jones Principal Auditor

TNA CO 852/1356/4 CERC Advisory Panel on National Income Studies Replies to Circular Despatch dated 25 July 1949 - Letter from Governor Macpherson to the Secretary of State for the Colonies dated 1 November 1949.

TNA CO 898/2 CERC papers and minutes 1949.

TNA CO 898/2 Colonial Economic Research Committee Papers and Minutes 1949 – Attachment to briefing note prepared by Phyllis Deane CERC “Draft Shortlist of Economic Research Subjects” 16 November 1949.

The National Archives, Inland Revenue Department (non-digitised)

TNA IR 40/6602.

The National Archives, H.M. Treasury (non-digitised)

TNA T208/127. UK Memorandum on National Income 1927-1929.

TNA T208/204.

TNA T172/322.

TNA T171/356, Pre-Budget Papers II, 1. The Speech, ii) Draft Budget Statement by a) Keynes.

TNA T172/356 Vol II.

TNA T172/356 “The Size of the Gap” Herbert Wilson Smith 28/02/1941.

TNA T172/356 “The Theory of the Gap”, Keynes 03/03/1941.

University of Cambridge, University Library

UL, Min.V.391- 397: DAE Committee of Management 1st Meeting Minutes, letter to Rockefeller Foundation 4 November 1944.

UL, Min.V.391- 397: DAE Committee of Management 6th Meeting Minutes, 16 June 1945.

UL, Min.V.391- 397: DAE Committee of Management Minutes, 21 April 1946.

UL, Min.V.399: DAE Committee 53rd Meeting Minutes 8 December 1954 – attachments.

UL, 9001.b.9891, Stone lecture in Greece, thought to be from 1953.

Newspapers

The Economist, 1941. Before the budget.

The Economist, 1941. The future of spending.

The Economist, 1941. The national income.

The Times, 1964. Computers may bring a new dynamic to economics: help in making long-term decisions.

Stone, R., 1947a. Social accounting: I. National income before and since the war. The Times Publishing Company, London.

Stone, R., 1947b. Social accounting: II. Consumption and the course of prices. The Times Publishing Company, London.

Stone, R., 1946. The national income: a statistical account of the British economy : expenditure, demand, and employment. The Times Publishing Company, London.

Annual reports

DAE annual reports (currently held in a storage cupboard in the Faculty of Economics). Department of Applied Economics Annual Report. Reports 1 through 5 were referenced in the main body text, the other reports in conjunction with reports 1-5 were used to generate figures in Chapter 6. From the end of July 2018 onwards these will be made available online thanks to a Marshall Library Digitisation project.

University of Oxford Institute of Statistics annual reports for the academic years 1936/37 and 1939/40. Held at the Bodleian Library, Oxford.

Privately held items

Stone Perse School lecture “The Political Arithmeticians”. Stored in the Stone Library (currently at the Centre of Development Studies, Cambridge).

Stone (date unknown), *The Department of Applied Economics in Cambridge*, p.1. Stone private papers (subsequently donated to Kings College Archives).

Preface to Kanaan (1965) Input-Output and Social Accounts of Iraq 1960-1963, stored in the private library of Sir Richard Stone.

Marshall Library 1927 Catalogue (stored at the Marshall Library of Economics, Cambridge)

Oral history interviews

Phyllis Deane: oral history by Nigely Harte, 19 September 2002. Archived at the LSE filed as “Phyllis Deane Interview for EHS 18/12/2010” (Accessed 24.08.16).

Geoff Harcourt: oral history conversation with Matthew Fright (21.07.17)

Lucy Slater: oral history interview by Janet Abbate, 9 April 2001. Archived at IEEE History Center (Interview #630), Hoboken, NJ, USA. http://ethw.org/Oral-History:Lucy_Slater (accessed 02.02.18)

Websites

Deaton, A., 2015. Angus Deaton - Biographical [WWW Document]. URL https://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2015/deaton-bio.html (accessed 9.12.16).

Official publications

INTERNATIONAL

Bjerkholt, O., 1995. Ragnar Frisch and the Foundation of the Econometric Society and Econometrica. Statistic Norway Research Department.

Federal Ministry of Economic Development, 1962. National development plan: 1962-1968. Lagos.

Prest, A.R., Stewart, I.G., 1953. The national income of Nigeria, 1950-51, Colonial research studies / Colonial Office. H.M.S.O, London.

Stone, R., 1946. John Maynard Keynes, Overdruk uit Economisch-Statistiche Berichten (Dutch Offprint of Economic Statistics) van 17 Juli 1946, No. 1523. Rotterdam.

UN

Subcommittee on national income studies, 1947. Measurement of national income and the construction of social accounts: report of the sub-committee on national income statistics of the league of nations committee of statistical experts.

League of Nations (Ed.), 1935. The aims, methods and activity of the League of Nations. Geneva.

League of Nations (Ed.), 1930. Ten years of world co-operation. League of Nations Publishers, Geneva.

United Nations, 1953. A system of national accounts and supporting tables.

United Nations, 1968. A system of national accounts.

BRITAIN

Chancellor Kingsley Wood ‘Financial Statement’ Parliamentary Session 1941 Hansard Vol 370 Column 1297-300, 07/04/1941.

Chancellor Kingsley Wood ‘The New Financial White Paper’ Parliamentary Session 1941 Hansard Vol 370 Column 1304-8, 07/04/1941.

Committee on National Expenditure Report (1931).

His Majesty’s Treasury, An analysis of the sources of war finance and an estimate of the national income and expenditure in 1938 and 1940. Cmd. 6261, H.M.S.O.

Macmillan Committee on Finance and Industry Report, 1931

Report of the Committee on National Debt and Taxation (1927).

Official histories

Hall, H.L., 1937. The Colonial office; a history. Pub. for the Royal empire society by Longmans, Green and co, London, New York.

Hancock, W.K., Gowing, M.M., 1949. History of the second world war: British war economy. His Majesty's Stationary Office, Plaistow, London.

Lynn, M. (Ed.), 2001b. Nigeria, British Documents on the End of Empire. University of London Institute of Commonwealth Studies: The Stationery Office, London.

Morgan, D.J., 1980. The official history of colonial development: the origins of British aid policy. Macmillan, London.

Ward, R., Doggett, T., 1991. Keeping score: the first fifty years of the Central Statistical Office. HMSO: Central Statistical Office, London.

Theses

Adebayo, D.A., 2016. The ILO and the Political Economy of Labour policy-making in Southwestern Nigeria, 1930-1958 (Masters in International History). Graduate Institute of International and Development Studies, Geneva.

Amdekar, S., 2018. From Lancashire to Bombay: Commercial Networks, Technology Diffusion and Business Strategy in the Development of the Bombay Cotton Industry (PhD in Development Studies). University of Cambridge, Cambridge, UK.

Cairncross, A., 1936. Home and Foreign Investment 1870-1913 (PhD in Economics). University of Cambridge, Cambridge, UK.

Cord, R., 2009. The Keynesian Revolution: A Research School Analysis (PhD in History and Philosophy of Science). University of Cambridge, Cambridge.

Endres, A.M., 1982. Economic thought and numerical observations: studies in "political arithmetic" (PhD in Economics). University of Wollongong, Wollongong, Australia.

Hirschman, D., 2016. Inventing the Economy. Or: How We Learned to Stop Worrying and Love the GDP (PhD in Sociology). Univeristy of Michigan, Michigan, USA.

Mitra-Kahn, B.H., 2011. Redefining the Economy: How the “economy” was invented in 1620, and has been redefined ever since (PhD in Economics). City University, London, UK.

Ogle, G., 2010. An Inquiry into the Definition and Measurement of the Economy (PhD). Adelaide University, Adelaide, Australia.

Rao, V.K.R.V. (Vijendra K.R.V., 1936. National Income of India 1931-1932 (PhD in Economics). University of Cambridge, Cambridge, UK.

Primary Sources

Petty, W., 1928. The Petty-Southwell correspondence 1676-1687 / edited from the Bowood papers by the Marquis of Lansdowne. Constable & Co., London.

Petty, W., 1927. The Petty papers : some unpublished writings of Sir William Petty / edited from the Bowood papers by the Marquis of Lansdowne. Constable & Co., London.

Petty, W., 1899. The Economic Writings of Sir William Petty. Together with the Observations upon the Bills of Mortality, more probably by Captain John Graunt. Edited by C. H. Hull.

Secondary Sources

Abbate, J., 2003. Women and gender in the history of computing. IEEE Annals of the History of Computing. 25, 4–8.

Acemoglu, D., Johnson, S., Robinson, J.A., 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. American Economic Review. 91, 1369–1401.

Ademoyega, A., 1962. The Federation of Nigeria: from earliest times to independence. Harrap, London.

Agar, J., 2003. The government machine: a revolutionary history of the computer, History of computing. MIT Press, Cambridge, Mass.

Amdekar, S., Singh, A., 2017. Cambridge and Development Economics, in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Armitage, D., 2013. Foundations of modern international thought. Cambridge University Press, Cambridge ; New York.

Arndt, H.W., 1988. Colin Clark, in: National Income and Economic Progress: Essays in Honour of Colin Clark. Macmillan, Basingstoke.

Arndt, H.W., 1987. Economic development: the history of an idea. University of Chicago Press, Chicago.

Aukrust, O., 1994. Scandinavian Contributions to National Accounting, in: Kenessy, Z. (Ed.), The Accounts of Nations. IOS Press, Amsterdam; Oxford.

Aukrust, O., Bjerve, P.J., Frisch, R., 1949. A system of concepts describing the economic circulation and production process. Oslo.

Backhouse, R., 2017. Economics, in: Bevir, M. (Ed.), Modernism and the Social Sciences: Anglo-American Exchanges, c.1918–1980. Cambridge University Press, Cambridge, pp. 17–38. https://doi.org/10.1017/9781316795514.002

Backhouse, R., 2010. Economics, in: Fontaine, P., Backhouse, R. (Eds.), The History of the Social Sciences Since 1945. Cambridge University Press.

Backhouse, R., 2004. History of economics, economics and economic history in Britain, 1824 – 2000. The European Journal of the History of Economic Thought. 11, 107–127. https://doi.org/10.1080/0967256032000171524

Backhouse, R., 2002. The Penguin history of economics. Penguin Books, London New York Victoria.

Backhouse, R., 1994. Why and how should we study the history of economic thought? Hist. Econ. Ideas 2, 115–123.

Backhouse, R., Cherrier, B., 2016. The Age of the Applied Economist: The Transformation of Economics Since the 1970s (SSRN Scholarly Paper No. ID 2868144). Social Science Research Network, Rochester, NY.

Backhouse, R., Cherrier, B., 2014. Becoming Applied: The Transformation of Economics after 1970 (SSRN Scholarly Paper No. ID 2526274). Social Science Research Network, Rochester, NY.

Baranzini, M., Marangoni, G., 2014. Richard Stone: an Annotated Bibliography. Università della Svizzera italiana, Lugano.

Barker, T., 2017. Richard Stone (1913-1991), in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Barker, T., Dada, W., Foster, W., Repapis, C., 2003. The history of the Cambridge Growth Project and the emergence of Space-Time. Cambridge Growth Project Archives Marshall Library.

Bauer, P., Meier, G.M., Seers, D., 1984. Pioneers In Development. Published for the World Bank, Oxford University Press.

Baumol, W., 2000. Leontief's Great Leap Forward: Beyond Quesnay, Marx and von Bortkiewicz. Economic Systems Research. 12, 141–152. https://doi.org/10.1080/09535310050005662

Begg, I., Henry, S.G.B., 1998. Applied economics and public policy, DAE occasional papers ; Cambridge University Press, Cambridge.

Bennett, B.M., 2011. The consolidation and reconfiguration of "British" Networks of Science, 1800-1970, in: Bennett, B.M., Hodge, J.M. (Eds.), Science and Empire: Knowledge and Networks of Science across the British Empire, 1800-1970, Britain and the World. Palgrave Macmillan, Houndmills, Basingstoke, Hampshire ; New York, NY.

Berrill, K., 1957. Review of Mercantilism. by E. F. Heckscher. The Economic Journal. 67, 327–329.

Betts, R.F., 2004. Decolonization, 2nd ed., The making of the contemporary world. Routledge, New York.

Beveridge, W.H.B., 1928. British food control. Oxford University Press; Yale University Press, London, New Haven.

Bevir, M., 2002. The logic of the history of ideas, Reprinted, first paperback edition. ed. Cambridge University Press, Cambridge.

Bevir, M., 2000. The Role of Contexts in Understanding and Explanation. Human Studies. 23, 395–411.

Bjerkholt, O., Knell, M., 2005. Did Ragnar Frisch discover input-output economics? 15th Input-Output Conf. Beijing 27 June - 1 July 2005.

Bjerkholt, O., Kurz, H.D., 2006. Introduction: the History of Input–Output Analysis, Leontief's Path and Alternative Tracks. Economic Systems Research. 18, 331–333.

Bjerve, P., 1996. Contributions of Ragnar Frisch to National Accounting. Statistic Norway Research Department, September 1996, 96/21.

Board of Inland Revenue, Stone, R., 1977. Inland Revenue report on national income, 1929. Department of Applied Economics, University of Cambridge, Cambridge.

Boianovsky, M., Trautwein, H.-M., 2006. Haberler, the League of Nations, and the Quest for Consensus in Business Cycle Theory in the 1930s. History of Political Economy. 38, 45–89.

Bolt, J., Gardner, L., 2016. De-compressing history? Pre-colonial institutions and local government finance in British Colonial Africa.

Bonar, J., 1900. Review of The Economic Writings of Sir William Petty, Together with the Observations upon the Bills of Mortality More Probably by Captain John Graunt by Charles H. Hull and John Graunt. The English Historical Review. 15.

Bos, F., 2006. The development of the Dutch national accounts as a tool for analysis and policy. Stat. Neerlandica 60.

Bourne, R., 2015. Nigeria: a new history of a turbulent century. Zed Books, London.

Bowen, I., 1939. The Building Industry in War-Time. The Economic Journal. 49, 663–669.

Bowley, A., 1942. Studies in National Income 1924-1938, The National Institute of Economic and Social Research: Economic and Social Studies. Cambridge University Press, Cambridge.

Bowley, A., 1941. Lord Stamp. Journal of the Royal Statistical Society. 104, 193–196.

Bowley, A., Keynes, J.M., 1940. The Measurement of Real Income. The Economic Journal. 50, 340–342.

Brendon, P., 2008. The decline and fall of the British Empire, 1781-1997. Vintage, London.

Broadberry, S., Campbell, B., Klein, A., Van Leeuwen, B., 2015. British economic growth, 1270-1870. Cambridge University Press, New York.

Broadberry, S., Howlett, P., 2016. Lessons Learned? British Mobilization for the Two World Wars, in: Eloranta, J., Golson, E., Markevich, A., Wolf, N. (Eds.), Economic History of Warfare and State Formation, Studies in Economic History. Springer Singapore, pp. 197–219.

Buck, P., 1977. Seventeenth-Century Political Arithmetic: Civil Strife and Vital Statistics. Isis 68, 67–84.

Budd, A., 1998. Obituary: Sir Alec Cairncross. The Independent.

Cain, P., Hopkins, A., 1993. British imperialism: innovation and expansion, 1688-1914. Longman, London.

Cairncross, A., 2011. Essays in economic management. Routledge, London.

Cairncross, A.K., 1953. Home and foreign investment, 1870-1913: studies in capital accumulation. C.U.P, Cambridge.

Cairncross, S., 2016. Austin Robinson: The Life of an Economic Adviser. Springer.

Cairncross, S.A., 2002. Economic Ideas and Government Policy: Contributions to Contemporary Economic History. Routledge.

Campion, H., 1949. International Statistics. Journal of the Royal Statistical Society. 112, 105–143.

Carson, C.S., 1999. 50-Year Retrospective of the Iariw: The Early Years. Review of Income and Wealth. 45, 379–396.

Carson, C.S., 1975. The history of the United States National Income and Product Accounts: The Development of an analytical approach. Review of Income and Wealth. 21, 153–181.

Castles, I., 2014. Measuring Economic Progress: From Political Arithmetick to Social Accounts, in: Measuring and Promoting Wellbeing, How Important Is Economic Growth? ANU Press, pp. 271–280.

Ceruzzi, P.E., 2012. Computing: a concise history, The MIT Press essential knowledge series. MIT Press, Cambridge, Mass.

Ceruzzi, P.E., 2003. A history of modern computing, 2nd ed, History of computing. MIT, Cambridge, Mass. ;London.

Chick, M., 1998. Industrial policy in Britain, 1945-1951: economic planning, nationalisation, and the Labour governments. Cambridge University Press, Cambridge; New York.

Chick, V., Tily, G., 2014. Whatever happened to Keynes's monetary theory? Cambridge Journal of Economics. 38, 681–699.

Clapham, J.H., 1922. Of Empty Economic Boxes. The Economic Journal. 32, 305–314.

Clark, C., 1942. The Economics of 1960, First Edition. ed. Macmillan, London.

Clark, C., 1940. The conditions of economic progress. Macmillan and co., limited, London.

Clark, C., 1937. National income and outlay. Macmillan and co., limited, London.

Clark, C., 1934. Further Data on the National Income. The Economic Journal. 44, 380–397.

Clark, C., 1933. The National Income and the Theory of Production. The Economic Journal. 43, 205–216.

Clark, C., 1932. The national income, 1924-1931. Macmillan, London.

Clarke, S., 2007. A Technocratic Imperial State? The Colonial Office and Scientific Research, 1940–1960. Twentieth Century British History. 18, 453–480.

Clavin, P., 2013. Securing the world economy: the reinvention of the League of Nations, 1920-1946, 1st ed. Oxford University Press, Oxford.

Comim, F., 2000. On the Concept of Applied Economics: Lessons from Cambridge Economics and the History of Growth Theories. History of Political Economy. 32, 145–176.

Constantine, S., 1984. The making of British colonial development policy 1914-1940. Frank Cass, Exeter.

Cooper, F., 2002. Africa since 1940: the past of the present, New approaches to African history. Cambridge University Press, Cambridge, U.K. ; New York, NY.

Cooper, F., 1996. Decolonization and African Society: The Labor Question in French and British Africa. Cambridge University Press.

Cord, R. (Ed.), 2017. The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Cord, R., 2009. The Keynesian Revolution: A Research School Analysis (PhD in History and Philosophy of Science). University of Cambridge, Cambridge.

Cord, R.A., 2017. The London and Cambridge Economic Service: history and contributions. Cambridge Journal of Economics. 41, 307–326.

Coyle, D., 2015. GDP: a brief but affectionate history, Revised edition. ed. Princeton University Press, Princeton.

Crafts, N.F.R., 1983. British Economic Growth, 1700-1831: A Review of the Evidence. The Economic History Review. 36, 177–199.

Crafts, N.F.R., 1980. National income estimates and the British standard of living debate: A reappraisal of 1801–1831. Explorations in Economic History. 17, 176–188.

Crafts, N.F.R., Mills, T.C., 2013. Rearmament to the rescue? New estimates of the impact of 'Keynesian' policies in 1930s' Britain. Warwick economics research papers series (TWERPS) 2013.

Craver, E., 1986. Patronage and the Directions of Research in Economics: The Rockefeller Foundation in Europe, 1924-1938. Minerva 24, 205–222.

Cristiano, C., 2009. Keynes and India, 1909–1913: a study on foreign investment policy. The European Journal of the History of Economic Thought 16, 301–324.

Cunningham, W., 1892a. The Relativity of Economic Doctrine. The Economic Journal. 2, 1–16.

Cunningham, W., 1892b. The Perversion of Economic History. The Economic Journal. 2, 491–506.

Cuyvers, L., 1983a. Keynes's Collaboration with Erwin Rothbarth. The Economic Journal. 93, 629–636.

Cuyvers, L., 1983b. Erwin Rothbarth's Life and Work. Journal of Post Keynesian Economics . 6, 305–312.

Danby, C., 2017. The Known Economy: romantics, rationalists, and the making of a world scale. Routledge, London.

Daunton, M., 2017. Cambridge and Economic History, in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Daunton, M., 2008. Just Taxes: The Politics of Taxation in Britain, 1914-1979, 1 edition. ed. Cambridge University Press, Cambridge.

Daunton, M.J., 2001. Trusting Leviathan: the politics of taxation in Britain, 1799-1914. C.U.P, Cambridge.

Davenant, C., 1698. Discourses On The Publick Revenues, And On The Trade of England: In Two Parts. To which is added, A Discourse upon Improving the Revenue of the State of Athens. Knapton.

De Vivo, G., Pasinetti, L.L., Trinity College (University of Cambridge) (Eds.), 2014. Catalogue of the library of Piero Sraffa. Fondazione Raffaele Mattioli per la storia del pensiero economico ; Fondazione Luigi Einaudi, Milano : Torino.

Deane, P., 2008. Political Arithmetic, in: Durlauf, S.N., Blume, L. (Eds.), The New Palgrave Dictionary of Economics. Palgrave Macmillan, Basingstoke, Hampshire ; New York.

Deane, P., 1958. Review of The Conditions of Economic Progress. The Economic Journal. 68, 370–371.

Deane, P., 1955. The Implications of Early National Income Estimates for the Measurement of Long-Term Economic Growth in the United Kingdom. Economic Development and Cultural Change. 4, 3–38.

Deane, P., 1953. Colonial social accounting, Economic and social studies, National Institute of Economic and Social Research ; Cambridge University Press, Cambridge.

Deane, P., 1948. The measurement of colonial national incomes, National Institute of Economic and Social Research Occasional Papers. Cambridge University Press, Cambridge.

Deane, P., 1946. Measuring National Income in Colonial Territories, in: Gilbert, M., Brady, D., Kuznets, S. (Eds.), Studies in Income and Wealth. National Bureau of Economic Research, New York, pp. 145–174.

Deane, P., Cole, W.A., 1967. British economic growth, 1688-1959: trends and structure, 2nd ed, Monographs 8. Cambridge University Press, Cambridge.

Deane, P., Crafts, N., 2008. Phyllis Deane Interviewed by Nicholas F. R Crafts, in: Lyons, J.S. (John S., 1944-, Cain, L.P., Williamson, S.H. (Eds.), Reflections on the Cliometrics Revolution: Conversations with Economic Historians, Routledge Explorations in Economic History ; Routledge, London.

Deane, P.M., 1951. Review of The Conditions of Economic Progress. Journal of the Royal Statistical Society. 114, 265–266.

Deaton, A., 2008. Stone, John Richard Nicholas (1913-1991), in: Durlauf, S., Blume, L. (Eds.), The New Palgrave Dictionary of Economics, Palgrave Macmillan, Basingstoke.

Debowicz, D., 2016. A social accounting matrix for Iraq. Journal of Economic Structures. 5, 24. https://doi.org/10.1186/s40008-016-0057-4

den Bakker, G., 1994. Dutch national accounts: a history, in: Kenessy, Z. (Ed.), The Accounts of Nations. IOS Press, Amsterdam; Oxford.

Denison, E.F., 1949. Review of The Measurement of Colonial National Incomes. The Review of Economics and Statistics. 31, 242–244. https://doi.org/10.2307/1927753

Di John, J., 2010. Taxation, Resource Mobilisation and State Performance. Crisis States Research Centre, Working Paper no. 84

Di John, J., Putzel, J., 2009. Political Settlements: Issues paper. Governance and Social Development Resource Centre paper.

Dimand, R.W., 2019. The Cowles Commission and Foundation for Research in Economics: Bringing Mathematical Economics and Econometrics from the Fringes of Economics to the Mainstream (SSRN Scholarly Paper No. ID 3451893). Social Science Research Network, Rochester, NY.

Donaldson, J., 1939. Review of Mercantilism by Eli F. Heckscher The Annals of the American Academy of Political and Social Science. 202.

Dupont-Kieffer, A., 2012. Lindahl and Frisch: Linking macroeconomics and national accounting in the interwar years for economic policies and planning. Journal of Economic and Social Measurement. 37, 145–174.

Edgerton, D., 2015. Controlling resources, in: Tooze, A., Geyer, M. (Eds.), The Cambridge History of the Second World War: Volume 3: Total War: Economy, Society and Culture, The Cambridge History of the Second World War. Cambridge University Press, Cambridge, pp. 122–148.

Edgerton, D., 2012. Britain's war machine: weapons, resources and experts in the Second World War. Penguin, London.

Eichengreen, B., 2004. The British economy between the wars, in: Floud, R., Johnson, P. (Eds.), The Cambridge Economic History of Modern Britain / Vol. 2: Economic Maturity, 1860-1939. Cambridge University Press, Cambridge.

Einzig, P., 1939. The Unofficial Market in Sterling. The Economic Journal. 49, 670–677.

Ellman, M., 2014. Socialist planning, Third edition. ed. Cambridge University Press, Cambridge.

Eriksen, I., Hanisch, T., Sæther, A., 2007. The Rise and Fall of the Oslo School. Nordic Journal of Political Economy. 33, 1–1.

Falola, T., Heaton, M.M., 2008. A history of Nigeria. Cambridge University Press, Cambridge.

Fear, J., 2015. War of the factories, in: Tooze, A., Geyer, M. (Eds.), The Cambridge History of the Second World War: Volume 3: Total War: Economy, Society and Culture, The Cambridge History of the Second World War. Cambridge University Press, Cambridge, pp. 94–121.

Fennell, S., 2020. Malthus, Statistics and the State of Indian Agriculture. The Historical Journal. 63, 1–27.

Fioramonti, L., 2013. Gross domestic problem: the politics behind the world's most powerful number, Economic controversies. Zed Books, London ; New York.

Fisher, I., 1920. The purchasing power of money: its determination and relation to credit interest and crises. Macmillan and Co, New York.

Fletcher, G.A., Thirlwall, A.P., 2008. Dennis Robertson. Palgrave Macmillan, Basingstoke.

Fogel, R.W., Fogel, E.M., Guglielmo, M., Grotte, N., 2013. Political arithmetic: Simon Kuznets and the empirical tradition in economics, NBER series on long-term factors in economic development. The University of Chicago Press, Chicago.

Foucault, M., 2009. Security, Territory, Population: Lectures at the College De France, 1977-78. Palgrave Macmillan UK : Imprint : Palgrave Macmillan, London.

Fright, M.P.J., 2016. Accounting for the oriins and impact of the DAE: Attempting an intellectual history of economic measurement, in: Applied Economics in Cambridge. Presented at the 40 Years of the Cambridge Journal of Economics, Cambridge Journal of Economics, St Catharine's College, Cambridge.

Galbraith, J.K., 1977. The Age of Uncertainty. Big Corporations, British Broadcasting Company, London.

Gardner, L., 2012. Taxing Colonial Africa: The Political Economy of British Imperialism. OUP Oxford.

Gehrke, C., Kurz, H.D., 2002. Keynes and Sraffa's "Difficulties with J. H. Hollander." The European Journal of the History of Economic Thought. 9, 644–671.

Gide, C., Rist, C., 1948. A History of Economic Doctrines From the Time of the Physiocrats to the Present Day, 6th ed. George G. Harrap & Co. Ltd., London.

Giffen, R., 1889. The growth of capital. George Bell, London.

Gilbert, J.C., 1940. Anglo-French Financial Co-Operation during the War, 1914-18. The Review of Economic Studies. 7, 159–168.

Gilbert, M., Brady, D., Kuznets, S. (Eds.), 1946. Measuring National Income in Colonial Territories, in: Studies in Income and Wealth. National Bureau of Economic Research, New York, pp. 145–174.

Gilbert, M., Clark, C., Stone, J.R.N., Perroux, F., Lieu, D.K., Evelpides, Divisia, F., Tinbergen, Kuznets, Smithies, Shirras, MacGregor, 1949. The Measurement of National Wealth: Discussion. Econometrica 17, 255–272.

Goodacre, H., 2019. The Economic Thought of William Petty: Exploring the Colonialist Roots of Economics. Routledge, Abingdon.

Goswami, M., 2018. Crisis Economics: Keynes and the End of Empire. Constellations 25, 18–34.

Grampp, W.D., 1952. The Liberal Elements in English Mercantilism. The Quarterly Journal of Economics. 66, 465–501.

Graunt, J., 1939. Natural and political observations made upon the bills of mortality. The Johns Hopkins press, Baltimore.

Guilhot, N., 2011. One discipline, many histories, in: Guilhot, N. (Ed.), The Invention of International Relations Theory: Realism, the Rockefeller Foundation, and the 1954 Conference on Theory. Columbia University Press, New York.

Hák, T., Janoušková, S., Moldan, B., 2016. Sustainable Development Goals: A need for relevant indicators. Ecological Indicators. 60, 565–573.

Haley, B., 1936. Review of Heckscher, Mercantilism. The Quarterly Journal of Economics. 50.

Hall, P.A., Soskice, D.W., 2001. Varieties of capitalism: the institutional foundations of comparative advantage. Oxford University Press, Oxford.

Harcourt, G., Kriesler, P., 2011. The Enduring Importance of The General Theory. Review of Political Economy. 23, 503–519.

Harcourt, G.C., 2017. Robert Charles Oliver (Robin) Matthews (1927-2010), in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Harcourt, G.C., 1995. Capitalism, socialism, and post-Keynesianism: selected essays of G.C. Harcourt, Economists of the twentieth century. E. Elgar, Aldershot, UK ; Brookfield, Vt., US.

Harrison, B., 2004. Lawrence, Frederick William Pethick-, Baron Pethick-Lawrence (1871–1961), politician. Oxford Dictionary of National Biography. https://doi.org/10.1093/ref:odnb/35491

Harrison, M., 2000. The Economics of World War II: Six Great Powers in International Comparison. Cambridge University Press, Cambridge.

Harrod, R., 1951. The life of John Maynard Keynes. Macmillan, London.

Hatton, T.J., 2004. Unemployment and the labour market, 1870-1939, in: Floud, R., Johnson, P. (Eds.), The Cambridge Economic History of Modern Britain / Vol. 2: Economic Maturity, 1860-1939. Cambridge University Press, Cambridge.

Heckscher, E., 1955. Mercantilism, 2nd ed. Allen & Unwin, London ; New York.

Hennessy, P., 2001. Whitehall, Rev. ed. with a new final chapter. ed, Pimlico. Pimlico, London.

Hicks, U.K., 1941. Lags in Tax Collection--A Neglected Problem in War Finance. The Review of Economic Studies. 8, 89–99.

Higgs, H., 1899. Review of The Economic Writings of Sir William Petty, Together with the Observations upon the Bills of Mortality, more Probably by Captain John Graunt. By Charles Henry Hull. The Economic Journal. 9.

Hillmann, H.C., 1940. Analysis of Germany's Foreign Trade and the War. Economica 7, 66–88.

Hobsbawm, E., 1994. Age of extremes: the short twentieth century, 1914-1991. Michael Joseph ; Viking Penguin, London : New York.

Hobsbawm, E., 1968. Labouring men: studies in the history of labour. Weidenfeld and Nicolson, London.

Hodge, J.M., 2011. Science and empire: an overview of the historical scholarship, in: Bennett, B.M., Hodge, J.M. (Eds.), Science and Empire: Knowledge and Networks of Science across the British Empire, 1800-1970, Britain and the World. Palgrave Macmillan, Houndmills, Basingstoke, Hampshire ; New York, NY.

Hodgson, G., 2006. What Are Institutions? Journal of Economic Issues. 40, 1–25.

Hodgson, G., 2000. What Is the Essence of Institutional Economics? Journal of Economic Issues. 34, 317–329.

Hodgson, G., 1998. The Approach of Institutional Economics. Journal of Economic Literature. 36, 166–192.

Hogben, L., 1938. Introduction - Prologema to Political Arithmetic, in: Hogben, L. (Ed.), Political Arithmetic: A Symposium of Population Studies. G. Allen & Unwin ltd., London.

Högskolan (Ed.), 1933. Wages, cost of living and national income in Sweden, 1860-1930, Stockholm economic studies. P. S. King, London.

Hollinger, W.C., 1954. National Income Estimates in the Statistical Policy of an Underdeveloped Area: A Comment. The Review of Economic Studies. 22, 220–225.

Howson, S., 2017. James Meade (1907-1995), in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Hull, C.H., 1900. Petty's Place in the History of Economic Theory. The Quarterly Journal of Economics. 14, 307–340.

Hull, C.H., 1899a. Petty's economic writings, in: Hull, C.H. (Ed.), The Economic Writings of Sir William Petty. Together with the Observations upon the Bills of Mortality, More Probably by Captain John Graunt. Edited by C. H. Hull.

Hull, C.H., 1899b. Petty's life, in: Hull, C.H. (Ed.), The Economic Writings of Sir William Petty. Together with the Observations upon the Bills of Mortality, More Probably by Captain John Graunt. Edited by C. H. Hull.

Ironmonger, D., 2012. Research note: What happened to time use during the Global Financial Crisis? Australian Journal of Social Issues 47.

Ironmonger, D., 1996. Counting outputs, capital inputs and caring labor: Estimating gross household product. Feminist Economics. 2, 37–64.

Jackson, E.F., 1951. The recent use of social accounting in the United Kingdom. Income and Wealth.

Jerven, M., 2013. Poor Numbers: How We are Misled by African Development Statistics and What to Do About it. Cornell University Press, Ithaca.

Johnson, E., 1937. Predecessors of Adam Smith: The growth of British economic thought. P.S. King & Son, London ; New York.

Johnson, E., 1936. Review of Mercantilism by Eli F. Heckscher and Mendel Shapiro. American Economic Review. 26.

Jordan, J., 2009. Machine-Age Ideology: Social Engineering and American Liberalism, 1911-1939, 1st edition. ed. University of North Carolina Press Enduring Editions.

Kaldor, N., 1941. Rationing and the Cost of Living Index. The Review of Economic Studies. 8, 185–187.

Kehoe, T., 1998. Social accounting matrices and applied general equilibrium models, in: Begg, I., Henry, S.G.B. (Eds.), Applied Economics and Public Policy, DAE Occasional Papers; Cambridge University Press, Cambridge.

Kelly, D., 2019. Malthusian moments in the work of John Maynard Keynes. The Historical Journal. 1–32.

Kenessy, Z. (Ed.), 1994. Keynes's How to Pay for the War. IOS Press, Amsterdam; Oxford.

Kennedy, P.M., 2017. The rise and fall of British naval mastery.

Kennedy, P.M., 1989. The rise and fall of the great powers: economic change and military conflict from 1500 to 2000. Fontana Press, London.

Kent, J., Young, J., 2013. International relations since 1945: a global history. Oxford University Press, Oxford.

Keynes, J.M., 2012a. The collected writings of John Maynard Keynes: The General Theory of Unemployment, Money and Interest, Reprint edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012b. The collected writings of John Maynard Keynes: A treatise on money: I The pure theory of money, Reprint Edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012c. The collected writings of John Maynard Keynes: The General Theory and after: Part 1. Preparation, Reprint edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012d. The collected writings of John Maynard Keynes: A treatise on money: II The applied theory of money, Reprint Edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012e. The collected writings of John Maynard Keynes: Essays in Persuasion, Reprint Edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012f. The collected writings of John Maynard Keynes: Activities 1939-1945: Internal War Finance, Reprint Edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012g. The collected writings of John Maynard Keynes: Economic Articles and Correspondence: Investment and Editorial, Reprint Edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 2012h. The collected writings of John Maynard Keynes: Activities 1931-1939: World Crises and Politics in Britain and America, Reprint Edition. ed. Cambridge University Press, Cambridge England ; New York.

Keynes, J.M., 1939. Official Papers. The Economic Journal. 49, 558–577.

Keynes, J.M., Robinson, E.A.G., 1939. War Economics and War Potential. The Economic Journal. 49, 625–625.

Keynes, J.N., 1904. The scope and method of political economy, 3rd rev. ed. Macmillan, London :, New York.

Khan, M., 2010. Political Settlements and the Governance of Growth-Enhancing Institutions [WWW Document]. URL http://eprints.soas.ac.uk/9968/ (accessed 23.2.18).

Kim, N., 2012. Historical Statistics of Korea: A Survey*. Korean Social Sciences Review. 2, 1–34.

Kim, N.N., Kim, J., 2015. Top Incomes in Korea, 1933-2010: Evidence from Income Tax Statistics. Hitotsubashi Journal of Economic. 56, 1–19.

Kindersley, R.M., 1939. British Overseas Investments, 1938. The Economic Journal. 49, 678–695.

King, D.S., 1987. The new right: politics, markets and citizenship. Macmillan Education, Basingstoke.

King, G., Barnett, G.E., Hollander, J.H., 1936. Two tracts by Gregory King, Reprint of Economic Tracts. Johns Hopkins Press, Baltimore.

Kurabayashi, Y., 1994. Keynes's How to Pay for the War, in: Kenessy, Z. (Ed.), The Accounts of Nations. IOS Press, Amsterdam; Oxford.

Kuznets, S., 1926. Cyclical fluctuations: retail and whole-sale trade, United States, 1919-1925. Adelphi, New York, USA.

Lacey, J., 2011. Keep from all thoughtful men: how U.S. economists won World War II. Naval Institute Press, Annapolis, Maryland.

Laughlin, J., 1899. The Economic Writings of Sir William Petty, Together with the Observations Upon the Bills of Mortality, More Probably by Captain John Graunt by Charles Henry Hull. J. Polit. Econ. 8.

Lawson, T., 2015. A concept of Social Ontology, in: Pratten, S. (Ed.), Social Ontology and Modern Economics, Economics as Social Theory. Routledge, Taylor & Francis Group, London ; New York, NY.

Lawson, T., 2003. Reorienting Economics. Routledge. https://doi.org/10.4324/9780203929964

Lepenies, P., 2016. The power of a single number: a political history of GDP. Columbia University Press, New York.

Leys, C., 2009. The Rise and Fall of Development Theory. Indiana University Press.

Lie, E., 2007. The "Protestant" View: The Norwegian and Scandinavian Approach to National Accounting in the Postwar Period. History of Political Economy. 39, 713–734.

Lindahl, E., Dahlgren, E., Kock, K., 1937. National Income of Sweden 1861-1930: Part I, Stockholm economic studies. Norstedt & Soner, London.

Lovejoy, A., 1948. Essays in the history of ideas. John Hopkins Press, Baltimore.

Low, D.A., Lonsdale, J., 2010. East Africa: towards the new order 1945-1963, in: Eclipse of Empire. Cambridge University Press, Cambridge.

Lynn, M., 2001a. Introduction, in: Nigeria, British Documents on the End of Empire. University of London Institute of Commonweath Studies: The Stationery Office, London.

Macekura, S.J., 2015. Of limits and growth: the rise of global sustainable development in the twentieth century, Global and international history. Cambridge University Press, New York.

Maddison, A., 2003. Macromeasurement Before and After Colin Clark. Australian Economic History Review, 44 (1), 1-34.

Maddison, A., 1994. Confessions of a chiffrephile. Banca Nazionale del Lavoro Quarterly Review, 47, 123–165.

Makower, H., Robinson, H.W., 1939. Labour Potential in War-Time. The Economic Journal. 49, 656–662.

Maloney, J., 1976. Marshall, Cunningham, and the Emerging Economics Profession. The Economic History Review. 29, 440–451.

Mamdani, M., 1996. Citizen and subject: contemporary Africa and the legacy of late colonialism, Princeton studies in culture/power/history. Princeton University Press, Princeton.

Marshall, A., 1910. Principles of economics: an introductory volume, 6th ed. London.

Marshall, A., 1892. [The Perversion of Economic History]: A Reply. The Economic Journal. 2, 507–519.

Masood, E., 2016. The great invention: the story of GDP and the making (and unmaking) of the modern world. Pegasus Books, New York.

McCloskey, D.N., 2018. The Two Movements in Economic Thought, 1700–2000: Empty Economic Boxes Revisited. Man and the Economy, De Gruyter. 5.

McCloskey, D.N., 1978. The Achievements of the Cliometric School. The Journal of Economic History. 38, 13–28.

McCormick, T., 2009. William Petty: And the Ambitions of Political Arithmetic. Oxford University Press, Oxford.

Meade, J.E., Stone, R., 1941. The Construction of Tables of National Income, Expenditure, Savings and Investment. The Economic Journal. 51, 216–233.

Meade, J.E., Stone, R.G., 1944. National income and expenditure. Oxford University Press:, H. Milford, London.

Meeks, G., 2017. Theories came and went, good data endured: Accounting at Cambridge, in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Meredith, M., 2011. The state of Africa: a history of the continent since independence, Rev. and updated ed. Simon & Schuster, London.

Middleton, R., 2004. Government and the Economy, 1860-1939, in: Floud, R., Johnson, P. (Eds.), The Cambridge Economic History of Modern Britain / Vol. 2: Economic Maturity, 1860-1939. Cambridge University Press, Cambridge.

Middleton, R., 1998. Charlatans or saviours?: economists and the British economy from Marshall to Meade. E. Elgar, Cheltenham.

Millmow, A., 2012. Colin Clark and Australia. History of Economics Review. 56, 56–70.

Mitchell, T., 2014. Economentality: How the Future Entered Government. Critical Inquiry. 40, 479–507.

Mitchell, T., 2005. The work of economics: how a discipline makes its world. European Journal of Sociology / Archives Européennes de Sociologie / Europäisches Archiv für Soziologie. 46, 297–320.

Mitchell, T., 1998. Fixing the Economy. Cultural Studies. 12, 82–101.

Mitchell, W.C., 1927. Business cycles: the problem and its setting, Publications of the National Bureau of Economic Research. National Bureau of Economic Research, Isaac Pitman, New York :, London.

Mitchell, W.C., King, W.I., Macaulay, F.R., Knauth, O.W. (Eds.), 1921. Income in the United States: its amount and distribution, 1909-1919, Publications of the National Bureau of Economic Research, incorporated. National Bureau of Economic Research, incorporated, New York.

Morgan, E.V., 1952. Studies in British Financial Policy, 1914-25. Macmillan and co., limited, London.

Morgan, M.S., 2011. Seeking parts, looking for wholes, in: Daston, L., Lunbeck, E. (Eds.), Histories of Scientific Observation. University of Chicago Press, Chicago, USA.

Morgan, M.S., 2008. “On a Mission” with Mutable Mobiles (SSRN Scholarly Paper No. ID 1497107). Social Science Research Network, Rochester, NY.

Morgan, M.S., 1990. The History of Econometric Ideas. Cambridge University Press.

Musgrave, R.A., 1959. The theory of public finance: a study in public economy. McGraw-Hill, New York.

Nason, J.M., Vahey, S.P., 2007. The McKenna Rule and UK World War I Finance. American Economic Review. 97, 290–294.

Nelson, R.R., 2002. Thoughts Stimulated by Reading Geoffrey Hodgson's Economics and Utopia. Review of Social Economy. 60, 109–113.

Newbery, D., 1998. Foreword, in: Begg, I., Henry, S.G.B. (Eds.), Applied Economics and Public Policy, DAE Occasional Papers; Cambridge University Press, Cambridge.

Nyamunda, T., 2017. British Sterling Imperialism, Settler Colonialism and the Political Economy of Money and Finance in Southern Rhodesia, 1945 to 1962. African Economic History. 45, 77–109.

Offer, A., 2017. Charles Hilliard Feinstein (1932-2004), in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Offer, A., 2008. Charles Feinstein (1932–2005), And British Historical National Accounts (MPRA Paper No. 9489). University Library of Munich, Germany.

Offer, A., 1993. The British empire, 1870-1914: a waste of money? The Economic History Review. 46, 215–238.

Offer, A., Söderberg, G., 2016. The Nobel factor: the prize in economics, social democracy, and the market turn. Princeton University Press, Princeton, New Jersey ; Oxford.

Okigbo, P.N.C., 1962. Nigerian national accounts, 1950-57. Federal Ministry of Economic Development, Enugu, Eastern Nigeria.

Oshima, H.T., 1957. National Income Statistics of Underdeveloped Countries. Journal of the American Statistical Association. 52, 162–174. https://doi.org/10.2307/2280842

Palmer, E., 1966. The meaning and measurement of the national income and of other social accounting aggregates. University of Nebraska press, Lincoln.

Pasinetti, L.L., 2007. Keynes and cambridge keynesians: A "revolution in economics" to be accomplished. Cambridge Univeristy Press, Cambridge.

Patinkin, D., 1976. Keynes and Econometrics: On the Interaction between the Macroeconomic Revolutions of the Interwar Period. Econometrica 44, 1091–1123.

Peden, G.C., 1996. Economic knowledge and the state in modern Britain, in: Green, S.D., Whiting, R.C. (Eds.), The Boundaries of the State in Modern Britain. Cambridge University Press, Cambridge.

Perham, M., 1960. Lugard the years of authority 1898-1945: The second part of the life of Frederick Dealtry Lugard later Lord Luggard of Abinger P.C., G.C.M., C.B., D.S.O. Collins, London.

Pesaran, M.H., 1991. The Et Interview: Professor Sir Richard Stone. Econom. Theory 7, 85–123.

Pesaran, M.H., Harcourt, G.C., 2000. Life and Work of John Richard Nicholas Stone 1913–1991. The Economic Journal. 110, 146–165.

Peters, G., 2001. Colin Clark (1905-89) Economist and Agricultural Economist. QEH Working Paper Series. 69.

Philipsen, D., 2015. The little big number: how GDP came to rule the world and what to do about it. Princeton University Press, Princeton.

Pigou, A.C., 1940a. The Measurement of Real Income. The Economic Journal. 50, 524–525.

Pigou, A.C., 1940b. War Finance and Inflation. The Economic Journal. 50, 461–468.

Pigou, A.C., 1922. Empty Economic Boxes: A Reply. The Economic Journal. 32, 458–465.

Pilling, D., 2018. The growth delusion: the wealth and well-being of nations. Bloomsbury, London Oxford New York New Delhi Sydney.

Polanyi, K., 1991. The Great Transformation: Political and Economic Origins of Our Time, eleventh printing. Beacon Press, Boston Massachusetts.

Prest, A.R., 1963. Review of Nigerian National Accounts, 1950-57. The Economic Journal. 73, 142–143.

Prest, A.R., 1960. Public finance in theory and practice. Weidenfeld and Nicolson, London.

Prest, A.R., 1953. The Role of National Income Estimates in the Statistical Policy of an Underdeveloped Area: A Comment. The Review of Economic Studies. 21, 223–228.

Preston, P., 2012. Theories of Development. Routledge.

Prévost, J.-G., Beaud, J.-P., 2012. Statistics, public debate and the state, 1800-1945: a social, political and intellectual history of numbers, Studies for the international society for cultural history. Pickering & Chatto, London.

Pugh, R.B., 1967. The Colonial Office, 1801-1925, in: Benians, E.A. (Ed.), Cambridge History of the British Empire. Vol.III: The Empire-Commonwealth, 1870-1919. Cambridge.

Pyatt, G., Round, J.I., 1977. Social Accounting Matrices for Development Planning. Review of Income and Wealth 23, 339–364. https://doi.org/10.1111/j.1475-4991.1977.tb00022.x

Rapley, J., 1997. Understanding development: theory and practice in the Third World. UCL Press, London.

Realistic Social Studies, 1938, Nature 141, 135–136. https://doi.org/10.1038/141135a0

Robbins, L., 1947. The Economic Problem in Peace and War : Some Reflections On Objectives & Mechanisms. Macmillan, Basingstoke.

Robertson, D.H., 1950. A Revolutionist's Handbook. The Quarterly Journal of Economics. 64, 1–14.

Robinson, E.A.G., 1951. The overall allocation of resources, in: Chester, D.N. (Ed.), Lessons of the British War Economy, National Institute of Economic and Social Research; Economic and Social Studies. Cambridge Univeristy Press, Cambridge.

Robinson, E.A.G., 1948. Foreword, in: Deane, P. (Ed.), The Measurement of Colonial National Incomes, National Institute of Economic and Social Research Occasional Papers. Cambridge University Press, Cambridge.

Robinson, E.A.G., 1939. The Problem of Wage Policy in War-Time. The Economic Journal. 49, 640–655.

Rose, N., O'Malley, P., Valverde, M., 2006. Governmentality. Annual Review of Law and Social Science. 2, 83–104.

Rostow, W.W., 1959. The Stages of Economic Growth. The Economic History Review. 12, 1.

Rothbarth, E., 1941a. Review of The Conditions of Economic Progress. The Economic Journal. 51, 120–124.

Rothbarth, E., 1941b. The Measurement of Changes in Real Income under Conditions of Rationing. The Review of Economic Studies. 8, 100–107.

Rothbarth, E., 1939. The Income and Fiscal Potential of Great Britain. The Economic Journal. 49, 626–639.

Ruggles, N.D., Ruggles, R., 1999. National Accounting and Economic Policy: The United States and UN Systems. Edward Elgar Publishing, Cheltenham.

Runciman, D., 2001. History of political thought: the state of the discipline. The British Journal of Politics & International Relations. 3, 84–104.

Rutherford, M., Desroches, C., 2008. The Institutionalist reaction to Keynesian Economics. Journal of the History of Economic Thought 30, 1, 29-38

Schenkel, A.F., 1995. The rich man and the kingdom: John D. Rockefeller, Jr., and the Protestant establishment, Harvard theological studies. Fortress Press, Minneapolis.

Schmelzer, M., 2016. The hegemony of growth: the OECD and the making of the economic growth paradigm. Cambridge University Press, Cambridge.

Schuknecht, R., 2010. British Colonial Development Policy After the Second World War: The Case of Sukumaland, Tanganyika. LIT Verlag Münster.

Scott, L., 2005. International history, 1945-1990, in: Baylis, J., Smith, S. (Eds.), The Globalization of World Politics: An Introduction to International Relations. Oxford University Press, Oxford ; New York.

Seager, H.R., 1900. Review of The Economic Writings of Sir , Together with Observations upon the Bills of Mortality, More Probably by Captain John Graunt. The Annals of the American Academy of Political and Social Science. 15, 145–149.

Seddon, D., 2008. The Labour Party and development, in: Desai, V., Potter, R.B. (Eds.), The Companion to Development Studies. Routledge, London.

Seers, D., 1953. [The Role of National Income Estimates in the Statistical Policy of an Underdeveloped Area]: A Rejoinder. The Review of Economic Studies. 21, 229–231.

Seers, D., 1952. The Role of National Income Estimates in the Statistical Policy of an Underdeveloped Area. The Review of Economic Studies. 20, 159–168.

Seim, D.L., 2013. Rockefeller philanthropy and modern social science, Studies in business history. Pickering & Chatto, London.

Seligman, E., 1899. Review of The Economic Writings of Sir William Petty; together with the Observations upon the Bills of Mortality. by John Grant and Charles Henry Hull. Political Science Quarterly. 14.

Sen, A., 1985. The Tanner lectures on human values: The Standard of Living.

Serra, G., 2014. An uneven statistical topography: the political economy of household budget surveys in late colonial Ghana, 1951–1957. Canadian Journal of Development Studies / Revue canadienne d'études du développement. 35, 9–27.

Shields, B., 2016. Mathematics, peace, and the cold war: Scientific diplomacy and richard courant's scientific identity. Historical Studies in the Natural Sciences. 46, 556–591.

Shipman, A., 2019. Wynne Godley: A Biography. Springer Berlin Heidelberg, New York.

Simey, T.S., 1961. The Contribution of Sidney and Beatrice Webb to Sociology. The British Journal of Sociology. 12, 106–123.

Singer, H.W., 1944. How Widespread are National Savings? A Critique of the Madge Enquiry. The Manchester School. 13, 61–79.

Singh, A., 2017. William Brian Reddaway (1913-2002), in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Singh, A., 2006. William Brian Reddaway 1913–2002, in: British Academy (Ed.), Biographical Memoirs of Fellows. V., Proceedings of the British Academy ; 138. Published for the British Academy by Oxford University Press, Oxford.

Skidelsky, R., 2004. John Maynard Keynes: 1883-1946: Economist, Philosopher, Statesman. Macmillan: Pan Books, New York.

Skinner, Q., 1988. Motives, intentions and the interpretation of texts, in: Tully, J. (Ed.), Meaning and Context: Quentin Skinner and His Critics. Polity Press, Cambridge, U.K.

Slater, L.J., 2004. EDSAC: Recollections on early days in the Cambridge Computing Laboratory. Journal of Economic and Social Measurement. 29, 119–122.

Sloman, P., 2015. The Liberal Party and the Economy, 1929-1964. Oxford University Press, Oxford.

Smith, A., 1776. An inquiry into the nature and causes of the wealth of nations. Printed for W. Strahan, and T. Cadell, in the Strand, London.

Speich, D., 2011. The use of global abstractions: national income accounting in the period of imperial decline. Journal of Global History. 6, 7–28.

Speich, D., 2008. Travelling with the GDP through early development economics' history Department of Economic History Working Paper series, London School of Economics and Political Science, London, UK 33. 08.

Stafford, J., 1940a. War Finance1. The Manchester School. 11, 36–46.

Stafford, J., 1940b. British War Controls—An Economic Comment. The Manchester School. 11, 142–162.

Stapleford, T., 2017. Econometrics, in: Bevir, M. (Ed.), Modernism and the Social Sciences: Anglo-American Exchanges, c.1918–1980. Cambridge University Press, Cambridge, pp. 39–76.

Stewart, I.G., 1954. National Income Estimates in the Statistical Policy of an Underdeveloped Area: A Further Comment. The Review of Economic Studies. 22, 226–227. https://doi.org/10.2307/2295880

Stolper, W.F., 1966. Planning without facts; lessons in resource allocation from Nigeria's development. Harvard University Press, Cambridge.

Stone, R., 1985. Richard Stone - Biographical, in: Odelberg, W. (Ed.), The Nobel Prizes 1984. Nobel Foundation, Stockholm.

Stone, R., 1984. Richard Stone - Prize Lecture: The Accounts of Society [WWW Document]. URL http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1984/stone-lecture.html (accessed 1.13.15).

Stone, R., 1981. The International Harmonisation of National Income Accounts. Accounting and Business Research. 12, 67–79. https://doi.org/10.1080/00014788.1981.9728791

Stone, R., 1978. Keynes, political arithmetic and econometrics, Proceedings of the British Academy Offprint. British Academy, London.

Stone, R., 1953. National income and national accounts : their construction and use in economic policy.

Stone, R., 1951a. The use and development of national income and expenditure estimates, in: Lessons of the British War Economy, The National Institute of Economic and Social Research: Economic and Social Studies. Cambridge University Press, Cambridge.

Stone, R., 1951b. The role of measurement in economics, University of Cambridge Department of Applied Economics Monographs. Cambridge University Press, Cambridge.

Stone, R., Champernowne, D.G., Meade, J.E., 1942. The Precision of National Income Estimates. The Review of Economic Studies. 9, 111–125.

Strange, S., 1996. The Retreat of the State: The Diffusion of Power in the World Economy. Cambridge University Press, Cambridge.

Strathern, M., 2000. Audit cultures: anthropological studies in accountability, ethics, and the academy, European Association of Social Anthropologists. Routledge, London ;New York.

Studenski, P., 1958. The income of nations; part one: history (with corrections and emendations). New York University Press, New York.

Studenski, P., 1958. The income of nations; part two: theory and methodology (with corrections and emendations). New York University Press, New York.

Suzuki, T., 2003. The epistemology of macroeconomic reality: The Keynesian Revolution from an accounting point of view. Accounting, Organizations and Society. 28, 471–517.

Szreter, S., 2012. Statistics and the public sphere: numbers and the people in modern Britain, c.1800–2000 – Edited by Tom Crook and Glen O'Hara. The Economic History Review. 65, 1174–1176.

Szreter, S., 2009. History, Policy and the Social History of Medicine. Social History of Medicine. 22, 235–244.

Szreter, S., 2007. The Right of Registration: Development, Identity Registration, and Social Security—A Historical Perspective. World Development. 35, 67–86.

Szreter, S., Kinmonth, A.L., Kriznik, N.M., Kelly, M.P., 2016. Health, welfare, and the state—the dangers of forgetting history. The Lancet 388, 2734–2735.

Thane, P., 2011. The making of National Insurance, 1911. The Journal of Poverty and Social Justice; Bristol.19, 211–219.

Thomas, J., 2017. Cambridge and Econometrics, in: Cord, R. (Ed.), The Palgrave Companion to Cambridge Economics. Palgrave Macmillan, London.

Tilley, H., 2011. Africa as a living laboratory: empire, development, and the problem of scientific knowledge, 1870-1950. University of Chicago Press, Chicago.

Tily, G., 2015. The national accounts, GDP and the "Growthmen": a review essay of Diane Coyle GDP: a brief but affectionate history 2013.

Tily, G., 2009. John Maynard Keynes and the Development of National Accounts in Britain, 1895–1941. Review of Income and Wealth 55, 331–359.

Tily, G., 2007. Keynes's general theory, the rate of interest and Keynesian economics. Palgrave Macmillan, Basingstoke.

Tinbergen, J., 1940. Econometric Business Cycle Research. The Review of Economic Studies. 7, 73–90. https://doi.org/10.2307/2967472

Tinbergen, J., 1939. Statistical testing of business-cycle theories, Series of League of Nations publications. II, Economic and financial. League of Nations, Economic Intelligence Service, Geneva.

Tomlinson, J., 2017. Managing the economy, managing the people: narratives of economic life in Britain from Beveridge to Brexit, First edition. ed. Oxford University Press, Oxford, United Kingdom.

Tomlinson, J., 1981. Problems of British economic policy, 1870-1945. Methuen, London ; New York.

Tooze, A., 2015. The deluge: the Great War, America and the remaking of global order, 1916-1931. Penguin, London.

Tooze, A., 2008. Trouble with Numbers: Statistics, Politics, and History in the Construction of Weimar's Trade Balance, 1918–1924. The American Historical Review. 113, 678–700.

Tooze, A., 2001. Statistics and the German state, 1900-1945: the making of modern economic knowledge, Cambridge studies in modern economic history ; 9. Cambridge University Press, Cambridge.

Tooze, A., 1999a. Weimar's Statistical Economics: Ernst Wagemann, the Reich's Statistical Office, and the Institute for Business-Cycle Research, 1925-1933. The Economic History Review. 52, 523–543.

Tooze, A., 1999b. La connaissance de l'activité économiques. Réflexions sur l'histoire de la statistique économique en France et en Allemagne 1914-1950, in: Zimmermann, B., Didry, C., Wagner, P. (Eds.), Le Travail et La Nation: Histoire Croisée de La France et de l'Allemagne. Maison des sciences de l'homme, Paris.

Tooze, A., 1998. Imagining national economies: national and international economic statistics 1900-1950, in: Cubitt, G. (Ed.), Imagining Nations. Manchester University Press, Manchester.

Toye, R., 1999. Keynes, the Labour Movement, and 'How to Pay for the War.' Twentieth Century British History. 10, 255–281.

Tribe, K., 2005. Constructing National Income in Britain, 1907-41. The History of Economic Thought. 47, 1–17.

Turner, S.P., 2015. Social Scientists as Experts and Public Intellectuals, in: Wright, J.D. (Ed.), International Encyclopedia of the Social & Behavioral Sciences. Elsevier, Amsterdam.

Ukelina, B.U., 2017. The Second Colonial Occupation: Development Planning, Agriculture, and the Legacies of British Rule in Nigeria. Lexington Books, Lanham.

Urrutia, M., 1988. New approaches to development planning, in: Urrutia, M., Yukawa, S. (Eds.), Development Planning in Mixed Economies. United Nations University, Tokyo, Japan.

Vaggi, G., Groenewegen, P.D., 2006. A concise history of economic thought: from mercantilism to monetarism, ed. Palgrave Macmillan, Basingstoke, Hampshire, New York.

Van Arkadie, B., Frank, C.R., 1969. Economic accounting and development planning: an introduction to general principles of accounting, input- output analysis, and national income accounts and their application to planning economic development, Rev. American ed. Oxford University Press, New York.

Vanoli, A., 2005. A History of National Accounting. IOS Press, Amsterdam.

Viner, J., 1935. Review of Mercantilism. by Eli F. Heckscher. The Economic History Review. 6.

Voll, S.P., 1975. Manpower and Education Planning in Underdeveloped Countries. Eastern Economic Journal. 2, 52–65.

Wagner, P., 2003. Social science and social planning during the twentieth century, in: Porter, R., Porter, T.M., Ross, D. (Eds.), The Cambridge History of Science: Volume 7, The Modern Social Sciences. Cambridge University Press, Cambridge.

Ward, M., 2004. Quantifying the world: UN ideas and statistics, United Nations intellectual history project. Indiana University Press, Indiana.

Waring, M., 1989. If Women Counted. Macmillan and co., limited, London.

Willcox, W., 1938. The Founder of Statistics. Revue de l'Institut International de Statistique / Review of the International Statistical Institute. 5, 4.

Wilson, T., Hopkin, B. (Eds.), 2000. Cairncross, Alexander Kirkland, 1911-1998, in: Biographical Memoirs of Fellows. V., Proceedings of the British Academy ; 105. Published for the British Academy by Oxford University Press, Oxford.

Yanovsky, M., 1965. Anatomy of social accounting systems. Chapman and Hall, London.

Young, W., Lee, F., 1993. Oxford economics and Oxford economists. Macmillan, Basingstoke.