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Empirical Microeconomics in Changing Times: A Reflection on 50 Years of IFS Research*

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Abstract

Since the publication of the Meade Report in 1978 and the establishment of the *Fiscal Studies* journal in 1979, IFS has been a world leader in the microeconomic analysis of tax policy. Here we document the growing importance of rigorous empirical analysis in our academic and policy research. We point to the expanding reach of IFS research outside the pure analysis of tax policy in the years following the Meade Report and the key role played by the ESRC Centre for the Microeconomic Analysis of Public Policy, established in 1991. This Centre provided the environment for long-term research across a wide set of fields that has enabled IFS to stay ahead in the policy debate and maintain a leading position in academic research. The breadth and depth of work in tax policy as it impacted on individuals, on families, on the labour market, on firms, on innovation, on retirement, on capital markets and on government revenues are exemplified through the Mirrlees Review.

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The expansion of IFS research into a broader set of areas, including health, child development and human capital, is captured through the recent launch of the Deaton Review on the causes and consequences of inequality, covering a broad set of inequalities and the challenges they bring to society, to policy and to research.

I. Introduction

Over the last 50 years, so much has changed in terms of the tools available to researchers. Large-scale data sets on individuals, families and firms have become available, and continual advances in computational power have made it feasible to estimate and simulate ever more sophisticated econometric models with these data. But at the same time, technological progress, globalisation and the digital revolution more generally have meant that the complexity and degree of interconnectedness of the processes that need to be modelled have also increased. Econometric methods have had to change and the types of questions that economists look at have changed as well. Those economists seeking to study and inform tax policy now look at a hugely diverse set of factors that relate to it, whether these are factors that suggest a need for policy change or factors that are direct or indirect consequences of tax policy changes.

The history of research at IFS encapsulates these developments and trends. At the point of our first substantive research contributions (the Meade Report in 1978 and the establishment of the *Fiscal Studies* journal in 1979), public economics research for tax policy purposes was largely theoretical or, if quantitative, typically used illustrative calculations based on representative households and firms or aggregate tax revenues. This began to change in the early 1980s with the first IFS Green Budget in 1982, the establishment of the tax and benefit simulation model TAXBEN also in 1982 and the publication of Dilnot, Kay and Morris (1984). This era represented the start of microsimulation research at IFS where a single year of detailed survey data was used to predict the distribution of effects of direct tax policy changes on a large representative sample of UK households, albeit under the assumption that their behaviour did not change.

Understanding individual agents' reactions to policy change – i.e. behavioural responses – was clearly a key challenge for researchers, and our ability to do this was limited. Even if we could use large data sets covering multiple years to estimate the kind of empirical models of economic behaviour that could allow us to understand people's choices and behaviour, these models had to be run on mainframe computers. Estimated parameters could then be brought down to the earliest personal computers and applied to a single year of data for policy simulation purposes. This all changed with the first 'micro-data revolution' at the very end of the 1980s, whereby computers became powerful enough, and data sets became plentiful and accessible enough, that we could

estimate and simulate models of behaviour from multiple years of household survey data on desktop computers, with rapidly increasing flexibility and numbers of covariates. Behavioural modelling had become a key goal of IFS research following the arrival of Richard Blundell as Research Director in 1986 and was therefore the main substance of our application to the Economic and Social Research Council (ESRC) for research centre funding shortly thereafter.

Following this, research capacity continued to increase exponentially. Desktop computers and computer software became powerful enough to estimate models of ever-increasing scale and complexity, allowing previous assumptions to be relaxed or interlinked processes to be modelled jointly. Data sets began to cover multiple dimensions – not just wages, hours of work or expenditures but also health, skills and cognition, family circumstances and subjective variables such as well-being, expectations for the future, or knowledge and information about the economy. Perhaps most importantly, data sets became longitudinal as opposed to cross-sectional, following individuals, families or firms over time and allowing researchers to build a much better understanding of dynamic processes and to make considerably more robust controls for potentially unobserved differences across people. And such data were becoming available for an increasingly large set of countries, thus increasing the types of economic and social institutions and the types of policy that could be studied. The nature of IFS research both broadened and deepened as a result, to the extent that the Mirrlees Review of tax policy in 2008 was able to provide immeasurably better quantitative evidence for the purposes of tax policy design than had the Meade Report 30 years previously.

Beginning around the same time as the Mirrlees Review was a second micro-data revolution, perhaps more commonly called the 'big data' revolution, whereby huge data sets either from administrative records covering all agents in the economy, or from high-frequency high-dimensional transaction data on large samples of consumers, became available to researchers under various types of secure access arrangements. Sometimes, this allows researchers to document and study the 'universe' of agents in the economy. In other cases, linkages between such administrative or transactional data sets and traditional household surveys allow researchers to study topics with a much greater degree of precision and granularity than previously possible. Once again, IFS researchers have been at the forefront of bringing evidence from these new forms of data and data sets to policy analysis.

In this paper, we review some of the key research contributions of the Institute over the last 50 years. We present our own perspective on the history but should note from the outset that we are only two of the many academics who have been involved at the Institute, which has always been a highly collective and collaborative lab-type research environment. Many other of the key researchers have contributed other papers to this special issue. A particular acknowledgement should go to the rest of the IFS Research Directors and CPP

Co-Directors over the years – in broadly chronological order: Ian Walker, Mike Devereux, Steve Bond, Costas Meghir, Orazio Attanasio, Rachel Griffith, Ian Crawford, Imran Rasul, Eric French, Martin O'Connell, Monica Costa Dias and Fabian Postel-Vinay – not just for their individual contributions but also for their role in shaping the Institute's research agenda, and then obtaining funding for, and subsequently supporting, much of the Institute's research.

We choose to present our summary through the lens of three major research initiatives. Taken together, they illustrate exactly how the research has both deepened and broadened, whether in terms of its methods or its aims, in order to keep up with these changing times and to take advantage of the ever-better data resources and computational methods. Each of these three initiatives – the ESRC Centre for the Microeconomic Analysis of Public Policy at IFS, the Mirrlees Review into taxation, and the recently established Deaton Review into inequalities in the UK – is dealt with in turn before we finish with some brief concluding thoughts in Section V.

II. Microeconometric research and the micro-data revolution: the ESRC Centre at IFS

The ESRC Centre for the Microeconomic Analysis of Public Policy (CPP) was established at IFS in 1991 and has been the fundamental reason that IFS has been able to carry out internationally leading economic research and to integrate it with policy analysis. It gives us the ability to commit substantial resources of time and effort to the underlying research and scientific base, methodology, data and models that underpin our contribution to policy. The long-term nature of the Centre funding has allowed us to invest in generating new knowledge, developing new areas of research, training new researchers and policy analysts, analysing new data sets and building new models. And ultimately, it allows IFS researchers and research associates to bring fruits of these investments to policy debate, either directly or through interactions with commentators and policymakers.

It was CPP funding that led to IFS being at the forefront of the (first) micro-data revolution in economics, and allowed us to promote and facilitate the use of microeconometric evidence in policy design, analysis and evaluation. The first Centre research proposal, written back in the late 1980s when IFS was 'only' 20 years old, was built around our plans for the estimation and simulation of individual- and firm-level responses to direct and indirect taxation. Amongst other things, we proposed to exploit the then relatively untapped resources of the Family Expenditure Survey and company accounts data which were still, at the time, accessible only on mainframe computers but just about to become accessible to researchers on desktop computers as a result of developments in computer hardware and software but also new innovations in the way that economic and social data were archived and made available to researchers.

Whilst the nature and scope of our work and the data we access have changed immeasurably since that original proposal, the overarching objectives of the Centre and, by extension, of IFS have always been, and will continue to be, those expressed in that original proposal – namely: (a) to make major scientific progress in understanding how individuals and firms behave and how they react to government policy and, more generally, to the economic and institutional environment; (b) to ensure this knowledge is used to have substantial positive impact on the operation and evaluation of policy across a broad range of areas including inequality, taxation, labour markets, welfare, pensions and, more recently, education, productivity, public finances, health and development; and (c) to build technical and policy capacity by training a new generation of highly skilled researchers.

But within these broad objectives, the IFS research agenda has evolved to stay in tune with the key scientific and policy priorities of the day, pushing the frontiers of knowledge and methodology, and making use of new data and tools as they become available, as well as developing new ones. Hence, the IFS and CPP research agenda has covered a broad spread of topics in applied labour and public economics, with particular focus on: inequality, poverty and living standards; retirement and savings; taxes and welfare benefits; human capital, education and skills; consumer behaviour; and innovation and productivity.

In recent years, our research has also broadened to look at many issues in public services and the various demands on public expenditure, including education spending, healthcare spending and the provision of healthcare services, devolved taxes and spending, and work relating to police funding, criminal offending behaviour and criminal justice. Looking forwards, this is a trend that is set to continue.

1. Inequality, poverty and living standards

Analysing how the distribution of income, consumption and wealth shapes inequality, poverty and living standards has always been a central area of our research, providing key insights into the determinants and dynamics of economic inequality. Early research at IFS showed the key role of redistribution.[1] We will return to a broader discussion of inequality, or more precisely inequalities, in Section IV, but one significant and highly influential early contribution was to document the stark rise of UK income inequality in the 1980s in a precise and consistent way over time.[2]

Our work at that time also looked into inequality in more depth. As one example, we showed how permanent changes in income (for example, changes in the return to certain skills caused by technical progress) and more short-lived

[1]For example, Morris and Preston (1986).
[2]Goodman and Webb, 1994.

events (for example, temporary layoffs) are eventually reflected in changes in consumption inequality. Using micro data on consumption, income and earnings, we studied mechanisms such as social insurance, savings and family labour supply, as well as market interactions that can mitigate the consumption response to these unexpected events. Results, based on the study of the joint dynamics of consumption and income inequality, were published in the mid 1990s[3] and then taken forward to develop the idea of partial insurance[4] and interpreted in terms of the specific market frictions that prevent complete insurance.[5] This work has been widely cited and spawned a new literature examining the dynamics of inequality, linking inequality in the labour market to consumption inequality, drawing out the importance of labour supply, credit and insurance markets, and the tax and welfare system. Throughout, we were very much concerned about the measurement of household and individual welfare as it enters into inequality and poverty indices. An edited volume on the measurement of household welfare[6] brought together work from the early 1990s on subjective measures of well-being, collective models of household welfare and life-cycle welfare approaches.

Along similar lines, and building on this earlier work, we published many other influential studies, including those looking at the role of income or employment risk,[7] the recent history of consumption inequality[8] and family labour supply.[9] The increasing importance of labour market inequality was at the heart of our research from the outset with work on wage inequality[10] and the key study documenting changes in the distribution of male wages.[11] From a theoretical point of view, this work used economic theory to identify the role played by various types of markets and their frictions, thus placing IFS research at the very forefront of the literature on the micro foundations of macroeconomics.

Methodologically, these results relied on our having developed an understanding of pseudo-panel data, panel data dynamics and econometric estimators for longitudinal data sets[12] in order to be at the frontier of the micro-data revolution and bring robust statistical evidence to bear on the topics of policy interest where new data were becoming available. Methodological developments in microeconometrics continued to be at the centre of our research, and the establishment of Cemmap – the Centre for Microeconometric

[3] Attanasio and Davis, 1996; Blundell and Preston, 1996 and 1998.
[4] Blundell, Pistaferri and Preston, 2008.
[5] Attanasio and Pavoni, 2011.
[6] Blundell, Preston and Walker, 1994.
[7] Banks, Blundell and Brugiavini, 2001; Meghir and Pistaferri, 2004; Low, Meghir and Pistaferri, 2010.
[8] Attanasio and Pistaferri, 2014.
[9] Blundell, Pistaferri and Saporta-Eksten, 2016.
[10] Meghir and Whitehouse, 1996.
[11] Gosling, Machin and Meghir, 2000.
[12] For example, Blundell and Bond (1998).

Methods and Practice – in 2000 with Andrew Chesher as Director has provided the focus for what has become the world-leading centre in microeconometrics both in research and in capacity building, with numerous conferences, masterclasses and courses.

This research provided the backbone to our public policy work on inequality and poverty, including our annual audit of poverty in the UK,[13] which is widely quoted in the media and policy documents. We regularly bring key theoretical or econometric evidence to the fore as part of the way in which we chart and explain inequality in wages, earnings, incomes and consumption for the UK and other countries, as well as using the econometric models to understand how inequality will be affected by policy reforms. We examine the effectiveness of a wide range of policies aimed at reducing poverty, including taxes and benefits, and other types of policy interventions. This work has had a major impact in the policy debate on children and inequality, the role of lone parents, pensions, education, and inequality and the role of tax and welfare reform.

Finally, in keeping with the gradual broadening and interconnectedness of research communities around the world and the increased availability of micro data internationally, we now have a track record of work on risk pooling, transfers and poverty alleviation in developing countries, including designing and studying interventions such as conditional cash transfer programmes related to health or education, and in-kind transfers designed to help poor households.[14] Our analysis of poverty and living standards in developing countries has had important policy impact – for example, the evidence generated on the long-run impacts of asset transfers to ultra-poor households is being used outside of academia by multiple research partners as well as by other organisations that implement, support and advocate for the asset transfers approach around the globe.

2. Retirement and savings

As the populations of many countries age, it is more important than ever that the pension system enables and encourages people to provide for their own retirement, while also helping those who reach retirement without enough wealth to maintain an acceptable standard of living. These objectives frequently, and perhaps inherently, conflict. Our research has studied individual and employer behaviour, and the impact of various actual and proposed government reforms.

Pensions provide insurance against adverse health, survival and earnings events and help the elderly maintain an acceptable standard of living. However, state pension provision potentially distorts saving and labour supply decisions,

[13] HBAI, various years.
[14] Attanasio, Meghir and Santiago, 2012; Bandiera et al., 2017.

creating important trade-offs for policymakers considering pension design. Research at the Centre has contributed to this debate, quantifying these trade-offs and measuring the well-being of the elderly. Early research measured the ways in which government pensions can discourage employment,[15] we used pension reforms in both the UK and other countries to estimate precisely the extent to which government pensions do crowd out private pensions,[16] finding that the crowd-out is less than complete, and we carried out multiple studies of specific aspects of UK pension reform and the incentives that were created or changed as a result.[17] With added computational power and better data, we were able to use dynamic structural models that account explicitly for various risks, and showed that minimum benefits for retirees provide valuable insurance and should be larger than at present.[18] Recent research at the Centre has also shown that pension design problems are particularly important in middle-income countries, where those who work in the informal sector are not covered by the pension system.[19]

Looking more generally than just at pensions, the issues surrounding the adequacy of retirement savings and the distribution of wealth have formed a core part of our work for many years. Early research was hindered by data that were either entirely absent or of patchy quality and coverage, although we still produced some of the first distributional analysis of wealth, savings and portfolios for the UK[20] and we were able to assess the adequacy of retirement savings by looking at consumption changes on retirement, showing that much of the fall in spending upon retirement can be explained by lower work-related spending.[21]

Motivated by this, we started to engage in calling for better data and then designing and collecting such data. We were at the forefront of driving forward new data collection on ageing, working with colleagues in epidemiology and sociology to found the English Longitudinal Study of Ageing (ELSA), the leading panel data source for ageing research in the UK, and then also using the accumulated knowledge on designing and collecting wealth data to advise the Office for National Statistics (ONS) with the design of the Wealth and Assets Survey. We were able to provide the first comparison of the distribution of financial wealth in the UK with that in the US,[22] and then subsequently develop more nuanced analysis of the changing distribution of wealth using

[15] Meghir and Whitehouse, 1997.
[16] Attanasio and Rohwedder, 2003.
[17] For example, Disney and Whitehouse (1996) or our various contributions to the NBER International Social Security project (e.g. Gruber and Wise, 1999 and 2004).
[18] De Nardi, French and Jones, 2016.
[19] Attanasio, Meghir and Otero, 2014.
[20] Banks and Blundell, 1994; Banks, Dilnot and Low, 1995.
[21] Banks, Blundell and Tanner, 1998.
[22] Banks, Blundell and Smith, 2003.

the Wealth and Assets Survey[23] and the adequacy of retirement savings.[24] More generally, our programme of work on the distribution of wealth and its implications for future retirement incomes provided key evidence for the 2006 Pensions Commission and more recently the DWP Framework for the Analysis of Future Pension Incomes. And the data-related collaborations with researchers from other disciplines have taken us into other research areas when it comes to looking at ageing outcomes. As a leading example, they have led to innovative and highly influential international comparative research, finding that English individuals near retirement age are in considerably better health than their American counterparts.[25]

3. Tax and benefit reform

Work on the impact and reform of taxation and welfare benefits has been at the heart of the CPP's research since its inception. The increased adoption of means-tested benefits and tax credits in the UK and elsewhere has refocused employment policy on creating incentives for lower-skilled individuals to gain and retain employment. A key innovation was to use detailed micro data and develop new microeconometric techniques with simulation methods to construct policy simulation models and to incorporate behavioural responses. This work has been hugely influential in the academic world and in the policy debate. Underpinning this research was our infrastructural investment in the detailed series of micro data on families' circumstances and the tax and benefit microsimulation model TAXBEN.

Particularly important has been research on labour supply responses, especially given reforms in the UK to in-work benefits aimed at incentivising individuals in low-income families into work and supporting earnings in work. This microeconometric research on household behaviour set the agenda for academic research worldwide. Early work on taxation and labour supply was at the core of this research.[26] A breakthrough paper[27] was the culmination of a line of research and won the Frisch Prize in 2000 awarded to the best applied paper published in *Econometrica*. We subsequently extended this research to establish clear differences in labour supply responses at the extensive and intensive margins and developed new methods allowing for unobserved heterogeneity across families, for fixed costs of work and for stigma costs in the take-up of tax credits and welfare benefits. Labour supply decisions within the family have become a growing part of our research, and are of particular relevance given the importance of reforms to in-work benefits and childcare

[23] Crawford, Innes and O'Dea, 2016.
[24] Crawford and O'Dea, 2020.
[25] Banks et al., 2006.
[26] Blundell, 1992.
[27] Blundell, Duncan and Meghir, 1998.

subsidies. This work was essential to the impact analysis of policy proposals, including the well-cited analysis of the working families' tax credit reform.[28]

Our research on taxation has fundamentally changed the public debate about tax policy and has had direct consequences for tax legislation on personal taxation and the taxation of savings, corporations and property. The academic papers cited above provided some of the key scientific evidence for the tax reform proposals in the Mirrlees Review of tax reform and went on to have significant impact on policy, discussed in more detail in Section III below.

4. Human capital, education and skills

Developing human capital is critical for improving growth and productivity, as well as for reducing inequality and poverty, in both developed and developing countries. An important strand of IFS research focuses on the process of human capital formation as a whole, recognising that the effectiveness of certain types of interventions to foster it might depend crucially on what happens in early life. We have examined the mechanisms of human capital development in the early years of life and how different traits, such as cognitive and socio-emotional skills, interact with parental inputs and other environmental factors over the life cycle.[29] Parental investment is important and can interact crucially with other investments over the life cycle, from early childcare and pre-school education, through to primary and secondary schooling, higher education and adult learning. Consequently, we have studied the drivers of parental behaviour, which range from financial resources to attitudes and beliefs, as well as the impact of parenting interventions, in developing countries, showing that parental behaviour is a crucial driver of the intergenerational transmission of skills and economic capabilities.[30]

Using the detailed longitudinal data in the UK cohort studies, we established the pattern of returns to educational investments while allowing for differences in family background and ability measures.[31] A related and influential piece of research looked at the effect of school-starting age.[32] And we have uncovered a strong complementarity in the returns to formal education when young and to on-the-job human capital investment.[33]

Another important strand of our research on human capital has looked at the role of school quality – for example, by using data from the British National Child Development Study to investigate the effect of pupil–teacher ratios and type of school on educational attainment.[34] In related work, CPP

[28] Blundell and Hoynes, 2004.
[29] For example, Attanasio, Meghir, Nix and Salvati (2017).
[30] Attanasio et al., 2014.
[31] Blundell, Dearden and Sianesi, 2005.
[32] Crawford, Dearden and Greaves, 2014.
[33] Blundell et al., 2016.
[34] Dearden, Ferri and Meghir, 2002.

researchers used novel measures of teacher quality, and data from a field experiment in Ecuador, to identify the role played by the former in early child development.[35] We have also looked at the impact of training programmes for young unemployed people and produced one of the first studies of the long-run (10-year) impact of one such programme.[36]

5. Consumer behaviour

Over the years, our research has made a major contribution to the understanding of the choices consumers make over which goods and services to purchase, the sensitivity of their decisions to changes in taxes and prices, the interdependence of decisions made by firms and those made by consumers, and the implications of all of these factors for government policy and for the wider economy. Early research showed the importance of non-linearities in consumer demand analysis[37] and proposed the use of an easy-to-implement yet integrable demand system – the Quadratic Almost Ideal system.[38] This allowed researchers to consider heterogeneity between rich and poor consumers, which had up to that point been relatively unstudied. Such heterogeneity is important, allowing for different goods to potentially behave as luxuries or necessities at different levels of income and therefore for indirect taxes to differentially affect poorer consumers. This research has been cited extensively and has become a standard tool in applied consumer demand analysis worldwide. Not only was this work extremely influential in consumer demand analysis, consumer surplus estimation and cost-of-living assessment, but it has also been influential in public economics and microeconometrics and formed the backbone of applied indirect tax analysis and the study of consumption taxes.

By emphasising that models could be made more flexible and allow for heterogeneity whilst still remaining coherent with economic theory, this CPP research also jump-started major research in three separate strands of empirical microeconometrics: non- and semi-parametric structural models; endogeneity in structural models; and methods for large demand systems. Subsequent research at the Centre on non-parametric revealed preference has created a new body of work using micro-data-based models to uncover new aspects of consumer behaviour.[39] Concerns about heterogeneity of responses and non-linearity in consumer behaviour have been a focus of recent work.[40]

An important line of this research explored the interaction between labour supply and consumption through the explicit modelling of non-separable

[35] Araujo et al., 2016.
[36] Attanasio, Guarin, Medina and Meghir, 2017.
[37] Blundell, Pashardes and Weber, 1993.
[38] Banks, Blundell and Lewbel, 1997.
[39] For example, Blundell, Browning and Crawford (2003 and 2008) and Crawford (2010).
[40] Blundell, Kristensen and Matzkin, 2014; Blundell, Horowitz and Parey, 2017.

preferences over consumer demands and commodity demands. One paper used the repeated cross-sections of the Family Expenditure Survey to explore these non-separabilities, placing household decisions in a life-cycle consistent framework.[41] Another used conditional demands to explore the impact of hours and employment within the family on consumer demands.[42] A third study examined the interplay between saving decisions and consumer demand.[43] And a fourth placed the non-separability of work and consumption in an intertemporal setting with choices over consumer demands, hours of work and employment.[44] This work provided a key link with our research on life-cycle saving decisions and the dynamic models of consumption and labour supply in our work on inequality dynamics and life-cycle living standards described above.

CPP research has also explored what drives large international differences in food purchasing and calorific intake, showing that interaction between prices, incomes and differences in food preferences is needed to explain cross-country differences.[45] Our research has also considered the interrelation between consumers and firms. The impact of policies that seek to influence consumer choice through advertising or altering prices has been analysed in studies of the introduction of a nutrient tax[46] and of how placing restrictions on advertising affects prices, purchases and hence diet quality and welfare.[47]

6. Productivity and innovation

Long-term increases in living standards and well-being depend on sustained growth in productivity. This in turn depends on investment, innovation and the allocation of resources. Centre research has made important contributions to the understanding of how product market competition, firm structure, spillovers and agglomeration of activities interact with investment to drive innovation and productivity.

Work at the outset of the CPP laid the groundwork for the panel data analysis of company investment and employment behaviour, bringing together longitudinal data from company accounts to create an unbalanced panel of company investment[48] and developing new dynamic panel data methods for company panel data.[49]

[41] Blundell and Walker, 1986.
[42] Browning and Meghir, 1991.
[43] Blundell, Browning and Meghir, 1994.
[44] Blundell, Meghir and Neves, 1993.
[45] Dubois, Griffith and Nevo, 2014.
[46] Griffith, Nesheim and O'Connell, 2018.
[47] Dubois, Griffith and O'Connell, 2017.
[48] Blundell et al., 1992.
[49] Arellano and Bond, 1991; Blundell and Bond, 1998.

Economists have long been interested in the relationship between competition and innovation. Early empirical work suggested that innovation increased with competition.[50] However, economic theory was largely at odds with this. To reconcile these conflicting views, research at the Centre brought together leading economics theorists with state-of-the-art econometric modelling to re-examine this relationship and provided new insights on the relationship between innovation, competition and growth.[51]

In an increasingly global world, it matters not only how much firms are investing and what they are investing in, but also where they are investing. The Centre was the home to much of the seminal work on how taxes affect firm location choices. This included important work on how to measure tax incentives[52] and how to model firm location choices.[53] Later work built on this to estimate how the location of intellectual property responds to corporate taxation.[54]

Once again, in this area, our empirical findings and associated expertise have directly informed policy debates. For example, our work has been central to discussions about the introduction of an R&D tax credit,[55] and our analysis was used in debates about the introduction of Patent Boxes in the UK[56] and across Europe[57] and went on to affect their subsequent redesign. Our research has also contributed to industrial policy and a better understanding of the UK's current productivity puzzle.[58]

III. Tax policy and tax reforms: from Meade to Mirrlees

It was late in 2006 that Richard Blundell (the then IFS Research Director), Robert Chote (the then IFS Director) and John Vickers (the then IFS President) first discussed bringing together what we had learned about tax reform at IFS over the past 25 years or so. It was soon to be the 30th anniversary of the Meade Report, which effectively launched IFS as an economics policy research institute. In its time, the Meade Report had been a seminal review of the UK tax system, the fruits of a commission chaired by the Nobel Laureate Professor James Meade, with John Flemming, John Kay and Mervyn King as 'junior' researchers.

In some important respects, the UK tax system had evolved in the way that the Meade Report recommended, especially in regard to the taxation of

[50] Blundell, Griffith and Van Reenen, 1999.
[51] Aghion et al., 2005.
[52] For example, Devereux, Pearson and Sørensen (1991).
[53] Devereux and Griffith, 1998.
[54] Griffith, Miller and O'Connell, 2014.
[55] Bloom, Griffith and Van Reenen, 2002.
[56] Griffith, Miller and O'Connell, 2010.
[57] Evers, Miller and Spengel, 2014.
[58] See, for example, Blundell, Crawford and Jin (2014) and Barnett et al. (2014).

savings and pensions, but it remained the product of often incoherent piecemeal changes rather than strategic design. The tax system had also struggled to adapt to profound changes in the economic, social and institutional environment in which it operates. And tax design had not benefited as much as it could from advances in empirical understanding of the way features of the system influence people's behaviour. As discussed in Section II, in the period from the publication of the Meade Report, IFS research had helped define the frontier of empirical analysis of behavioural responses to tax and benefit reform.

In 2006, we felt that the time was ripe once again to ask an expert commission to reflect on the research we and others had undertaken and take a hard look at the tax system: to try to identify the characteristics that would make for a good tax system in an open economy in the 21st century and to suggest how the British tax system in particular might be reformed to move closer to that ideal. There was only one person who could be the Chair of such a review, and that was Jim Mirrlees. He would bring the rigour, the independence and the academic credibility. After all, his work had provided the key insights for the vast majority of the theoretical developments on tax over that period, and his framework had also provided the structure for the explosion of recent empirical analysis of welfare-improving reform. But would Jim agree to do it? Well, to our delight, he jumped at the idea! Together with Jim, a small 'Mirrlees Review' editorial group was formed – comprising Stuart Adam, Tim Besley, Richard Blundell, Steve Bond, Robert Chote, Malcolm Gammie, Paul Johnson, Gareth Myles and Jim Poterba.

Whilst the Meade Report focused largely on direct taxes, the Mirrlees Review set out to look across the whole tax system. Indeed, the view that the tax system needs to be seen as a whole underlined the entire approach of the Mirrlees Review and underpinned IFS research more generally. And whilst we retained a clear focus on the UK, like IFS research in general we tried to ensure that our conclusions were relevant internationally and we took more than just a UK-centred approach.

As we put together the arguments for tax reform, the financial crisis unfolded, changing the entire economic landscape. At first, we thought the conclusions of the Review would not survive such a tumultuous period in the economic lives of the majority of developed countries and their peoples. But we were wrong. The pressures on tax revenues and the strains on the tax system resulting from the crisis underlined the need for a tax system that redistributes effectively and taxes efficiently.

The Mirrlees Review has become a blueprint for reform. It is read on the screens (and sits on the shelves) of policymakers and policy researchers around the world. It has been the foundation reference for many tax proposals and continues to be so. Taking a holist approach to reform and recognising the complexity of interactions between the different parts of the tax system, the Review presented a comprehensive reform agenda. By separating the reform of

personal income taxation, value added taxation, capital taxation, the taxation of housing etc. into a sequence of integrated but bite-sized analyses, it provided an attractive and accessible framework for coherent reform.

Steeped in the empirical tradition of IFS research, the analysis in the Review was based on solid evidence drawn from the research at the ESRC Centre described in Section II above. It adopted the Mirrlees approach to the trade-off between inequality and efficiency as a framework for organising thinking. With increasing focus on inequality together with the clear requirement for efficient design, this approach could not be more relevant to today's needs. The empirical underpinning of the analysis places it firmly in the real world, recognising the differences across individuals and firms in the way they interact with the tax system.

That does not mean to say that all the suggestions of the Mirrlees Review have been implemented or are universally accepted. There continue to be many (far too many) examples from around the world of poorly designed reforms to tax systems. Important new evidence and new theory have also emerged since the final report was published in 2011. But the underlying ideas laid out in the Review largely still stand. Arguing the case for coherent tax reform is never ending. The Review remains key evidence in the case for reform.

From the outset, the intention of the Review was to take a 'big picture' view of tax design, asking what society wants the tax system to achieve and how best it might be structured to accomplish that. In the final report,[59] we tried both to set out an overarching vision for the tax system and to suggest some desirable incremental reforms. The starting point was to look at the economics of the tax system, although we received a great deal of useful input from tax lawyers, advisers and practitioners, as well as those involved currently and in the past with the practicalities of tax design and implementation. Of course, some of those who spend most of their time thinking about tax design and implementation from these perspectives might have identified different priorities and have taken different approaches if they had undertaken this review themselves. Economists cannot claim to have all the answers to good tax design, but thinking hard about the economics of the tax system is essential if it is to work effectively.

The Mirrlees Review aimed at developing a broad set of characteristics that defined a good tax system and, in so doing, providing a set of recommendations for tax reform in modern open economies. The Review comprised of two volumes, published by Oxford University Press and free online. The first volume – *Dimensions of Tax Design*[60] – was the book of ideas and evidence, with expert evidence across a wide range of aspects of tax reform. This volume brought together the top tax and public finance economists in the

[59]Mirrlees et al., 2011.
[60]Mirrlees et al., 2010.

world, matching them with young empirical researchers at IFS. We thought of some 25 names – all the great names, in fact: the likes of Alan Auerbach, Peter Diamond, Jerry Hausman, John Kay, Emmanuel Saez, Joel Slemrod, Nick Stern and many more. It turned out to be a giant volume – over 1,300 pages. All of the 63 authors who contributed to *Dimensions* played an important part in forming and developing the ideas that underlie our conclusions, both through the contributions they wrote and through the many discussions we had with them. Our thoughts and views were also influenced over the period of this review by discussions at conferences, seminars, meetings and presentations far too numerous to list.

The second volume – *Tax by Design*[61] – was written by the editors and aimed at providing an integrated picture of policy reform, not the kind of piecemeal approach seen in much of the recent policy reform. The motivation came from a desire to examine the complete tax system, including personal taxes, corporate taxes and indirect taxes, and to do this in the context of new evidence, new theory and a new economic environment. How should we design a tax system that can raise the revenue that government needs to achieve its spending and distributional ambitions whilst minimising economic and administrative inefficiency, keeping the system as simple and transparent as possible, and avoiding arbitrary tax differentiation across people and forms of economic activity? The book framed the proposals by suggesting that a useful benchmark should be a progressive, neutral tax system. Each of the three key words of that formula – 'progressive', 'neutral' and 'system' – is important.

Three of the key findings of the Review were:

(i) *The need to think of the tax system as just that – a system.* The way that different taxes fit together matters, as does being clear about the role of each tax within the system.
(ii) *The central role of redistribution in the tax and benefit system.* The extent of that redistribution will be determined by society's preferences and the impact of the system on efficiency. The trade-off between redistribution and efficiency is at the centre of many debates about tax policy.
(iii) *The importance of neutrality as a benchmark.* While we often will want to deviate from neutrality, it is often valuable and will always be an important benchmark for assessing the system.

First, consider the system as a whole. This simple imperative is nearly always ignored in practice. Thinking of the system as a whole has at least three important consequences. First, it implies that it is the overall effect of the system on, for example, redistribution or polluting activity that matters. Not

[61] Mirrlees et al., 2011.

every tax needs to be 'greened' to tackle climate change as long as the system as a whole does so. And not all taxes need be progressive as long as the overall system is. In general, the right tools for achieving distributional objectives are direct personal taxes and benefits. Since the rates on these can be adjusted to achieve the desired degree of progressivity, other aspects of the tax system can be focused on achieving efficiency. Second, thinking of the system as a whole should lead us always to consider how the different parts of it work together. Too often, policies on corporate taxes, personal income taxes and taxes on savings are designed almost in isolation. The result is inefficiency, complexity and opportunities for avoidance. Third, a good tax system should be structured to meet overall spending needs. Earmarking of revenues for particular purposes should be avoided. It is very difficult to justify linking spending on particular items to receipts from particular taxes.

Second, consider neutrality. A neutral tax system is one that treats similar activities in similar ways. For example, a system that treats all income in the same way achieves neutrality over the choice of the form in which income is received. A system that taxes all forms of savings in the same way achieves neutrality over the form in which households save. The tax system in the UK, like that of most modern economies, is full of non-neutralities which are difficult to justify and are likely to create welfare losses. It distorts choices between debt and equity finance, between capital gains and other forms of capital income, between owner-occupied housing and other assets, between different forms of remuneration for work effort, between different forms of carbon emissions and between different forms of business organisation. These distortions create complexity, encourage avoidance, and add costs for both taxpayers and governments.

A tax system that treats similar economic activities in similar ways will tend to be simpler, avoid unjustifiable discrimination between people and economic activities, and help to minimise economic distortions. But a neutral tax system is not always a good one: in some cases, the efficient policy must discriminate between different activities – for example, taxes on alcohol and tobacco and on activities that damage the environment. In such cases, there is a compelling case that people left to their own devices will behave in ways that harm themselves and others. Moreover, there is ample evidence that the individual behaviours in question can be influenced by tax policy. Similar exceptions apply to pension saving and to research & development (R&D), where society wishes to encourage behaviour that may have high social returns. There are somewhat subtler arguments applying to goods associated with work (such as childcare), where there is a case for a more lenient tax treatment in order to offset the disincentive to work created by the tax system as a whole. But such arguments must be treated with healthy caution. Even if a theoretically compelling case can be made, the advantages of departing from neutrality must be weighed against the disadvantages of complicating the tax

system. Defining and policing boundaries between differently taxed activities is fraught with difficulty: it increases administrative and compliance costs, and creates perverse incentives to label one kind of activity as another. Hence, the hurdle for departing from neutrality should be high, requiring a strong and clear justification. This test is likely to be passed by relatively few items, such as environmentally harmful activities, 'sin taxes', pensions, R&D, educational investments and childcare. This is a far narrower list than the exceptions that we observe in practice.

Third, consider progressivity. The Mirrlees Review took no stance on the desirable degree of progressivity within the tax (and welfare) system, but at its heart is an analysis of how to manage the inevitable trade-off between redistribution and work incentives and hence how to design the system carefully to minimise the efficiency loss associated with achieving progressivity. One key conclusion was that it generally makes sense to rely on the direct tax and welfare system to achieve progression. Using differential consumption taxes or taxes on capital is usually an inefficient means of achieving redistribution.

1. Choosing the tax rate schedule

As an example of the way the Review combined the Mirrlees approach with empirical evidence, consider the tax rate schedule. To achieve redistribution efficiently implies having a rate schedule that reflects knowledge of the shape of the income distribution and the responsiveness of people to taxes and benefits at different income levels. It also implies taking into account decisions over both whether to work (including when to retire) and how much to work, in addition to other responses such as tax avoidance and migration.

To highlight the arguments, consider choice of the tax rate for top incomes. We can think of the different ways in which a (small) increase in the rate applied to the top tax bracket affects social welfare. There are three impacts on social welfare: (i) a *mechanical effect* on tax revenue; (ii) a *behavioural response* on tax revenue; and (iii) a *welfare effect*. The size of the welfare effect depends on the redistributive tastes of the government.

With no behavioural response, increasing the top rate will increase government revenue. This is the *mechanical effect* on tax revenue, and it is a benefit to society, as the revenue can be used for government spending or higher transfers. Increasing the top rate may also induce top-bracket taxpayers to reduce their earnings (but not below the top bracket, because nothing has changed below this point) because of the substitution effect. This is known as the *behavioural response* on tax revenue, and it is a cost to society as tax revenues will fall. Finally, any increase in the top rate will reduce the welfare of top-bracket taxpayers. This is the *welfare effect*, and it is a loss to society. If the government values redistribution, then, for incomes above a certain level, it will consider that the marginal value of income is small. In the limit,

the welfare effect will be negligible relative to the mechanical effect on tax revenue.

The analysis here closely follows the work of Brewer, Saez and Shephard (2010) for the Review. Consider a reform that changes the top tax rate τ by a small amount $d\tau$. Let z be the earned income being considered for taxation. The top bracket begins at income z^* and assume there are N taxpayers in the top bracket. The mechanical effect of the higher marginal tax rate on incomes above z^* is

$$dM = N\,(z - z^*)\,d\tau > 0.$$

The behavioural effect will depend on e – the elasticity of earnings with respect to the net-of-tax rate $1–\tau$. Reported income will be reduced by

$$dz = -\frac{e.z.d\tau}{1-\tau}.$$

Hence revenue will be reduced by

$$dB = -\frac{N.\tau.e.z.d\tau}{1-\tau}.$$

Suppose the government values giving an extra £1 to a top-bracket taxpayer at g – this will be strictly less than 1, since the weighted sum of welfare weights is unity. The welfare effect of the higher marginal tax rate on incomes above z^* is

$$dW = -g.N\,(z - z^*)\,d\tau < 0.$$

Summing these terms, we find

$$dM + dB + dW = N\,(z - z^*)\,d\tau\left(1 - g - \frac{e.a.\tau}{1-\tau}\right)$$

where $a = z/(z–z^*)$. At the optimum, this has to be zero, which implies that the optimal tax rate on the top bracket is

$$\tau^* = \frac{1-g}{1-g+a.e}.$$

Note that a is a parameter of the upper tail of the Pareto distribution ($f(z) = C/z^{1+a}$), estimated to be around 1.67 in the UK tax return data used in

the Mirrlees Review. If g, the value of an extra pound to someone in the top tax bracket relative to someone with lower income, is approximately zero, then

$$\tau^* = \frac{1}{1 + a.e},$$

which is very simple to estimate if we know the taxable income elasticity. For example, if this elasticity $e = 0.5$, then $\tau^* = 1/(1 + 1.67 \times 0.5) = 0.545$, implying a top tax rate of approximately 55 per cent. The estimates of e in the Review were rather imprecise and fell in the 0.35–0.55 range with a central estimate of 0.46, suggesting a top tax rate of around 57 per cent.

The view taken in the Review was that, without some changes to the tax base, it was difficult to argue for a higher top rate, even if redistribution were a high priority. Removing exemptions and non-neutralities between different types of capital income and between self-employment, employment and business incomes would be a higher priority. Other key issues that still remain in choosing the top tax rate are: whether the elasticity e has changed over time; whether the method for estimating e is reliable; and how alternative wage-setting models would change the arguments.[62]

Equally important for the Review was how we should tax (or subsidise) lower incomes. The analysis conducted was similar in approach to that outlined above for top tax rates, relying on a detailed understanding of the distribution of taxable income from tax return records and a rigorous understanding of the response elasticities at different points in the income distribution. The 'optimal' tax and benefit rate schedule was allowed to be 'non-linear', in that marginal tax rates at a particular point of the earnings distribution can be set differently from marginal rates at other points.

Interestingly, in the original Mirrlees framework, negative marginal tax rates were never optimal, ruling out earnings subsidies which are possible in in-work benefits and earned income tax credits. All this was found to change with the introduction of the empirically relevant participation (or 'extensive' margin of labour supply) response. With participation effects, the optimal tax formula changes and negative tax rates become possible, which can justify earned income tax credit policies. This reflects the importance of empirical research on labour supply elasticities, documented in the Review, which had suggested that behaviour at the *extensive* margin is more responsive to incentives than behaviour at the *intensive* margin,[63] at least for certain types of individuals and households.

This work implied that high marginal tax rates at the bottom were no longer necessarily desirable and that negative participation tax rates can be optimal.

[62] See Piketty, Saez and Stantcheva (2014), for example.

[63] The extensive margin of labour supply concerns the decision about *whether* to work and the intensive margin concerns the decision about *how much* to work.

For example, mothers of school-age children and people around retirement age were found to be particularly responsive to work incentives, especially at the extensive margin. They should, therefore, all else equal, face lower effective participation tax rates than others, and perhaps even work subsidies – implicit in in-work benefits such as the UK's working tax credit and the EITC in the US. There are, of course, limits to how tax and benefit payments might be conditioned on characteristics, with some possibilities constituting unfair and illegitimate discrimination. And being more generous to people with certain characteristics can create an undesirable incentive to acquire those characteristics. There is also some tension here with seeking neutrality and, as a consequence, the hurdle for such departures from neutrality should again be high.

2. The shape of a progressive and efficiently designed package of tax reforms

The Mirrlees Review devoted substantial attention to how one should think about and measure progressivity. Nearly all popular discussion, and much academic work, relating to this focuses on the effect of taxes on people's current incomes. Ideally, though, we should try to assess the progressivity of the tax system in terms of people's lifetime resources, not just as an annual snapshot. One way of getting closer to doing this is to consider the distribution of expenditure and not just the distribution of income. Lifetime income and lifetime expenditure will be very similar (the main difference being bequests made or received); but annual income and annual expenditure will differ much more as people borrow and save to reflect fluctuating incomes and varying needs over their life cycle. In the absence of perfect measures of lifetime resources, shorter-term measures of income and expenditure can therefore provide complementary indicators of lifetime resources and should be considered carefully in combination with each other; though of course some people are constrained in how much they can borrow, making a snapshot of current income more relevant for them.

There are other generally desirable features of a tax system. The Mirrlees Review discussed the roles of simplicity, stability and transparency. Simplicity – to the extent that such a concept can sensibly be applied to something as inevitably complex and unwieldy as a modern tax system – is in any case likely to be closely related to the idea of neutrality. But the concept of a progressive, neutral tax system is a powerful one.

In terms of the shape of a potential reform package, the Review laid out some specific suggestions for the UK, as summarised in Table 1.

It is certainly true that not all of these recommendations have been followed. Nonetheless, the Mirrlees Review has been influential in numerous finance ministries and treasuries around the world. It has been translated into other

TABLE 1

Main recommendations of the Mirrlees Review

Taxes on earnings
Merge income tax with employee (and ideally employer) National Insurance contributions
End practice of tapering personal allowances and move to a transparent, coherent rate schedule
Introduce a single integrated benefit, removing high effective marginal tax rates (90% and more) faced by low earners
Strengthen work incentives for those whose youngest child is school age and for 55- to 70-year-olds
Indirect taxes
Remove nearly all the current zero and reduced rates and, where possible, exemptions from VAT
Retain a destination basis for VAT while ending the zero-rating of exports
Introduce a tax equivalent to VAT on financial services
Replace council tax and stamp duty land tax on housing with a tax proportional to the value of property
Environmental taxes
Introduce a consistent price on carbon emissions, through extended coverage of EU Emissions Trading Scheme and consistent tax on other emissions
Replace much of the current tax on petrol and diesel with a national system of congestion charging
Taxation of savings and wealth
Introduce a rate-of-return allowance for large holdings of equities, unincorporated business assets and rental property
Tax capital income and capital gains above the rate-of-return allowance at earned income tax schedule
End generous treatment of employer pension contributions and replace tax-free lump sum
Remove avoidance opportunities from inheritance tax and look at a lifetime wealth transfer tax
Business taxes
Introduce an allowance for corporate equity into corporation tax to align treatment of debt and equity
Align tax treatment of employment, self-employment and corporate-source income
Replace business rates and stamp duty land tax on business property with a land value tax

languages and formed the basis for tax reform programmes around the world. To quote Larry Summers, former Secretary of the US Treasury, 'Theory and practice rarely are brought together effectively. This volume is the best public economics has to offer. It should be read by anyone who cares about the future of taxation – that is anyone who cares about the future of government'. Mervyn King, the then Governor of the Bank of England, commented: 'Whatever view you take of tax reform, you will need to read this volume in order to participate in the debate'.

IV. Beyond tax policy: the Deaton Review of inequalities in the 21st century

As IFS goes beyond its 50th year, the issues facing policymakers, and by extension researchers aiming to influence or inform policymaking, are more complex than they ever were. The areas many would identify as holding the biggest challenges – climate change, population ageing, globalisation, obesity, mental health, immigration – all raise issues of so-called 'joined-up' policymaking. More specifically, an understanding of many different areas of government and the links between them, as well as insights from many science and social science disciplines, is necessary in order to understand the key issues, potential solutions and the trade-offs that may be involved.

One issue that many would consider missing from the list of policy challenges above is that of inequality, which increasingly defines economic and political debate in many developed countries. As well as being another highly complex issue in the 'joined-up' policymaking sense, inequality is perhaps particularly complicated since any actions that governments might take with regard to other big challenges they face will also have inequality consequences that will depend on the way policies are designed or reformed. That is to say, all of the big challenges facing society, from climate change to immigration, feed into our discussions of the causes and consequences of inequality. There are deep interactions at play between the level and nature of inequality in an economy and the way in which policymakers react to the changing world as they deal with other challenges that are presented.

Over the years, IFS has carried out an enormous amount of work on inequality, as discussed in Section II, not just in terms of documenting trends in economic inequalities but also in terms of understanding some of the processes that drive various aspects of it (for example, wage processes and labour market returns or consumption insurance mechanisms). But in a number of conversations, much like those that subsequently led to the Mirrlees Review, it became clear that we felt there was much more that could be done to bring this work together, add in new perspectives both from other areas of economics and from other disciplines, and address the issue of inequality head on. In short, we felt we needed another review with the scale, depth and authority that the Mirrlees Review had had on taxation policy, but this time with an even broader scope and remit – to bring together evidence on all aspects of inequality and the forces that drive it, and to suggest implications and options for policymakers. Once again, we felt there was only one person with the breadth, scientific rigour and authority to chair such a review, and we were delighted when Angus Deaton agreed to join us, chair the review and work with us on what we now realise is perhaps the most ambitious single undertaking in the 50-year history of IFS.

The Deaton Review, generously funded by the Nuffield Foundation, began in 2018 with the formation of an expert panel with distinguished representatives from all aspects of economics (Orazio Attanasio, James Banks, Tim Besley, Richard Blundell, Penny Goldberg, Paul Johnson, Robert Joyce, Imran Rasul and Jean Tirole) as well as other key scientific disciplines (Lisa Berkman (epidemiology), Kathleen Kiernan (demography), Lucinda Platt (social policy) and Debra Satz (philosophy)). From the first panel discussions, centred on commissioning evidence chapters and structuring thoughts on how the Review would be organised, it has become immediately apparent that two central tenets will need to guide the Review if it is to deliver on its goals of being policy relevant and credible.

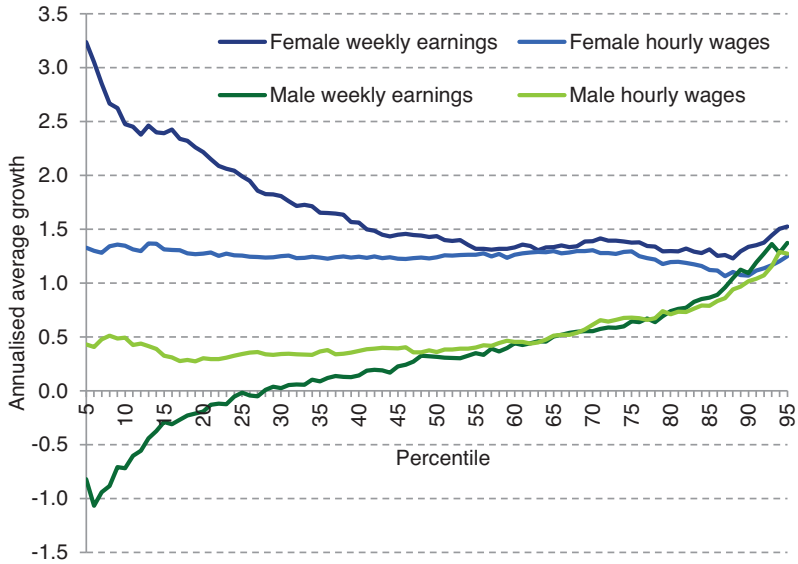
First, the Review will need to look into 'inequalities', not just 'inequality'. That is to say, it needs to cover different measures of inequality (not just distributional statistics such as Gini coefficients or 90:10 ratios, but also evidence on shares of resources of particular groups such as the top 1 per cent or, importantly, systematic differences between groups defined by salient characteristics such as gender, race, geographic location and education) and it needs to cover these measures not only in the traditional economic dimensions such as pre- and post-tax wages, income, wealth or consumption expenditure, but also in crucial broader dimensions such as health, housing, family circumstances, political voice and representation, and access to justice. So rather than just looking at the shapes of distributions, it is important to understand what types of people are gaining and losing, and in what ways, as the various distributions evolve.

Second, and following on from this, it is clear that some inequalities should matter more (or less) than others, whether this is from the perspective of politicians, policymakers or the general population. In order to inform a discussion of which inequalities should matter, why and to whom, it will be important to move beyond description and focus on the forces driving these inequalities and any potential repercussions of them. These 'causes and consequences' provide the basis for informed discussion of whether a particular inequality might be viewed as a problematic issue that a policymaker should attempt to address, and also provide the necessary information about where a policymaker could best intervene should they want to address them. Such an agenda will clearly build on previous IFS research but move us into new areas, taking advantage of new types of data or the ability to work with new types of researchers on new topics in order to join together the various narratives. And it will need to look to lessons from other countries, and from history, in order to assess potential policy effects.

Even in the 'traditional' areas of IFS research in economic inequalities that we have described above, there will be considerable work to do to knit together the various findings into a coherent narrative on what has been going on and why. One simple example would be the different stories on headline

FIGURE 1

Growth in male and female weekly earnings and hourly wages, 1994–95 to 2015–16



Source: Blundell et al., 2018.

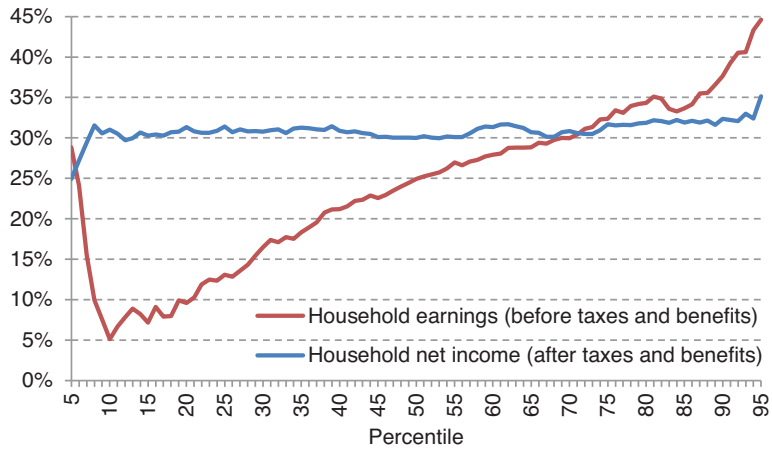
income inequality trends over time in the UK. If one looks at Gini coefficients or 90:10 ratios, one sees the well-documented sharp increase in inequality between 1979 and 1991 but, broadly speaking, no increase in inequality since then. Why, then, is there so much concern about rising inequality, particularly in the period since the financial crisis 11 years ago? One answer might lie in looking at other measures of income inequality. The Gini and, of course, the 90:10 are poor at capturing changes at the top of the distribution. Strikingly, and as shown previously for the US by Piketty and Saez (2003), the fraction of income earned by the top 1 per cent has continued to rise steadily in the UK even once the Gini and 90:10 measures had plateaued in the early 1990s, as shown by Joyce and Xu (2019) in their overview analysis for the launch of the Deaton Review.

Other measures instead of income may also be more salient in driving the inequality narrative since the financial crisis. If current perceptions of increases in inequality are related to certain groups feeling 'left behind', then many factors – including work and the nature of jobs, or the ability to participate in various other aspects of society – may well be important.

Figure 1 shows growth over a 20-year period across the percentiles of the distribution of wages and earnings for men and women in Great Britain. The most notable feature is that the bottom of the male earnings distribution

FIGURE 2

Growth in working households' incomes, 1994–95 to 2017–18



Source: Joyce and Xu, 2019.

experienced negative growth rates over this period, compared with the positive increases at the top – hence the distribution of male earnings has certainly become more unequal. But this effect is not nearly so pronounced for male wages, where there has been positive growth at the bottom of the distribution. It is changes in hours of work that have driven much of the increase in male labour market inequality. For those men on lower wages, hours of work have fallen back consistently over this 20-year period. A reverse story appears for women. Female earnings are now considerably more equal than they were, with big increases at the bottom of the distribution over the last 20 years. Again, these have been primarily driven by hours changes, since the change in wages across the distribution, just as with the men, is considerably flatter.

How these changes in individual labour market earnings translate to household incomes depends on who is single and who is married, and who is married to whom. It also depends on how the tax and benefit system treats the resulting household incomes. Figure 2 looks at the corresponding growth rates in household incomes across the percentiles of the distribution for households with at least one earner and shows the different stories that result from whether one looks at pre-tax pay or post-tax (and benefit) incomes. The net effect of changes in male and female earnings on household pre-tax pay is that, while there has not been a fall in earnings at the bottom of the distribution, there has still been a widening of the distribution due to low growth rates in pre-tax pay not keeping up with the higher growth rates at the top. But the tax

and benefit system does considerable work in equalising these effects, such that the average annual real growth in post-tax-and-benefit income has been remarkably flat across all but the extreme percentiles of the distribution.

And this is not the whole story when it comes to income inequalities, for two further reasons. First, it is not necessarily the same households, or types of households, at the same percentiles of each of the two distributions. More importantly perhaps, when it comes to the population as a whole, the number and types of households that have workers in them at all are changing over time, not least because of the changing demographics of the ageing population, and the average incomes of non-working households are also changing. Taking this into account and looking at the types of people who are at the bottom of the overall income distribution (defined as having less than 60 per cent of median net equivalised income after deducting housing costs), Joyce (2019) has shown that 58 per cent of this group are now working households, as opposed to 41 per cent in 1997–98, so there is certainly a sense in which, despite the flat profile in Figure 2, the incomes of poorer working households have been falling behind those of the rest of the population.

So even constructing a holistic narrative in the areas where IFS research has been documenting inequalities and the changing fortunes of different groups for many years will be an important task. More important, however, will be the integration of this narrative with related insights and narratives relating to processes, outcomes or groups that we have, historically speaking, studied less. The Deaton Review, along with the evidence studies and workshops that will form some of its key outputs, will be truly novel and challenging in this regard.

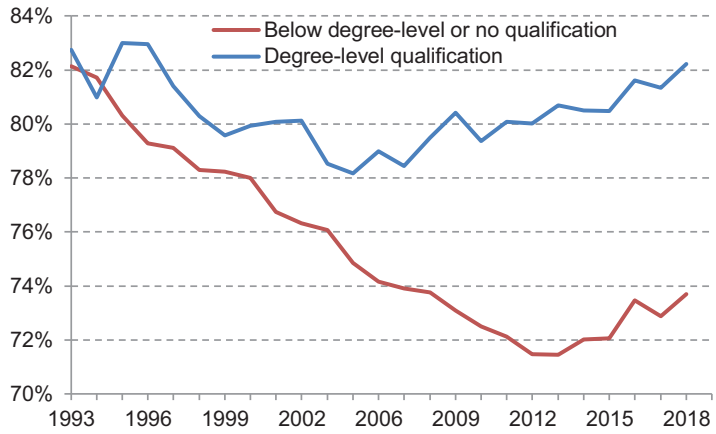
Two of the most important aspects of life – family circumstances and health – will undoubtedly form a large part of the Review. Taking family first, low-income and low-educated individuals are increasingly likely to live alone. Blundell et al. (2018) show that, in the bottom fifth of the wage distribution, the fraction of people married or cohabiting declined by 20 per cent between 1994 and 2015, and Figure 3 shows that the differences by education group are equally stark, with a gap in marriage and cohabitation rates of around 10 percentage points opening up between those with a degree and those with below degree-level or no qualifications.

Similarly, there is accumulating evidence that health inequalities are changing and increasing. Whilst IFS research has tended to focus on morbidity and disability differences by education at older ages,[64] mortality at all ages is an important and very objective indicator. Recent ONS data reveal that the gap in life expectancy at birth between the most affluent and the most deprived areas (as measured by the Index of Multiple Deprivation, IMD) has widened. For men, the gap has increased from 9.0 years to 9.7 years between 2001 and

[64] Banks et al., 2006; Avendano et al., 2009.

FIGURE 3

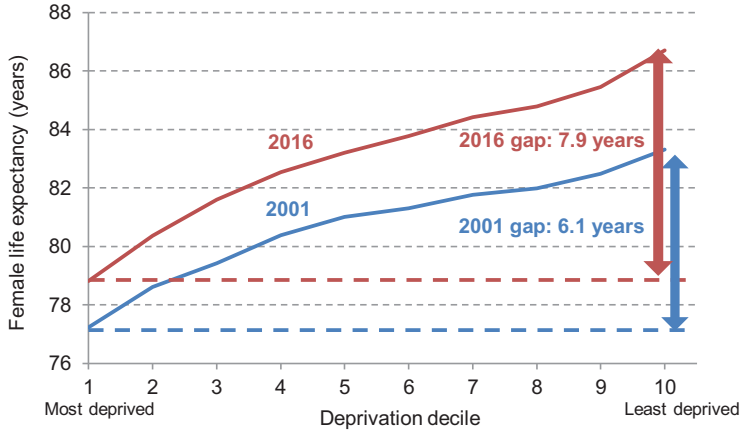
Share of 40- to 45-year-olds who are married or cohabiting



Source: Joyce and Xu, 2019.

FIGURE 4

Female life expectancy at birth by IMD decile



Source: Joyce and Xu (2019), based on Bennett et al. (2018).

2016, and for women, as shown in Figure 4, the increase in the gap has been from 6.1 years to 7.9 years over the same period.

Such changes in health and mortality have already been documented in the US, where they have been linked to the changing fortunes and inequality in

the labour market.[65] The increase in so-called 'deaths of despair' – suicides, drug-related deaths and poisonings, and liver mortality – has been particularly stark in middle-aged low-education males. Whilst the same decomposition by income and education is yet to be carried out for the UK, Joyce and Xu (2019) use ONS data to show that there has been a similar rise in aggregate deaths of despair in the UK, albeit from a lower base. For those aged 45–54, deaths of despair have risen from 29.9 to 60.7 per 100,000 between 1993 and 2017 for males and from 14.7 to 25.9 per 100,000 for females.

Inequalities in these different dimensions – income, work, health and family structure – are likely to interact and reinforce each other. They may also interact with, and stem from, other inequalities such as those in wealth, social connections and networks, access to things such as the education system or justice, and even political voice and representation. They may also be patterned in particularly salient ways if one looks by geographical area, ethnicity, class, cohort or gender. Any narrative on inequality cannot be reduced to one dimension; it has to encompass the myriad forms and patterns of advantage and disadvantage. So to create a set of evidence covering the holistic picture in a coherent manner will be a considerable challenge, but one that empirical microeconomists with designs on informing policy in a serious way need to engage with.

And this is exactly the research that we hope will emerge from the Deaton Review. Focusing on the forces driving the relationships, and the potential repercussions of the various inequalities, we will engage with issues surrounding the creation of rents and the market power of firms, the changing nature of labour markets and labour contracts, the changing nature of families and communities, and the various changes in the way that individuals' geographical location and family circumstances can enable or constrain economic mobility. Consequently, we expect policy recommendations and policy-relevant findings from the Review to be much broader than relating to just the tax and benefit system alone. When considering appropriate policy responses to increasing inequalities, or at least to those inequalities that are deemed to be particularly concerning, it may well be the case that there is a stronger role for education policy, competition policy, regulation, trade or regional policy. And no analysis of policy options in this area could be carried out without some understanding of the nature of any intergenerational transition effects or the political economy of policy change.

It will be a challenge, but there is no more important or pressing set of issues for microeconomists to get to grips with, and so these are some of the areas where readers can expect to see IFS research outputs over the next few years. The Deaton Review agenda is emblematic of all that empirical microeconomics has become and encapsulates how different the evidence we now produce is

[65] Case and Deaton, 2015.

from the type of fiscal policy analysis IFS started with 50 years ago, and even from that which emerged from the Mirrlees Review 10 years ago. In order to best inform tax policy, not just when it comes to addressing inequalities but also more generally, the research at IFS now needs to use multiple sources of big data, covering multiple dimensions in addition to economic circumstances. It needs to build a complex picture of interacting factors with inputs from multiple other disciplines. The empirical analysis relates to much more than just taxes and benefits, but it needs to be carried out if one is to credibly inform tax policy in the new world, and it certainly needs to be carried out if one wants to understand the changing nature of inequalities and what policymakers might do about them.

V. Conclusions

Over the 50-year period since its inception, IFS research has grown to span multiple subject areas and is unified by a desire to develop a rigorous empirical foundation for improving public policy in a changing economic and social environment. The future agenda will both continue to focus on the interrelated research areas above and address new challenges.

Exploiting further linkages within economics and with researchers outside of economics is likely to be at the forefront of research. The continued advance of the micro-data revolution with access to new data, including administrative data linkages, in the UK, the US and European and developing countries will provide a wealth of new opportunities. Even closer interaction with researchers worldwide, exploiting our unique research environment for capacity building in empirical policy research, will provide the intellectual hub to leverage these opportunities. Together they will enable us to continue to be at the frontier in the use of new methods and new data, deriving new insights into public policy.

It could not be a more exciting prospect for the next generation of IFS researchers.

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