



LABOR SUPPLY AND TAXATION

RICHARD BLUNDELL

Edited by Andreas Peichl and Klaus F. Zimmermann

OXFORD

Labor Supply and Taxation

IZA Prize in Labor Economics Series

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Richard Blundell
2012 IZA Prize Laureate

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Andreas Peichl
Klaus F. Zimmermann

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Great Clarendon Street, Oxford, OX2 6DP,
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First Edition published in 2016

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Impression: 1

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Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

British Library Cataloguing in Publication Data

Data available

Library of Congress Control Number: 2015940149

ISBN 978-0-19-874980-6

Printed in Great Britain by Clays Ltd, St Ives plc

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Award Statement of the IZA Prize Committee

The 2012 IZA Prize in Labor Economics is awarded to Richard Blundell (University College London and IFS) for his path-breaking contributions to the econometric analysis of labor markets and public policy reforms. Professor Blundell has played a major role in the development of modern labor and policy analysis. His work is characterized by a focus on pressing questions in economic policy, the development of cutting-edge econometric methods to tackle such questions, and painstaking analysis of micro data. Blundell's contributions laid the foundations for the modern economic analysis of labor supply, consumer behavior, and policy reforms. His work has been enormously influential in the worldwide debates about tax and welfare reforms over the past decades.

Richard Blundell has provided some of the most significant contributions to the econometric analysis of labor supply. Among his early work was a seminal paper with Richard Smith in which they provided a novel test for endogeneity in econometric models (*Econometrica*, 1986). The test signified a crucial advancement in addressing important empirical questions, for instance, regarding the relationship between household income and female labor supply. Richard Blundell's work has greatly enhanced our understanding of how taxation and social policy influence individuals' labor market behavior. Blundell did not only help develop a new theoretical framework for understanding labor supply reactions to policy changes. He also complemented the theoretical analysis by developing the necessary instruments for careful empirical analysis, and he applied these tools to real-world policy questions. His paper with Alan Duncan and Costas Meghir (*Econometrica*, 1998) is exemplary of this approach. The authors developed novel methods to examine

how household labor supply responds to tax reforms, and used these methods to estimate the reactions to the UK policy reforms in the 1980s.

Richard Blundell also made fundamental contributions to studying labor supply and consumer demand in an integrated, unifying framework. His approach offered a dynamic perspective, taking into account that consumption smoothing over the life-cycle and labor supply are inherently linked. More recently, Blundell has also been concerned with economic inequality and the changes in income distributions. He made important methodological contributions that have advanced the econometric modeling of such dynamic issues. Furthermore, Blundell was among the first to explicitly take individual-level heterogeneity into account when assessing actual policy problems.

In addition to his academic contributions, Richard Blundell has made a compelling case for more evidence-based research and policy advice. He has taken a leading role in demonstrating the importance of giving researchers enhanced access to micro data for their research. Throughout his career, Blundell has intensely engaged in the policy debate. From 2006 until 2011, he served as co-editor of the influential Mirrlees Review. In this role, he provided practical recommendations for improving UK tax policy and helped develop the pillars of an efficient modern tax system. His enduring commitment to research and policy make Blundell a role model for combining academic strength with policy relevance.

Richard Blundell currently holds the David Ricardo Chair of Political Economy at University College London and is Research Director of the Institute for Fiscal Studies, where he is also Director of the ESRC Centre for the Microeconomic Analysis of Public Policy. He is a Commander of the British Empire, Fellow of the Econometric Society and of the British Academy, and Honorary Member of the American Economic Association and the American Academy of Arts and Science. In 1995, he was awarded the Yrjö Jahnsson Prize for his work in microeconometrics, labor supply and consumer behavior; in 2000, he received the Frisch Medal by the Econometric Society for his 1998 *Econometrica* paper with Alan Duncan and Costas Meghir. Blundell has delivered numerous distinguished lectures, and he holds honorary doctoral degrees from the Universities of St. Gallen, Bergen, and Mannheim. He is the current president of the Royal Economic Society,

and past president of the Econometric Society, the European Economic Association, and the Society of Labor Economists. He also served as co-editor for journals such as *Econometrica*, the *Journal of Econometrics*, and the *Review of Economic Studies*.

George A. Akerlof	University of California, Berkeley; IZA
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Acknowledgements

This volume draws on more than three decades of research, much of it co-authored with the brilliant students and colleagues of whom I have been lucky enough to work with over the years. In particular, I would like to thank Antoine Bozio, Mike Brewer, Monica Costa-Dias, Alan Duncan, Marco Francesconi, John Ham, Guy Laroque, Julian McCrae, Costas Meghir, Andrew Shephard, John Van Reenen and Ian Walker.

The early work in this volume was written while I was a lecturer in the Econometrics Department at the University of Manchester. Since 1984 I have been Professor of Economics at University College London and since 1986 also Research Director at the Institute for Fiscal Studies. I am very grateful for the creative environment afforded to me by these institutions.

The bulk of the research reported here is part of the program of research of the ESRC Centre for the Microeconomic Analysis of Public Policy at IFS. Funding from the ESRC, grant number R000239865 is gratefully acknowledged.

The data used in these studies was made available by the ONS through the ESRC Data Archive and has been used by permission of the controller of HMSO. Neither the ONS nor the ESRC Data Archive bear responsibility for the analysis or the interpretation of the data reported here.

I would like to thank Andreas Peichl and Klaus Zimmermann, who edited this volume for their advice and comments.

Finally, I would like to thank IZA for awarding me the IZA Prize in Labor Economics and for the support it has offered me, and many other researchers in Labor Economics, over the years.

Richard Blundell

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Part I

Introduction by the Editors: Taxation and Labor Supply – Revisiting the Contributions by Richard Blundell

Andreas Peichl and Klaus F. Zimmermann

The question of how individuals adapt their behavior in response to policy changes is one of the most investigated topics in empirical labor and public economics. Do people reduce their working hours if governments decide to raise taxes? Might they even withdraw completely from the labor market? Even if these questions are not new, they are still topical – maybe more topical as ever before. Labor supply estimations are extensively used for various policy analyses and economic research. Labor supply elasticities are key information when evaluating tax-benefit policy reforms and their effect on tax revenue, employment and redistribution. For instance, the question whether welfare programs should be directed to the workless poor, through traditional demogrant policies, or the working poor, via in-work support (Saez 2001) depends on whether participation decisions (the extensive margin) systematically prevail over responses in terms of work hours (the intensive margin). Large participation responses may subsequently lead to large elasticities in the lower part of the income distribution, which is crucial for welfare analysis (see Eissa, Kleven and Kreiner 2008). Finally, the optimal taxation of couples, and notably the issue of joint versus individual taxation, critically relies on the knowledge of cross-wage elasticities of spouses (Immervoll et al. 2011).

Understanding labor supply behavior, both in a static and dynamic context, and using this evidence to guide policy has been on the research agenda of Richard Blundell for many years. He has made several path-breaking contributions in the field of labor supply and taxation

for which he was awarded the 2012 IZA Prize in Labor Economics. Every year, the Institute for the Study of Labor awards the Prize to an individual who has made outstanding contributions to policy-relevant research and methodological progress in the field of labor economics. Since its establishment in 2002, the Prize has been given to several distinguished labor economists; two of them later even received the Nobel Prize in Economics. The 2012 Prize honors Richard Blundell's path-breaking contributions to the modern econometric analysis of labor markets and public policy reforms. Professor Blundell is an eminent scholar and has worked on a range of issues in labor economics, econometric theory and tax policy. His research is unified by a focus on household behavior and the way various labor market and tax policy institutions affect this behavior. His empirical work is driven by policy questions and motivated by economic theory. Many of his contributions show how frontier level econometric methods can be put to work in studying applied problems.

Richard Blundell holds the David Ricardo Chair of Political Economy at University College London. He is a graduate of the University of Bristol and London School of Economics. At the age of 23, he became a faculty member at the University of Manchester without obtaining a PhD first. Since 1986 he has been Research Director of the Institute for Fiscal Studies (IFS), where he is also Director of the ESRC Centre for the Microeconomic Analysis of Public Policy. He is a Commander of the British Empire, Fellow of the Econometric Society and of the British Academy, and Honorary Member of the American Economic Association and the American Academy of Arts and Science. In 1995, he was awarded the Yrjö Jahnsson Prize for his work in microeconomics, labor supply and consumer behavior; in 2000, he received the Frisch Medal by the Econometric Society. Blundell has delivered numerous distinguished lectures, and he holds honorary doctoral degrees from the Universities of St. Gallen, Bergen, and Mannheim. He is the current president of the Royal Economic Society, and past president of the Econometric Society, the European Economic Association, and the Society of Labor Economists. He also served as co-editor for journals such as *Econometrica*, the *Journal of Econometrics*, or the *Review of Economic Studies*. Professor Blundell has edited nine books and published more than 180 papers – many in the most prestigious economics journals. Many of his papers are very influential as evidenced from their large number of citations. In total, his work was cited more than 33,500 times according to Google Scholar (as of August 2013); his Repec score is 8500 ranking him in the top 20 of economists world-wide. His h-index is 72 – implying that 72 of his publications

have been cited at least 72 times. 175 publications have been cited at least 10 times, 120 of those have received at least 10 citations in the last 5 years. For instance, his 1998 Journal of Econometrics Paper with Steve Bond on the GMM Dynamic Panel Estimator has received more than 7,000 citations and his 1999 Handbook of Labor Economics survey on labor supply with Thomas MaCurdy has received more than 1,600 citations.

In various publications, Richard Blundell has provided some of the most significant contributions in the economic and econometric analysis of labor supply and taxation. He was involved in developing a new theoretical framework for our understanding of labor supply reactions to policy changes and complemented the theoretical analysis by developing the necessary instruments for careful empirical analysis. He made fundamental contributions to studying labor supply and consumption smoothing over the life cycle in an integrated framework. In addition to his academic contributions, Richard Blundell has been at the forefront in pushing for more evidence-based research and policy advice. He has taken a leading role in demonstrating the importance of enabling researchers an enhanced access to micro data for their research.

Throughout his career, Professor Blundell has been and still is intensely engaged in the policy debate by applying his empirical methods to real-world policy questions. For instance, he is one of the editors of the Mirrlees Review of Tax Reform. In this role, he provided practical recommendations for improving UK tax policy and helped developing the pillars of an efficient modern tax system. This project drew together insights on labor supply and commodity demand, along with basic principles of tax design, to offer suggestions for reforming the UK tax system. Its findings have been discussed in both academic and policy circles in the UK and elsewhere.

In a similar spirit, IZA recently proposed a tax reform concept for Germany, which is based largely on methodology developed by Richard Blundell. The key element of IZA's concept for a simple, efficient and fair tax system are plans to integrate regressive social insurance contributions into the progressive system of income tax, meaning that social insurance contributions and income tax are no longer levied separately, instead that there is consequently only one payment to be made to the state (see Löffler et al. 2012). An integrated system of income tax would not only finance the country's social security system but also other state services, including investment in education and infrastructure. Simulations for Germany show that such a reform would reduce the burden above all on low- and middle-income earners, while

increasing the fiscal burden on the top 10% of earners. Importantly, the proposal would have a considerable effect on the labor market, leading to the creation of an estimated half a million new jobs due to the more efficient tax structure.

IZA's special focus on Labor Policy reflects the great importance of evidence-based policy making. With its team of policy experts, IZA analyzes and evaluates existing policies on the national and international level, utilizes the results of the IZA program areas, and develops concrete policy proposals. With its own behavioral techniques, *IZAΨMOD* (IZA Policy Simulation MODel), IZA is able to analyze the labor supply reactions and employment effects of tax and benefit reforms in Germany (see Peichl, Schneider and Siegloch 2010). *IZAΨMOD* enables the institute to give policymakers information about appropriate modifications of planned initiatives even prior to their adoption. *IZAΨMOD* consists of three main components. The basis is a static microsimulation model for the German tax and benefit system. The second module is an econometrically estimated labor supply model, which takes into account behavioral reactions to tax reforms. The estimation and modeling in this step relies heavily on methods developed and applied by Richard Blundell. The third component is a labor demand module, which completes the analysis of the labor market and allows a global assessment of the effects of policy measures.

In addition to making own reform proposals, *IZAΨMOD* is used to evaluate current policies. For instance, Eichhorst et al. (2012) analyze the recent trend of increasing marginal employment at the expenses of low-wage full time jobs. It finds substantial disincentives set by the current legislation and calls for a reform of the mini-job regulations as well as income taxation (married couple tax splitting) and finds that these would have a large positive impact on the labor market.

The connection between IZA and Richard Blundell is very long. He joined IZA as a Research Fellow in October 1999, shortly before IZA's first anniversary. But even before this time, Richard was already connected to IZA Director Klaus F. Zimmermann, who had introduced him and his co-author Costas Meghir to the labor group at the University of Mannheim to which he was affiliated with in the 1980s, to discuss Richard's early work on labor supply and taxation. Later on, they both contributed to a volume on *"Welfare and Work Incentives"* edited by Tony Atkinson and Gunnar Mogensen in 1993. While Richard discussed *"Taxation and Labour-Supply Incentives in the UK"* (Blundell 1993), Zimmermann (1993) focused on Germany. Both studies conclude that tax incentives matter but that the resulting labor supply elasticities are usually small. They also highlight the importance of

using micro data, microsimulation models and microeconomic techniques when analyzing the effects of tax reforms on labor supply.

When assessing the effects of policy reforms on the labor market, most studies only focus on labor supply. The interaction of supply and demand side is not explicitly modeled, which might lead to biased estimates of potential labor market outcomes. This is discussed in Chapter 5 of this volume based on Blundell, Ham and Meghir (1987). At IZA, Peichl and Siegloch (2012) propose a straightforward method to remedy this shortcoming. The authors use information on firms' labor demand behavior and feed them into a structural labor supply model, completing the partial analysis of the labor market on the microdata level. They show the performance and relevance of our extension by introducing a pure labor supply side reform, the workfare concept¹, in Germany and simulating the labor market outcome of the reform. The results show that demand effects offset about 25 percent of the positive labor supply effect of the policy reform.

Discrete choice models have become the workhorse in labor supply analyses. However, they are often criticized for being a black box due to numerous underlying modeling assumptions, with respect to, e.g., the functional form, unobserved error components or several exogeneity assumptions. In a methodological contribution, IZA researchers open the black box and show how these assumptions affect the statistical fit of the models and the estimated labor supply elasticities (Löffler, Peichl and Siegloch 2014). In total, the authors estimate more than 3,250 different model specifications. The results show that the specification of the utility function is not crucial for performance and predictions of the model but that the estimates are extremely sensitive to the treatment of wages – a neglected dimension so far. Estimated labor supply elasticities vary greatly depending on whether wages and preferences are estimated separately or jointly; and whether and how wage prediction errors are taken into account (not at all, single draw or full distribution integrated out). As a consequence, the authors propose a new estimation strategy which overcomes the highly restrictive but commonly made assumption of independence between wages and the labor supply decision.

Static models of labor supply are very useful to predict *ex ante* the effect of tax-benefit policy reforms or more generally to provide an order of magnitude of the short-term response to financial incentives. Several excellent surveys report evidence on labor supply elasticities for different countries and different periods.² However, the literature only reaches a consensus on few aspects, establishing that own-wage elasticities are largest for married women and small or sometimes

negative for men. In terms of magnitude, a large variation in labor supply elasticities is found in the literature. For instance, Blundell and MaCurdy (1999) report uncompensated wage elasticities ranging from -0.01 to 2.03 for married women, while Evers, de Mooij and van Vuuren (2008) indicate huge variation in elasticity estimates. Admittedly, much of the variation across studies is due to different methodological choices, including the type of data used (tax register data or interview-based surveys), selection (e.g. households with or without children), the period of observation (see Heim 2007) and estimation method.

Bargain and Peichl (2013) have collected empirical evidence focusing on 15 European countries and the US. For each demographic group (e.g. married or single individuals with or without children), they observe a large variance in estimates across all available studies, pointing to data year and estimation methods as the main sources of variation. The authors show that international comparisons based on existing evidence are generally imperfect and incomplete, with insufficient common support across studies to conclude about genuine differences in labor supply responsiveness between countries. The only clear pattern in the literature is that elasticities are larger for women in countries where their participation rate is lower. However, estimates are missing or scarce for several EU countries and also some demographic groups, such as childless single individuals.

To close some of the gaps in the literature, Bargain, Orsini and Peichl (2014) provide labor supply elasticity estimates for 17 European countries and the US based on a harmonized approach using a structural discrete choice model as used in well-known contributions for Europe (van Soest 1995; Blundell et al. 2000) or the US (Hoynes 1996; Keane and Moffitt 1998). They report compensated and uncompensated own-wage and income elasticities separately for men and women, both single and in couples, with and without children, as well as cross-wage elasticities for individuals in couples. The authors find that that own-wage elasticities, both compensated and uncompensated, are relatively small and much tighter across countries than suggested by previous results in the literature. In particular, estimates for married women lie in a narrow range between 0.2 and 0.6 , with significantly larger elasticities obtained for countries in which female participation is lower (e.g., Greece, Spain, Ireland). Elasticities for married men are smaller and even more concentrated, while elasticities for single individuals show substantial variation with income levels. Consistent results are also found across countries, with important implications for welfare and optimal tax analysis: the extensive margin

systematically dominates the intensive margin; for single individuals, whereas income elasticities are extremely small. Using a decomposition analysis, Bargain, Orsini and Peichl (2014) rule out differences in tax policy, wage/hours levels and demographics as explanations for cross-country differences in labor supply responses. Accordingly, the results are consistent with Western countries having genuinely different individual and social preferences, e.g. different preferences for work and childcare institutions.

IZA is not only applying the methods developed by Richard Blundell and others but also helping in advancing the field. It was in order to demonstrate the state of the art in labor supply modeling and to compare the performance of quasi-experimental techniques with the established structural models that IZA invited about 20 international top researchers to a workshop in Dublin in 2012. Of course, Richard Blundell contributed to this workshop as well. In his keynote speech, he emphasized the importance of labor supply for consumption smoothing as a response to (unemployment) shocks. Overall, the workshop clearly showed that research on labor supply behavior has made tremendous progress recently. Different approaches exist to evaluate the labor supply effects of policy reforms and researchers need to scrutinize carefully which identification strategy is best suited for their research question. High unemployment rates in many European labor markets point to the need to improve labor market institutions, including tax and transfer systems. Credible research results can help policy makers to improve labor market regulations and to achieve the intended policy goals. IZA will continue leading the research in this area and organizing future workshops on this topic.

IZA, together with 28 partner institutes and universities, is a key contributor to the “NEUJOBS” research project which is financed by the European Commission under the 7th Framework Program. The objective of NEUJOBS is to analyze possible future developments of the European labor markets under the main assumption that European societies are now facing or preparing to face main transitions that will have a major impact on employment. IZA’s contribution to the NEUJOBS project is to model structural and behavioral aspects of labor supply and labor demand in order to shed light on the important question how employment in European labor markets might look like in 2030 or even beyond. The labor force is projected to shrink in most EU countries while becoming older and more educated in composition. Dolls et al. (2013) add a behavioral dimension to this trend and find divergent implications across countries. The behavioral changes (hours worked per worker) can worsen or dampen the structural changes (the

size of the labor force). Notable challenges are expected to arise in Austria, Germany and Spain.

In order to provide researchers interested in labor supply a comprehensive reference, this volume brings together a number of key papers which were the basis for awarding Richard Blundell the 2012 IZA Prize in Labor Economics. Many of the papers that are included in this collection are widely read classics. Of course, selecting papers for such a volume can only be incomplete given Richard Blundell's impressive list of publications. For instance, Blundell, Chiappori and Meghir (2005) and Blundell et al. (2007) analyze collective models of labor supply. They find that the estimates of the sharing rule show that male wages and employment have a strong influence on bargaining power within couples. Blundell, Walker and Bourguignon (1988) analyze the optimal taxation of family income when accounting for labor supply incentives. The authors argue that the tax system should discriminate between individuals in the same household if their labor supply responses are different. Blundell, Meghir and Neves (1993) suggest an intertemporal model for labor supply and consumption. Blundell et al. (1988) investigate the practical importance of the functional specification of labor supply equations for the analysis of tax/benefit reforms. In addition to methodological contributions, Richard has also written widely read and cited surveys. For instance, Blundell and MaCurdy (1999) reviewed different approaches to modeling labor supply.

Being selective was not easy. We had to focus on the topic of labor supply and taxation for which Richard was awarded the IZA Prize 2012. We also tried to achieve a good balance between methodological contributions and policy applications from different periods of Richard's career. The resulting book consists of three parts. In the first part, the topic is introduced followed by two recent and overarching chapters on labor supply and policy. Part II is more analytical and conceptual. This section presents Richard Blundell's early work, arising from demand theory and the integration of labor supply and commodity demand modeling. These initial papers are largely concerned with tackling methodological issues or with grounding the analysis of labor supply in an appropriate theoretical model. The third and last part illustrates how these analytical techniques can be put to good use through various policy applications and their impact on household behavior. The papers in this section showcase the wide range of policies that bear on labor market activities, particularly those of low-income households. The careful analysis of welfare-to-work policies, job search programs, and tax policy provides not only insight on each of these initiatives in particular, but also a reminder of the "choice of instrument" problem

when tackling redistribution while preserving work incentives. The different chapters will be introduced in the following.

Part II of this book gives an overview of the topic labor supply and taxation. Chapter 1 highlights the role of empirical evidence in tax policy design. The context for the discussion is the recently published *Mirrlees Review* of tax reform. This chapter highlights the taxation of earnings and also comments on earnings taxation in the context of VAT base-broadening reforms and the taxation of capital. Five different topics are discussed: (i) key margins of adjustment, (ii) measurement of effective tax rates, (iii) the importance of information and complexity, (iv) evidence on the size of responses, and (v) implications from theory for tax design.

Chapter 2 proposes a systematic way of examining the importance of the extensive and the intensive margins of labor supply in order to explain the overall movements in total hours of work over time. This analysis is applied to the evolution of hours of work in the US, the UK, and France and shows that both the extensive and intensive margins matter in explaining changes in total hours.

Part III summarizes Richard's methodological contributions. Chapter 3 deals with modeling the joint determination of household labor supply and commodity demand. In addition to choosing the allocation of total expenditure between commodities, households may also be able to make decisions over the allocation of their time between market work and leisure. In both theoretical and empirical work it has often been the case that these decisions have been analyzed separately. This chapter shows the theoretical attractions of considering the joint determination of the allocation of time between work and leisure and the allocation of total expenditure between commodities in a utility maximizing framework. The empirical importance of the joint determination model over the separate determination of labor supplies and commodity demands is then evaluated using micro data.

Chapter 4 is rather technical and estimates a utility maximizing model of the joint determination of male and female labor supplies. The emphasis is on the estimation of within period preferences that are consistent with inter-temporal two-stage budgeting under uncertainty. Chapter 5 extends the standard model of labor supply by accounting for unemployment. In the basic empirical model of female labor supply any woman reporting zero hours of work is assumed not to want to work. Labor supply parameters are estimated from a likelihood function where the probability of an individual recording zero hours is equivalent to the probability of her not having positive desired hours of work. All non-participants in this 'Tobit' model are assumed

not to want to work. The assumptions of the Tobit model stand in sharp contrast to those made in calculating the labor force statistics. In particular, those reporting zero hours of work but seeking work are considered to be labor market participants, and a measure of the unemployment rate is often formed from data on such individuals. The purpose of this chapter is to modify the standard model of female labor supply to allow for unemployed workers who want to work at their perceived market wage but cannot find a job.

Chapter 6 is based on the 1998 *Econometrica* paper with Alan Duncan and Costas Meghir which was awarded the Frisch Medal of the Econometric Society in 2000. It provides a methodology for estimating labor supply responses using tax reforms from the 1980s. However, changing sample composition, aggregate shocks, the changing composition of the tax paying population and discontinuities in the tax system create serious identification and estimation problems. The paper develops grouping estimators that address these issues. The results reveal positive and moderately sized wage elasticities and as well as negative income effects for women with children. In addition, the developed 'grouping IV estimator' has become a standard tool in empirical labor economics.

Chapter 7 investigates single women's labor supply changes in response to three reforms that affected individuals' work incentives using British panel data. It is found that only the 1999 reform led to a significant increase in single mothers' hours of work. The mechanism by which the labor supply adjustments were made occurred largely through job changes rather than hours changes with the same employer.

Chapter 8 is the first of Part IV on policy applications and is a compilation of several papers on increasing work incentives in the UK. It deals with the labor market impact of the Working Families Tax Credit (WFTC) which, in 1999, replaced the Family Credit as the main package of in-work support for families with children in the UK. This chapter analyzes the impact of WFTC on hours and participation. To simulate labor supply responses, the authors use a discrete behavioral model of household labor supply with controls for fixed and childcare costs, and unobserved heterogeneity. They also simulate a number of scenarios regarding the take-up of the credit, entry wage level and hourly childcare price. The results show that the WFTC increased participation rates among single mothers by around 2.2 percentage points, while participation rates for married women decreased. As a consequence of both effects, the simulation results indicate a small increase in overall participation of around 30,000 individuals.

In-work benefit reforms seek to reduce poverty and promote employment among low-income families. Using evidence from similar policies in the USA and Canada, Chapter 9 reviews the likely impact of recent UK reforms. The focus is on employment and hours. In particular, the paper examines the effectiveness of the new Working Families Tax Credit in the UK in increasing employment among low-income families. It presents evidence suggesting modest increases in employment for single parents and workless married couples with children, but with some off-setting reductions in employment in two-earner couples with young children.

Alongside the growth in overall employment and the steady rise in average real incomes over the 1990s, the UK experienced a concentration of worklessness and low pay among certain groups in society. This was particularly acute for families with children, but was also reflected in the frequency of spells out of work by the young and by the falling attachment to the labor market of older men. In response, the focus of welfare policy shifted towards “making work pay”. The Working Families Tax Credit and the New Deal were central among the policy options that were implemented. Chapter 10 considers the validity of the arguments underlying this shift in welfare policy and asks: which policies work and why? It examines two broad classes of policy options that are motivated by the “making work pay” objective: (i) active labor market programs that involve wage subsidies together with improved job matching; and (ii) earned income tax credits that supplement wages for working low-income families. These programs have many features in common. Using evaluations of UK reforms this chapter brings empirical evidence into the debate on the effectiveness of these programs and assesses which aspects of the design of welfare-to-work programs work well and which aspects could be improved.

Chapter 11 also compares active labor market policy and employment tax credits based on evidence from UK reforms. The background motivation is that many welfare-to-work programs in both North America and Europe are directed at making work pay for the low skilled. This chapter identifies two alternative policies that are motivated by this same objective: active labor market programs that involve wage subsidies together with improved job matching; and earned income tax credits that supplement wages for working low-income families. Although sharing similar concerns over labor market incentives for low-skilled workers, these alternative policies typically differ in many important ways. This chapter evaluates the impacts of two such programs designed to enhance the labor market attachment of low-wage workers in the UK.

Chapter 12 exploits area-based piloting and age-related eligibility rules to identify treatment effects of a labor market program for mandatory job search assistance – the New Deal for Young People in the UK. A central focus is on substitution/displacement effects and on equilibrium wage effects. The program includes extensive job assistance and wage subsidies to employers. The results show that the impact of the program significantly raised transitions to employment by about 5 percentage points. The impact is robust to a wide variety of non-experimental estimators.

Chapter 13 is based on the Adam Smith Lecture 2005 presented at the joint EALE/SOLE World Meeting in San Francisco, June 2005. In this paper, the impact and optimality of Earned Income Tax Policies to tackle the low labor market attachment and high incidence of poverty among certain groups is analyzed. EITC policies have taken a central position in recent EU labor market policy debate and the focus of this chapter is on actual reforms over the last decade in the UK.

Chapter 14 examines the optimal design of low-income support using a structural labor supply model. The approach incorporates unobserved heterogeneity, fixed costs of work, childcare costs and the detailed non-convexities of the tax and transfer system. The analysis considers purely Pareto improving reforms and also optimal design under social welfare functions with different degrees of inequality aversion. The authors explore the gains from tagging and also examine the case for the use of hours-contingent payments. Using the tax schedule for lone parents in the UK as policy environment, the results point to a reformed non-linear tax schedule with tax credits only optimal for low earners. The results also suggest a welfare improving role for tagging according to child age and for hours-contingent payments, although the case for the latter is mitigated when hours cannot be monitored or recorded accurately by the tax authorities.

Finally, in Part V Richard Blundell summarizes and concludes his research on labor supply and taxation over the last 30 years and provides an outlook for future research – explicitly accounting for human capital decisions, the dynamics of life cycle family labor supply decisions and restrictions on job offers and choices of hours of work. Richard concludes by stating that analyzing labor supply and taxation is clearly set to remain an active and emerging field of economic research for many years to come.

The future of labor is being set today through the decisions of individuals and policy makers. Today's labor market and today's policies set in motion decisions about participation, education and retirement which cast a long shadow into the future, as individuals progress through

their careers over the life cycle. With the future of labor program area, IZA seeks to improve our understanding of the effects of today's labor market and labor policies on future labor market outcomes in the hope that better understanding will lead, eventually, to better policy. Analyzing labor supply and how it is shaped by policies is a key element of this research area and Richard Blundell is among the most important contributors. Continuing this line of research is high on IZA's research agenda in order to provide evidence-based policy advice in the spirit of Richard Blundell's work. The IZA Prize in Labor Economics 2012 honors the work of an eminent scholar who has greatly shaped our view on labor market analysis and economic policy. Richard is a role model to many researchers across the globe. His work is a remarkable combination of academic excellence and policy relevance.

Part II

Overview

Introduction

What is it that makes economic research so compelling? My short answer would be the challenges of a continually changing economic environment and the interplay between policy questions and empirical research. Nowhere is this more the case than in the study of labor supply and taxation. How should we develop the foundations for rigorous empirically-based policy analysis? How should we balance policy and methodological research? New evidence, new (applied) theory and a new economic environment, keep these questions alive and move the frontier forward. Research has to run just to keep up!

The studies in this volume are dedicated to addressing these challenges. In the first chapter I begin with the question: what is the role of empirical research in policy analysis? To answer this I consider the role of evidence loosely organised under five headings - my 'five steps to heaven' – heaven as seen by an addict of empirical economic research!

I have chosen these five steps reflecting on the long history of studies presented in this volume. Many of these draw on research and discussions with many wonderful co-authors, students and colleagues from University College London over the years. Much of this research has also been driven by the continuing flurry of key policy questions raised in day-to-day work at the unique Institute for Fiscal Studies. The building of the UCL-IFS research and policy base over nearly three decades has been the bedrock of this research and I have been a lucky fellow traveller in this journey. This work is team research and I thank my many co-authors, mentors and students in this venture.

The first of my *five steps* is entitled 'Key margins of adjustment to reform'. In other words – getting the facts straight. Where are there important differences in behaviour that may have resulted from policy reform? From a labor supply perspective this is answered in the second

chapter that investigates the key differences across countries and demographic groups in key measures of labor supply.

The second of the steps is ‘Measurement of effective tax incentives’. Exactly how does the policy change the incentives faced by individuals? If we see little response it may be that individuals are not responsive, but it may also be that there was nothing for them to respond to! Getting the measurement of incentives right requires a huge investment of integrating the various aspects of the tax and welfare benefit system together with the data on labor supply – something my colleagues at IFS have been involved in over many years. Indeed they have created an unparalleled research resource on which I have drawn on extensively in many chapters in this volume.

Next comes ‘The importance of information and complexity’. We, as economists, are not always so proficient at figuring out effective incentives in tax systems, so we might well ask how well do the agents themselves understand them. What is the role of information, stigma and cognition? Governments too can exploit ‘less than salient’ taxes. Transparency seems a first principle in reform but understanding responses to existing reforms requires a careful modelling of this aspect of behaviour. With the cocktail of multiple benefits and taxes facing low-wage workers in the UK, this has been a key component in reform simulation models but perhaps this behaviour should attract more attention by public finance economists more generally.

Forth on the list is the microeconometrics core – ‘Evidence on the size of responses’. The aim is to understand causal impact of policy on behaviour. To recover the ‘deep’ parameters that reflect preferences and constraints. Here I argue that an eclectic mix of experimental and structural approaches can provide a powerful evidence base for reform.

Finally, the theory of mechanism design and optimal taxation comes into play – ‘Implications from theory from optimal policy design’. Insights from theory for constrained efficient policy under different modelling assumptions on social welfare functions, individual preferences, expectations and credit markets are central here.

In sum, I hope the studies in this volume tee-up a large and exciting agenda for future research. In the concluding chapter I take a look toward the future. Where is the action likely to be? Not only is there room to improve what we have done already, there is also a continual requirement to adapt to new economic environments, new insights from theory, new policy ideas and new data measurements. But that’s what makes this area of research one of the most compelling in applied economics!

As a final precursor I would like to thank the numerous colleagues and students who, over the years, have helped me with the work in this volume, especially those who have co-authored some of the papers presented here. Much of the research would have not been possible without the funding from the Economic and Social Research Council of the UK through the ESRC Centre for the Microeconomic Analysis of Public Policy at IFS. For this I am eternally grateful. Finally, I also want to thank two talented economics undergraduates at UCL, Fabien Eckert and Hannes Ansorg, who helped prepare this volume.

1

Tax Policy Reform: The Role of Empirical Evidence

1.1 Introduction

How should evidence be used in the study of tax design? What is the appropriate balance between theory and empirics? These questions lay at the heart of the *Mirrlees Review*. Motivated by the aim to develop a broad set of principles for what makes a *good tax system*, the *Review* was an attempt to base tax reform on the large body of economic theory and empirical evidence. It was inspired by the Meade Report (1978) with the idea to review tax design from first principles for modern open economies in general and for the UK in particular. The UK over the past thirty years would be the working laboratory.

The *Mirrlees Review* was published in two volumes: *Dimensions of Tax Design* (Mirrlees et al. 2010) bringing together expert evidence across a wide range of aspects of tax reform, and *Tax by Design* (Mirrlees et al. 2011) setting out the conclusions and recommendations. This paper examines the role of evidence used in the derivation of the recommendations for reform. It also examines the linkages between theory and empirical evidence. To maintain consistency and coherence in the discussion, the focus here will be on the taxation of earnings although the *Review* itself concerned all aspects of the tax system. The discussion is organized loosely under five related headings:

The original version of this chapter was published as: Blundell, R. (2012). Tax Policy Reform: The Role of Empirical Evidence, in: Journal of the European Economic Association, 10(1): 43–77. © 2012 by European Economic Association. I would like to thank the Editor, referee and participants at the JEEA Lecture at the AEA meetings and at the FBBVA Lecture in Madrid, for helpful comments. I am also grateful to my co-authors and co-editors on the Mirrlees Review for the many discussions over the course of the Review. All figures and tables not directly sourced are from the second volume of the Mirrlees Review, Tax by Design (2011).

- (i) Key margins of adjustment.
- (ii) Measurement of effective tax rates.
- (iii) The importance of information and complexity.
- (iv) Evidence on the size of responses.
- (v) Implications from theory for tax design.

The first of these headings highlights the importance of establishing empirical facts about key aspects of behavior where we think taxes could have an impact. The second reinforces a pervasive theme of the *Review* which was to consider the tax system as a whole and examine the *wedge* created by all aspects of the tax system, including the implicit tax rates in the benefit and tax-credit systems. This also naturally motivates the third heading which relates to the understanding of the incentives implicit in the tax and benefit system by the individuals, households, and firms themselves and the stigma and hassle costs involved by those accessing the system. The fourth heading is the core of any rigorous empirical analysis and concerns the robust measurement of the causal impact of tax reforms. Here I suggest the use of a mix of (quasi-)experimental and structural approaches with the experimental approaches acting as a ‘reality check’ on the structural model. Structural models allow the study of behavior in counterfactual environments and it is difficult to envisage a complete empirical analysis of tax design analysis that does not draw on such counterfactuals.

Under the final heading, these empirical relationships are brought together with the structure of mechanism design from economic theory to determine efficiency costs, overall optimality, and improvements to tax design. There are three key ingredients to any optimal tax analysis: the accurate measurement of response elasticities, the detailed description of the distribution of income, and some view of social welfare weights. The first two of these are positive and can be learned from a careful evidence-based analysis. The last is normative and therefore something over which reasonable people may differ. The aim here is to draw broad evidence-based conclusions while making fairly weak assumptions on social welfare weights, perhaps assuming no more than that they are declining in some measure of equivalized income.

Why the focus on earnings taxation? Earnings taxation is ideally suited for examining the role of evidence in tax design. There are substantial empirical results on labor supply responses to tax reform for individuals and families, see Blundell and MaCurdy (1999) and Meghir and Phillips (2010) for surveys. This research has emphasized the need to distinguish between the intensive and extensive margins of labor supply – that is between the decision of whether to work or not and how much to

work, respectively. It has also shown clear differences in responses by age, gender, and family composition. Both of these observations are central to tax design. Further, tax return information provides additional evidence on taxable income elasticities, highly relevant for the design of earnings taxation, see Gruber and Saez (2002), for example. We will argue that this evidence naturally supplements and extends work on employment and hours of work responses to tax reform.

The next five sections of this paper reflect these five aspects of the empirical analysis of reform. This is not meant to imply that the taxation of earnings should stand separately from the design of the rest of the tax system. As the *Review* recommendations volume *Tax by Design* makes clear, any comprehensive reform must bring together all aspects of taxation. Indeed, the taxation of earnings bears the brunt of much of the tax reform proposals through the need to adjust for changes in redistribution and work incentives induced by other aspects of the reform package. Therefore, to round off this paper, the discussion turns to the interplay between earnings tax design and base-broadening reforms to VAT, as well as to the taxation of capital and reforms that seek to align effective tax rates across all sources of income.

1.2 Key Margins of Adjustment

With the focus on earnings tax reforms, our analysis begins with the key changes in lifetime employment patterns over the last three decades. This sets the scene for understanding where, over their working life, individuals and families are most likely, and most able, to respond to tax reform.

The recent history of variation in hours and employment has been made up of three key trends which we will argue also point to the three key margins where responses to tax reform are most likely to occur: a decline in employment among men especially at older ages, a strong rise in employment and total hours of work for women, and a decline in employment among those in their late teens and early 20s reflecting the increase in educational attainment over this period.

As has already been noted, an important distinction in analyzing labor supply responses is between the extensive (whether to work) and intensive (how much to work) margins of labor supply. Although it is the case that hours of work are often found to respond less than employment decisions, Blundell, Bozio and Laroque (2011a) show that the intensive and extensive margins both matter in explaining the broad changes in total hours over the last three decades in the UK, France and the United States. But they matter in different ways for different

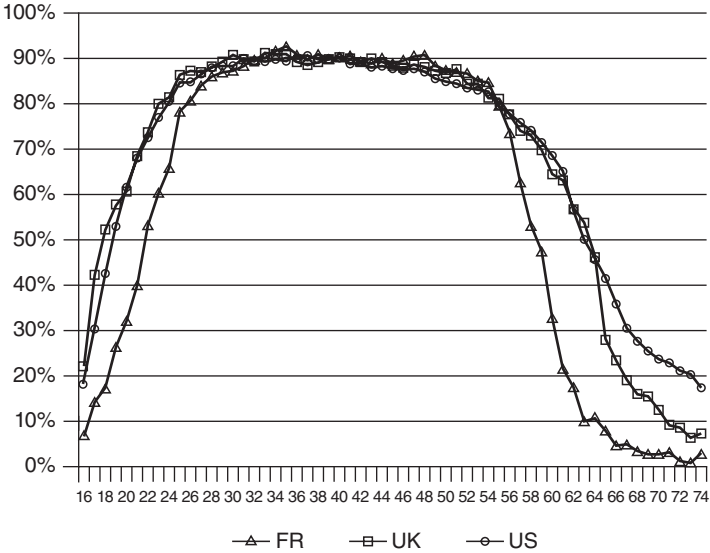


Figure 1.1. Male Employment in the UK, 2007

Source: Blundell, Bozio and Laroque (2011b).

age and demographic groups. For men, variations in the extensive margin occur mainly at the beginning and at the end of their working lives. These are the schooling-work margins and the early retirement margins: Figure 1.1, from Blundell, Bozio and Laroque (2011b), provides a broad view of employment rates by age for the UK, France and the United States in 2007 (just before the onset of the most recent recession). The similarity of average employment rates in 2007 for men aged 30–54 in these three economies is striking. It suggests that differences in employment are concentrated at early and later points in the working life. Heckman (1993), Prescott (2004), Ohanian, Raffo and Rogerson (2008), and Gruber and Wise (1999) have all pointed to the importance of the extensive margin at these points of the life cycle.

The extensive margin is not the end of the story. Figure 1.2 points out that hours differences, conditional on employment, matter too for men and they matter across the working life. Although it is unlikely that tax and benefit systems alone explain all these differences, in any discussions of tax reform it would seem unwise to play down the intensive margin too much.¹

For women, Figures 1.3 and 1.4 show that hours conditional on employment and employment itself both vary across the working lives.

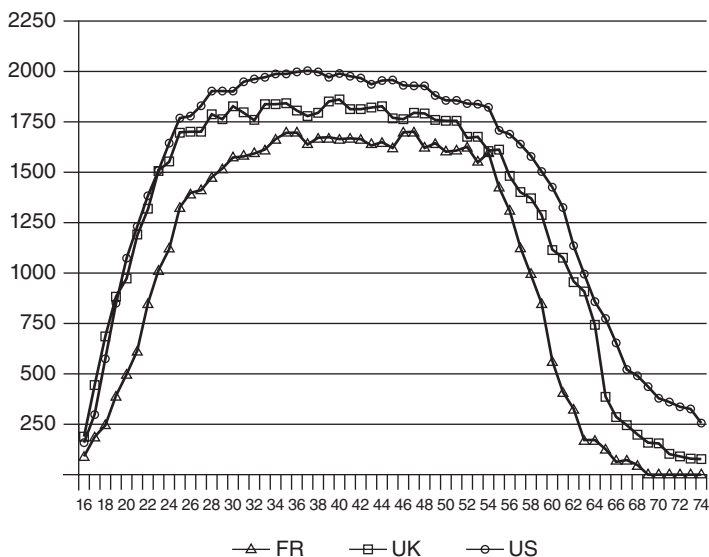


Figure 1.2. Male Total Hours Worked in the UK

Source: Blundell, Bozio and Laroque (2011b).

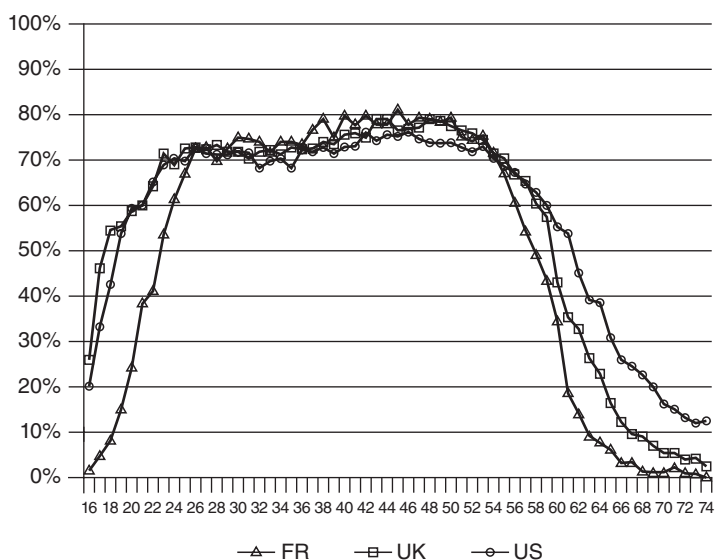


Figure 1.3. Female Employment in the UK, 2007

Source: Blundell, Bozio and Laroque (2011b).

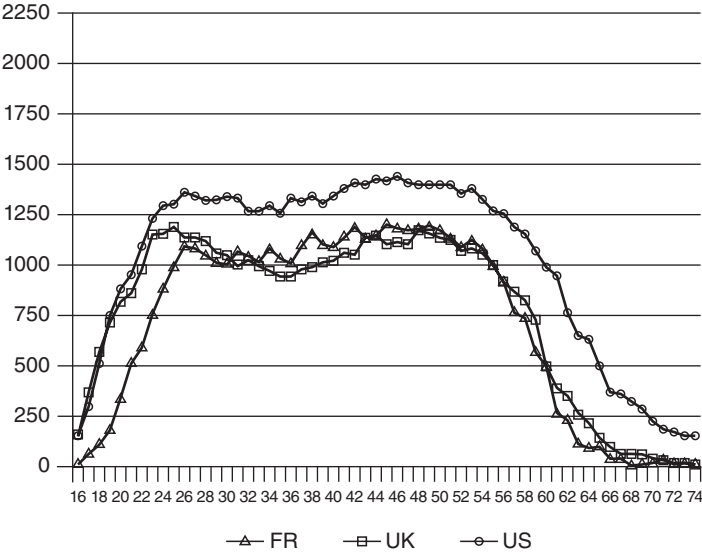


Figure 1.4. Female Total Hours Worked in the UK, 2007

Source: Blundell, Bozio and Laroque (2011b).

As was the case for men, average employment rates in 2007 were surprisingly close at ages between the late 20s and early 50s. Again, it is at the early and later periods in the working life where the extensive margin choices become important. We will also point to important variation at the extensive margin for mothers with pre-school children and with lower levels of education. Hours of work conditional on employment for women show more variation over the life cycle, especially in the UK where there still remains a dip around child-bearing ages. For women with younger children it is not usually just an employment decision that is important, it is also whether to work part-time or full-time. Some of this variation in the UK we will be able to attribute to the specific design of the tax and benefit system.

In the sections that follow we focus a little more in detail on what has happened to the labor supply of women over the recent past and relate it to some of the key changes in tax and benefit policy. To wrap up the descriptive discussion in this section it is worth examining the overall changes in labor supply in France, the United States and the UK over the three decades leading up to 2007. Figure 1.5 from Blundell, Bozio and Laroque (2011a) presents such a breakdown of total hours worked by age and gender. The huge declines in total hours

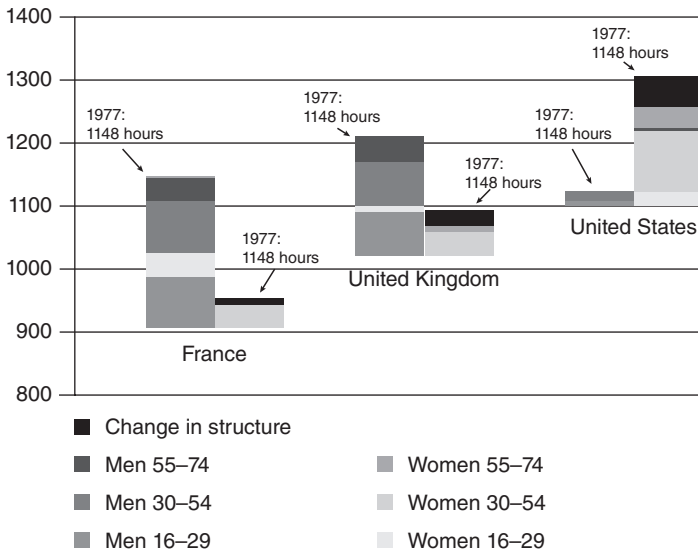


Figure 1.5. The Change in Total Hours by Age and Gender

Source: Blundell, Bozio and Laroque (2011a).

among men in the UK and France and the large rise in women's labor supply in the United States dominate the picture. These changes in total hours mask somewhat the key changes which have occurred at the extensive and intensive margin. For example, it turns out the expansion for women at the extensive margin (employment) over this period is quite similar in the United States and France – what differs is the distinctly different paths at the intensive margin.

To allocate total hours changes between the extensive and intensive margins is not a trivial exercise. While we observe the changes in hours per worker and employment, we do not know exactly how these changes contribute to the changes in total hours worked. Blundell, Bozio and Laroque (2011a) address this by developing bounds on the changes at the extensive and intensive margins which allow such a decomposition. They consider how the overall average hours worked H per person varies over time and across countries. Of course, this quantity differs across a person's characteristics, age and gender for instance. Suppose there are $j = 1, \dots, J$ broad categories. The overall statistic H_t is computed in any year t as an average of the total hours in category j , H_{jt} , with weights equal to the population shares q_{jt} :

$$H_t = \sum_{j=1}^J q_{jt} H_{jt}$$

They then write total hours of work H_{jt} as the product of hours per worker h_{jt} and employment in the labor market p_{jt} :

$$H_{jt} = h_{jt} p_{jt}$$

When we observe a change in yearly hours worked per person, $H_t - H_{t-1}$, we would like to be able to know how much of the change is due to the intensive or extensive margins. First define a structural effect S_t due to the change in the composition of the population:

$$S_t = \sum_{j=1}^J H_{jt} [q_{jt} - q_{j,t-1}]$$

Then measure the change due to the behavior of category j , holding the population structure constant as in date $t - 1$, as in a Laspeyres index:

$$\Delta_{jt} = q_{j,t-1} [H_{jt} - H_{j,t-1}], \quad (1)$$

then the total change across all J categories of workers is simply

$$\Delta_t = \sum_{j=1}^J \Delta_{jt}, \quad (2)$$

and we have by construction

$$H_t - H_{t-1} = S + \Delta_t. \quad (3)$$

The change in total hours for any category of workers reflecting changes at the intensive margin (hours per worker), and at the extensive margin (employment) satisfies two polar exact statistical decompositions:

$$\Delta_{jt} = q_{j,t-1} \{ [h_{jt} - h_{j,t-1}] p_{jt} + [p_{jt} - p_{j,t-1}] h_{j,t-1} \} \quad (4)$$

or

$$\Delta_{jt} = q_{j,t-1} \{ [h_{jt} - h_{j,t-1}] p_{j,t-1} + [p_{jt} - p_{j,t-1}] h_{jt} \} \quad (5)$$

The first term on the right-hand side is the intensive margin, weighted in the top formula (4) with the final employment rate (as in a Paasche index) and in the bottom formula (5) with the initial employment rate (as in a Laspeyres index). The second term is the extensive margin (Laspeyres in (4), Paasche in (5)). The empirical counterparts to these are given in Table 1.1.

The indices examine what part of any overall change in hours is attributable to changes at the extensive or intensive margin for any particular subgroup of the population. The row $[I - L, I - P]$ shows the bounds on the intensive margin, L standing for Laspeyres (the change in hours being weighted by the initial employment rate), P for Paasche (final employment rate). Similarly, the Laspeyres index for the extensive

margin ($E - L$) (resp. $E - P$), given by the second term in equation (4) (resp. (5)), is equal to the change in employment multiplied by average hours worked at the initial (resp. final) date.²

Turning first to prime-age workers, the steep decline at the *intensive* margin for prime-aged men in France and the UK relative to the United States is striking. For this group the bounds are quite narrow and leave little room for ambiguity. These changes represent an enormous shift in the relative position of these countries. Table 1.1 tells us that the *extensive* margin for prime-age men in Britain and in France also falls more than in the United States, although there are declines in the United States too. As we have noted, for prime-age women it is the increase at the extensive margin that is so extraordinary, especially in the United States and in France where the bounds in Table 1.1 suggest a very similar change and one that is nearly twice the size of that experienced in the UK. Intensive margins provide an interesting picture here, falling back strongly in France, staying put in the UK while growing in the United States.

For older men and women there is a large decrease in hours per worker in France, similar in the UK, contrasting with an increase in the United States. There are falls at the extensive and intensive margins for UK men but increases at the extensive margin for UK women. This phenomenon is replicated to some extent across all countries and offsets the stronger incentives to retire earlier in the UK and in France. The contrast with the United States is stark, where at all margins and for both genders the bounds point to positive changes for older workers. The changes among the young are also sizable and predominantly

Table 1.1. The Extensive and Intensive Margins Between 1977 and 2007

Year	Youth (16–29)		Prime aged (30–54)		Old (55–74)		All (16–74)
	Men	Women	Men	Men	Men	Women	
Δ	–82	–38	–82	–82	–36	–3	–195
[I–L, I–P]	[–37,–28]	[–23,–19]	[–59,–56]	[–59,–56]	[–11,–8]	[–9,–10]	[–185,–183]
[E–L, E–P]	[–54,–45]	[–19,–16]	[–27,–23]	[–27,–23]	[–28,–25]	[7,6]	[–12,–10]
Δ	–71	–9	–70	–70	–42	10	–118
[I–L, I–P]	[–42,–36]	[–23,–26]	[–48,–45]	[–48,–45]	[–22,–19]	[–6,–8]	[–161,–167]
[E–L, E–P]	[–35,–29]	[17,14]	[–25,–22]	[–25,–22]	[–23,–20]	[17,15]	[50,43]
Δ	–19	22	–19	–19	6	38	165
[I–L, I–P]	[–6,–6]	[1,1]	[–5,–5]	[–5,–5]	[3,3]	[3,5]	[15,17]
[E–L, E–P]	[–13,–13]	[21,21]	[–14,–14]	[–14,–14]	[3,3]	[33,35]	[148,150]

Note: I–P designs the Paasche measure of the intensive margin, I–L the Laspeyres measure, with E–P and E–L respectively for the extensive margin, as described by equations (4) and (5).

Source: Blundell, Bozio and Laroque (2011a).

negative. In France and the UK there are large falls for young men at both the extensive and intensive margin.

These changes inform us as to where labor supply is likely to be most responsive to reform. They also set up the key question in the analysis of tax incentives and labor supply: How well do structural economic models explain these changes in observed behavior? For this we have to turn first to the measurement of the effective tax rates in the tax and benefit system.

1.3 Effective Tax Rates

What of effective tax rates? To understand how taxes and benefits might affect labor supply choices, we need to measure the effective work incentives implicit in the tax and benefit system. To describe the distribution of incentives implicit in the tax and benefit system, there are two summary measures that are useful to document: the effective marginal tax rate (EMTR, that is the proportion of a small increase in earnings taken in tax and withdrawn benefits) and the participation tax rates (PTR, the incentive to be in paid work at all) defined by the proportion of total earnings taken in tax and withdrawn benefits.

Perhaps the main (perceived) defects in current welfare/benefit systems is that participation tax rates at the bottom remain very high. This is certainly the case in the UK where effective marginal tax rates are well over 80% for some low-income working families. As we will see, this is mainly due to the phasing-out of means-tested benefits and tax credits. But high implicit tax rates at low incomes can be optimal for welfare functions that place a high weight on redistribution.

Consider a typical budget constraint for a single mother. A complete analysis of the effective tax rate will combine the implicit tax rates in the benefit system, the tax credit system and the income tax system. Figure 1.6 provides such a case study and shows the complexity arising from the cocktail of taxes and benefits. This constraint assumes all eligible benefits are accessed.³

One component of particular interest in the taxation of earnings is the tax credit system which has become an increasingly important part of the effective tax system facing low-earning families in many countries. In the UK, the earned income tax credit (called the Working Tax Credit (WTC), previously the Working Families Tax Credit) scheme has certain unique features. As with other tax credit systems, the UK system is designed to enhance income in work for those facing low rates of pay and/or higher costs of work. Figure 1.6 provides a case-study

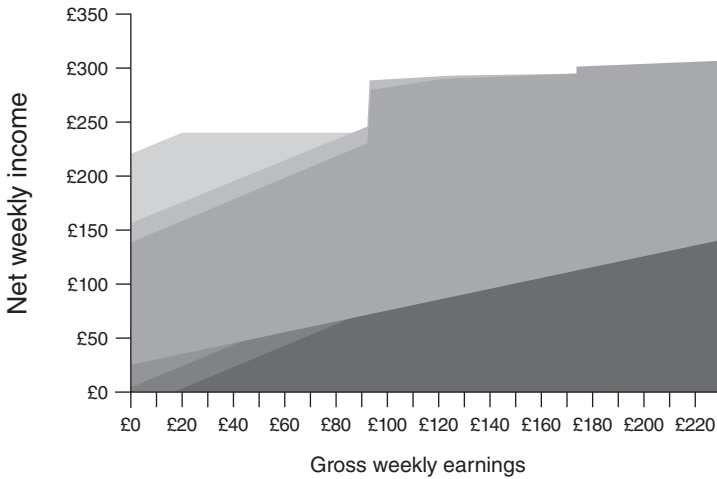


Figure 1.6. The Interaction Between Taxes and Benefits in the UK

Note: Lone parent, with one child aged between one and four, earning the minimum wage (£5.80 per hour), with no other private income and no childcare costs, paying £80 per week in rent to live in a council tax Band B property in a local authority setting council tax rates at the national average.

Source: Blundell and Shephard (2010).

budget constraint for an example low-income single parent. In the UK eligibility depends on an hours of work condition which consists of a minimum hours rule at 16 hours per week with an additional hours-contingent payment at 30 hours. There is also a family eligibility criterion which requires children in full-time education or younger. The tax credit then consists of an adult credit plus amounts for each child. There is a family net income eligibility threshold, above which the credit tapers away at 55%. Taken together with Income Support and other benefits, low-income earners in the UK can face a complex rate schedule with relatively high effective tax rates. Indeed, families in receipt of other benefits would gain less from the WTC than otherwise equivalent families not receiving these benefits.

The distribution of these tax rates by income and family type in the UK is presented in Figures 1.7 and 1.8. In an important sense it is the participation tax rate that is relevant for the employment margin, and the marginal tax rate for the effort margin. The EMTRs and the PTRs can be negative as well as positive, but they are typically positive and often high at lower incomes.

Couples with one earner and lone parents are the two distinct groups in the picture of average marginal tax rates by gross earnings in Figure 1.7.

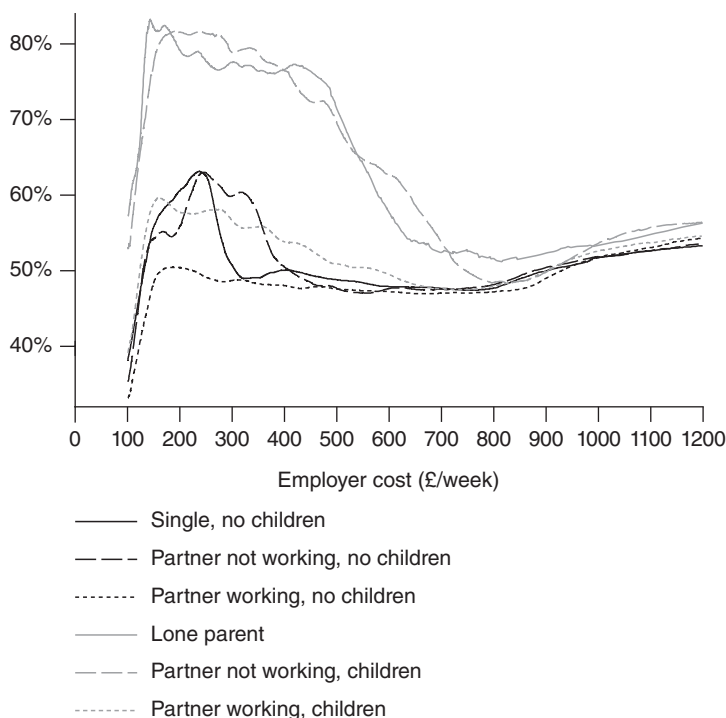


Figure 1.7. Average EMTRs for Different Family Types

They face high effective marginal tax rates when their earnings are low. High tax rates at low earnings are a distinctive feature of many tax systems and have led some commentators to question why lower-earning individuals face the highest tax rates.

But any system that redistributes income by targeting benefits towards families with low earnings and high needs will induce high effective tax rates as a natural by-product.

The effective tax rates in Figures 1.7 and 1.8 indicate the strong redistribution towards low-income families with children in the current UK tax system. Indeed, the more accurately the tax system targets low income, the higher the effective marginal tax rate on low earnings is likely to be. Not surprisingly therefore, tax schedules can easily possess the feature of high effective marginal tax rates at low earnings. It is simply the result of means-testing which is the flip-side of targeted redistribution. Whether it is optimal or not will depend, as we shall see in what follows, on the responsiveness of labor supply to these implicit