Tier 1 Investor Route: An Attempt at Economic Analysis[1]

Alan Manning, CEP, LSE

This note is about the likely effect of immigrants who enter the UK through the The Tier 1 (Investor) category which is currently described by the Home Office as being "for high-net-worth individuals who want to make a substantial financial investment (£1m) in the UK". At the moment the most common such route seems to be the purchase of £1m of gilts, which can be subsequently sold after 5 years.

The impression is sometimes given that it is obvious that such immigration is beneficial to the receiving country – they are included under the more general category of "high-value migrants".

The alleged benefits are not entirely clear. This route seems to date from 1994 at least but the motivation for it – if it ever existed – seems to have been lost in the mists of time. It seems likely it is for three possible reasons:

   a. Tier 1 Investors as Consumers: to the extent that they are resident they spend income in the UK and hence provide employment to UK natives.
   b. Tier 1 Investors as Investors, most commonly as buyers of Gilts
   c. Tier 1 Investors as Taxpayers

The purpose of this note is to consider these ways in which Tier 1 investors might affect economic outcomes, considering these three roles separately.

Tier 1 Investors as Consumers

Most models of the impact of immigration assume that the immigrants are workers whose main impact is through the labour they supply. In contrast, in the case of investors, they are providers of capital and consumers.

It is perhaps taken as obvious that anyone spending money in the UK must be 'creating jobs'[2] – such a view would not be supported by economic theory.

In many ways, such a view is simply the flip side of the 'lump of labour' fallacy which holds that an increase in the immigration of workers must cause job loss for natives because there is a fixed number of jobs given by demand. It is a fallacy because – in the medium to long-run at least – employment is determined by supply-side more than demand-side factors.

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2 See for example the heading to the Boris Johnson article (possibly not written by him) "We should be humbly thanking the super-rich, not bashing them. As well as creating jobs and giving to charity, the wealthy should be hailed as Tax Heroes" http://www.telegraph.co.uk/comment/columnists/borisjohnson/10456202/We-should-be-humbly-thanking-the-super-rich-not-bashing-them.html.

Similarly the view that the immigration of consumers must add to jobs because they are adding to demand is fallacious for the same reasons – it is wrong to assume the level of employment is determined by demand alone.[3]

Let's consider some simple models of what we would expect to be the effect of allowing wealthy individuals with a source of income outside the UK to be resident in the UK. We consider two models – one in which there are only produced goods and another in which there is a good (think of housing) which is not produced and is in inelastic supply.

A Model with Traded and Non-Traded Goods

If the economy has only one type of good, produced both in the UK and abroad (so is tradeable) then the presence of a wealthy individual in the UK will have no impact for good or ill. The extra expenditure in the UK that comes from their presence (and is in the balance of payments as a capital inflow) will simply be same as the reduction in net exports.

To have the possibility of a non-zero effect would seem to require at least two types of goods, one traded and one non-traded. So let us consider a model of this type.

Assume that UK employment in the traded good sector is given by L_t and that output produced in the traded good sector is given by $F_t(L_t)$. Assume that this good is traded in an internationally competitive market so the price of the traded good P_t is exogenous to the UK. Labour demand in the traded good sector will satisfy:

$$P_t F_t'(L_t) = W \tag{1}$$

In what follows it will be useful to consider variations in traded good sector employment and the wage and differentiating (1) gives us:

$$d \ln L_t = \varepsilon_t d \ln W \tag{2}$$

Where ε_t is the elasticity of labour demand in the traded goods sector.

Assume that UK employment in the non-traded good sector is given by L_n and that output produced in the traded good sector is given by $F_n(L_n)$. The price of the non-traded good, P_n, will be determined domestically but labour demand in the non-traded good sector will satisfy:

$$P_n F_n'(L_n) = W \tag{3}$$

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[3] There are perhaps some arguments that the economic situation of the last few years had been an unusual period in which demand factors influence employment more than normal. But the Investor route is much older than that.

Where we have assumed that labour can move freely between both traded and non-traded goods sectors so that the wage is equalized in the two sectors.

In what follows it will be useful to consider variations in traded good sector employment, the non-traded-goods price and the wage and differentiating (1) gives us:

$$d \ln L_n = \varepsilon_n \left[d \ln W - d \ln P_n \right] \tag{4}$$

Where ε_d is the elasticity of labour demand in the traded goods sector.

On the supply of labour we make the simplest possible assumption, namely that there is an inelastic supply of labour L to the economy which can work in either sector i.e. we have:

$$L_t + L_n = L \tag{5}$$

Differentiating this we have that:

$$d \ln L_t = -\frac{\beta}{1-\beta} d \ln L_n \tag{6}$$

Where β is the share of non-traded employment in total employment. One could easily relax this assumption – to allow for some elasticity in the supply of labour or a 'wage curve' with some unemployment and the results would qualitatively be the same.

Now let us turn to the demand for products. To keep things simple assume that all consumers whether UK workers, UK capitalists or the Tier 1 investor themselves have the same homothetic preferences so that we can represent their indirect utility function by $v(P_t, P_n)Y$ where Y is their income. This means that demand for the non-traded good will be given by:

$$X_n^d = -\frac{\partial \ln v(P_t, P_n)}{\partial P_n} \left[WN + \Pi + M \right] = x_n^d (P_t, P_n) \left[WL + \Pi + M \right] \tag{7}$$

Where WN is the income of UK workers, Π the profits of UK firms and M the total expenditure of the Tier 1 Investor in the UK that we treat as exogenous (though conceivably could be a choice variable for them).

Demand equals supply in the non-traded goods sector means that (7) can be written as:

$$F_n(L_n) = x_n^d (P_t, P_n) \left[P_n F_n(L_n) + P_t F_t(L_t) + M \right] \tag{8}$$

Differentiating this we have that:

$$\alpha_n d \ln L_n = -\eta_n^d d \ln P_n + s_n d \ln P_n + s_m d \ln M \tag{9}$$

Where α_n is the share of labour in non-traded output, η_n^d is the own-price elasticity of demand for non-traded goods, s_n is the share of non-traded goods in total income and s_m is the share of the tier 1 investors in total income.

The two labour demand curves, (1) and (3), the labour supply equation (5) and this market-clearing condition for non-traded goods (8) give us 4 equations in the 4 unknowns $\left(L_t, L_n, W, P_n\right)$. As usual we do not explicitly need the market-clearing condition for the traded goods sector because of Walras' Law.

We model the increase in Tier 1 investors (as consumers) as an increase in M and consider the impact on the UK economy. Using (2), (4), (6) and (9) we can solve for the change in the endogenous variables as a function of $d \ln M$. This leads to:

$$d \ln L_n = \Delta^{-1} s_m d \ln M > 0 \tag{10}$$

Where:

$$\Delta = \alpha_n + \left(\eta_n^d - s_n\right)\left[\frac{1}{\varepsilon_n} + \frac{\beta}{1-\beta}\frac{1}{\varepsilon_t}\right] \tag{11}$$

Which it is reasonable to expect should be positive (this is a sort of stability condition)

$$d \ln L_t = -\frac{\beta}{1-\beta}\Delta^{-1} s_m d \ln M < 0 \tag{12}$$

$$d \ln P_n = \Delta^{-1}\left[\frac{1}{\varepsilon_n} + \frac{\beta}{1-\beta}\frac{1}{\varepsilon_t}\right] s_m d \ln M > 0 \tag{13}$$

$$d \ln W = \frac{1}{\varepsilon_t}\frac{\beta}{1-\beta}\Delta^{-1} s_m d \ln M > 0 \tag{14}$$

Intuitively what will happen is clear – the presence of the immigrants in the UK increases the demand for non-traded goods, leading to a reallocation of labour from the traded goods sector (like manufacturing) to the non-traded goods sector (like household services). As the UK now produces fewer traded goods the current account of the balance of payments deteriorates but this is made up by the money being brought into the country by the immigrants. This reallocation of labour requires an increase in the price of non-traded goods and the wage.

How does this affect the welfare of natives? The increase in the wage makes one think that UK workers must be better off but the increase in the price of non-traded goods acts to off-set this. Using the indirect utility function we can write the total change in log utility of UK workers as:

$$d \ln U = \frac{\partial \ln v}{\partial \ln P_n} d \ln P_n + d \ln Y = -\gamma_n^d d \ln P_n + d \ln W \tag{15}$$

Where γ_n^d is the share of non-traded goods in total expenditure. Using (13) and (14) this can be written as:

$$
\begin{aligned}
d \ln U &= \left\{ -\gamma_n^d \left[\frac{1}{\varepsilon_n} + \frac{\beta}{1-\beta} \frac{1}{\varepsilon_t} \right] + \frac{1}{\varepsilon_t} \frac{\beta}{1-\beta} \right\} \Delta^{-1} s_m d \ln M \\
&= \left\{ -\frac{\gamma_n^d}{\varepsilon_n} + \frac{1-\gamma_n^d}{\varepsilon_t} \frac{\beta}{1-\beta} \right\} \Delta^{-1} s_m d \ln M
\end{aligned}
$$

(16)

Which is ambiguous in sign i.e. the change in the welfare of UK workers may be positive or negative. Let us consider some special cases:

Special Case 1: Constant Returns in Both Sectors

This is the case where $\varepsilon_t = \varepsilon_n = \infty$ in which case (13) and (14) tell us that $d \ln P_n = d \ln W = 0$ which implies from (16) that $d \ln U = 0$.

This can be readily understood. If there is constant returns to scale in the traded goods sector then the labour demand curve (1) becomes:

$$
P_t A_t = W
$$

(17)

Which fixes the wage independent of anything else. The labour demand curve in the non-traded goods sector (3) then becomes:

$$
P_n A_n = W = P_t A_t
$$

(18)

Which fixes the non-traded goods price independent of anything else. So no prices or wages are changed by the influx of Tier 1 investors. There is still a shift in employment from the influx – from traded to non-traded sectors.

Special Case 2: Constant Returns in Traded Sector, Decreasing Returns in Non-Traded Sector

This is the case where $\varepsilon_n < \infty = \varepsilon_t$ in which case (13) and (14) tell us that $d \ln P_n > 0 = d \ln W$ which implies from (16) that $d \ln U < 0$ i.e. workers are worse off.

This can be readily understood. If there is constant returns to scale in the traded goods sector then the labour demand curve (1) becomes:

$$
P_t A_t = W
$$

(19)

Which fixes the wage independent of anything else. But the transfer of labour from the traded to the non-traded goods sector means that the price of non-traded goods must rise given decreasing returns to scale there.

Special Case 3: Decreasing Returns in Both Sectors with Identical Elasticities of Labour Demand

This is the case where $\varepsilon_t = \varepsilon_n = \varepsilon < \infty$ in which case (16) can be written as:

$$d \ln U = \frac{\beta - \gamma_n^d}{\varepsilon(1-\beta)} \Delta^{-1} s_m d \ln M \tag{20}$$

So that the sign of the effect on workers' welfare depends on whether β, the share of non-traded employment in total employment, is greater or smaller than γ_n^d, the share of non-traded goods in total expenditure.

These examples show that there is no clear presumption that the influx of Tier 1 investors is beneficial to the UK workers through the channel that the wealthy investors are residing in the UK and spending money here. The clearest prediction is that the influx of Tier 1 investors will cause a reallocation of employment away from traded and towards non-traded goods sectors, not something that is generally thought of as a good thing.

A Model with Housing

It is often alleged – especially at the moment – that foreign investors (most of them probably non-resident) drive up the price of housing especially as the supply of housing in the UK is relatively inelastic. Let us consider a model to think this through.

To make things simple assume there is a just one good (which is traded) in the economy but there is also housing which is in fixed supply and is not produced by labour. The price of the traded good, which we will denote by P, will be fixed in world markets and, given total labour supply, this then fixes the wage, both independent of the presence of Tier 1 investors. Assume there is constant returns in this sector so all income is wages. But the price of housing, denoted by P_h, will typically respond to the presence of tier 1 investors. If the supply of the flow of housing services is H, then demand equals supply in the market for housing must, by analogy to (7) satisfy:

$$H = -\frac{\partial \ln v(P, P_h)}{\partial P_h}\left[WL + P_h H + M\right] = x_h^d(P, P_h)\left[WL + P_h H + M\right] \tag{21}$$

From this we can derive how the price of housing will respond when there is an increase in M caused by Tier 1 investors. Differentiating (21) we will have:

$$0 = -\eta_h^d d \ln P_h + s_h d \ln P_h + s_m d \ln M \tag{22}$$

Which implies that:

$$d \ln P_h = \frac{s_m d \ln M}{\eta_h^d - s_h} \tag{23}$$

Where η_h^d is the own-price elasticity of demand for non-traded goods, s_h is the share of non-traded goods in total income and s_m is the share of the tier 1 investors in total income. As before, it is natural to assume that $\eta_h^d > s_h$ which is a sort of stability condition so that an increase in M leads to an increase in house prices.

How are UK citizens affected by this change? If one is a worker who does not own any housing, the impact of the Tier 1 investors must be negative – the wage does not change but the price of housing rises. But some UK citizens are also owners of housing.

Let us consider the change in utility of UK citizens as a whole. The change in log utility must be given by:

$$d\ln U = \frac{\partial \ln v}{\partial \ln P_h} d\ln P_h + d\ln Y = -\gamma_h^d d\ln P_h + s_h d\ln P_h = \left(s_h - \gamma_h^d\right) d\ln P_h = 0 \qquad (24)$$

Where γ_n^d is the share of housing in total expenditure which must equal the share of income from housing. So there is no net benefit or loss to UK citizens from the Tier 1 investors but there are distributional effects – workers lose and home-owners gain.

<u>Tier 1 Investors as Buyers of Gilts</u>

Now consider the likely impact of Tier 1 Investors not as consumers but as investors. In practice it seems that Tier 1 Investors mostly choose to satisfy the 'investment' criterion by purchasing £1m of gilts that must be held for at least 5 years. There is some evidence that they regard this as distorting their investment decisions from what they would otherwise have been. But, even if this is the case, this does not mean it benefits the UK citizen.

To think through the impact of this policy it is perhaps useful to first consider a market for an abstract good with demand and supply as represented in the Figure below:
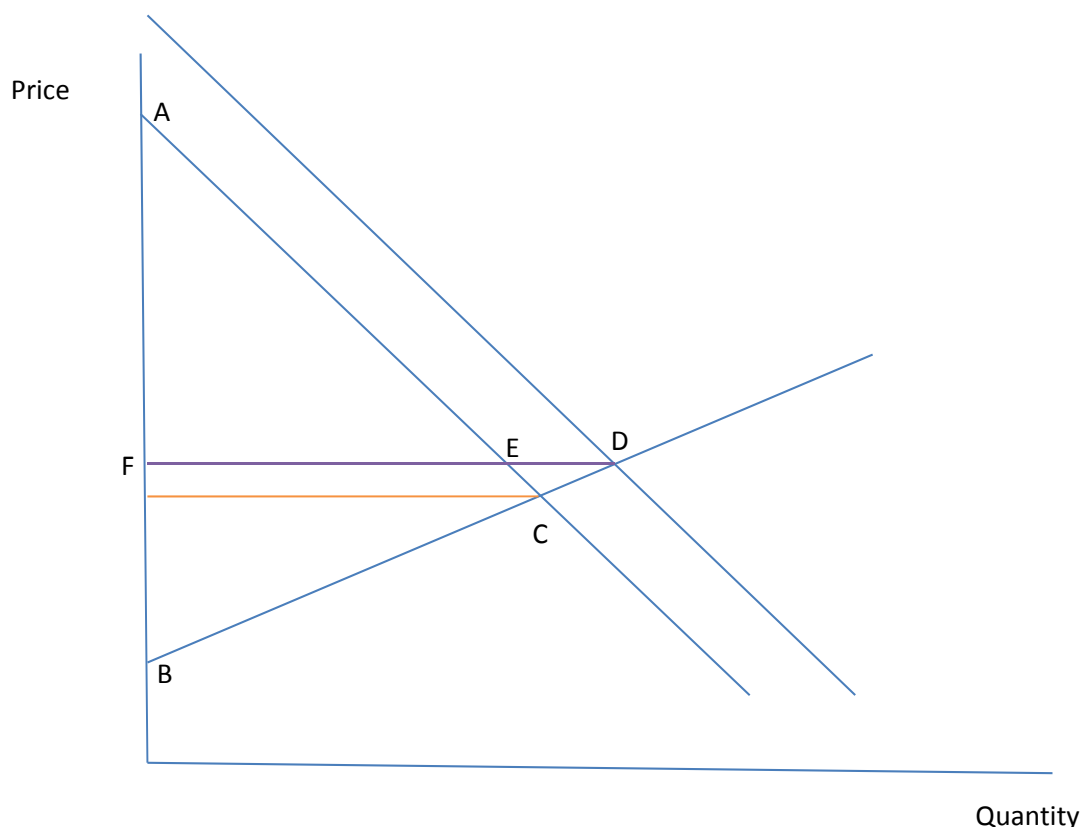
Assume that the lower demand curve drawn is the initial one and the equilibrium will be at point C. The total consumer and producer surplus will be the area ABC. Now suppose the demand for the product is artificially raised to be the new demand curve which is shifted to the right by an equal amount. This causes the equilibrium in the market to shift form point C to point D. The price rises and the quantity sold also rises though by less than the shift in demand.

What happens to welfare? We will assume that one does not care about the welfare of the person with the extra demand (the Tier 1 investor in our case). So total consumer surplus remains the area under the original demand curve i.e. the area AEF. Note that this falls i.e. domestic consumers are made worse off. But producer surplus rises to be the area BFD. Putting this together one obtains the result that the gain in welfare is the triangle represented by the area DEC.

Simple demand and supply theory tells us that the change in price from the extra demand for gilts is given by:

$$dP = \frac{1}{\varepsilon^d + \varepsilon^s} \frac{dM}{Q} \qquad (25)$$

Where ε^d is the elasticity of the demand curve, ε^s is the elasticity of the supply curve, dM is the size of the increase in demand and Q the size of the market. The change in quantity is given by:

$$dQ = \frac{\varepsilon^s}{\varepsilon^d + \varepsilon^s} \frac{dM}{P} \qquad (26)$$

The total change in welfare can be written as $0.5 * dP * dQ$ which can be written as:

$$\frac{1}{2} \frac{\varepsilon^s}{\left(\varepsilon^d + \varepsilon^s\right)^2} \frac{dM^2}{PQ} \qquad (27)$$

i.e. it depends on the size of the extra demand in relation to the size of the market and the elasticities of the supply and demand curves.

All of this has been about an abstract market, but what would we expect if the market is that for UK gilts. In this case the 'price' is the inverse of the interest rate. So we would expect the extra demand for UK gilts from Tier 1 investors to lower the interest rate. This will benefit those who are borrowers (the UK government and, behind that, UK taxpayers and citizens) but will harm those who are lenders (i.e. the owners of gilts) who may also, directly or indirectly, be UK citizens. This is the equivalent of the transfer of surplus from buyers to sellers in the abstract example.

How large the welfare effect will be depends on the elasticity of supply and demand curve for UK gilts which in turn are likely to depend on how close a substitute is UK government debt for other types of debt. This topic is one actively considered by macroeconomists at the moment (for example, has quantitative easing reduced interest rates?) and I think it is fair to say that it is not a question on which there is a strong consensus.

But it is perhaps worth thinking about a number of special cases. First, if UK government debt is a perfect substitute for the government debt of some other countries (e.g. the US) and the rate of return on this debt is unaffected by UK policy (because it is small in relation to the size of the US) then the demand curve for UK government debt will be perfectly elastic ($\varepsilon_d = \infty$) and the welfare gain from the Tier 1 investors will be exactly zero. This case might be thought to have some plausibility because the interest rates on UK and US government debt do move very similarly.

That is one case, but it is worth considering an extreme case to make the point that the even in this case, the benefits might not be large. Suppose that one thinks that QE has reduced UK interest rates – an optimistic estimate would be that £1bn of QE has reduced interest rates by 5 basis points for 1 year. In this case a Tier 1 investor, purchasing £1m of gilts would be expected to reduce interest rates by the amount $0.05.\frac{1}{1000}$ -basis points. If the government is issuing £150bn of new

debt this lower interest rate should be applied to that which means that the benefit to the UK government from the purchase of gilts by the Tier 1 investor is given by:

$$\frac{0.05}{100}.\frac{1}{1000}.150000 = £0.075m = £75k$$

Which is probably not a very high price to charge for the rights to UK membership. Even this is almost certainly an over-estimate for a number of reasons:

- It focuses on the change in surplus from a reduction in interest rate for the borrower and completely ignores the fact that savers are made worse off
- It applies to unusual times when the government deficit is unusually large.
- If the Tier 1 investor sells the gilts after 5 years then the effect will then be reversed – the value of having £75k for 5 years is less than £10k

Hence, it is hard to escape the conclusion that the benefit to UK citizens from a Tier 1 investor buying £1m of gilts is tiny.

This analysis has assumed that the Tier 1 investor buys gilts. What happens if they buy other forms of capital e.g. shares in a UK company. A similar analysis could apply – if one thinks that free capital mobility around the world means there is a world interest rate then this investment will simply displace other capital investment producing no benefit to the UK economy at all.

Tier 1 Investors as Tax-Payers

To the extent that Tier 1 investors pay UK tax this will be a benefit to the UK citizen (though needs to be set against any public services the consume). How much tax is being paid by them is a question that should be examined – I do not know the answer to this question.

Conclusion

The benefits to the UK citizen from the Tier 1 investor route are not obvious – they need to be given more careful consideration than seems to have been the case in the past.

It is hard to escape the conclusion that UK citizenship is in effect being 'sold' to these individuals but that the price being charged is not high, certainly nowhere near what one would expect the price to be if one auctioned UK passports. Of course the idea of selling UK passports may not appeal to many people and the current system of investor visas hides that this is what we are doing but in hiding it, probably sells them at a very low price.