

# Labour Economics

## Supervision 1

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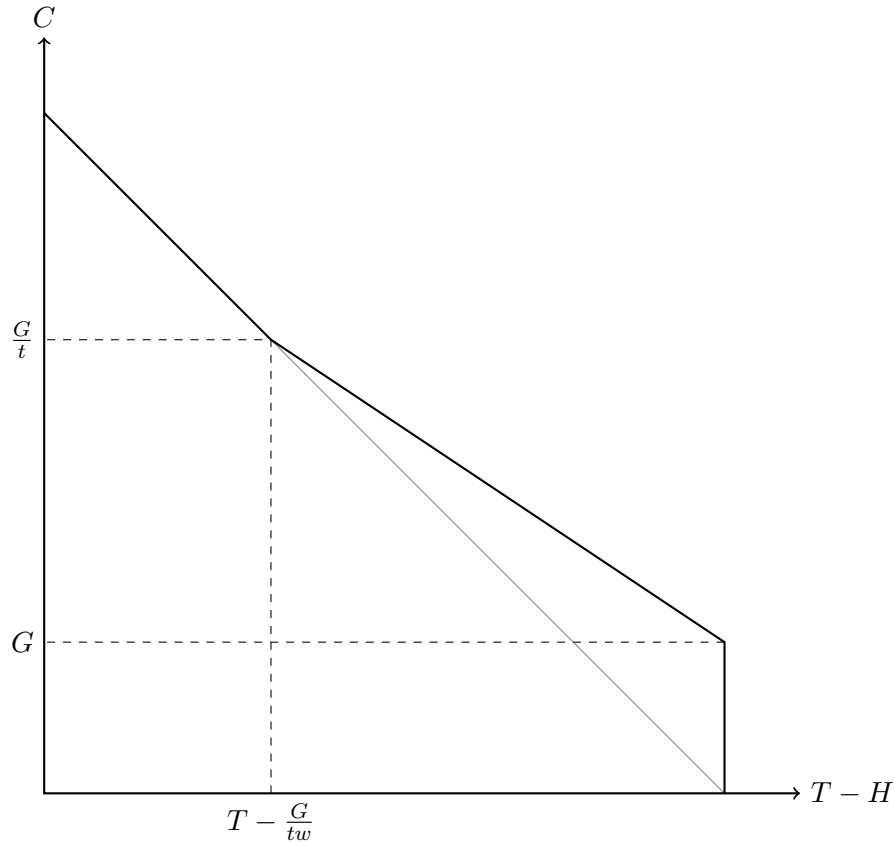
### Question 1

(a)

For simplicity, we assume that non-labour income is 0. The government offers a benefit of  $G$  when there is no income, and withdraws  $t$  in benefits per dollar of income earned up until the benefit given is 0. This occurs when  $twH = G$  or  $H = \frac{G}{tw}$ . Letting consumption be  $C$  and the total endowment of time be  $T$ , and normalizing the price of consumption to 1, the worker's budget constraint is

$$C = \begin{cases} G + (1-t)wH & \text{if } 0 \leq H \leq \frac{G}{tw} \\ wH & \text{if } H > \frac{G}{tw} \end{cases}$$

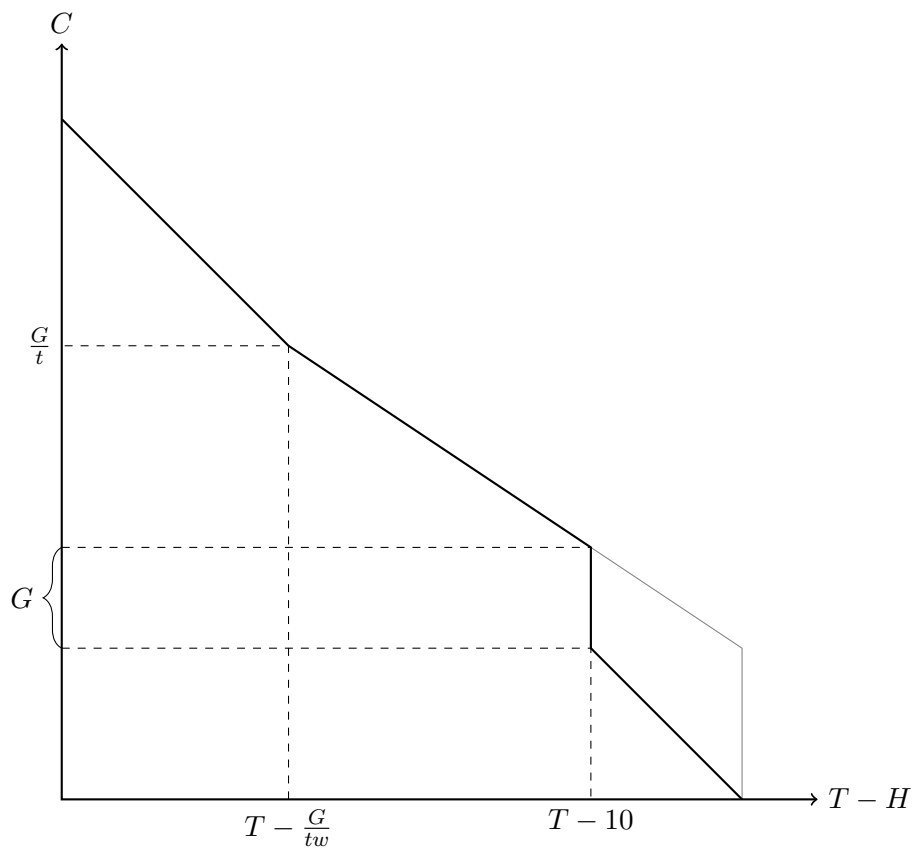
This is represented graphically below:



With the work requirement, the new budget constraint becomes

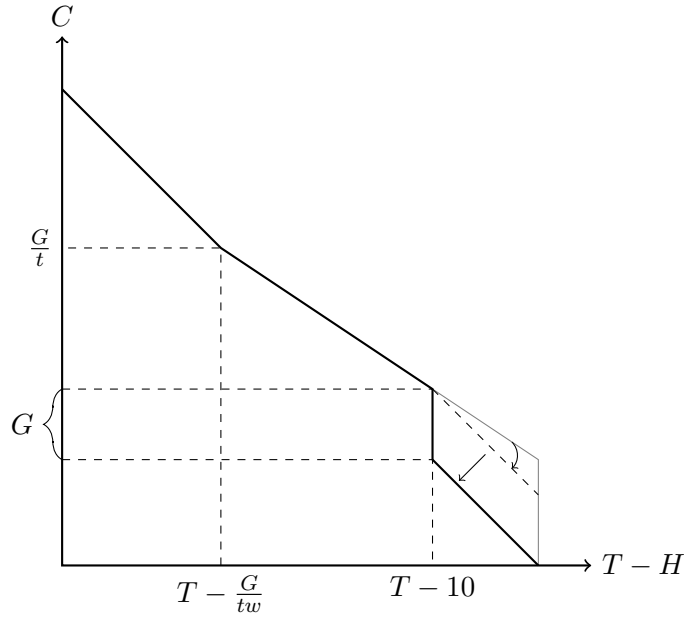
$$C = \begin{cases} wH & \text{if } 0 \leq H < 10 \\ G + (1 - t)wH & \text{if } 10 \leq H < \frac{G}{tw} \\ wH & \text{if } H \geq \frac{G}{tw} \end{cases}$$

and the diagram becomes



(b)

There is no change in incentives for workers whose optimal choices were already to work 10 hours or more. For workers whose optimal hours of work were less than 10, the shift in the budget line for that region involves both a negative income effect and a negative substitution effect in terms of leisure, if we assume leisure is a normal good. This can be shown by decomposing the shift in the budget line:

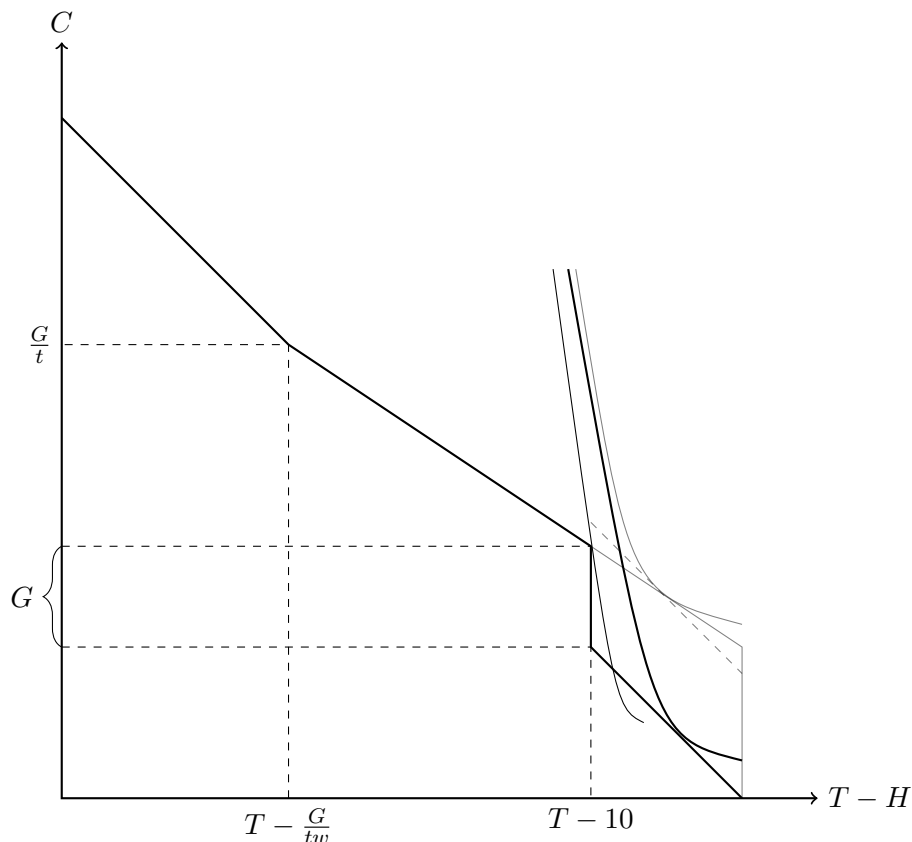


Therefore there should be an unambiguous increase in hours worked relative to the case with just a negative income tax. Anyone who would have worked less than 10 hours with just a negative income tax is made strictly worse off under the work requirement. This is because the new budget set is a proper subset of the old one, and revealed preferences imply that the new optimal choice is worse. In this partial equilibrium setting there is no clearly defined 'winner' of this policy. More broadly, if the government is running a balanced budget, then presumably everyone who was working 10 hours or more before the restriction was imposed benefits from lower tax payments.

(c)

If the individual does not value leisure much relative to consumption, then the change in number of hours worked will be further biased upwards as the negative substitution effect for leisure will become even larger.

If the individual values leisure a lot relative to consumption, but leisure is an inferior good over the range we are considering (even though this sounds somewhat paradoxical), there can be a decrease in hours worked following the work requirement. This is because the substitution effect becomes very small and the income effect predominates, as such:



In the above example the indifference curves are very steep; a small decrease in leisure has to be compensated by a very large increase in consumption. The substitution effect, shown by the dashed tangent line along the old indifference curve, is very small in this case. It is outweighed by the income effect that arises from shifting from the dashed line to the new budget line. The example above seems contrived but is nevertheless possible, thus the effect on  $H$  is ambiguous. Otherwise, if we retain the assumption that leisure is always a normal good, then someone who values leisure a lot will still work more under the new policy, just that the change is smaller in magnitude.

If the work requirement increases to 20 hours, the qualitative effects remain the same if we are comparing to the case with just a negative income tax. If we are comparing with the work requirement of 10 hours, and we keep the assumption that leisure is a normal good, the number of hours worked unambiguously increases. People whose optimal choice was to work less than 10 hours or more than 20 hours will not be affected, while anyone in between will work more, even those at the kink where  $H = 10$ . This is for the same reasons as before; we can evaluate the increase in the work requirement as (1): a movement up along the old indifference curves and (2): a inward shift in the budget line.

(d)

If the government has perfect information, then this will not affect labour supply incentives at all while improving the welfare of those who are constrained in their supply of labour. On the other

extreme, if it is costless for workers to present as non-workers, then the effective budget set is

$$C = \begin{cases} G & \text{if } H = 0 \\ wH & \text{if } 0 < H < 10 \\ G + (1 - t)wH & \text{if } 10 \leq H < \frac{G}{tw} \\ wH & \text{if } H \geq \frac{G}{tw} \end{cases}$$

and some (or all, depending on  $G$  and the worker preferences) people whose previous optimal choice was  $H < 10$  that will now have an incentive to not work at all.

The likely scenario is probably somewhere in between the two extremes, depending on how this is regulated. The optimal incentive-compatible scheme will depend on the underlying distribution of workers' ability and preferences, and it will not achieve the first-best outcome.

(e)

The first thing one could do is to administer the grant on an inclusionary basis: individuals with certain disabilities or household conditions are eligible, subject to a doctor's certification or assessment by social workers. How easy this is depends on the specific criteria. It is probably more difficult (though sometimes possible) for individuals to malingering in order to receive the grant, especially for physical conditions. If, for example, the government would like to provide the grant to single parents who are constrained in their labour supply, there might be an incentive for individuals to overstate their family commitments. However, whether this actually happens on a notable scale is questionable from a sociological standpoint. This will also incur administrative costs as workers are assigned to monitor the claimants.

If a requirement for job search is imposed, then some governments might be tempted to judge whether an individual is employable or not by looking at the duration of unemployment (which by definition includes the fact that he is searching for a job). A problem with this is that this may just provide another economic incentive to put less effort into the job search until one is classified as 'unemployable'. Again, whether this is a likely response is suspect, but we could test this by checking if there is any bunching in the duration of unemployment across individuals at the threshold where one becomes eligible. This will be especially so if the criterion for eligibility does not 'reset' after one finds a job. Even if it does, if the individual is in a position where employment tends to be unstable (i.e. with little guarantee of long-term employment), then it might be safer for him to wait a while and qualify for benefits rather than to get a job and risk having to wait the long period before qualifying for benefits again if he is terminated shortly after. Most importantly, this is an unambiguously welfare-reducing policy for the truly 'unemployable', who are precisely the people most in need of help. People who are truly not employable will have to be subject to meaningless job searches and follow-ups with case workers, meanwhile not being able to collect benefits. This might put them off from even trying to qualify in the first place, especially if they already have a tight time constraint.

## Question 2

(a)

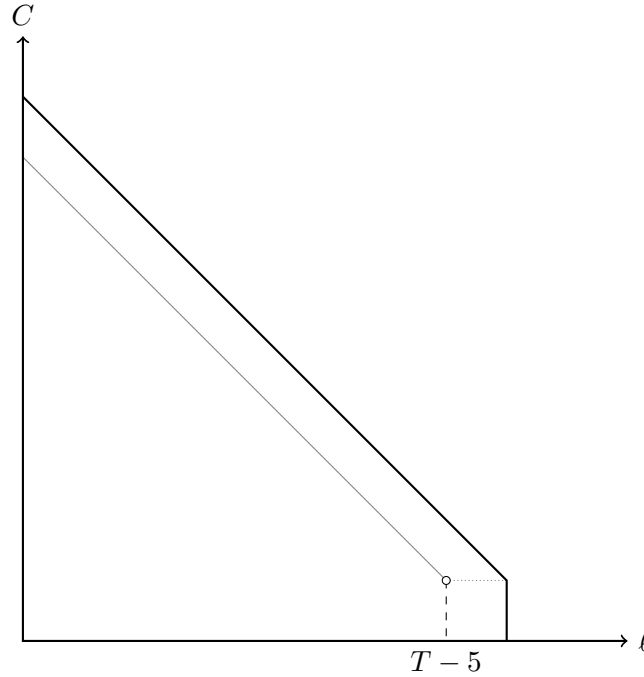
This is false and can be shown with a trivial example. If someone with Cobb-Douglas preferences has an optimal choice  $\bar{\mathbf{x}} \in \mathbb{R}^n$ , someone can have the same optimal choice with a Leontief utility function of the form  $U(\mathbf{x}) = \min\{\bar{\mathbf{x}} \circ \mathbf{x}\}$  where  $\circ$  denotes the element-wise product of two vectors.

(b)

If the total time endowment is  $T$ , non-labour income is  $N$ , and we normalize prices to 1, then the budget constraint for person A (Alison) is  $C = w(T - \ell - 5) + N$  or

$$\ell = \begin{cases} T & \text{if } C = 0 \\ T - 5 - \frac{C-N}{w} & \text{if } C > 0 \end{cases}$$

while the budget constraint for person B (let's call her Beth instead of Ann) is  $C = w(T - \ell) + N$ . If we plot both their budget sets on the same graph, Alison's budget set will be circumscribed within Beth's, as such:



With this there are three possibilities. If Beth's optimal choice is not to work, then with the same preferences it will also be optimal for Alison not to work. If Beth's optimal choice is to work, two things can happen. Alison's optimal choice might involve working less and consuming less leisure, since part of her budget set is just equivalent to an decrease in income relative to Beth's. If not, it may be that Alison's optimal choice is not to work at all and consume more leisure than Beth. The former will be true when Beth works many hours, and the latter will be true when Beth works very few hours. Thus the statement is true only for some cases.