Proposition 3 *If $\eta_{\widetilde{L}\widetilde{G}} > 0$, and $\gamma > \rho$, then $\eta_{\widetilde{L}\widetilde{G}} < 1$ if $\alpha < 1$; $\eta_{\widetilde{L}\widetilde{G}} > 1$ if $\alpha > 1$. If $\eta_{\widetilde{L}\widetilde{G}} > 0$, and $\gamma < \rho$, then $\eta_{\widetilde{L}\widetilde{G}} < 1$ if $\alpha > 1$; $\eta_{\widetilde{L}\widetilde{G}} > 1$ if $\alpha < 1$.*

Proof. Assume $\eta_{\widetilde{L}\widetilde{G}} > 0$. The condition $\eta_{\widetilde{L}\widetilde{G}} > 1$ implies

$$\left|\eta_{r\widetilde{G}}\right| > \left|1 - \alpha + \alpha\eta_{r\widetilde{G}}\right|. \tag{20}$$

Consider first the case in which both $\eta_{r\widetilde{G}}$ and $1 - \alpha + \alpha\eta_{r\widetilde{G}}$ are positive, which occurs when $\gamma > \rho$. Notice that in this case $\eta_{r\widetilde{G}} = \frac{1}{\epsilon}\frac{(\gamma-\rho)\frac{\widetilde{G}}{\widetilde{L}^{\alpha}}}{(\gamma-\rho)\frac{\widetilde{G}}{\widetilde{L}^{\alpha}} + (\rho-1)} > 0$ implies $\eta_{r\widetilde{G}} < 1$. Therefore, condition (20), which collapses to $(1-\alpha)\,\eta_{r\widetilde{G}} > (1-\alpha)$, is verified only for $\alpha > 1$.

Consider now the case in which both $\eta_{r\widetilde{G}}$ and $1 - \alpha + \alpha\eta_{r\widetilde{G}}$ are negative, which occurs when $\gamma < \rho$. Condition (20) collapses to $(1-\alpha)\,\eta_{r\widetilde{G}} < (1-\alpha)$, which for $\eta_{r\widetilde{G}}$ negative is verified only for $\alpha < 1$. ■

The above proposition establishes that whenever a positive multiplier results from the 'slope reversal' of the PS schedule described above, the multiplier turns out to be greater than one. When a positive multiplier is obtained under the usual conditions (public demand more elastic and decreasing returns, or public demand less elastic under increasing returns), its value is lower than one.

The interesting implication of proposition 3 is that if the 'slope reversal' mechanism operates, the increase in employment and output is more than proportional to the increase in public expenditure. In this peculiar case, in the new equilibrium position the share of public demand on aggregate demand decreases - and though public demand is more (less) elastic than private demand, the new equilibrium mark-up increases (decreases). For example, in the presence of an increasing returns technology, the existence of a public component of demand more elastic than the private component (a) may bend downwards the PS schedule; (b) ensures that a fiscal expansion shift this downward sloping schedule outwards and generate a more than proportional increase in output: at the initial equilibrium the demand elasticity increases, stimulating the expansion, while at the final equilibrium the elasticity of demand actually decreases This qualitative difference between the direction of the change of the mark-up at the initial and final equilibrium positions is specific to the 'reversal of the slope' situations and does not show up in the other situations, in which the employment and output multiplier is positive.

4 Extensions

In the above discussion some simplifying hypotheses have been introduced, among which the most relevant are the absence of income effects of taxation on labour supply and the reversed-L shape of the labour supply schedule. As to the former, we believe that it is a convenient one, when the focus is on a transmission mechanism of fiscal policy based on product market competitiveness. It is conceptually easy to embody both the labour supply and the elasticity effects in more complicated models. As to the latter, it allowed us to concentrate the analysis on labour demand and to escape the problems of stability and multiplicity of underemployment equilibria, which could arise in the presence of two positively-sloped behavioural relations on the two sides of the labour market. However, the supply side of the labour market obviously contributes in defining quantitatively and qualitatively the macroeconomic effects of a change in the degree of monopoly power. In this section, we briefly take up this point by verifying the robustness of Propositions 1 and 2 to the introduction of both an upward sloping competitive labour supply, and a wage setting schedule which possibly describes non-competitive features of the labour market.

a) *Competitive labour supply*

The most straightforward way to reformulate the supply side of the labour market is to think of a constant elasticity upward sloping competitive supply function such as[11]

$$L = \left(\frac{\omega}{\theta}\right)^{\frac{1}{\sigma - 1}}, \qquad \sigma > 1$$

By applying the same procedure developed in section 3, the following employment multiplier can be obtained

$$\eta_{\tilde{L}\tilde{G}} = \frac{d\widetilde{L^*}}{d\widetilde{G}}\frac{\widetilde{G}}{\widetilde{L^*}} = -\frac{\eta_{r\widetilde{G}}}{(\alpha - 1) - \alpha\eta_{r\widetilde{G}} - (\sigma - 1)} \tag{21}$$

Simple inspection of equation (21) shows that Proposition 1 still holds.[12] As far as Proposition 2 is concerned, the new formulation of the multiplier shows that a downward shift of a positively sloped PS schedule is no more a sufficient condition for an increase in public expenditure to be expansionary. However, the additional condition $\left((\sigma - 1) < (\alpha - 1) - \alpha\eta_{r\widetilde{G}}\right)$, which ensures that with $\gamma < \rho$ the employment multiplier (21) is positive, is indeed the Walrasian local stability condition. In other words, Proposition 2 holds, provided that the equilibrium under consideration is locally stable.

b) *Non competitive wage setting schedule*

We describe the non competitive features of the labour market by coupling the PS schedule with the following wage setting (WS) schedule

$$\omega = \Omega\left(u, \epsilon\right), \qquad \Omega_u = \frac{\partial \Omega}{\partial u} < 0 \quad \Omega_\epsilon = \frac{\partial \Omega}{\partial \epsilon} < 0$$

where u is the unemployment rate and ϵ is again the product demand elasticity. Through this general formulation we capture some common features of unions and bargaining models, namely that wages are set as a mark-up over the

[11] This labour supply can be easily obtained by modifying the utility function (1) into $U\left(C, \frac{M}{P}, L\right) = C^\beta \left(\frac{M}{P}\right)^{1-\beta} - \frac{\theta}{\sigma} L^\sigma$.

[12] Indeed, if $\gamma > \rho$ a positive multiplier is now in principle consistent also with a positively sloped price setting schedule, but this case can be ruled out by stability considerations.

workers' outside opportunities, that the latter are inversely correlated to the rate of unemployment and, finally, that the mark-up over outside opportunities depends positively on the degree of market power on the product market. Notice that the reference to this non competitive framework opens the possibility that a transmission mechanism of fiscal policy, based on changes in product demand elasticity, operates not only directly, *via* shifts in the PS schedule, but also indirectly *via* induced shifts of the WS schedule.

In order to evaluate the effectiveness of fiscal policy on employment we follow the same procedure developed in section 3, and obtain the employment multiplier:

$$\eta_{\widetilde{L}\widetilde{G}} = -\frac{\eta_{r\widetilde{G}} - \dfrac{\widetilde{G}}{\omega}\dfrac{\partial\Omega}{\partial\widetilde{G}}}{(\alpha-1) - \alpha\eta_{r\widetilde{G}} - \dfrac{\widetilde{L^*}}{\omega}\dfrac{\partial\Omega}{\partial\widetilde{L}}}$$

To evaluate the sign of this multiplier, we again consider first the case in which the elasticity of public demand is higher than that of private demand. If $\gamma > \rho$, $\partial\Omega/\partial\widetilde{G} = \Omega_\epsilon\left(\partial\epsilon/\partial\widetilde{G}\right) < 0$ and $\partial\Omega/\partial\widetilde{L} = \Omega_u\left(\partial u/\partial\widetilde{L}\right) + \Omega_\epsilon\left(\partial\epsilon/\partial\widetilde{L}\right) > 0$. This allows us to establish that if the conditions for the PS schedule to be negatively sloped are verified, then an expansionary fiscal policy has a positive effect on employment. The PS curve shifts upwards and the overall effect is amplified by a downward shift of a positively sloped WS schedule.

If $\gamma < \rho$, $\partial\Omega/\partial\widetilde{G} > 0$ while $\partial\Omega/\partial\widetilde{L}$ is ambiguous in sign. If it is positive, so that the WS is positively sloped, and if the PS is upward sloping as well, then the above multiplier is positive, provided the WS intersects the PS from above (it is flatter at equilibrium). This configuration resambles that obtained above in a competitive framework. In this case, however, we cannot easily rely upon stability conditions. As noticed by Manning (1990), if both the labour and the goods markets are non competitive, no equilibria can be assessed to be stable or unstable, without *a priori* information on the degree of the nominal and real price and wage rigidities. Finally, we notice that if the WS schedule turns out to be negatively sloped, the multiplier is unambiguously positive.

5 Conclusions

In this paper we have highlighted the properties of a macroeconomic model with monopolistic competition, where the differentiated goods which enter the aggregate output basket are demanded and consumed by both the private and the public sector, with different demand elasticities. In this set-up, the level of public expenditure influences the overall demand elasticity and the labour demand schedule, through a direct 'demand composition' effect. In particular, we have proved that an increase in public expenditure may increase output, not only (as previously established) when public demand is more elastic than private demand and returns are decreasing, or when it is less elastic and returns are increasing. There is a set of technological conditions, from moderately increasing to moderately decreasing returns, in which fiscal policy is expansionary, independently of the way in which it alters the elasticity of demand at the initial equilibrium.