

Taxation, Tax Credits and Labour Supply

How do taxes affect people's work decisions? David Phillips, an economist at the Institute for Fiscal Studies, investigates and looks at the effect of a flagship government policy.

Few people like paying taxes; it means less money to spend on the things you want, right? Because of this people have an incentive to change their behaviour in order to avoid paying tax. Economists think a lot about the effects of the tax system on incentives to work, save for retirement, and to engage in the black economy. This article looks in some detail at how taxes affect people's decisions about work, and shows that the effects can be complex and different for different people.

The Basics

To start off, think about John who initially works 30 hours and keeps his entire hourly wage £10, earning a total of £300 per week. If we now impose a tax rate of 20%, his take-home **hourly** wage falls to only £8. How will this fall in his take-home wage affect the number of hours John decides to work? Economists identify two opposing effects.

First, because each hour of work is worth less in extra pay than before, we might expect John to work fewer hours. This is the *substitution* effect; John substitutes leisure time for working time because it now only costs him £8 in lost wages if he works an hour less rather than £10. In the same way we might buy more CDs if they are cheaper, we might 'consume more leisure when its price (in terms of lost wages) falls.

Second, notice that the tax has reduced John's income from £300 to £240 at 30 hours. Economists typically assume people consume less of something the less income they have – we call goods that satisfy this principle **normal goods** - so it makes sense to assume this about leisure time too. This is the *income* effect; he will 'consume' less leisure because he is now poorer, and hence will work more hours. Another way of thinking about this effect is this: suppose John originally worked 30 hours because he had an earnings target of £300 - he now has to work more hours to reach this because of the tax.

So economic theory doesn't give us a straight answer to our question about the effect of the tax; maybe John works less but maybe he works more. It all depends upon the relative

magnitudes of the income and substitution effects, and these may differ for different people. However, understanding these two opposing effects can provide answers to some important policy-related questions as we'll see below.

Taxes don't just affect hours of work – they can also affect the decision to work at all. Does what we've learned help us here? Imagine Jane who could also earn an hourly wage £10 but has decided instead not to work. The tax reduces her potential hourly wage but, because she is not working, her current income is unchanged. Hence there is only a negative *substitution* effect which means she cannot respond to the tax by entering work. In this case, theory gives a concrete answer; a tax on labour income is a disincentive to entering the labour force.

The Evidence

The combined effect of the substitution and income effects is called the **uncompensated wage effect**. If this is positive it means that people respond to higher wages (i.e. lower taxes) by working more. Economists continue to devote a lot of effort to measuring the size of the uncompensated wage effect (and its component substitution and income effects) using an array of statistical techniques. Whilst this remains an active area of research and there is much debate about the effects of tax on labour supply, a tentative summary of the main findings is possible.

- A tax tends to discourage work, particularly for married women with young children. But the effect is not large – which is to say, the uncompensated wage effect is usually positive, but not by much.
- The size of the uncompensated wage effect seems to be highest for those working low hours. Furthermore, the decision to participate seems to be much more strongly affected than the decision to adjust hours once working. This means a tax tends to affect labour force participation and part-timers more than those working full time.
- Hours of work are only one of many aspects of labour supply potentially affected by taxation. Incentives to educate oneself or engage in training, to seek promotion or put in effort and decisions about how to allocate work-time over our lives all seem to be affected. A focus on hours of work only may *underestimate* effects. A sizeable literature focuses on measuring the response of income to tax changes; the idea is changes in income may partly capture these broader effects.

The Working Tax Credit

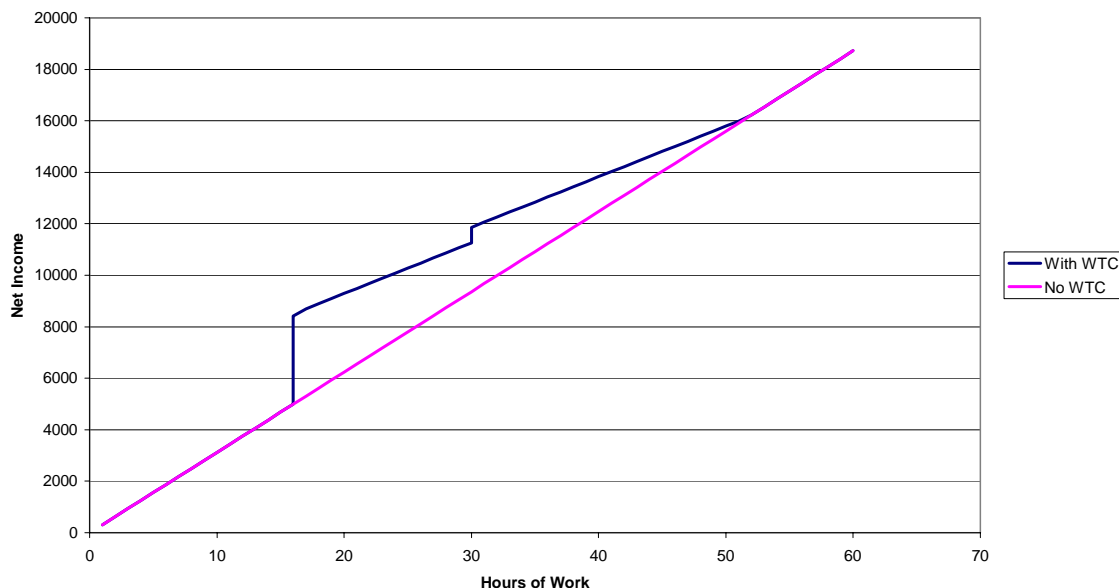
Governments have long had policies designed to increase labour force participation, particularly for families with children, by providing monetary incentives that ‘make work pay’ and since 2003 the Working Tax Credit (WTC) has been the main programme.

So just what is WTC? For families with children, it is a tax credit that supplements family income provided at least one parent works 16 hours per week, with an extra payment at 30 hours.

Because the programme is quite complex we restrict ourselves to looking at the basic credit for families with children. Furthermore, in analysing the effects of the programme, we abstract from other taxes and benefits affecting families because we assume these would be unchanged in the absence of WTC. This simplifies our diagrams.

Figure 1 below show the income of a lone parent at different hours of work, both with and without WTC. We’ve assumed a wage of £6 an hour.

Figure 1: Lone Parent's Working Tax Credit



Looking at figure 1 we can see WTC raises the lone parent’s income by £3430 when she reaches 16 hours per week, and an extra £605 ‘bonus’ if she works more than 30 hours.

Notice that after about 17 hours the slope of the dark line (take home income with WTC) is less than the slope of the pale line (take home pay without WTC). This is because when *family* income exceeds £5220, the tax credit is withdrawn at a rate of 37p for every £1 over this threshold which for our purposes is equivalent to a tax of 37%. At just over 50 hours and with earnings of £16000, all WTC has been withdrawn.

Applying what we've learned about labour supply we can see that the effect of the tax credit on work behaviour depends upon how much they are currently working. If the lone parent is not working, or works less than 16 hours, her current income is unaffected but the programme raises her take-home wage if she were to work more than 16 hours: with no income effect and a positive substitution effect she will work *more*. If she worked more than 30 hours notice that her net income is now higher, but because she now only keeps 63p of every £1 she earns, her net wage per hour is lower. In this case the substitution and income effects work together to make her work *less*.

For those working between 16 and 30 hours, the effect is somewhat more complex. At first glance, the effect would seem to be the same as for those working in excess of 30 hours, hence decreasing labour supply. However, there is now the possibility of increasing work to above 30 hours to earn the additional 'bonus', encouraging longer hours. Overall WTC causes:

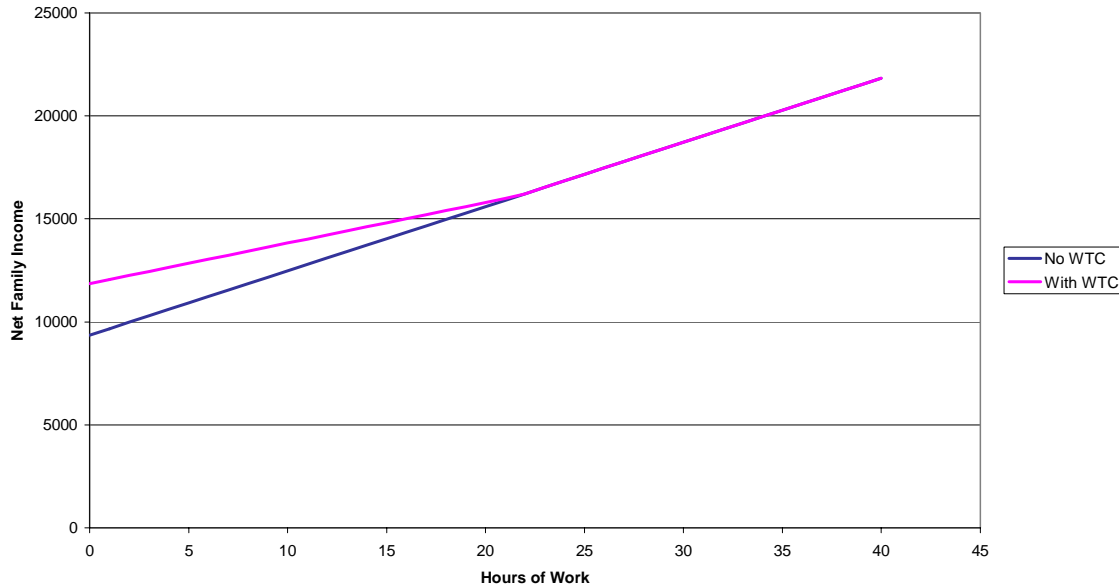
- An increase in participation for lone parents with entry at at least 16 hours.
- "Bunching" around 16 and 30 hours as lone parents adjust hours to gain most benefit from the WTC payments. For some this means less work, for others, more.

The rules of WTC are the same for couples with children. For couples, the incentives for the main earner (typically the father) are similar to those for lone parents. But what about for the mother? Figure 2 shows her budget constraint, assuming that when making her work decision she takes full account of her partners earnings (we call this **income pooling**) and that her partner works 30 hours and both earn £6 an hour. It starts at £9360 because that's what the father is earning based on these figures.

Notice that in our simple model, WTC *cannot* increase labour supply for the partner. Family income is higher with WTC than it would be without it and because family income is above

£5220, tax credits are being withdrawn, and the partner keeps only 67p for every £1 earned. This means both the income and substitution effects act to *reduce* the labour supply of the partner. Hence for couples, whilst WTC may increase or decrease labour supply for the main worker, it is almost bound to reduce it for the secondary worker.

Figure 2: Wife's Budget Constraint



Empirical work at the IFS supports what we've just learned. Analysing the Working Families Tax Credit (which preceded WTC) for the Inland Revenue, researchers estimated that the policy *increased* the labour supply of lone mothers by 5.11% mainly through increased participation, *reduced* that of mothers in couples by 0.56%, and *raised* it by 0.75% for fathers in couples¹.

Conclusions

We have learned that tax has an ambiguous effect on hours worked, but that we can use theory to work out the likely effect of the government tax and tax credit policies. In particular, we have shown that tax credits designed to encourage work can actually *discourage* it for those already working, and for partners of those in receipt of them. This problem of **adverse work incentives** is not restricted to WTC, but affects (more seriously) other benefits/tax-

¹ See Brewer and Browne, "The effect of the working families' tax credit on labour market participation" Available here: http://www.ifs.org.uk/publications.php?publication_id=3564 for a summary.

credits that are means tested including child tax credit and housing benefit. It is something government must always keep in mind when designing policy.