

Introduction

The core objective of the ESRC Institute at IFS is to inform and improve the quality of policymaking and the quality of public debates around economic policy in the UK and internationally. We do this by conducting internationally leading research, acting as a national resource by collaborating with a wide range of researchers in the UK and abroad, engaging with policymakers and practitioners, and building capacity through training new generations of researchers. Using our unique position within the respected, independent and influential IFS, we are fully committed to bringing the high-quality and rigorous insights from our research, and the research of others, to bear on issues of current public interest.

Our research agenda is driven by our core areas of expertise, but will continue to evolve in response to the changing policy landscape. Here we set out some of the main areas that we expect to develop over the next five years. These all address questions of immediate and persisting importance for society and policymakers. Poorly designed policy can be costly both economically and socially, and a better understanding of the evidence can lead to better and more effective policy. Developing a better understanding requires careful application of economic analysis to the best available data and long-term investments in building a high-quality evidence base. Crucially, it also means thinking about and working on many aspects of economic behaviour simultaneously. When thinking about the fundamental forces acting on the economy, such as demographic change or new technologies, it is only by having a deep understanding of how individuals, households, firms and markets work that we will be able to shed light on the impact of such changes and the likely winners and losers from them.

Our agenda builds on the strengths we have developed over many years. It makes use of our extensive data resources, modelling techniques, institutional knowledge, policy awareness and academic leadership. While mainly focused on improving policy in the UK, we also study other developed economies as well as low- and middle-income countries. We bring the insights of cutting-edge economic models and theories to the questions we address, making use of the dozens of large-scale administrative, household- and firm-level data sets in which we have unrivalled expertise, as well as developing work on new data sets. Our strong track record is built on a history of significant research contributions across the spectrum of topics in applied microeconomics. In recent years, our research has broadened and we are now also generating important research contributions in collaboration with social scientists from other disciplines. This is reflected in our proposed research, and the ongoing *IFS Deaton Review: Inequalities in the 21st Century* in which we are collaborating with political scientists, epidemiologists, philosophers and sociologists [81].

A key strength of the ESRC Institute is its location within IFS, which provides a unique environment in the way it combines frontier research with an active and politically independent agenda of engagement with economic policymaking. The ESRC Institute provides the stable funding that facilitates groundbreaking independent research as well as long-term investments in developing a unique range of models and data sets. IFS provides phenomenal reach into the media and government, facilitating the communication of our research ideas and insights for policy. Together they provide a national resource that will produce a new generation of policy-savvy and exceptionally well-trained young economists. Over the past three decades, we have trained some of the UK's, indeed the world's, leading microeconomists as well as providing some of the most influential economic policymakers and commentators.

Here we focus on our proposed research programme and management plans. We also give a broad overview of our major expected outputs, but more detail can be found in the sections on *Capacity building* and *Pathways to impact*.

The research programme

Our research covers a broad spectrum of interrelated topics and is designed to address major challenges the UK and other economies face in ensuring the resilience of households, firms and the broader economy. These challenges include technical change, automation, globalisation, rising inequalities, financial security for an ageing population, and extending and transforming working lives through health and skills acquisition. We bring together a critical mass of highly regarded experienced and talented young economists and draw on researchers from outside economics where important. We build on collaborations with other research groups in the UK and abroad to exchange knowledge, exploit synergies and maximise impact. For example, we collaborate with the CEP on two themes that are pivotal to the work of both institutes – one investigating the role of firms and innovation for wage inequalities, productivity and wage progression, the other examining the low-wage labour market and the effectiveness of tax credits, minimum wages and labour market regulation in the changing world of work.

We describe our agenda under five interconnected themes:

- I. Inequalities and living standards**
- II. Tax and benefit reform**
- III. Human capital and productivity**
- IV. The challenges of an ageing population**
- V. Demands on public expenditure and public services**

There are overarching themes and a common methodological framework. Our research focuses on the impacts of policy and importantly on the mechanisms through which those impacts arise. We use large microdata sets and employ cutting-edge econometric techniques. This requires that we:

- 1) **Model** the determinants of people's **decisions** over the life course and the interactions between different economic actors. We focus on dynamic decision-making – how individuals take some key lifetime decisions and how these affect their, and their family's, future well-being. We incorporate how these decisions shape the environment within which decisions are made and the behaviour and decisions of other agents including employers, retailers and providers of services.
- 2) Understand the **context within which decisions are taken**. Our research highlights the constraints, frictions and opportunities that individuals, firms and governments face in making decisions. We examine how labour, capital and consumer markets work, where they don't work and how they interact. Understanding the context is crucial to evaluate current policy or design effective reform.
- 3) Use appropriate **microeconomic evaluation methods** and develop new ones where they do not exist. We analyse and evaluate specific policies, and make important methodological contributions on how to **identify policy impacts**. We study not only the effect of policies but also what drives that effect and hence what might be the effect of future or new policies and how they can be better designed.
- 4) Develop new **data and measurement tools**, which is central to our research agenda. We continue to work closely with Administrative Data Research UK to create linkages between existing data sets and to develop new methods for analysing these data.

The streams of our research programme are linked by these overarching themes and by multiple overlapping policy challenges. We provide references in a separate document; these are only to our own

work to demonstrate our track record.

I. Inequalities and living standards

A cornerstone of our research is on **the nature of inequalities, changes in inequalities, and the key forces that have been shaping them**. We will examine how inequalities have developed within and between different groups (such as by skills, gender, race, age, region and country), how dimensions of inequalities (such as earnings, income, consumption, wealth, health, education and skills) evolve and interrelate, and how the UK compares to peer countries in various dimensions of inequalities and poverty.

Our research will assess how government policies offset or reinforce the effects of key forces shaping inequalities, such as globalisation and technological change. Increasingly, it is becoming clear that the tax and benefit system alone is not adequate to address concerns about inequalities. We will analyse policies that address the root causes of inequalities, including labour market policies and institutions, education and training, healthcare policy, competition and trade policy, patent law, and corporate taxation and ownership structures. This research will interact closely with research on the other broad themes.

Research on inequalities will play a major role in informing and enhancing IFS's recently launched five-year review of inequalities – the *IFS Deaton Review: Inequalities in the 21st Century* [74]. This Review brings together world-renowned experts from across the social sciences with the aim to understand inequalities not just of income, but of health, wealth, political participation, and opportunity; and not just between rich and poor but by gender, ethnicity, geography, age and education. Our ESRC Institute research will provide detailed analysis on the main forces that drive inequalities – from technological change, globalisation, labour markets and corporate behaviour to family structures and education systems.

In our research on inequalities, we will consider policy reforms from countries around the world, and we will continue to **build and learn from close international collaborations**. Important examples are our work with co-authors in the US [42, 43] and our ongoing work on dynamics in inequalities using the Norwegian Population Register data [8, 41, 48]. This work on register data will complement our work on the UK and allow us to study in more granular detail the transmission of labour market inequalities to family income inequalities, in particular the extent to which different groups by education and family background are able to insure their standard of living against adverse labour market shocks. This will give us greater insight into how family earnings, social insurance policies and savings act together to change the pattern of inequalities over the life cycle.

More generally, our work will highlight **the dynamics of inequalities** using innovative combinations of large-scale administrative panel data and survey data. We will develop new methods to study the dynamics of inequalities in large-scale panels, such as Understanding Society, the English Longitudinal Study of Ageing, and the Cohort Studies, that are linked to administrative records [35, 13]. We will take advantage of recent improvements in local-level geographical data to understand regional disparities. We will use and develop data that describe the task contents of occupations (e.g. O*NET), to offer new insights into the role of labour markets, firms and the assignment of workers into jobs in shaping inequalities [76].

Labour markets

Technology, automation, demographic change, trade and deregulation are transforming the organisation of production, with profound effects on labour markets. There is concern that changes are coalescing to produce a **polarised labour market** that exacerbates inequalities by funnelling some workers into secure, high-paying, high-progress careers and others into precarious, stressful, low-paying jobs.

We will study how well labour markets function in terms of matching workers to appropriate jobs. Workers, who have heterogeneous skills, take jobs that involve tasks with heterogeneous skill requirements. A worker's skills determine how good they are at a job; the difficulty of finding a job that is a good match to the worker's skills raises the issue of skill mismatch, especially important when we recognise the multidimensional nature of skills. Documenting and exploring the causes and consequences of skill mismatch will be an important building block of our research on inequalities.

Polarisation of the labour market in terms of earnings and employment rates has been well documented, but recent evidence suggests that polarisation of physical and emotional costs of occupations is also important; in the US since the 1950s, there has been a shift away from physically tiring and hazardous occupations towards occupations where work is perceived as 'less meaningful'. We will investigate **trends in the health contents of jobs**, exploiting the unique content of the O*NET data, and assess consequences of those trends for lifetime health inequalities, including mental health.

This speaks to our research priority to **understand the determinants of declining productivity** for some groups of workers. We will focus on dimensions that are not currently well understood and that are important for inequalities. We will investigate the consequences for workers of increased specialisation and reduced occupational diversity within firms. We will analyse the impact of the observed slowdown in worker reallocation (sometimes described as the '**decline in business dynamism**') on inequalities and aggregate productivity. We will go beyond the traditional one-dimensional view of skills to identify which skills matter most for labour market performance; see the section on *Human capital and productivity*. This work has direct implications for policies on education and training.

Another important dimension of inequalities is the **gender gap**. After years of reductions in the gaps in labour force participation, education and pay between men and women, convergence has slowed. Pay differences remain large. Having children leads to long-term wage stagnation for many women, and also sorting into different types of jobs and firms [53, 54]. We document that travel-to-work time falls sharply for women after childbirth as mothers confine their job search to jobs that are closer to home, pay less and allow for less valuable experience accumulation. We will assess these ideas and their implications using a combination of individual-level data (from Understanding Society), occupation-level descriptors (from O*NET), and geocoded job vacancy data (from Jobcentre Plus and Burning Glass).

Firms, market power and geography

Recent evidence on the **evolution of market power** shows that firm-level profitability has risen, driven largely by an increase in the mark-ups of some large firms [64, 65]. We will extend this work to understand the implications for inequalities in the UK and elsewhere, and study what these trends mean for productivity growth and how they inform possible recommendations for tax and benefit reform.

The increasing fragmentation of production across firms and countries has profound repercussions for global inequalities. How do these changes in global value chains affect profits and rent sharing across firms? How do newly developed production networks influence the spatial agglomeration of economic activity, and what implications does that have for inequalities? The impact of these changes on **the distribution of gains from globalisation across individuals and space** will be a key research topic, cutting across the themes of *Inequalities* and *Productivity*.

We will investigate how changes in international trade patterns affect inequalities, a key concern in understanding the impact of Brexit and the rise of populism more generally [73, 1]. Research to date has focused on the impact on low-skilled workers, who are adversely affected by increased international trade.

We will extend this analysis to also consider the impacts of trade on prices that feed through differently to different groups due to variation in the types of goods that they typically consume.

Health

The English healthcare system is publicly provided and funded out of tax revenues, but despite this there is still much to learn about its redistributive effect. We aim to use data from the English Longitudinal Study of Ageing, matched to administrative hospital records and tax data, to develop new measures of the distribution of lifetime medical transfers received and the taxes paid for that care and show how this varies with lifetime income, education and other characteristics. We will compare England with the US and other European countries, exploiting the differences in healthcare systems. We are particularly interested in the role of prices and other factors in driving differences in healthcare use across countries.

In the UK, social care, such as nursing-home care, is funded out of pocket if the household has even modest levels of wealth and by the government otherwise. This system transfers resources to those most in need, but implicitly taxes assets at rates close to 100% and is thus potentially very distortionary. There are many proposals, such as the Dilnot report, to reform this system. Such reforms have obvious immediate effects on equity and in providing insurance. We will consider the dynamic effects and evaluate how such reforms might affect savings, in both housing and other assets, as well as the use of healthcare. This will allow us to better understand the winners and losers from, and long-term effects of, various social care reforms. To do this, we will exploit recent reforms to social care funding across local councils.

Inequalities in the incidence and costs of obesity and diet-related disease are substantial and persistent, particularly at young ages [70]. A key driver of these inequalities is disparities in the nutritional quality of diets. Those disparities may be driven by behaviour or by geographical differences in food availability or prices. An important source of calorie-dense, unhealthy foods is cafes, restaurants and takeaways. Building on our previous work, we will exploit novel longitudinal data on individuals' purchases of food and drinks for consumption outside the home to **investigate the roles that preferences for and availability of low-priced fast food and takeaway foods play in driving health inequalities** [68]. We will exploit the panel structure and demographic information to model consumer preferences and responses to prices accounting for rich patterns of heterogeneity that can drive inequalities in behaviour. Our research will highlight the drivers of inequalities in diet and assess the extent to which these are propagated between generations. It will further feed into our research on potential corrective policies, detailed in the section on *Tax and benefit reform*.

Social mobility

Growing disparities in the financial and time resources available to children have been driven by diverging trends in family environments (maternal age, employment, paternal involvement, single motherhood, divorce and family income). Children from better-off backgrounds typically grow up in households with older mothers and high maternal employment, and are more likely to reach higher education. Children from less-advantaged backgrounds are more likely to grow up in households with divorce and lone motherhood, and are less likely to reach higher education. These diverging trends shape inequalities in the medium and long run, highlighting the need for a better understanding of the role of families and public policy in **improving the resources available to children from disadvantaged backgrounds**. We plan to integrate a new research strand on social mobility into our work on *Inequalities* and on *Human capital and productivity*, in order to build understanding of the role that human capital plays in the intergenerational transmission of income and well-being.

Low- and middle-income economies

A body of research at the ESRC Institute at IFS has studied **poverty alleviation in low- and middle-income countries** [3]. For example, we have evaluated the impacts of large-scale asset transfers to the poorest rural households in Bangladesh [16]. Such transfers have been shown to permanently lift beneficiary households out of poverty, and to fundamentally change the distribution of income and assets across households in village economies. In ongoing work, we are examining the intergenerational impacts of such policies looking at their impacts on human capital and labour market outcomes of children of beneficiaries. We will examine a range of interventions in education, health and labour markets in low-income settings through South Asia and sub-Saharan Africa. This work has implications for understanding the fundamental drivers of inequalities such as human capital accumulation, and the process of worker–firm matches. We will study the impacts on beliefs, mental health and psychological traits of a range of traditional anti-poverty policies, including asset transfers, micro-finance and training. This will enable us to establish a broader picture of the full set of consequences on the poor of their deeper engagement in economic markets.

The key first step in the analysis of inequalities is to get **measurement** right. The measurement of living standards overwhelmingly relies on data collected at the household level. Yet individuals may be poor even if their household is not poor, because the **intra-household distribution of resources** may be unequal. Building on our existing research [75, 51], we aim to develop empirical models that we can apply to data across many countries using the World Bank’s Living Standards Measurement Study.

II. Tax and benefit reform

The tax and benefit system plays a key role in addressing some of society’s biggest challenges, including tackling inequalities, low productivity, poor health and environmental harms. Policymakers need to decide how to tax top incomes and corporations, what sort of financial support to provide for low earners and families in poverty, and how to design taxes to change behaviours. There are many challenges in deciding **how best to organise the tax system in a globalised economy** posed by the rise of the platform economy, growing self-employment, concerns over new technology, regional disparities and Brexit.

Many radical policy reforms are being discussed, including fundamental changes to taxes on corporate income, wealth holdings and capital incomes, the provision of a universal basic income, and how best to design green taxes to address climate change, while addressing the distributional impact across families with different incomes and different demographic structure needs careful analysis. Our research will provide a rigorous and independent assessment of these proposals.

Transfers

Governments use a range of cash transfers in an attempt to support people during periods when they have few resources or high needs. Their actual effects depend on many factors, including who claims the support they are entitled to, how decisions such as whether to work are affected, and how the incidence of the support that is paid is shared between the intended beneficiaries and others (e.g. employers in the case of tax credits, and landlords in the case of housing benefit). These are complex empirical questions of the kind that we have a long history of work in answering [2, 78]. Shifting economic trends and policy priorities are raising big new questions and new data are providing better ways to answer them.

One of the major trends in transfer provision in the UK and internationally has been the growth in in-work support, mostly through tax credits [37, 39]. The efficacy of this support as an instrument for

redistribution depends on the incidence of the schemes – the extent to which in-work cash transfers support the families they are aimed at rather than leading to employers holding down wages. Some progress has been made in understanding the aggregate incidence of tax credits; the ability of employers to hold down wages will vary with competitive conditions and so is likely to vary, for example, in the geographic dimension. We will use novel data on workers' wages and the firms they work for to characterise the competitiveness of local labour markets for different kinds of workers. This will enable us to **examine the incidence of tax credits and how this varies across local labour markets**. We will study the scope for using in-work benefits in conjunction with minimum wage policy to prevent shifting of the incidence. The appropriate balance and interplay between those policies is central to today's policy choices, as transfers are being cut back while the minimum wage is aggressively increased. We will collaborate with the CEP to examine the interaction between transfer policy, minimum wage and labour market regulation in addressing the challenge of low earnings. This will include an examination of how traditional welfare state tools might be adapted or replaced in response to the growing prevalence of 'gig' or 'alternative' work arrangements such as solo self-employment.

There have been huge structural changes to the benefit system for working-age people in the UK. Universal credit is integrating almost all means-tested working-age benefits and tax credits into a single transfer payment. This provides a large natural experiment, with 2.5 million people already claiming this new benefit at the time of writing. The design of this system continues to be controversial, with the opposition suggesting that it may replace the system with something else entirely. This context provides both the imperative and an opportunity to learn more about the impacts of different policy designs. Reforms that seek to integrate different components of the welfare benefit system are on the policy agenda in many other developed economies, so the study of UK welfare reform is at the forefront of an important emerging evidence base internationally. We will study the extent to which welfare integration can achieve its key aims to increase take-up of benefits and to strengthen financial work incentives for those who currently face the weakest incentive. We will do this by **extending existing models of joint decision-making over labour supply and take-up** [32] and exploiting a new link between large-scale longitudinal household survey data and longitudinal administrative data on benefits receipt.

Dynamics

The academic literature has highlighted the importance of dynamic considerations when designing tax or welfare policy. The policy debate is increasingly recognising that longer-term objectives are crucial when designing welfare reform, alongside the more immediate concerns of encouraging employment. A particular concern is **wage and career progression** [36], which is often lacking for the low-skilled and which relies on **human capital accumulation** and **increased productivity** while in work. Our research will examine how incentives created by benefits and tax credits can affect the trade-off between shorter commutes and finding jobs better matched to one's skills, and how choices between full-time and part-time work **affect the interplay between tax and benefit policy and the career and wage progression of men and women of different skill levels**.

Entrepreneurship

A central trade-off facing policymakers is whether to raise the tax burden on capital income to combat inequalities and prevent labour market distortions or to keep capital taxes low to promote saving, entrepreneurship and economic growth. Our research will address this policy choice. We will **exploit newly available data from administrative tax records** that match corporate and personal tax records, developed in [63, 77]. The number of people working for their own business has grown rapidly over the

past two decades, and this poses challenges around how to support the low-income self-employed without encouraging the under-reporting of incomes. We have shown that people who run their own incorporated businesses are highly responsive to the tax system, almost entirely due to the intertemporal shifting of income [77]. **We will estimate how the taxation of business income affects business start-up** and subsequent outcomes such as individuals' decisions over the organisational form of that business, investments and other choices made while running a business. Our research will inform debate about how best to balance the taxation of workers and firms to promote labour productivity by shaping the types of work people do.

Multinational firms

The UK has relied heavily on multinational firms investing here in recent decades. Our position in the single market, alongside low corporate tax rates and relatively liberal labour market regulations, has been central in attracting such investment. All this looks like it could change, not least in the face of Brexit and the policies being put forward by the Labour party. In addition to the growing importance of firms whose value derives from intangible assets, which are difficult to tie to particular locations, this has meant that the way multinationals are taxed is increasingly under scrutiny. A broad array of policy options is being considered, with proposals for a radical overhaul of how multinationals are taxed gaining traction. Multinationals play an important role in determining the scale and location of investments in capital and people, and therefore in driving productivity, economic growth and inequalities, and they are central in shaping labour market opportunities, the types of jobs on offer and where they are located. Understanding the costs, benefits and local impacts of international investments, and how multinational location choice responds to policy, is a key part of our agenda.

Tools developed at the ESRC Institute at IFS will provide the basis for understanding the possible impacts of new policies under consideration [66, 30, 69]. We will **advance work on firm location choice**, by extending models to capture the possibility that workers in different locations are potentially complements in production. We will do this by relaxing the assumption that workers in different locations must be substitutes. We will apply this to the **study of how tax affects where high-skilled, innovative jobs are located**. This work will enable us to better understand whether some policy levers – including the R&D policies on which most governments spend substantial sums, as well as broader corporate tax reforms – are more effective than others in attracting high-skilled activities and thereby **raising local and national productivity**, and what the potential gains are to international coordination in policy.

Consumer choice

Many tax policies aim to influence consumer choice, for instance discouraging excessive intake of alcohol or tobacco. These 'corrective' measures are at the centre of the current debate over tax policy and increased calls for the introduction of radical green taxes, the recent adoption of soda taxes and restrictions on advertising junk foods. Key to designing effective policies is to understand how individuals will respond, and in particular how their responses might vary [34, 67]. Developing new data and new methods to uncover the impact of price changes and indirect taxes, and how they vary across individuals, will remain central to our research.

Corrective policies are often implemented in markets where firms are likely to strategically respond to policy, for example by adjusting prices, changing product design and advertising. We will incorporate the response of firms and consumers into work on the effects of policies, building on our previous work by **modelling how firms will change their product offering and dynamic advertising strategies** [67,

68, 79]. For instance, a tax levied on sugar provides firms with an incentive to redesign products to lower their tax liability. We will extend our work on equilibrium models to incorporate dynamic decisions firms make over investments in advertising and product development to simulate the effects of policies, capturing both consumer and firm response, and to consider optimal policy design. We will continue to work with the market research firm Kantar to exploit unique longitudinal data on the products households purchase from grocery stores, the food and drinks individuals buy on-the-go (including novel data on restaurants and fast food outlets), and individual-level exposure to television advertising.

Tax design in lower-income country settings

Many of the key concerns (such as inequalities and poor health) and challenges (such as non-compliance and the mobility of multinationals) in tax design are far more acute in lower-income countries than in high-income countries. The increasing availability of survey and micro-administrative data in developing countries is opening opportunities to advance understanding of tax design in these settings. We will exploit these opportunities to make important contributions to understanding how **tax design should be modified in lower-income countries** where, for example, labour market informality and imperfect tax enforcement are particularly important.

We will revisit a number of key questions, such as the incidence and behavioural effects of value-added taxes, when they are appropriate tools for redistribution, and the setting of thresholds and simplified regimes. We will consider how policy design and administrative innovations can increase tax compliance, a key issue in low-income countries. And we will examine how the mobility of corporate income and activity is particularly affecting low- and middle-income countries. Exploiting the longstanding partnerships that we have built with policymakers in a range of lower-income countries in collaboration with the Department for International Development, our research will provide the opportunity to support policymaking and influence tax design in settings where research capacity has historically been limited and the impacts on well-being are potentially large.

III. Human capital and productivity

Human development and skills – what we call human capital – are a key determinant of economic success, inequalities and intergenerational mobility [10]. Studying how human capital is shaped by experiences, environment and investments and how it responds to different policies and interventions is critical to understanding the formation of inequalities and how to tackle them. It is now well established that human capital develops gradually over the life course, from the in-utero stage through childhood and into old age, building on successive investments, experiences and achievements. Inequalities in human development at one stage in life carry long-term consequences for the productivity of future investments in human capital, as well as later outcomes such as educational attainment, family formation, income, criminal behaviour and mental health. Human capital has many dimensions, including cognition, socio-emotional skills, and physical and mental health, all of which interact with each other in driving later economic outcomes and wider well-being [9].

We propose a research agenda that tackles many open questions. What are the differences in the type and optimal timing of investments that drive the formation of cognitive relative to socio-emotional skills? What is the relative importance of different dimensions in driving economic outcomes and well-being? And critically for policy, **what are the routes through which disadvantage affects human capital formation and how can interventions be designed to mitigate these effects?** We will study human capital formation in high- and low-income settings in collaboration with experts from several disciplines

including psychology, public health and education, underpinned by models tailored to the different stages of human development. This agenda will draw on administrative, survey and cohort data, as well as new primary data collected using randomised control trials and longitudinal studies. A key challenge that we will continue to address is the difficulty of measuring the different aspects of human capital, relevant features of the environment and dimensions of investment.

Key data resources will include survey data from the UK cohort studies and the Longitudinal Education Outcomes (LEO) administrative data. The UK cohort studies uniquely combine detailed information on home environment during childhood, parental characteristics, investments and attitudes, with lifelong education, socio-economic and health outcomes. An especially novel feature of the cohort studies is the availability of genetic and epigenetic data. LEO follows all children from primary school to university, and into working life. Additionally, we will use several longitudinal data sets from the UK and other countries that have sophisticated measures of human capital and investments and continue to collect data as part of randomised control trials and longitudinal studies, placing great emphasis on producing data suitable for advancing research on a wide range of questions, not just the specific evaluation at hand.

Childhood and caregivers

The early years are a critical window in which some of the most important traits are established. We will study how much inequalities arising in the early years matter for later inequalities in later life using UK cohort data. **We are interested in inequalities in skills development and their long-term impacts on educational attainment, employment, income, health and family formation** [33, 13].

Parents play a vital role in the process of human capital formation, through the financial resources they provide, their own human capital, parenting practices and choices, and the transmission of genetic risks. We will study the impacts that families have on children, linking to our agenda on social mobility [14]. For example, using the Millennium Cohort Study, we will investigate the interlinkages between maternal labour supply, investments in children and child development. Mothers face multiple demands on their time, and in particular need to trade off time in paid work, which provides higher material investments, against more time investments. The relative importance of these inputs may change over time, as the child ages, and may depend on the quality of alternative arrangements, such as childcare. We will formalise this trade-off and use variation in the policy environment and availability of childcare to quantify the role of various investments for child development from early years into adolescence.

We will also model parental behaviour driven by beliefs about the process of child development and the utility of different forms of parental investment. We have collected data on parental beliefs in England, Colombia and India. The data for India are one of the first examples of such data being collected longitudinally. We will use these data to better model parental behaviour and establish the main drivers of parental investment and choices.

The findings from this research will feed into work focusing on how effective interventions can be designed. While policymakers require the tools to ensure that all children have access to a nurturing environment that best supports their development, much of the evidence about early childhood interventions is US-based and derives from intensive programmes that are not necessarily scalable. A central goal of our agenda is to test *scalable* models of early childhood interventions in different contexts. We are carrying out randomised control trials of early years interventions in the UK, Ghana, India, Nigeria and Colombia. These target three key dimensions of investments in children: **parental non-financial investments**, by providing information and training aimed at improving parental skills;

parental financial investments, by introducing unconditional cash transfers; and **pre-school education**, by improving the classroom environment and pedagogy. These data will allow us to study the mechanisms underlying the impacts of these interventions and contribute to a better understanding of development in early childhood, of the mechanisms through which poverty and poverty-related risks affect children, and of what the key ingredients are of a successful early childhood intervention.

Childhood disadvantage can have persistent long-term effects on adult economic outcomes [9, 13]. To investigate the nature of these persistent effects, we will use UK cohort studies and administrative data from other countries (including Colombia and Denmark) to characterise labour market trajectories of more and less disadvantaged youth and study heterogeneity in these. We will build on insights from the recent search and matching literature to focus on differences in the stability of jobs and quality of employers that more and less advantaged youth are able to access, informing work under *Inequalities*.

Schooling

As children grow up, schools and peers become increasingly important determinants of their continuing development. Our broad aim is to study **the determinants of education investments and the role of schools and peers for the choices and outcomes of children** of different abilities and from different backgrounds. For example, we are building historical data on catchment areas for each primary and secondary school in the UK; combining these with UK administrative data will allow us to study the effects of school quality on education attainment and labour market outcomes.

We will also study education decision-making in adolescence using new data we will collect from Year 11 students in a sample of 120 UK schools. We will elicit beliefs about subject choice from students and parents, as well as information on how power is shared within the family, in order to study how the interaction between parents and children shapes subject choice. Further, in collaboration with the experimental group at the Centre for Experimental Research on Fairness, Inequality and Rationality (Norway), we are developing field studies that will allow us to learn more about the role of peers and peer group structures in adolescent development and behaviours.

Labour markets, skills and wage progression

Human capital continues to develop during adulthood, building on earlier achievements. We will study the role of jobs, firms and the labour market in driving human capital investments during the working life. We will build on previous work [36] to investigate the complementarities between these investments and the human capital accumulated during childhood and adolescence. This theme links closely to our research on the causes and consequences of skill mismatch, in the *Inequalities* section.

One line of research will focus on the role of **education, work experience and on-the-job training** as key drivers of human capital [35, 15]. We will measure how these investments are rewarded in the labour market and how they are linked to labour supply and wages over the working life. Drawing on UK household panel data, we will analyse the impact of welfare, education and training policies on human capital investments, careers and earnings over the life cycle. By changing the incentives to invest in human capital and work, these policies may also affect earnings and their progression.

Low-skilled workers in the UK have on average experienced little wage progression over recent years [44]. This has important consequences for inequalities and is a cause of persistent poverty. There is widespread concern that the type of jobs that low-skilled workers have access to do not promote the accumulation of skills that would allow them to progress in their careers and find better jobs. However, preliminary work using UK data on workers and the firms they work for suggests that some low-skilled

workers, in particular those that match to an innovative firm, experience faster wage growth. In collaboration with the CEP, we will take this work forward to determine the characteristics of workers, firms and job types that lead to improvements in productivity and pay.

There is very mixed evidence on the effectiveness of job-training and search-assistance programmes in helping disadvantaged young people to find work [31, 52]. We will utilise data from several randomised control trials that study the effects of different job-training programmes targeting disadvantaged youth in Denmark, Uganda and Colombia. We will use high-frequency longitudinal survey and administrative data which allow us to study how the effects of these programmes evolve over time and what the critical ingredients are of effective designs. This links to planned work on educational outcomes, labour market opportunities and decisions to engage in criminal activities, described in the *Public expenditure* section.

Health, environment and human capital

Health is a key dimension of human capital. **We will focus on understanding formation of and investments in health, as well as the link between health and labour market outcomes**, as described under *Inequalities*. The availability of polygenic scores and epigenetic data for the 1958 UK cohort will allow us to study how shock and policy effects on health vary by genetic predisposition and are transmitted via biological pathways. This approach also links closely to our agenda on *Ageing*. We will further utilise the just-released genetic data on children and both biological parents in the 2000 cohort (the Millennium Cohort Study) to study the degree to which the intergenerational correlation of health (e.g. obesity) and other dimensions of human capital can be attributed to genetic versus socio-economic pathways for transmission.

A persistent puzzle in public health in low-income settings has been the low uptake of apparently highly cost-effective preventive behaviours and investments, such as sanitation. Using multiple data sets from randomised control trials on sanitation interventions in India and Mali, we will study constraints on the uptake of sanitation infrastructure stemming from financing and social constraints and whether improved health due to a cleaner environment in early childhood aids human capital accumulation later in life. We are collaborating with epidemiologists from the London School of Hygiene and Tropical Medicine to design, implement and evaluate combined sanitation and early childhood interventions in India.

IV. The challenges of an ageing population

As populations age, it becomes more important that pension and disability benefit systems enable and encourage people to work and provide for their own retirement. At the same time, these systems must provide insurance against adverse events and help maintain an acceptable standard of living for those whose health limits their ability to work, who reach retirement with insufficient wealth or who outlive their financial resources. These two objectives are inherently in conflict. We will continue to contribute to evaluating the trade-offs that policymakers face in reforming policy and to measuring the well-being of the elderly [40]. Our proposed research will **study individual and employer behaviour and the impact of various actual and proposed government reforms on retirement, savings and health**.

Retirement and savings over the life cycle

We will exploit the detailed information in the English Longitudinal Study of Ageing (ELSA), a data set designed and developed by IFS and partners at UCL and University of Manchester. ELSA is a longitudinal survey of the over-50s with detailed information on private wealth, physical and mental health, family circumstances and genetic information and also links to administrative data on taxable earnings, welfare benefits and pensions, and NHS medical care records. These data have already led to

innovative and highly influential international comparative research, finding, for example, that English individuals near retirement age are in considerably better health than their American counterparts [22, 23, 24, 33, 38]. We now have new links to administrative data, and younger cohorts of workers moving through newly reformed pension and welfare systems, which will enable us to address a new range of questions. We will continue to design ongoing waves and collaborate with others in data collection around the world including in Ireland, Scotland, US, Europe, China, Japan, India, Brazil and South Africa.

We will study **the distribution of retirement wealth and its components**, and the degree to which these are related to lifetime earnings patterns [45, 56]. We will assess whether older individuals with similar genetic endowments exhibit different life-cycle labour force participation rates, labour income and retirement wealth depending on the mix of policies they face. Research linking genetic endowments to socio-economic outcomes such as employment, income and retirement wealth is still in its infancy and much remains to be learned about how genetic endowments affect economic behaviours and outcomes over the life cycle. Research on US data has shown sharp differences in retirement wealth between people with different ‘polygenic scores’ capturing the summary effect of genetic endowments on educational attainment. However, it is unclear how the policy environment (and in particular the structure of pensions and retirement savings policies) interacts with those genetic endowments, potentially either exacerbating or mitigating the relationship between genes and outcomes. We will work with the authors of the US study to provide the first in-depth cross-country comparison of life-cycle economic behaviour of individuals with similar genetic endowments. A cross-country comparison provides a useful ‘laboratory’ to help us understand the way in which policies interact with genetic endowments in driving behaviour.

We will continue to study the **evolving labour market for older workers**, assessing how changes in the health and disability of the population impact earnings, participation rates, hours choices and different forms of labour market participation such as self-employment and multiple job holding, which are becoming considerably more common [22, 17, 33]. Related to this, we will look at the relationship between age, physical and mental health, and productivity of older workers and the role of on-the-job training and job search in facilitating continued productivity at older ages for those at different points in the skill and lifetime earnings distribution. This work dovetails with the work described under ‘Labour markets, skills and wage progression’ in Section III. For example, in closely related analysis, we will exploit the O*NET data in order to understand the tasks, knowledge and health structure of jobs at older ages and the association of that with individuals’ willingness and ability to stay in the labour market at older ages both before and after the state pension age.

Pensions policy and its effects on retirement outcomes

We will exploit recent reforms to pensions and retirement policies to study labour supply and retirement wealth. For example, we will continue to assess the **impact of changing state pension age on employment and labour market behaviour** [18, 62, 59]. Building on our recent work looking at the effects of work on physical mobility and cognition [21], we will look for longer-run effects on spending patterns and mental health. There is evidence that awareness of this reform was low, so we will use both standard economic models and new models that allow for limited attention when modelling **how households understand and respond to complex pension system rules**. We will jointly model how individuals learn about the reforms, and how their labour supply and savings respond, which can help us understand whether people have saved adequately and prepared for the loss of benefits. The study of these reforms will also add to our previous research showing that consumption responds to pension reforms by less than would be predicted by the simplest life-cycle models [11, 12]. We will assess whether

these relatively small responses are due to limited information or other potential channels, such as delayed retirement or liquidity constraints. Understanding the effects of the reforms at different points in the health and wealth distribution will be a key part of analysing how disability benefits should be designed to take account of the increasing fraction of the population who will experience disability or poor health before starting to receive their state pension.

Other changes to the pension system, such as the move from defined benefit pensions to a system of defined contribution schemes, have resulted in much lower levels of pension accumulation for younger cohorts, but have given private sector employees considerably more choice and freedom to accumulate and decumulate retirement wealth. In addition, the recent introduction of automatic enrolment into defined contribution pensions has been shown to change participation in private pensions in younger cohorts. We will build on our recent work and analyse the **consequences of auto-enrolment** and improve the understanding of the mechanisms through which it is having effects [60, 61].

These reforms have changed the risks faced over the life cycle, reducing the job tenure risk associated with defined benefit pensions, but increasing the risk of low savings or asset returns associated with defined contribution pensions. The changing balance between private and state provision changes the risks faced by successive cohorts. Recent reforms to annuitisation rules also change the nature of risks faced, or at least the price of insuring those risks, at older ages. We will consider broad issues of **retirement provision and risk sharing**, noting that individuals on average now bear the risk at the accumulation and decumulation phase of pension saving, whether this relates to asset returns, employment, non-annuitisation or the risk that individuals are unable or unwilling to plan for the future, or to execute previous plans, potentially due to limited (or declining) cognition. We will use a range of data sources to look at accumulation in defined contribution pensions and how it is affected by pay rises and tax changes. We will document the gender pension gap and decompose it into its key drivers and components, and look at the retirement and saving behaviour of the long-term self-employed and consider how this was affected by the reforms to state pension age.

Following on from our previous work showing that individuals with lower cognition have different retirement wealth trajectories pre- and post-retirement [25] and are less likely to shop around for annuities in the decumulation phase of pensions [20], we will study how pension and annuitisation changes, as well as other policy changes, have affected asset accumulation and savings adequacy for different groups.

The research into pension reforms, labour supply and retirement savings adequacy forms part of the broader set of questions on how and why households accumulate savings or debts over their lifetime and how this relates to the distributions of risks they face [19]. Understanding housing and mortgage debt will be another important element of this agenda. We will study the motives behind households' decisions to accumulate mortgage debt and how they impact their response to subsequent shocks. This will provide an evidence base for policymakers charged with designing and implementing new 'macro-prudential' interventions through instruments such as maximum permissible loan to value/income ratios.

V. Demands on public expenditure and public services

We will continue to analyse the UK public finances, publish a broad range of outputs that assess the record of government, and examine forecasts for government revenues and spending to inform the public debate. Our flagship publication, the annual IFS Green Budget, remains a key source for scrutinising government public finances and helps policymakers, the general public and other stakeholders to understand the challenges and trade-offs faced by government. For example, the

government faces particular challenges in **funding the NHS** due to an ageing population and a host of cost pressures [50]. Spending on closely related services such as **social care** has seen large reductions in recent years. Understanding the interlinkages between different areas of public spending is a critical input to help policymakers understand the social trade-offs in allocating resources across different public services and how one area can impact demands in other parts of the public sector. We will study the link between social care and health outcomes among the elderly and at earlier stages of the life cycle. Using linked administrative data, we will examine linkages between early childhood interventions and health, as well as links between education, labour market policies and the criminal justice system.

Local and devolved tax and spending

One key structural change to the UK tax and spending system in recent decades has been a **substantial devolution of powers** to the nations within the UK. We will continue to explore the implications of devolution for public policy design [29]. Understanding the interactions between the taxation of business incomes, which currently remains centralised, and income taxation, which has been partially devolved to Scotland, will be an important dimension of this agenda.

Reforms to how **English local government** and the **devolved governments** in Scotland, Wales and Northern Ireland **are funded** have increased the extent to which revenues depend on local or regional economic performance. These are significant and have the potential to fundamentally change local and devolved government **incentives and behaviour**, and the extent to which **resources and fiscal risks are shared** across the UK. In partnerships with researchers, policymakers in Scotland and Wales, a range of councils, and private sector organisations we have analysed the potential impacts of existing and proposed reforms, developing unique expertise and tools such as our new local government finance model, and informed policy debate and development [4, 5, 6, 7, 72, 80].

We will continue to examine the impact of proposed reforms on local and devolved governments' incentives, funding and funding risk and extend this work to consider the patterns and drivers of local and regional inequalities. We will examine the factors driving the different tax and spending choices of different councils and consider the impacts on outputs, such as the quantity and quality of public services and local socio-economic outcomes. New powers over tax and benefits will likely lead to increased differences in policy across the UK. We will analyse policy options and exploit this policy variation to help us answer more fundamental questions about the impact of policies on behaviour and outcomes.

The distributional effects of public spending

The redistributive impact of public spending is as important for understanding the effect of the public sector on the distribution of well-being as the much more extensively studied impacts of taxation. The most common procedure for assessing this is to value the benefits of publicly provided goods and services according to the cost of provision, and to assume these benefits are distributed according to use or entitlement. This approach faces formidable challenges in identifying beneficiaries and capturing the pronounced life-cycle pattern to consumption of public services. We will produce new evidence on the **redistributive effects of spending on health, education and local government services** using this cost-based approach. We will also look at the effect of using alternative approaches, such as willingness to pay. This also has limitations as the monetary value of benefits consumed might differ markedly from the value of these services *ex post*. A fully satisfactory approach requires a more complete understanding of the demand for public services, and we will investigate the possibilities of extending this research.

Productivity in healthcare delivery

The medical workforce covers a large and diverse group of public sector employees. Measuring and improving the productivity of staff, and the teams and organisations in which they work, is essential to understanding how to train, recruit and retain a workforce capable of delivering quality care to patients. We will use large administrative data containing information on staff and patient hospital records to examine variation in the productivity of individual medical staff and teams. We examine the impact of senior physicians (consultants) on patients, exploiting physician movement across hospitals over time to separate the effects of physicians from the hospitals in which they work and the characteristics of patients. We will also use novel granular data on patient care and clinical staff from a large London NHS hospital group to examine the impact of staffing disruptions on nursing team productivity and patient outcomes.

Drawing on previous work on the impact of outside pay on public sector workers [46, 58, 55], we will use newly available data from the NHS Electronic Staff Record data set that contains comprehensive monthly payroll data to explore the extent to which workers of different types and qualifications match with hospitals with particular characteristics, and to examine the impact of NHS pay and outside options on recruitment and retention of NHS staff, linking this to patient outcomes.

Hospital waiting-time targets and patient outcomes

Failure of hospitals to meet A&E waiting-time targets has attracted substantial media attention in recent years, and has generally been held up as evidence of falling quality across the NHS. We will examine what such targets imply for patient care. In preliminary work [71], we show targets led to many patients admitted or discharged just before the four-hour target (instead of after this). The reductions in waiting times were particularly large for patients with time-sensitive and complex conditions, such as stroke and sepsis. The target also led to substantial falls in mortality among these patients – in other words, the target sped up the care received by these critically ill patients, and therefore saved lives. This work is of direct policy interest and will help to evaluate and inform further reforms.

We will continue to research issues related to health spending in middle- and low-income countries. We will study the design of health insurance, as well as the determinants of efficiency in the provision of healthcare. In one project, we will use detailed medical and insurance claims administrative records from Colombia, which will allow us to understand key issues in the design of health insurance. We will also study the take-up of medical innovations and whether qualification requirements for healthcare workers are overly stringent, both crucial factors in determining the efficient use of available resources.

Education

Our work on education spending provides policymakers and the public a longer and more comprehensive picture of how spending per student has evolved across different stages of education than has previously been available [28, 47, 26]. Setting out these long-run trends is essential for informing public debate. To underpin our agenda on choices over public spending in education, we will study the returns to investing in different stages of education, how these gains vary across households (related to work on *Inequalities*) and what the most effective ways to design funding policies are (linking to *Tax and benefit reform*).

Two examples are research on public investment in early years and in higher education. Sure Start has been one of the largest programmes for children under 5 in England. Spending on Sure Start has been cut by two-thirds since 2009–10. We continue to investigate whether and how Sure Start impacted children's health and educational attainment [49]. This research is providing policymakers with concrete evidence on the returns to funding Sure Start and details on the households and areas that have gained

most from this public expenditure. Understanding the drivers of higher education choice, the choice of subject and institution, and the variation in returns is crucial to explain earnings differences for those with post-secondary education and to the good design of higher education policy. The implications for public spending of getting well-designed policies in place are large.

The evidence on choice over, and returns to, higher education in the UK has been limited due to data constraints. We now have access to the **Longitudinal Educational Outcomes administrative data set**, linked to post-graduation earnings and other demographic information, which enables us to estimate the impact of higher education on individuals' early-career earnings [27]. We are also able to investigate how returns vary by subject, higher education institution and students' prior attainments. We will estimate lifetime returns to higher education, taking into account forgone earnings while studying and loan repayments, and how individuals choose degree subject and institution. These projects will collectively provide policy-relevant evidence on the role of universities in reducing the gender pay gap and other group-based inequalities (e.g. by ethnicity, socio-economic status and region).

There is increasing interest in the impact schools have on children's longer-term outcomes. We will exploit unique data on school catchments to estimate the effect of just getting into a school versus just missing out. Our previous research has shown effects of various policies on education outcomes, e.g. school-starting age [57], and documented strong complementarities between returns to formal education when young and on-the-job human capital investment later in life. Establishing such causal links across the life cycle allows policymakers to factor in the full social benefit of public expenditure on education at any given tier of the education system.

Criminal justice

We will develop a new agenda examining the causes and consequences of criminal behaviour, both for individuals involved and for public spending. We will examine how engagement in criminal activity and other forms of anti-social behaviour relates to educational and labour market opportunities, so linking together decisions over the life cycle. We will explore which policies can deter or prevent individuals from engaging in criminal behaviour. This work will utilise newly available administrative records on offenders in the UK linked to court outcomes, allowing us to describe the time profile of an individual's offences over time, identify critical ages at which the returns to intervening are highest, and document how patterns of criminal behaviour and the operation of the criminal justice system vary across regions and by labour market characteristics.

Management and leadership plan

The ESRC Institute at IFS is directed by Richard Blundell, who takes overall responsibility for its management. He has a long and successful record of managing and leading large programmes of research. He is supported by six Co-Directors – Attanasio, Banks, French, Griffith, Postel-Vinay and Rasul – in providing intellectual leadership and managing the research programme. This is a stable team, with a long and successful record of collaboration, and with a diverse and complementary set of skills which is key to supporting the breadth of the cutting-edge research programme at the ESRC Institute at IFS. The Co-Directors hold chairs at UCL, Manchester and Yale, but all also have appointments at IFS and spend considerable time physically at IFS, working closely with junior researchers, attending seminars and providing the intellectual leadership that best supports their development.

The management of the ESRC Institute at IFS is carefully integrated with the management of IFS. Blundell and the Co-Directors work closely with Paul Johnson, the Director of IFS. Griffith is Research

Director of IFS and Costa Dias and O'Connell are Deputy Research Directors of IFS; they work closely with full-time staff at IFS to ensure that the research programme is integrated with other IFS work and to identify the necessary resources within IFS. Blundell, the Co-Directors, Johnson, Costa Dias and O'Connell meet regularly with senior researchers and members of the administrative team to discuss the progress of projects, their planned and actual impact, knowledge exchange, and how resources should be allocated.

An **Advisory Committee**, chaired by Hilary Hoynes (Berkeley) and including high-level national and international academics, policymakers and business people, meets twice a year. Its role is to provide advice and challenge the Directors on the content, quality and dissemination of the work and to ensure that progress is made against objectives.

Support in day-to-day management is fully integrated into IFS management. IFS Associate Directors are full-time IFS staff responsible for managing researchers, raising co-funding and ensuring high-quality dissemination. An effective and flexible administrative team provide additional support. Bonnie Brimstone and Emma Hyman take the lead in managing the large and diverse range of outputs that we anticipate from the ESRC Institute at IFS. They ensure that the outputs are widely available and publicised through various channels to maximise reach and impact.

Expected outputs

The ESRC Institute at IFS has a history of world-leading research contributions, which we will continue to develop. Our research programme has identified many major areas of academic and policy interest where big gaps in knowledge remain, and where we expect to make key contributions to be published in top economic journals. Our research feeds directly into the policy analysis IFS carries out regularly, and will underpin many interactions both within and outside academia. We will continue to develop our research programme and open up new research avenues. For instance, the holistic work on inequalities embodied in the IFS Deaton Review, involving many researchers from many disciplines and locations around the world, is only possible because of the accumulation of research work carried out within IFS and supported over the years by the ESRC.

The training and development of a new generation of researchers is one of the most significant outputs of the ESRC Institute at IFS. We have a strong track record in developing world-class economists working both in and outside the academic world. Our plans and expected outputs in this area are described in *Career development and capacity building*. We also plan to make major contributions to the policy debate and to inform both technical and non-technical audiences, described in *Pathways to impact*.

Summing up

The overarching objective of the ESRC Institute at IFS will continue to be to make major scientific progress on a range of topics, ensure this knowledge is used to have substantial positive impact on the **operation and evaluation of policy**, and operate as a national resource to **build technical and policy capacity**. These objectives contribute directly to **promoting and supporting the production and application of world-class, independent social science**.

Our research agenda spans 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. Our research will be grounded in the successful practices built up in the ESRC Institute at IFS over many years.