INTERMEDIARY MICROECONOMICS   
ECON 20002

Assignment 2

Group Name: ***The Wu Tax Clan***

Callum Griffin (640115) & Marcello de Livera (638860)

Tutor : James Nesbit, Friday 3:15pm

***Question 1***

***a)***

***Conditional Labour and Capital Demand***

Production function:

Marginal Product of Labour (=

Marginal Product of Capital (= =

Marginal Rate of Technical Substitution =

At cost minimizing optimum point, the tangency condition states:

Expansion Path:

Substituting Expansion Path into Production Function:

Substituting L\* into expansion path function

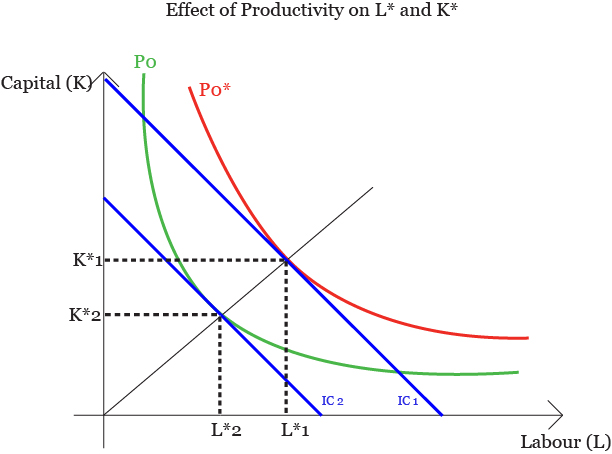
Both L\* and K\* have inverse relationships with Productivity (A(t)). That is, as productivity increases, the firm requires less of both inputs (Capital and Labour) to keep producing the same level of output. Productivity in turn varies with time (t).

The graph below shows the approximate effect of A(t) on the optimal input choices when producing output = 0. P0 shows the production function with A(t), while Po\* has no productivity multiplier.

That is

P0:

P0\*:



The optimal labour choice when the productivity is excluded is shown at L\*1, but when A(t) is included in P0, the optimal choice decreases to L\*2. Similarly, when A(t) is excluded the optimal capital choice is at K\*1, which drops to K\*2 when A(t) is included in the production function. This clearly shows that A(t) results in a drop in conditional labour demand (L\*) and conditional capital demand (K\*) when t > 0, which reflects the lower cost of producing a good when productivity increases. The lower cost is reflected by the shift in the tangent Iso cost line from IC1 to IC2. The firm requires fewer inputs to produce P0 units of output, shown by the isoquant line shifting towards the origin.

***b)***

Oztronics’ average cost of production =

Production function:

Let

A(t) =   
w = $25  
r = $1200  
α = 0.25  
β = 0.75

Production function shows Constant Returns to Scale.

Therefore average cost and marginal cost are constant, so

Average cost AC(q) = marginal cost MC(q) = cost of producing 1 unit of output C(1)

C(q)=wL\* + rK\*

Marginal Product of Labour (= =0.25

Marginal Product of Capital (= =0.75

Marginal Rate of Technical Substitution= = = =

At the cost minimizing optimum (L\*, K\*), according to the tangency condition:

Expansion Path:

Substituting expansion path equation into production function

Substituting L\* into expansion path equation

c(q) = wL\* + rK\*

AC(q) = C(1) due to Constant returns to Scale, so we substitute q=1

Average Cost of Production =

Today’s (Current) Average cost of production when t = 0

== $800

In order to be viable in the market for 50” Plasma TV’s, Oztronics must satisfy

AC(q) ≤ P

Where P = market price for 50” plasma TV’s = $750

800 > 750

Therefore Oztronics cannot viably produce a 50” plasma TV today without tax protection.

***C)***

Assuming the price of TV’s remains constant over the protection period, Oztronics’ average cost must decrease from $800 to at least $750 in order to be viable against un-taxed competition.

Time taken to decrease Average cost of production to $750:

750 =

0.0645=0.01t

t = 6.45452

The government protection must be provided for 6.455 years before Oztronics’ average cost of production decreases enough to make them viable in an un-taxed market.

In 2 years, Oztronics would only be able to decrease average cost of production to  
   
which would make Oztronics unviable if the tax protection was lifted.

6.455 years exceeds Oztronics’ CEO's expectation of 2 years until Average Cost of Production decreases enough to viably produce televisions.

***d)*.**

The federal government must consider the tradeoff between the benefits and costs of implementing the tax when deciding whether it is justified. The main benefit is that the local firm, Oztronics, will be able to viably produce plasma televisions as the market price will be higher than their average cost of production. This will increase the local producer surplus, as exhibited in figure 3. The federal government will also generate revenue by taxing plasma televisions that are imported, which is likely in their own best interest.

The disadvantages of the tax would be that consumers would have to pay a higher price for their plasma televisions and this would coincide with a fall in consumer surplus. Overseas television producers would also lose out as their supply of televisions would be unmet by demand at the new higher price. The supply and demand equilibrium is shown in figure 1. below, figure 2. demonstrates the effects of the tax on total surplus. Figure 2. also makes clear the deadweight loss caused by imposing tax.

There could be a gain or loss of total welfare depending on the size of the fall in consumer surplus and rise in local producer surplus, however a loss is more likely to occur, in line with figure 2. To minimise the loss in future years, the government could reduce the tax as Oztronic’s productivity increases and production costs decrease. A lower tax could be introduced after the first 2 years, followed by a removal of the tax at the end of year 7.

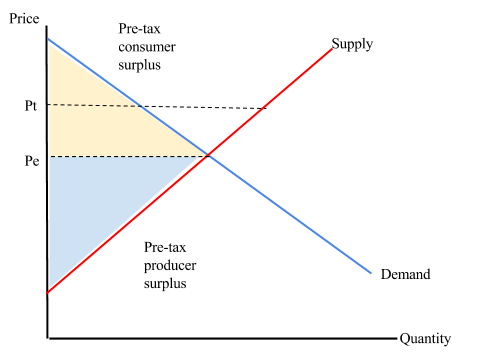
Figure 1. 

Figure 2. 