

Childcare and Labour Supply

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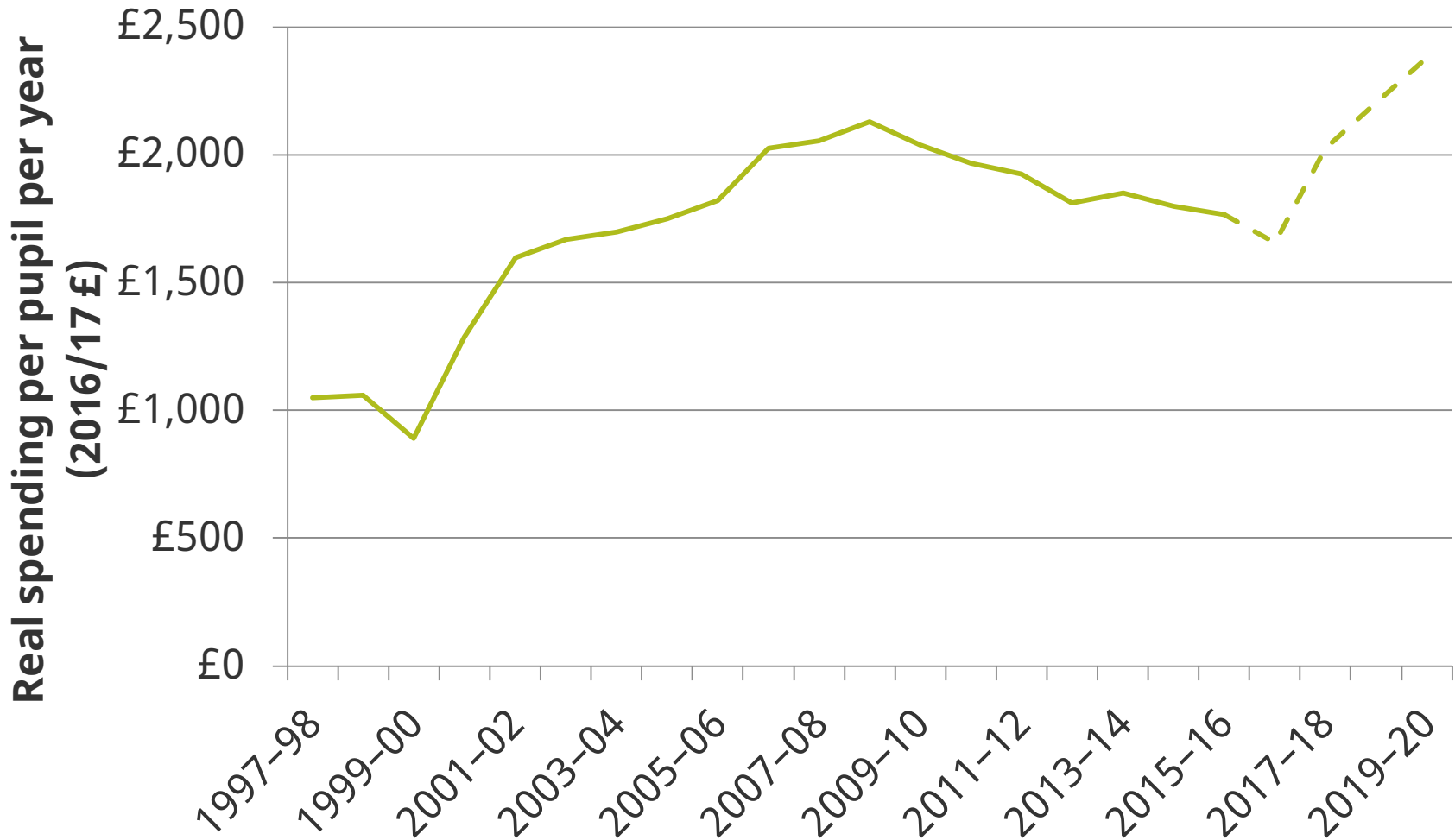
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Early years policy in England

Total spending on children under 5 is estimated at £7.5 billion

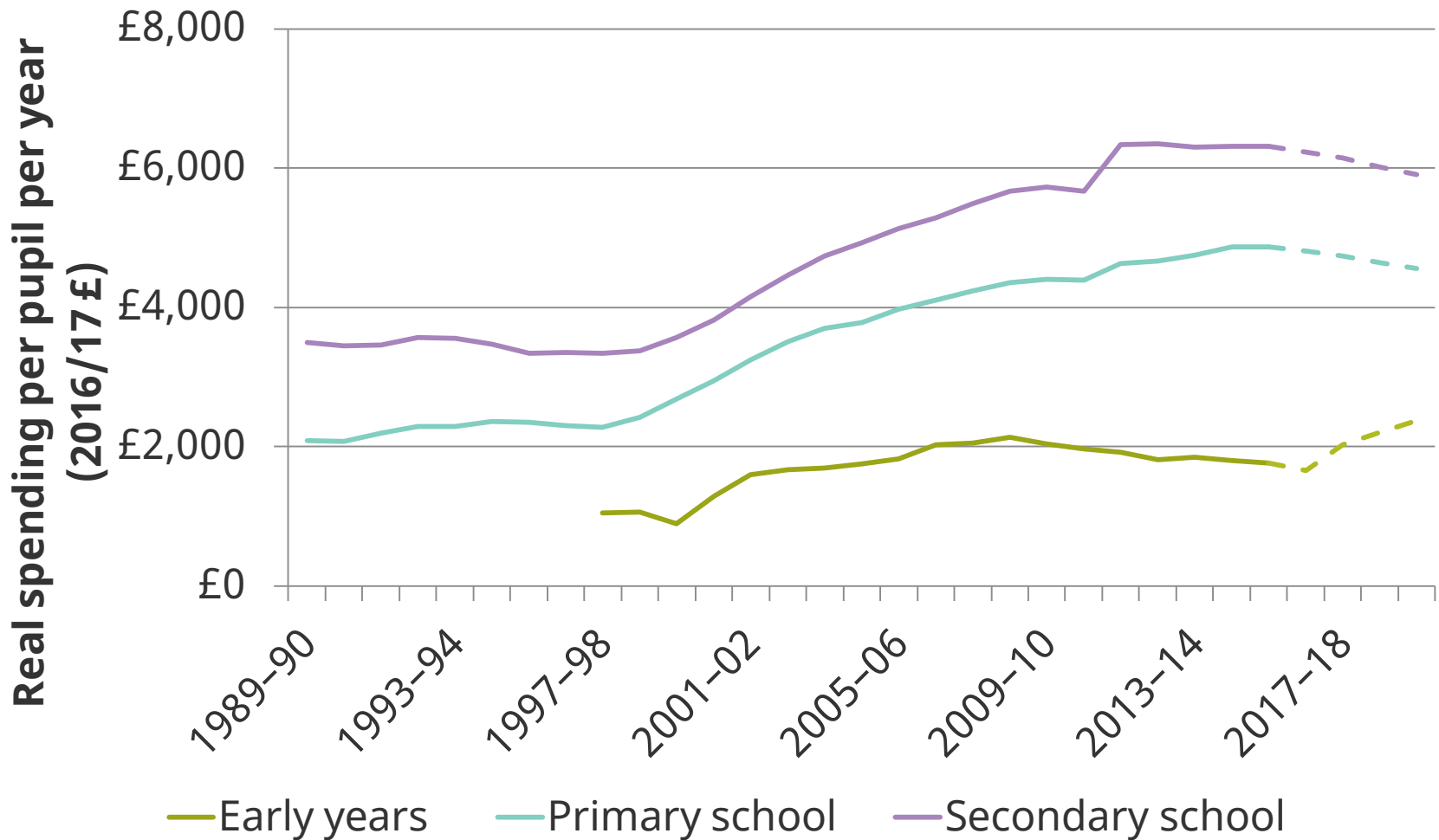
Substantial growth in spending over the last 20 years, and big projected rises

Early education spending per pupil



Source: Adapted from Belfield and Sibieta (2016), "Long-Run Trends in School Spending in England."

Education spending per pupil at different ages



Source: Adapted from Belfield and Sibieta (2016), "Long-Run Trends in School Spending in England."

Early years policy in England

Total spending on children under 5 is estimated at £7.5 billion

Substantial growth in spending over the last 20 years

And significant political interest in increasing government involvement even further

- Labour and Liberal Democrats proposed large increases in subsidies for childcare during 2017 election
- Government has recently extended eligibility for free childcare places for 3- and 4-year-olds in working families
- Lively debate about funding cuts for family services such as Sure Start Children's Centres

Early years policy in England



Source: <http://www.portsmouth.co.uk/news/politics/parents-march-in-portsmouth-to-oppose-sure-start-closures-1-4998083>

Four big questions

The rapid growth in public spending on the early years leaves us with four big questions:

- What early years programmes exist in England?
- Why might government want to subsidise childcare?
- Can subsidies actually accomplish this?
- How can we assess whether subsidies are working?

Early years policy in England

Early Childhood Education and Care (ECEC)

English early years policy focuses on early childhood education and care (ECEC)

- Early education: programmes aimed at improving child development
- Childcare: programmes to provide care for children (and typically help parents – mostly mothers – return to the labour force)

In practice, this is a fuzzy distinction

- Most programmes (claim to) target both education and childcare
- Important to assess a programme's impact on both dimensions

Components of early years spending

Early education programmes

- Free entitlement to part-time nursery place for 3- and 4-year-olds (and disadvantaged 2-year-olds)
- Extended from 15 to 30 hours per week for 3- and 4-year-olds in working families

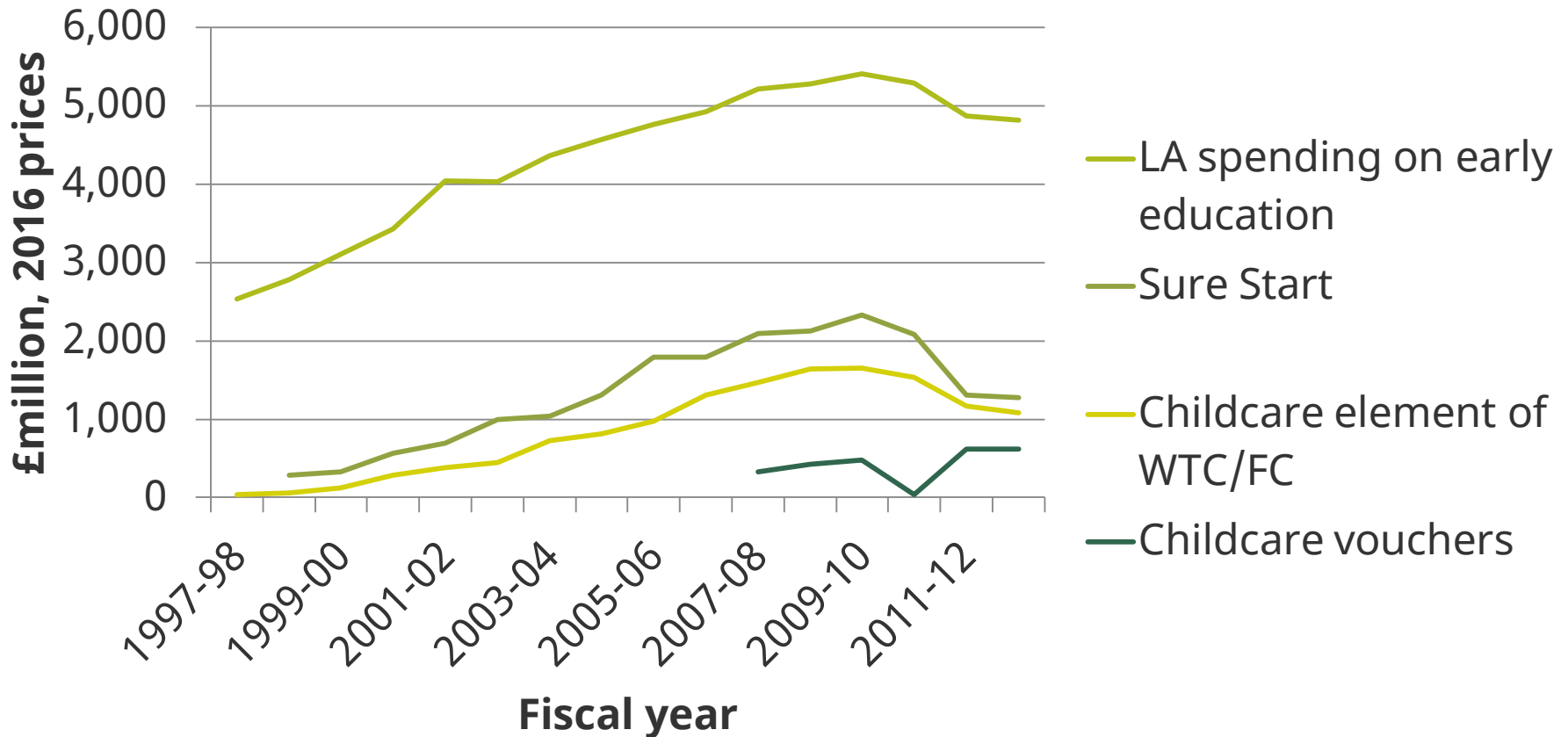
Childcare subsidies

- Childcare element of Working Tax Credit/Universal Credit
- Tax-free childcare and employer childcare vouchers

Sure Start Children's Centres

- Network of ~3,000 centres offering childcare, early education, health, and family support services

Spending on children under 5 in England



Source: Table 2 of K. Stewart and P. Obolenskaya (2015), "The Coalition's Record on the Under Fives: Policy, Spending and Outcomes 2010-2015."

The case for subsidies

Why subsidise anything?

Micro 101: Under certain conditions, competitive markets are productively and allocatively efficient

But there are many ways to justify government intervention:

- Equity (trade off some efficiency to get a more equitable outcome)
- Market failures, including
 - Missing or incomplete markets
 - Imperfect competition
 - Asymmetric information
 - Externalities

Why subsidise nursery places?

Efficiency arguments

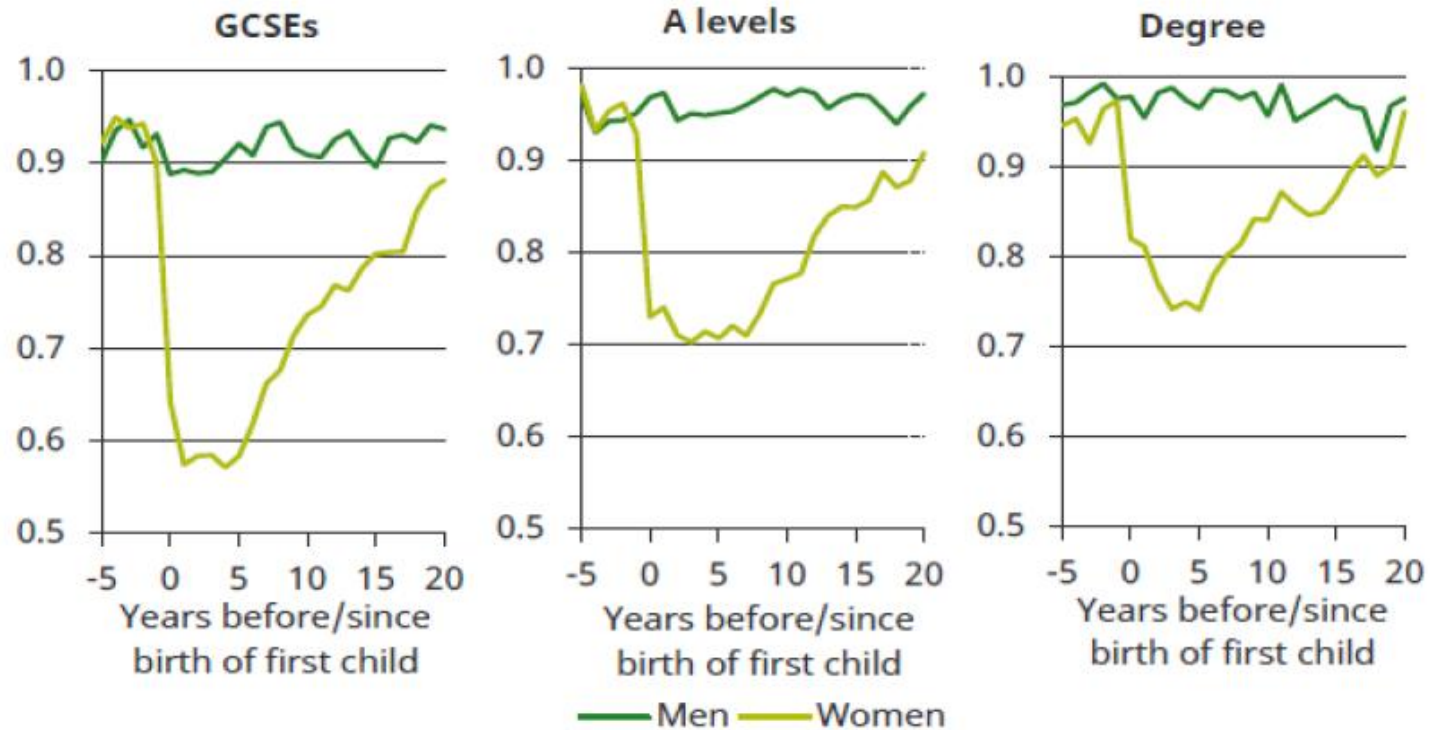
- Externalities: Parents make childcare decisions, but child's human capital is affected
- 'Internalities': Stronger labour force attachment boosts parents' human capital, with benefits for lifetime earnings
- Information constraints: Parents may not understand the production function for child development or their own human capital
- Credit constraints: Markets may not exist to borrow against future anticipated earnings (of parents or children)

Equity arguments

- Mitigating inequalities in child development by socio-economic status
- Mitigating inequalities in labour force outcomes by gender

Fertility and female labour supply

Employment rates by age of first child and education level

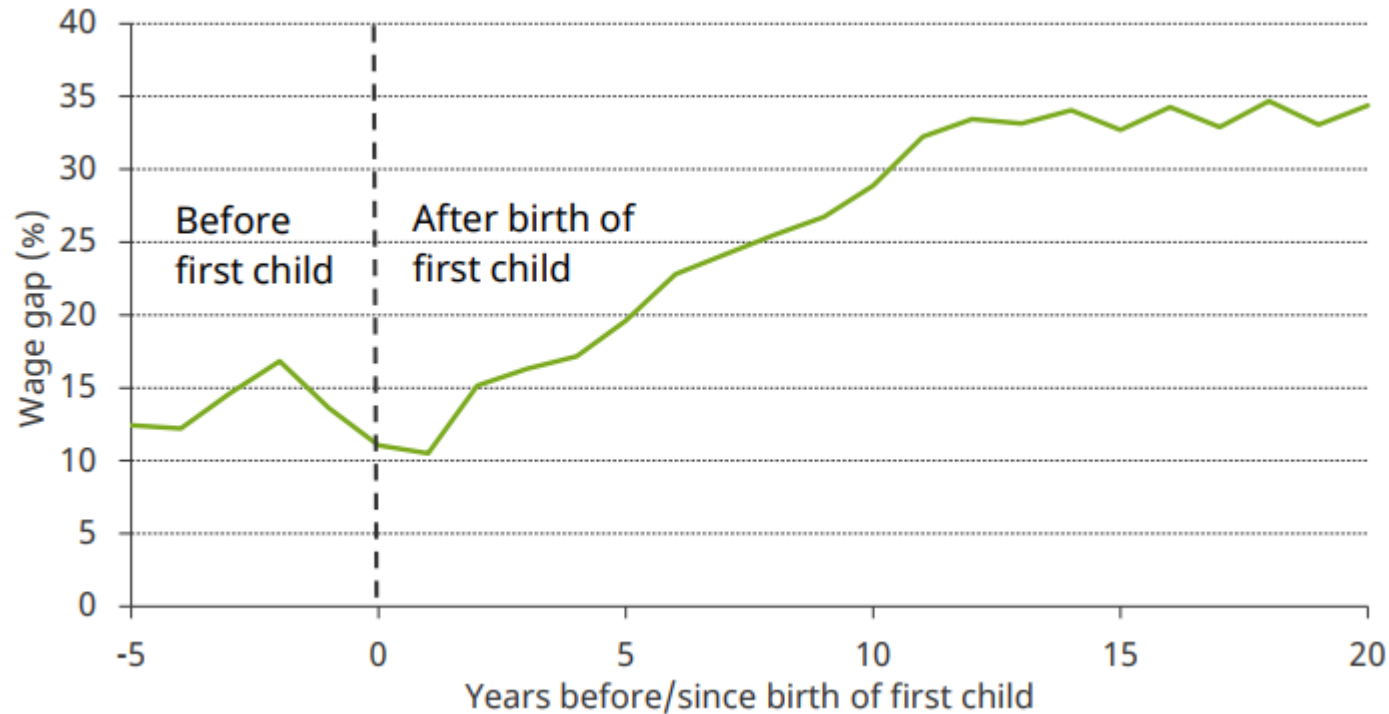


Source: Costa Dias, M., W. Elming, and R. Joyce. (2016). "The Gender Wage Gap." IFS Briefing Note BN186. London: Institute for Fiscal Studies.

Data from the British Household Panel Study, 1991-2008.

Fertility and female labour supply

Gender wage gap by time to/since birth of first child



Source: Costa Dias, M., W. Elming, and R. Joyce. (2016). "The Gender Wage Gap." IFS Briefing Note BN186. London: Institute for Fiscal Studies.

Data from the British Household Panel Study, 1991-2008. Individuals in the bottom two and top one percentiles of the gender- and year-specific hourly wage distributions excluded. Wage gap is calculated on the basis of hourly wages.

The economics of childcare subsidies

Can subsidies work?

Can extending the provision of free childcare hours increase childcare take-up and maternal labour supply?

- Parents' effective wage = wage – childcare cost
- Subsidising childcare can increase the effective wage
- But we know from Micro 101 that this has ambiguous effects:
 - Substitution effect: higher wage → higher cost of leisure → work more
 - Income effect: higher wage → higher income → consume more leisure → work less
- Overall impact depends on current care usage and policy design

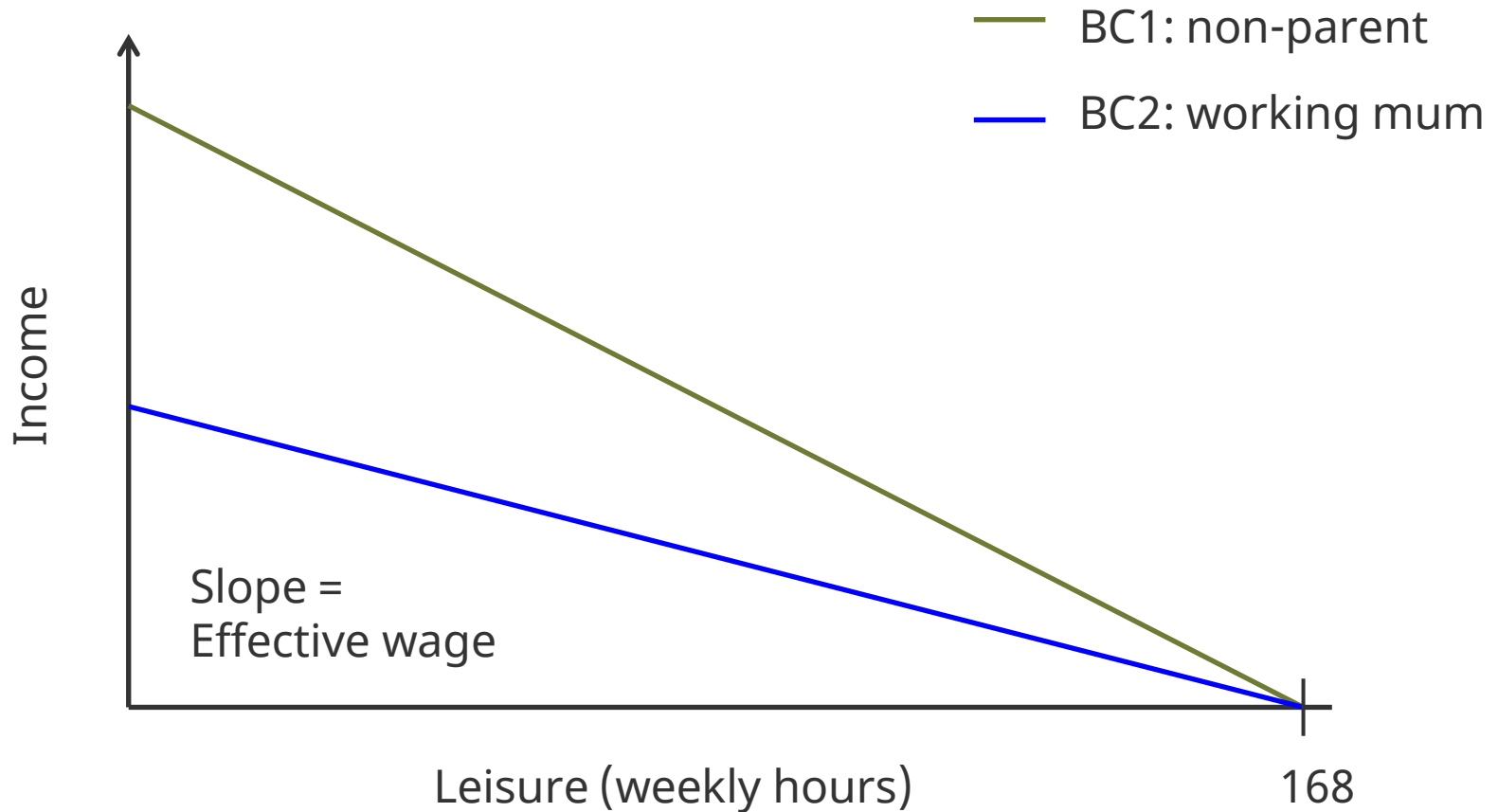
Labour supply and childcare: Simple model

A (very) simple model:

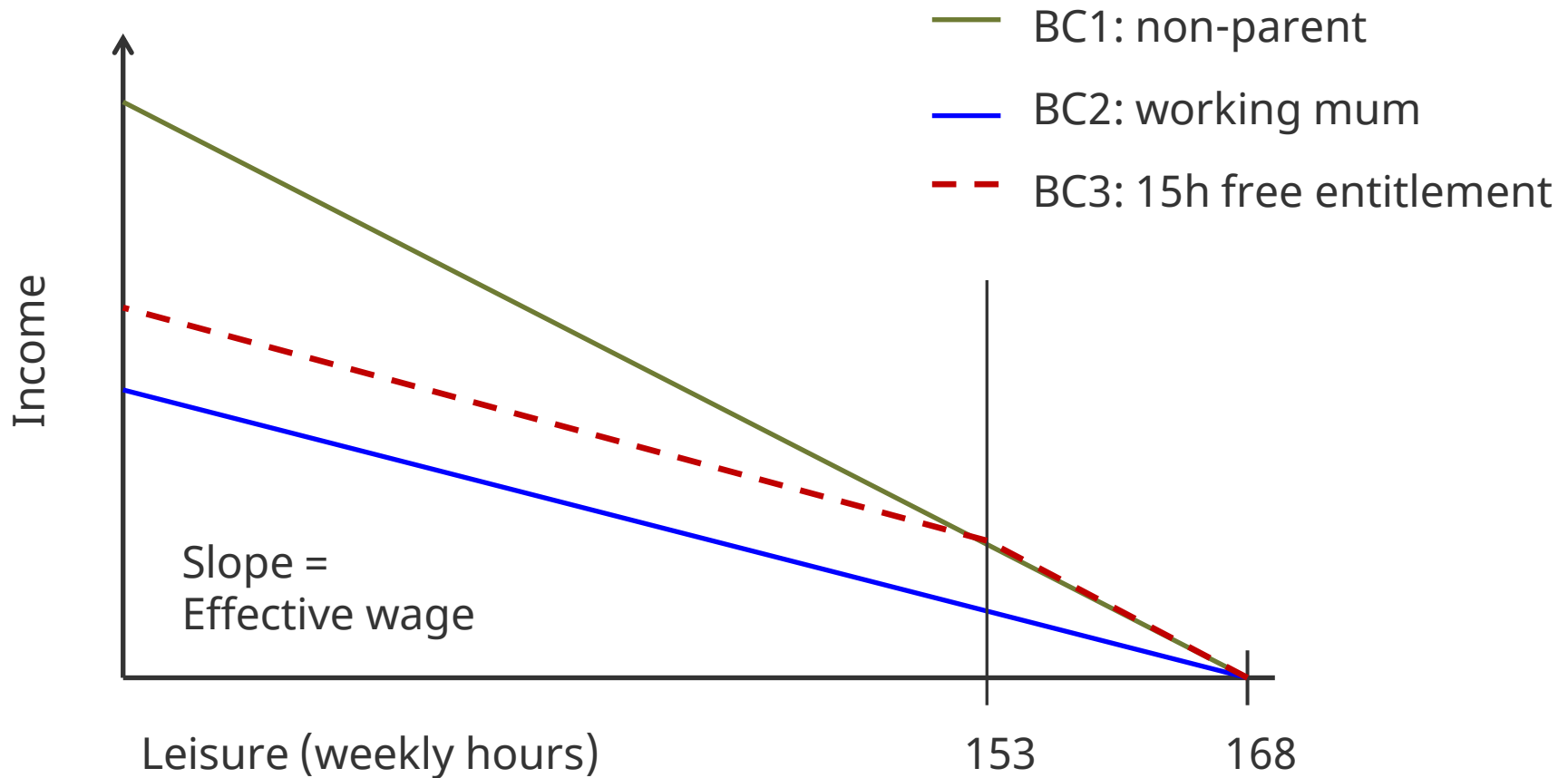
- Focus on mothers (no intra-household bargaining)
- Assume work and childcare hours continuously chosen
- Assume work and paid childcare are perfect complements
- Assume free entitlement lasts year-round
- Ignore dynamic effects (like human capital depreciation or labour market attachment)
- Assume time at home with the child counts as leisure!

Simple model

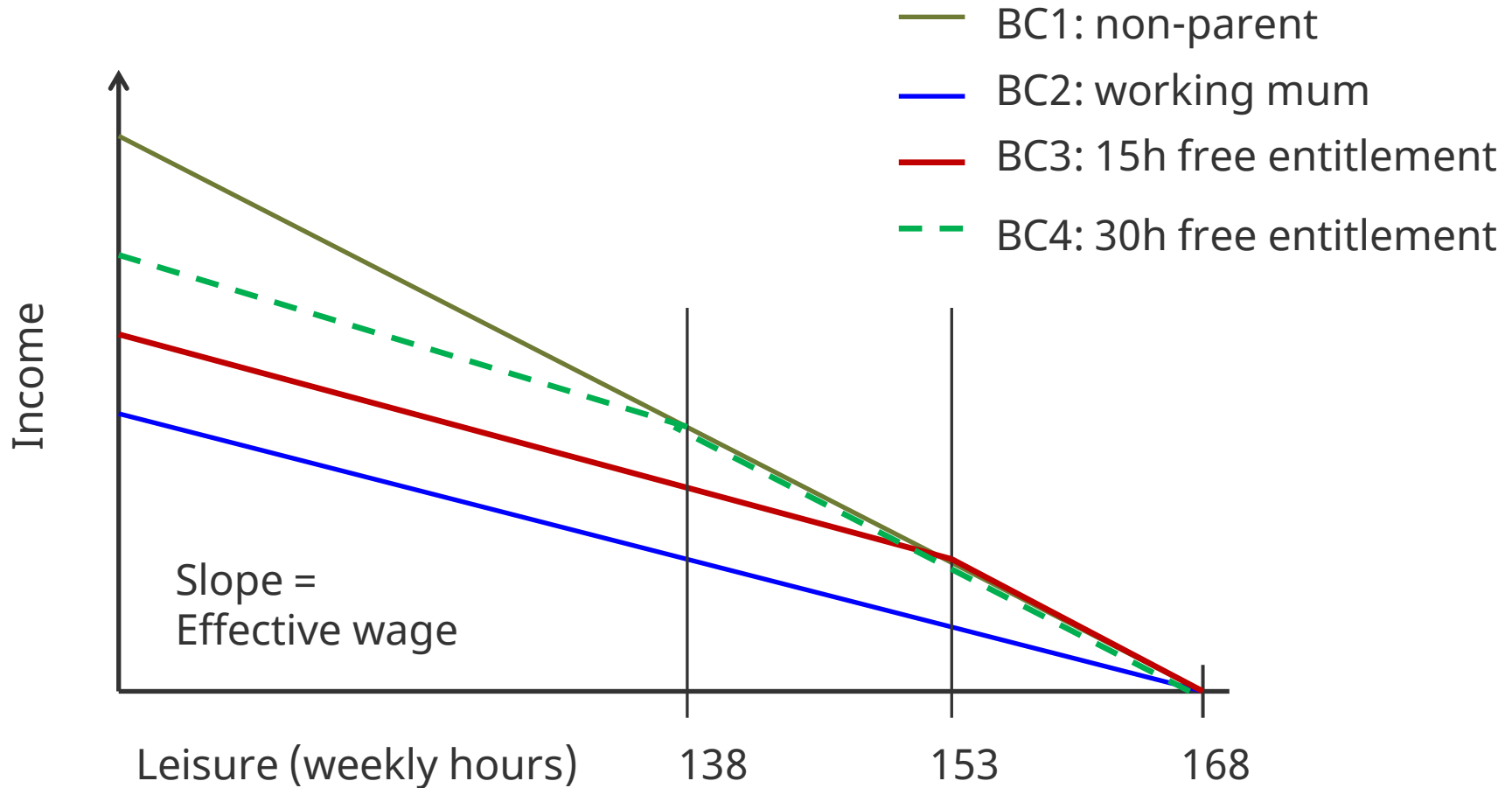
Assume that mothers' effective wage = nominal wage - childcare cost



Simple model: 15h free entitlement



Simple model: Extension to free entitlement



Simple model: Extension to free entitlement

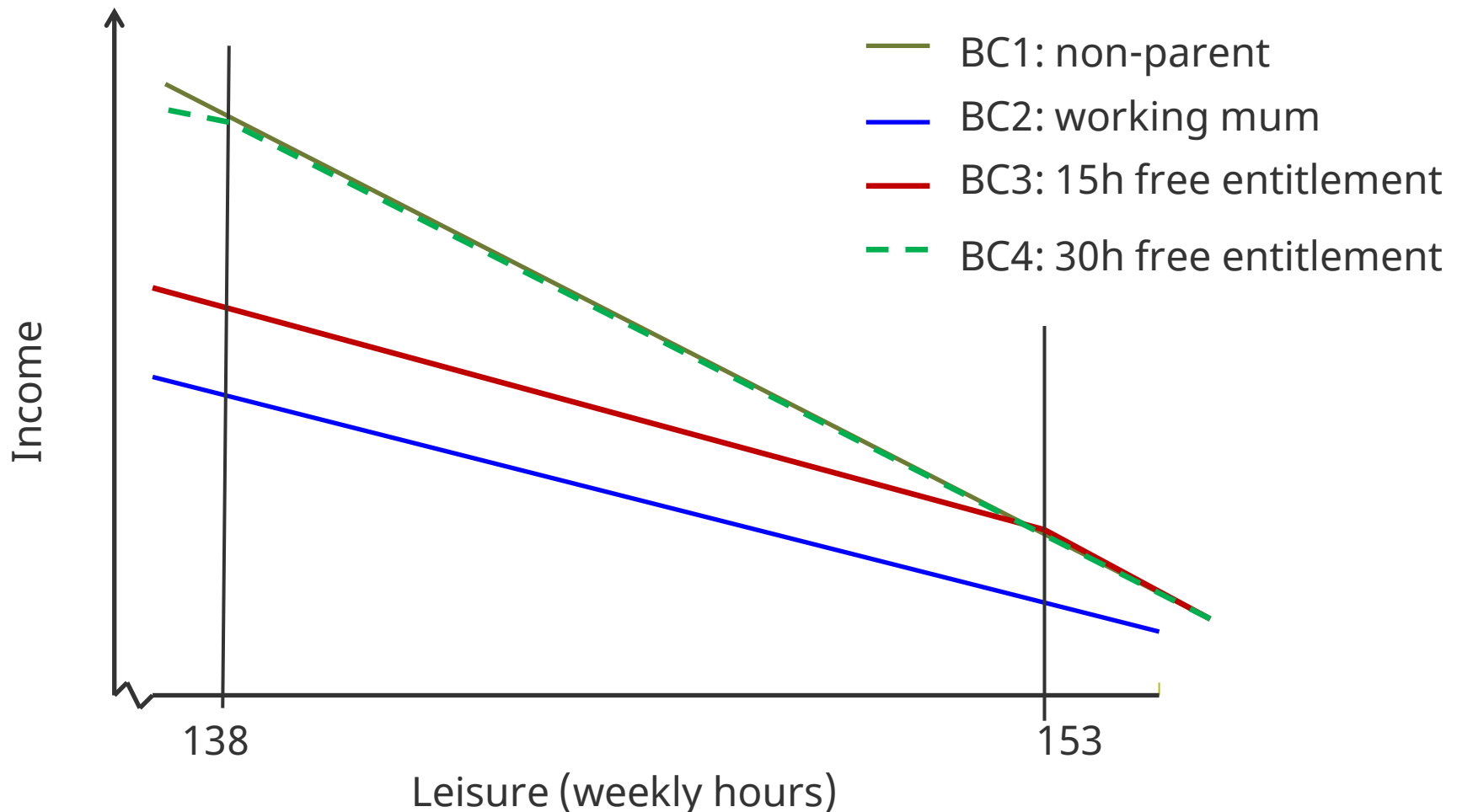
How will labour supply (and childcare use) change?

- For mothers working <15 hours:
 - No relevant changes
- For mothers working > 30 hours:
 - Income effect only: reduce working hours
- For mothers working 15-30 hours:
 - Substitution and income effects: overall effect ambiguous

Note of caution: Since this is more than a marginal extension, there can be additional complexities (e.g. bunching at the kink point)

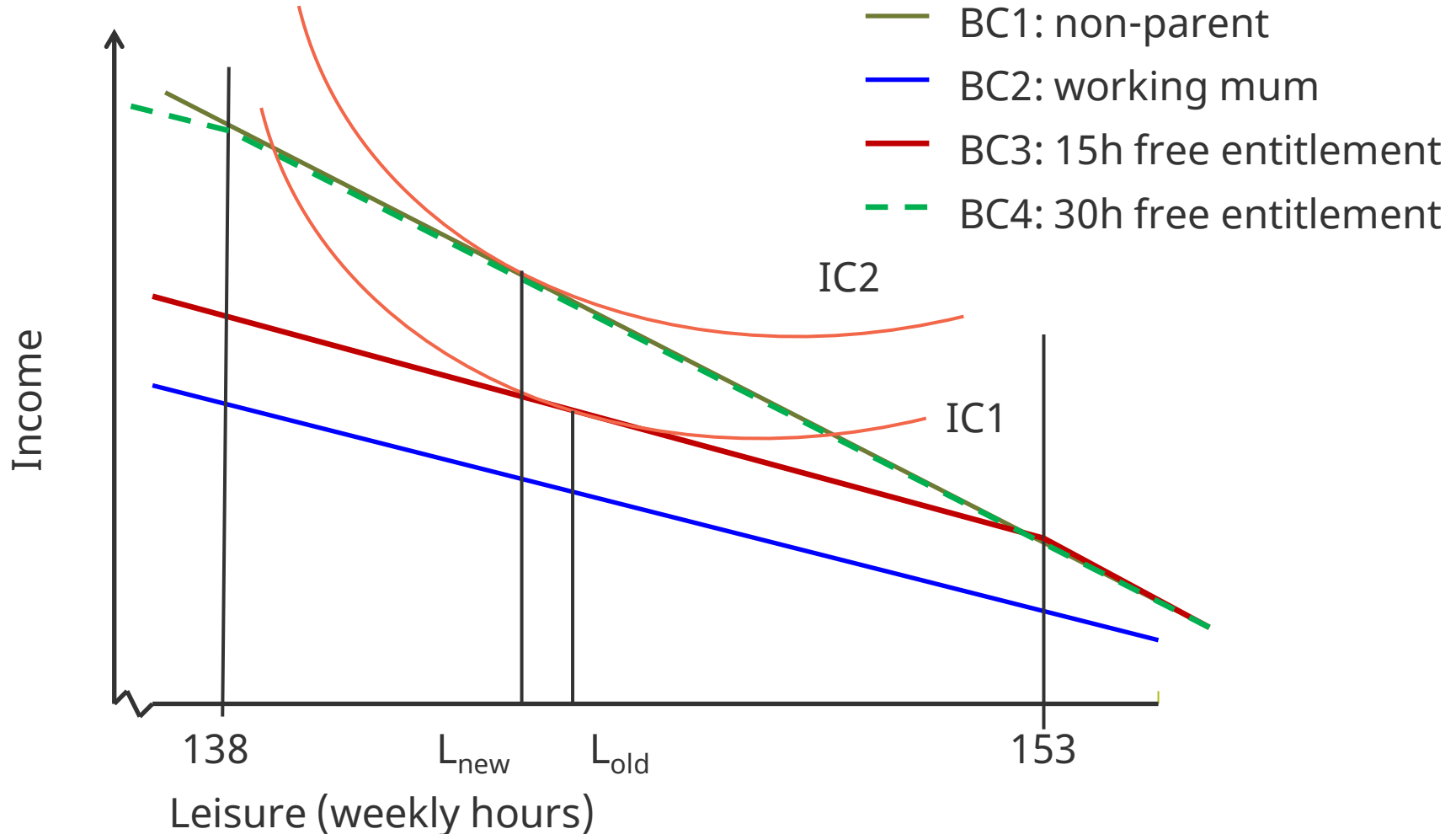
Simple model: Extension to free entitlement

We can zoom in on mothers with ambiguous labour supply effects



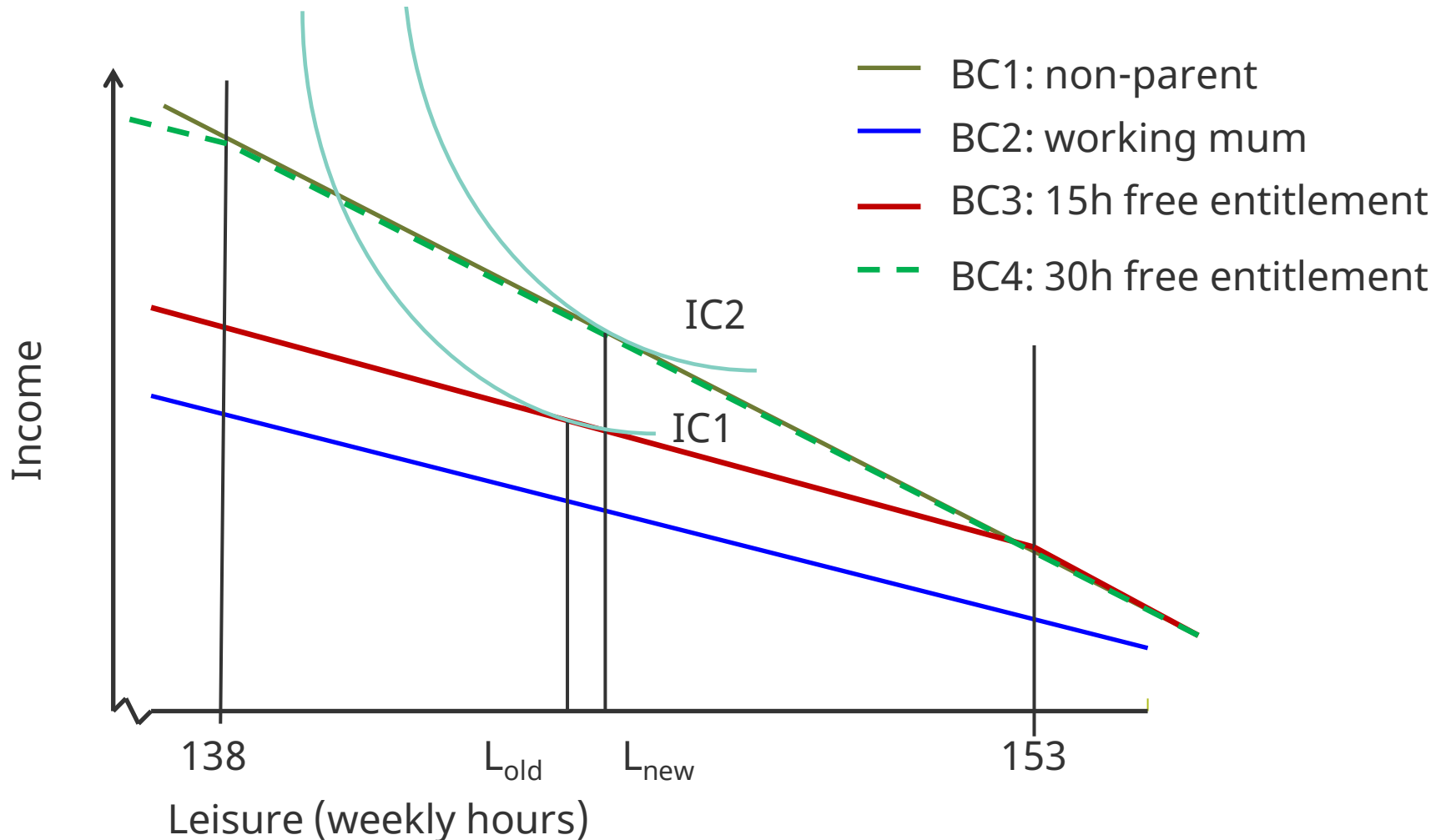
Simple model: Extension to free entitlement

Some will choose to work more...



Simple model: Extension to free entitlement

... Others will work less



Free entitlement: Beyond the simple model

In practice, this model is probably too simplified to be very useful

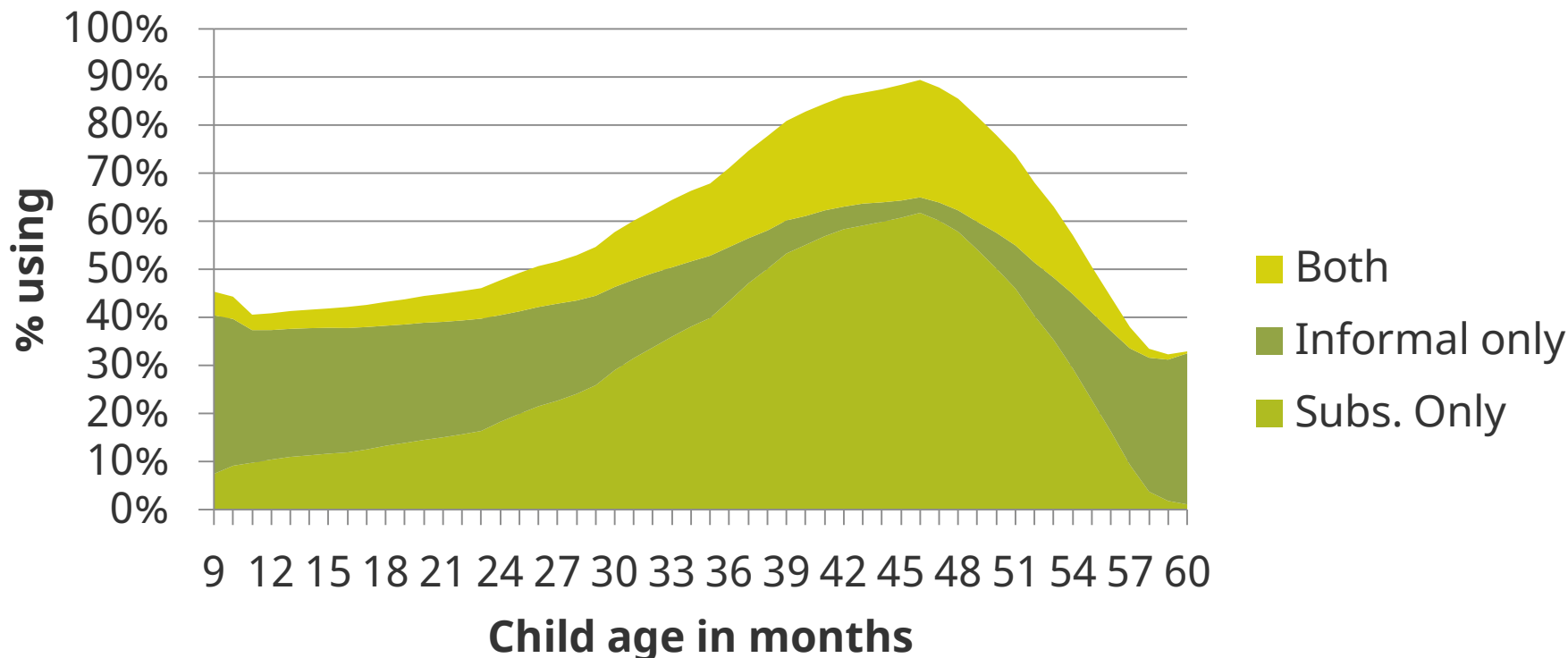
In the real world, many parents also have access to informal childcare

Informal care provides another margin for childcare subsidies to crowd out existing care arrangements

- Even in the simple model, parents switch from paying for formal care to using free formal care
- Now, parents might also substitute free formal for informal care
- This is known as the 'crowding-out' effect

Different care types

Combinations of subsidisable and informal care



Data from Millennium Cohort Study (children born 2000-01). Subsidisable care includes care in nurseries, nursery school and classes, playgroups, and preschool.

Free entitlement with informal care: Unconditional extension

The effect of increased formal childcare subsidies on labour supply (and total childcare use) depends on the extent of crowding-out

- Full crowd-out: No change in total childcare use or labour supply
- Partial crowd-out: Effect depends on initial labour supply and initial use of formal care
 - Mums using <15hr formal care: No change in marginal rate
 - Mums using >30hr formal care: No change in marginal rate; income effect only
 - Mums using 15-30hr formal care: Size of the increase in formal care will depend on the extent of crowd-out

Supply-side considerations

We have focused on the demand side (how much childcare will families take up when there is a price change)

But there are important supply-side factors as well, e.g.:

- There may not be sufficient places available
- Quality might suffer from extension of free entitlement
- Parents might not be able to choose hours freely (either in labour market or in childcare market)
- Childcare providers might try to recoup costs by raising other prices

Empirical evaluation of childcare subsidies

The evaluation problem

As applied economists, we want to know whether these policies work in practice (not just in theory)...

... But evaluation comes with lots of challenges!

The evaluation problem

Does offering the free entitlement boost maternal labour supply?

Naive estimate: Compare labour market outcomes of users and non-users of childcare

Problems?

- Reverse causality (labour supply \rightarrow childcare)
- Selection bias (those with more labour market attachment seek childcare)
- Might miss important heterogeneity

Internal validity

Economists need to find ways to overcome the evaluation problem and derive credible, internally valid causal estimates

Randomised controlled trials (RCTs) are very convincing, but can be hard to deliver

Economists therefore look for ‘natural experiments’ to mimic random assignment in a ‘quasi-experimental’ approach

Two aspects of policy reform particularly common:

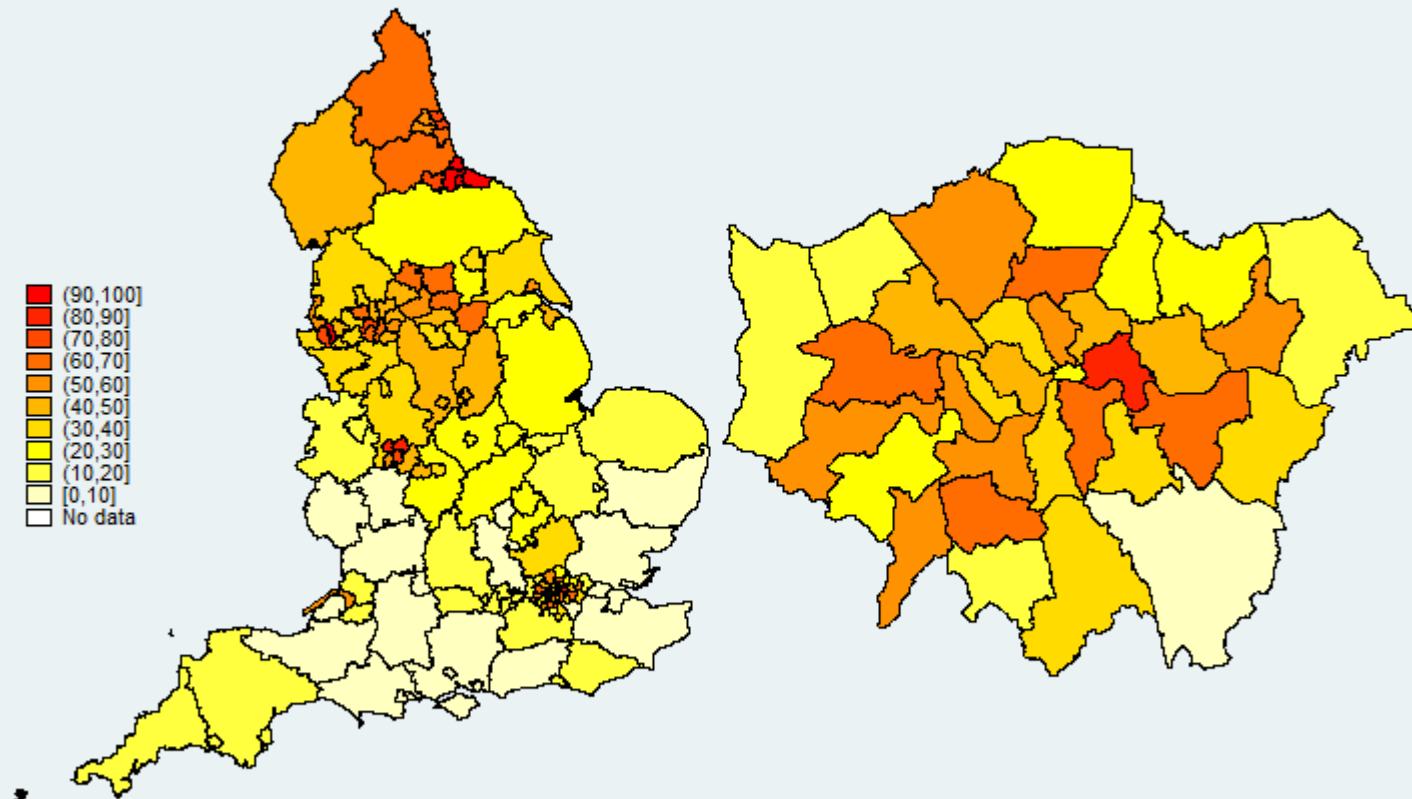
- Differential rollout across time and space
- Age of eligibility rules

Internal validity: Differential rollout

Many childcare programmes are rolled out at different speeds in different areas

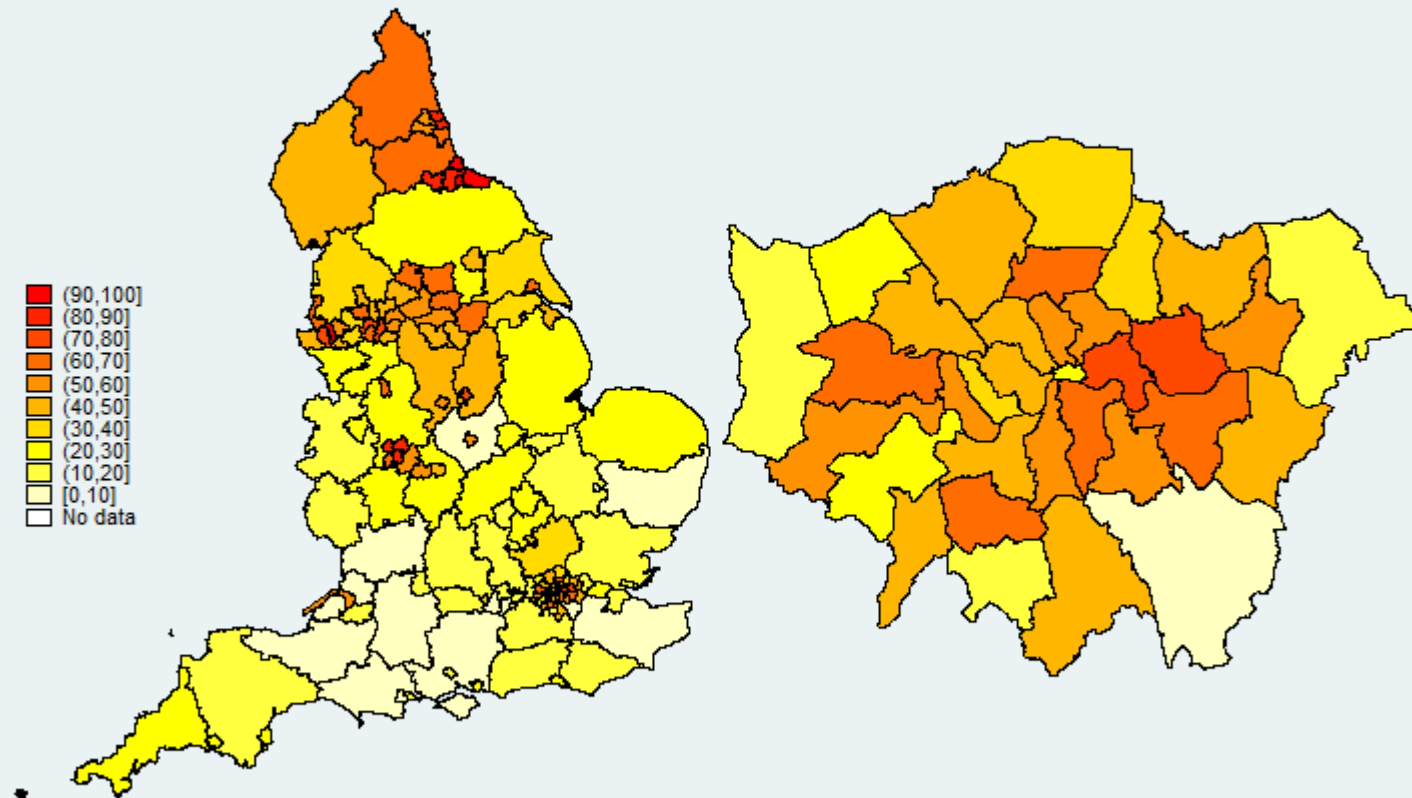
Free entitlement expansion

% of 3yos with funded childcare place, 1997



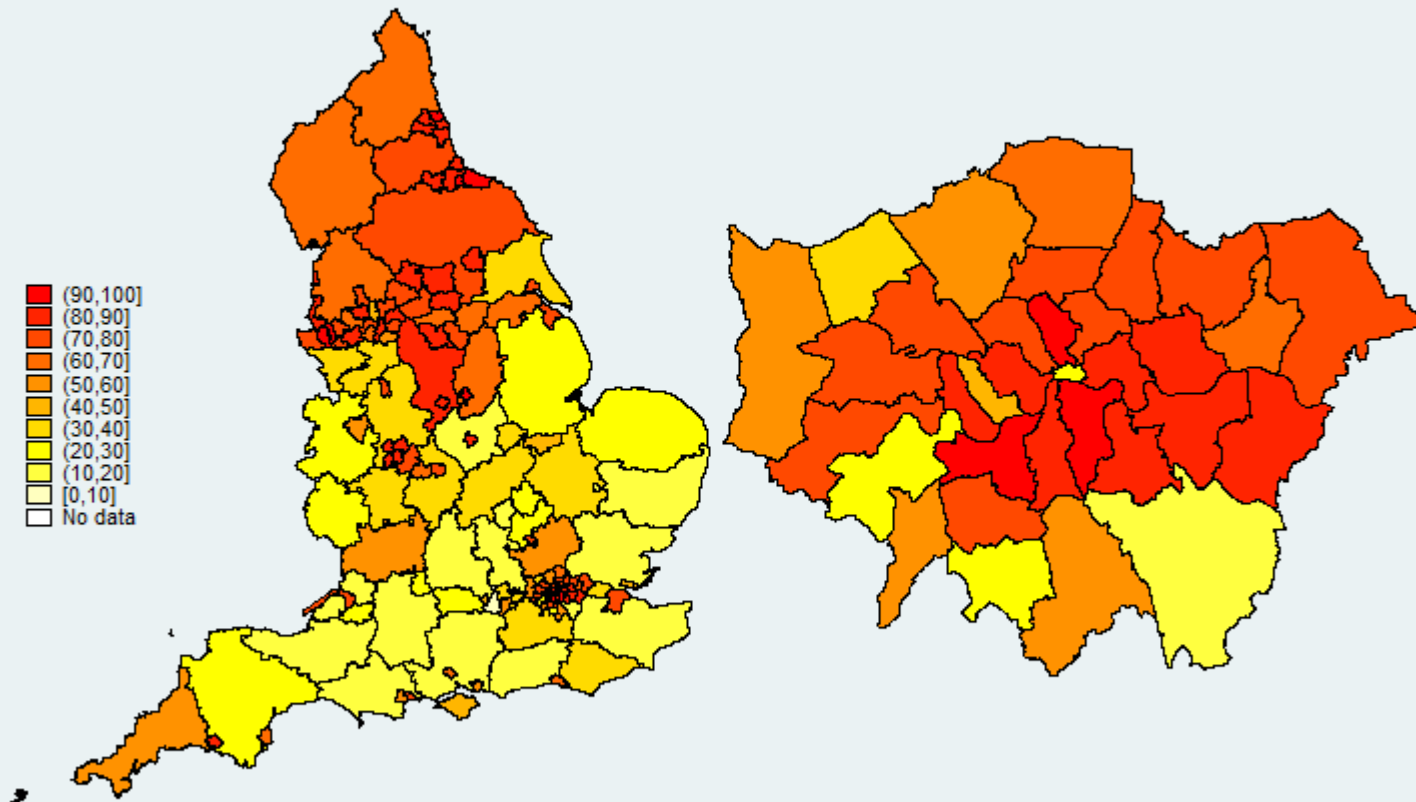
Free entitlement expansion

% of 3yos with funded childcare place, 1999



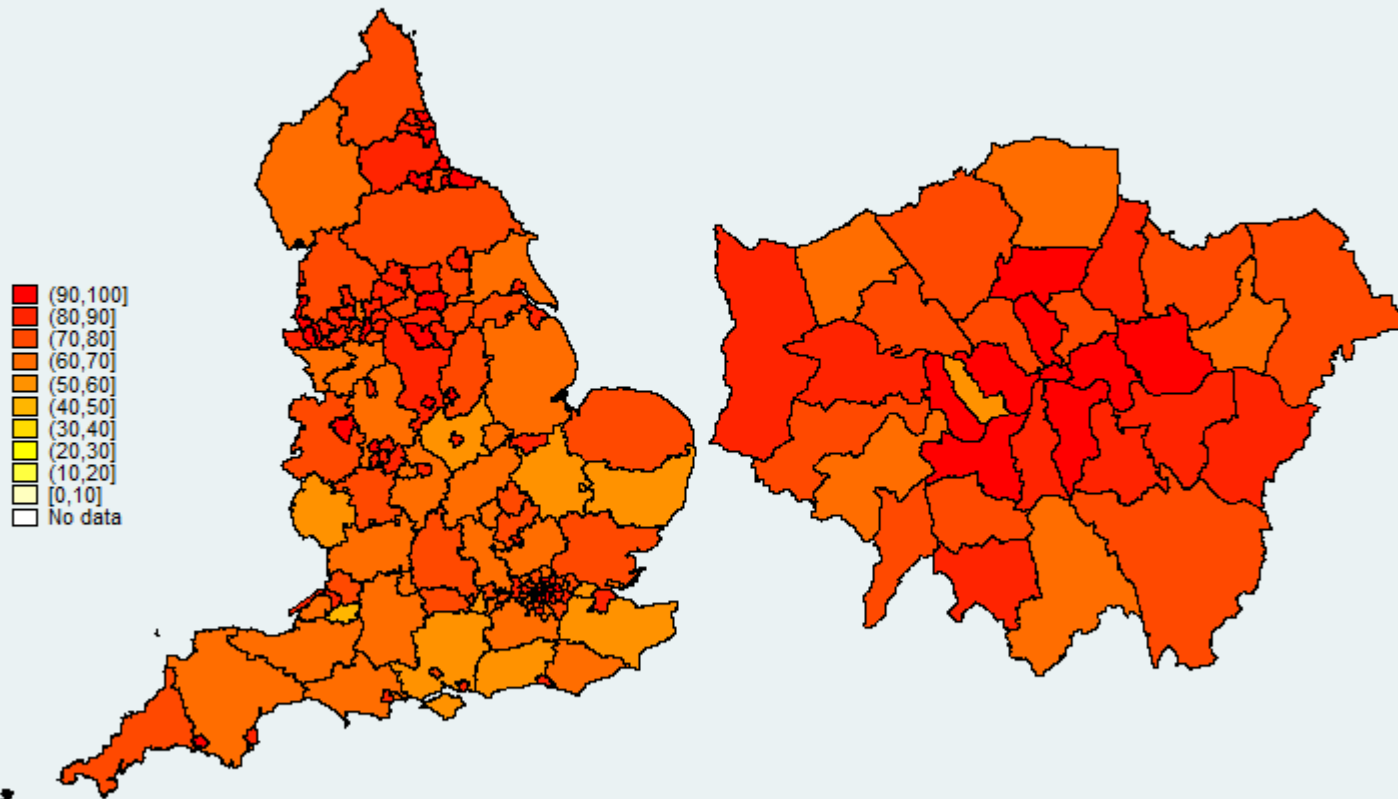
Free entitlement expansion

% of 3yos with funded childcare place, 2001



Free entitlement expansion

% of 3yos with funded childcare place, 2003



Internal validity: Differential rollout

Many childcare programmes are rolled out at different speeds in different areas

Idea: Exploit the *geographic* and *temporal* variation in access to childcare

- This can be as an instrument (where childcare use is known) or in a difference-in-difference set-up

Assumption: Conditional on observables, different rollout speeds in different areas otherwise unrelated to maternal labour supply

- Areas rolling out the programme faster aren't meaningfully different
- Families don't choose where to live based on the rollout speed

Internal validity: Age of eligibility

In most childcare programmes, eligibility is a function of a child's date of birth, but often not a linear one

This means that some children become entitled at a slightly earlier age than others, based on their month of birth

- In England, difference in total free entitlement eligibility can be up to 4 months; for school, up to 1 year

Free entitlement eligibility rules

Birth month	Become eligible	Age eligible (months)	Extra months
January	April	39	2
February	April	38	3
March	April	37	4
April	September	41	0
May	September	40	1
June	September	39	2
July	September	38	3
August	September	37	4
September	January	40	1
October	January	39	2
November	January	38	3
December	January	37	4

Internal validity: Age of eligibility

Idea: Compare children with different care entitlements at given age

- This can be done in a regression discontinuity design or (with panel data) an individual-level difference-in-difference

Assumption: Month of birth has no other impact on maternal labour supply

- Parents with strong labour force attachment don't choose the time of birth to optimise childcare eligibility

Case study: Full-time vs. part-time care

Brewer et al. (2016) investigate the labour supply impacts of part- and full-time free childcare places in England

They exploit date of birth cut-off rules for free entitlement and school

- Free entitlement: eligible part-time from term after turning 3
- School: eligible full-time from September after turning 4

This means they can compare:

- The impact of part-time free care vs. no free care
- The impact of full-time free care vs. third term of part-time free care

Case study: Full-time vs. part-time care

Effects on childcare usage:

- Free part-time care increases use of subsidisable care by 3.3hr/wk, but overall care use rises by just 1.6 hrs
 - However, the policy is effective at moving families into formal care use: 17 percentage point rise in share using any subsidisable care
- Offering a full-time rather than part-time place increases both subsidisable and informal care use

Case study: Full-time vs. part-time care

Effects on labour supply:

- No impacts on mothers with younger, ineligible children
- When affected child is the youngest, free part-time care raises the probability that mother is in the workforce slightly (3%)
 - But no effect on employment or weekly hours
- Full-time care boosts labour force participation (9%), employment (6%), and weekly hours (6%) relative to free part-time care
 - Equivalent to around 12,000 more mothers in paid work each year
 - Implies a cost of £65,000 for each additional working parent

Is that the answer?

In addition to credible (internally valid) causal estimates, we need to think about external validity when trying to apply to new contexts

- How much does the effect of a 15-hour programme in England tell us about effects of different programmes/in different countries?

Particularly important in looking at childcare and labour supply

- Anticipated nonlinearities (e.g. because of non-continuous hours choice)
- Differences in policy design (e.g. targeting, relative emphasis on quality and cost, supply-side vs. demand-side interventions)
- Extent of crowd-out might vary considerably

External validity

Reflecting these concerns, the literature on childcare and maternal labour supply finds very mixed effects

In general, effect of childcare on maternal labour supply larger in contexts where:

- The availability and use of other forms of childcare is low
- The female employment rate was initially low

Also important heterogeneity of impacts within a country

- Robust finding that extending childcare entitlements only boosts labour supply of mothers whose youngest child is affected
- Many studies find bigger effects for single mothers

Summary

Summary

There is significant spending in the UK early years sector, and perhaps even more significant public interest in childcare policy

There is a case for government intervention in the childcare market to address market failures and reduce inequalities (between genders and across socio-economic status)

However, subsidy policies can be difficult and costly to implement:

- Potential for subsidised places to simply crowd out informal or paid formal care, with little real impact on labour supply
- Need to be sensitive to income and substitution effects

Summary

These complexities mean that it's important to rigorously evaluate whether childcare subsidy programmes are working in practice

Typically, economists use quasi-experimental variation from programme rollouts or eligibility criteria

- One such paper in England finds limited impact of part-time free childcare places, but modest benefits from 30 hours of free care

However, need to be very careful when extending these findings to other policy reforms or institutional contexts

Sources and Additional Material

Sources

Belfield, C. and L. Sibieta (2016). "Long-Run Trends in School Spending in England." London: IFS Report R115.

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<http://sticerd.lse.ac.uk/dps/case/spcc/WP12.pdf>

Additional resources

Data on public spending on education in the UK ([link](#))

Putting UK education spending in international context ([link](#))

Summary of international evidence base on childcare and labour supply ([link](#))

- See especially Table 1 for an overview of the very mixed effects found

The impact of free entitlement on child development ([link](#))

Analysis of childcare plans during the U.S. election ([link](#))