

**‘Extend the Neoclassical Model of Choice to develop a simple
Income-leisure model of individual labour supply use the model
to explore the argument that higher rates of income tax
Are disincentives to work.**

For most households, the single most important source of income is labour i.e. in modern USA families receive on average 89% of income from wages and salaries (Blank, 1988). This essay looks at the trade off between labour/leisure hours and the results that occur when a tax is imposed; notably the income and substitution effects. This essay also takes into account that everybody is different and that an imposition of a higher rate of income tax has more than just the one effect. Obviously some assumptions need to be made; notably its assumed in this essay that the hours in a week that aren't spent at work are spent on leisure time; up to the total of 24 (hours in a day). Leisure is defined as all non – market activity; in this essay it means simply not working.

The first part of the essay asks to draw up a simple Income – Leisure model. This is illustrated in Figure 1 (below)

Figure 1....a simple Income-Leisure Model of labour supply.

This Income – Leisure Model shows the choice that an individual has in a specific 24 hour time period. He/she has the choice of working for 24 hours, taking leisure for 24 hours or a combination of the two. T Stands for Time Endowment, the maximum amount of time that can be spent on leisure. In this case T is equal to 24 hours. Income (on the left axis) is the total amount of income that can be earned in that day; in this case it is assumed that an individual can't earn any more than £120 in that day and that there is no variance in the hourly rate (i.e. overtime or unsociable hours). It can therefore be deduced that if this individual earns the full £120 then they have spent all 24 hours working and vice versa if they don't earn a penny then all 24 hours will have been spent on leisure. There are two points drawn on Figure 1. Point A shows a case where the individual spends 20 hours at work and only 4 hours for leisure time. Point B is a more likely example; the individual spends 12 hours for work and leisure respectively. The opportunity cost of leisure is the hourly rate; in this case ($\pounds 120/24$) which is equal to £5 an hour. A wage increase would cause the opportunity cost of leisure to increase and the opposite would happen for a wage decrease.

Figure 1 was just a basic model and it assumed that the individual was free to do what they wanted over that 24 hour time period; there were no constraints. The individual's preference would be demonstrated by an indifference curve intersecting the budget constraint; showing preferences for income level and hours of leisure per day at a level that satisfies their needs. The second part of the essay question asks what happens when there is an increase in income tax (tax on an individual's salary). Tax has the effect that

some people want to work more to make up for lost earnings and some decide to keep their hours the same or even work less and spend that time on leisure. The following examples look at someone who chooses to work more and someone who chooses to work less when the level of income tax rises. It's important to assume for the following examples that these individuals earn relatively large amounts of money and are therefore in the higher brackets of income tax. An individual earning next to nothing wouldn't be affected by income tax as it's zero on small incomes. When a tax is imposed, income decreases and consumption of goods and services becomes more expensive in the sense that the employee has to give up more leisure time for each unit of consumption. Hence, there is a tendency to substitute leisure for consumption that is to decrease the labour supply. This is the substitution effect of a wage decrease. Assuming leisure is a normal good, the income and substitution effects work in opposite directions and the outcome is logically ambiguous. The Income Effect is when the change in labour hours that results when a wage increase/decrease causes the consumer to move to a higher or lower indifference curve. The Substitution Effect is defined as the change in labour hours that results when the wage rate increases/decreases and moves the consumer along a given indifference curve to a point with a new Marginal Rate of Substitution.

Figure 2....an increase in tax of £3 for every hour worked.

A tax of £3 per every hour worked means that instead of earning £10 an hour, Person A now only earns £7 per hour (The budget constraint therefore shifts from B1 to B2) Effectively this is reducing the opportunity cost of an hour of leisure. In this instance, Person A has moved to point e2 on the new budget constraint and this results in a loss of hours worked ($n_2 - n_1$). Person A values leisure time more than money and once the opportunity cost of an hour of leisure fell from £10 to £7 they choose to consume that leisure rather than work. In this case the Substitution Effect outweighs the Income Effect and this is illustrated in Figure 3 (below)

Figure 3....Demonstrating the Substitution Effect outweighing the Income Effect.

For this individual, the Substitution Effect of the wage decrease (from E1 to Ec) dominates the Income Effect (from Ec to E2) hence the labour supply decreases when the wage rate falls. This is most likely to occur for an individual nearing retirement or an individual with substantial wealth; there is no point working more when you don't need/have to.

This isn't always the case. Some people value income more than leisure and once an increase in tax has been levied, they choose to increase their hours at work to make up for the lost income. This is illustrated in the example of Person B who works the same amount of hours as person A originally and also experiences a tax of £3 on an hourly rate of £10.

Figure 4...Person B increasing hours at work in response to a tax hike.

Analysing the diagram, work is increased by $n_1 - n_2$ hours in response to a deduction of £3 per hour due to tax. This implies that the Income Effect dominates the Substitution Effect as hours worked have increased to maintain the previous level of income; they haven't chosen to consume the extra leisure like Person A. This is illustrated in Figure 5.

Figure 5....Demonstrating the Income Effect outweighing the Substitution Effect.

For this individual, the Income Effect of the wage decrease (from E_c to E_2) dominates the Substitution Effect (from E_1 to E_c) hence the labour supply increases when the wage rate falls. This situation is more likely to occur for an individual with responsibilities; i.e. a person with large debt or a person with responsibilities such as a family. When their income decreases their natural reaction would be to work more as they simply can't afford to lose money.

Figures 2 thru 5 have demonstrated the effects of an increase in tax for the higher brackets. A lot depends on the individual; they are still free to choose what they want to do. Essentially everybody is different and once tax has been increased everybody reacts differently to it. Figures 2 and 3 illustrated an individual who decided to work less when tax was increased; they valued leisure at a higher premium than work; Substitution outweighing Income. Figures 4 and 5 highlighted the opposite of this, an individual who was prepared to work more and cut down on their leisure time to try and keep to the same standard of living that they were at before. It cannot be emphasised enough about everybody being different and there is more than one response to a tax hike. Variables such as age (i.e. just starting work at 16 or nearing retirement at 65), whether the individual is single/married with children/no children and whether they actually get any job satisfaction (someone who hates their job is far less likely to increase their hours in the workplace than someone who loves their job). If the increase of income tax was imposed, someone who was nearer to 65 would be far more likely to work less than

someone who has just left school at 16. Young people generally accumulate a lot more debt than someone nearing the end of their working life and as a result when their wage decreases due to tax they would most likely put more hours in at the workplace. The same could be said for someone who was married with children and an individual who was single with no ties. The individual with a family obviously has more financial ties than the person who is single and as a result you would expect the individual with family to work more as money is more important.

To conclude, the essay has covered the issues of what the effect an increase in income tax has on an individual. There are three possibilities; they can work more to try and earn the same amount as they did before, they can work the same amount of hours and earn less or they could simply cut back their hours if they valued leisure more than work (the opportunity cost) or in some extremes an increase in income tax could bring on retirement for some people. It would be very hard to definitively say that an increase in income tax is a disincentive to work because in some cases it is and in some cases it isn't and in some cases it has no effect. It all comes down to the individual and their circumstances. In some extreme cases it could be that an increase in income tax acts as a disincentive to work; in some cases extra money the Government raises comes back to the individual i.e. Working Families Tax Credit and other forms of social benefits. The more revenue the Government makes from tax the more likely social benefits will be increased, making some individuals better off. Obviously there are those who don't get any social benefits. Generally the typical assumption is that when income goes down, the demand for leisure goes down (*ceteris paribus*). It's impossible to make a generalisation

that demand goes down for leisure in every individual's case; some people simply value leisure more than work i.e. an investment banker taking early retirement at 55 to play more golf instead of giving more of their earnings away to the taxman.

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