

European Integration and Employment

The need for fiscal policies coordination

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Abstract

To investigate the consequences of European markets integration, this paper develops a neo-keynesian model where fiscal policies affect firms' market power and employment. Stronger product market competition is shown to reduce the marginal ability of governments to improve employment through public consumption. As competition *crowds out* fiscal spending, the positive impact of markets integration on employment is weakened. Moreover, in a context where national goods' demand becomes "global", the marginal benefit for each *national* fiscal authority of increasing public consumption is lower than the marginal benefit for the community. This result stresses one source of coordination failure within EMU.

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1 Introduction

This paper is a theoretical contribution investigating the links between the macroeconomic policy regime and the structure of product and labor markets within EMU. Recent economic literature has shown a growing interest in issues related to EMU good working. Concerns have mainly been raised about existing asymmetries across countries as well as the extent to which effective wage coordination might take place within EMU (Soskice and Iversen, 1998). With respect to the overall macroeconomic policy regime, much has been said concerning the possible effects of economic integration on national governments' actions: this debate has focused on the impact of

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integration on the size and scope of governments' interventions mostly in relation to the future role of welfare states within EMU (Anderson, 1999). In spite of the large amount of research done on EMU-related issues, relatively little has been said on the interactions between the nature of EMU policy mix (particularly countercyclical fiscal policies) and the changing structure of labor and product markets. However, one crucial outcome of EMU is precisely an increase in competition on national product markets, which is itself bound to have an impact on labor markets structure (Amable and Gatti, 2001). This paper suggests that this process will also affect the nature of the "optimal" policy mix, and more precisely the role and operation of countercyclical national fiscal policies.

The role of fiscal policies has partially been neglected in recent debates because the Stability (and Growth) Pact is thought to impose too stringent conditions on member countries, which prevent them to run any effective fiscal policy. Indeed, the main rationale behind the Stability and Growth Pact (SGP) is to overcome the individual temptation for excessive government expenditure (Canzoneri and Diba, 1999; Buti *et al.*, 1998). For instance, Beetsma and Uhlig (1999:547) submit that 'the essence of the Stability and Growth Pact is to watch the fiscal deficit of each member country closely, and punish those, whose deficits are excessive'. In this respect, the economic literature has up to now partially neglected the role of supranational fiscal coordination in creating a good environment for low equilibrium unemployment in EMU. However, several authors have pointed out that EMU will primarily have to define an appropriate macroeconomic policy mix to improve EMU *macroeconomic* performance following *common symmetric shocks* (Allsopp and Vines, 1998). To understand the problems faced by fiscal authorities in the EMU-zone, one should note that a crucial feature of EMU is the existence of cross-country demand externalities stemming from the increasingly global nature of aggregate demand versus the national nature of fiscal decisions. In fact, though national consumers and fiscal authorities might still have a consumption bias towards national goods, one main consequence of markets integration is indeed the ongoing process of internationalization of demand. However, the still marginal role played by ECOFIN proves that a national bias in fiscal decision making persists, mainly due to the absence of a real EMU-wide fiscal authority.

This situation can be pictured in a simple way by assuming that EMU can be represented as a multi-sector economy where individuals from different member countries consume a single "global" consumption good that is produced out of several "country specific" intermediate goods. This allows me to study the performance of such a multi-sector economy following aggregate shocks. I will first argue that in the presence of imperfect competition on the product market, a mechanism exists by which fiscal consumption contributes to reduce profit-margins thus improving the equilibrium level of employment. In this context, more intense competition reduces the marginal ability of government to improve employment through fiscal consumption and therefore reduces the "optimal" level of spending. Hence, increased competition leads on the one hand to reduced profit margins, which generates a direct positive impact on employment, but on the other hand also induces a contraction of fiscal

consumption, which tends to push up equilibrium unemployment. Finally, the paper submits that the existence of cross-country demand externalities introduces a possibility of coordination failure in the interaction among independent fiscal authorities (Gatti and van Wijnbergen, 2001). This coordination failure stems from the fact that each fiscal authority will underestimate the overall impact of an increased fiscal consumption on the macroeconomic performance: in a context of "global" demand, any increase in national fiscal consumption will be taken by individual fiscal authorities to improve global demand only by a factor $\frac{1}{m}$, m being the number of member countries. This produces a free-riding effect which generates sub-optimal levels of fiscal consumption. This effect is shown to be stronger the larger the number of member countries.

The paper is organised as follows. Section 2 presents the basic model of imperfect competition and demand externalities. Section 3 introduces the role of fiscal policies in this setup and Section 4 presents an attempt to develop a simple political economy of fiscal consumption in a context of increasing product market integration and strategic interactions among national fiscal authorities. Section 5 briefly concludes.

2 A simple model with demand externalities

EMU multi-sector economy is characterized by one final consumption good and a fixed number m of sector/countries each populated by n firms producing national goods. The final good represents aggregate cross-country demand and is produced competitively according to a constant returns to scale technology using all national goods. On the other hand, on each national market there are n firms engaged in Cournot-type competition. Hence, each sector/nation is characterized by imperfect competition on the product market. Imperfections are also present on the labor market, that is wages are set according to an efficiency wage mechanism. Each country's public sector expenditure is financed via non-distortionary wage taxes and fulfills the balanced budget requirements. For the sake of simplicity, public expenditure will later be specified as a simple proportion of aggregate production.

2.1 Market power and demand

I assume that each national economy is populated by workers and "rentiers". The formers are only entitled to wage revenues while the latter earn the profits generated by imperfectly competitive firms. Both workers and rentiers maximize their utility over alternative options, that is the cross-country consumption good versus the national good. Utility maximization leads to the result that both rentiers and employed workers use a proportion β of their net revenue for the consumption of the final good while a proportion $1 - \beta$ of their revenue goes to the purchase of the national good (see Appendix 1 for details). As a consequence the part of country s net national income, which contributes to the international demand for national goods as intermediates, is given by $I_s^i = \beta \cdot I_s$. Note that $I_s = n_s \cdot \pi_s + w_s \cdot L_s$ is total national income, n_s being the number of firms populating the economy, π_s being profit, w_s

the real wage level and L_s the level of employment.

To generate the international demand for national goods, I assume that a "global" consumption good is produced by means of all national intermediates according to a constant returns to scale technology (see Appendix 2). Due to the ongoing process of integration of European product markets, it is probably safe to assume that the relative price of country s ' national good is determined on the world market, that is by the international demand for national intermediates, which stems from the production of the cross-country consumption good. Hence, in each country s firms face a demand function for the national good, which is given by:

$$\frac{P_s}{P} = \left(\frac{Y_s^i}{\tilde{Y}/m} \right)^{-1/\eta}$$

Y_s^i is the part of national production going as an input to the production of the international consumption good and $\frac{\tilde{Y}}{m}$ is country s ' part in global demand (i.e. production of the final consumption good), P_s is the price of country s ' national good and P is the international final good's price (\tilde{Y} and P are both defined in Appendix 2). By definition, Y_s^i must equal the part of national income that contributes to international demand, that is: $Y_s^i \equiv I_s^i = \beta \cdot I_s$. Moreover, again by definition, national income equals national production: $I_s \equiv Y_s$, with Y_s being defined below. One can thus write $Y_s^i = \beta \cdot Y_s$. This asymmetry between the international component of production/demand on the one hand and total production on the other, leaves some room for fiscal consumption to produce a distortionary effect on national firms' market share and monopolist power. However, before moving on to this point, let me turn to the firm's profit maximization problem.

Let y_{js} be the level of production of firm j in country s . One has:

$$Y_s \equiv \sum_{j=1}^n y_{js}$$

where Y_s is total national production of good s . Within country s , each firm j has a production function which uses labor as its sole input: $y_{js} = \alpha \cdot l_{js}$, α being labour productivity. Profits are defined by $\frac{P_s}{P} \cdot \alpha \cdot l_{js} - w_s \cdot l_{js}$ with $\frac{P_s}{P} = \left(\frac{Y_s^i}{\tilde{Y}/m} \right)^{-\frac{1}{\eta}}$, w_s being the level of the real wage in country s measured in terms of the final good price. Given this setup, profits maximization by firm i in country s leads to the first order condition $\frac{P_s}{P} \cdot \alpha \cdot \left(1 - \beta \cdot \frac{\varepsilon}{n_s} \cdot \frac{Y_s}{\tilde{Y}/m} \right)$ which yields:

$$\frac{P_s}{P} \cdot \alpha \cdot \left(1 - \beta \cdot \frac{\varepsilon}{n_s} \cdot \frac{Y_s}{\tilde{Y}/m} \right) \quad (1)$$

as it can easily be shown that *ex-post* $\frac{\tilde{Y}}{m} = Y_s^i$ and $Y_s^i = \beta \cdot Y_s < Y_s$. This result stems from the fact that the national propensities to consume the international final good equals $\beta < 1$; as a consequence, part of national production and demand are kept "sheltered" and directly addressed to national goods: this component of national

production/demand does not affect relative prices stemming from international demand for national goods. Also, firms are assumed to be able to take advantage of their market positions on the international demand side and impose the same prices on "sheltered" national markets.

2.2 Labour market rigidities and equilibrium employment

Having derived the first-order condition for profit maximization by imperfectly competitive firms, I close the model by defining the wage setting mechanism. I will assume that the real wage level in each country is set according to an efficiency wage mechanism *a la* Shapiro-Stiglitz [1984]. This allows me to introduce some rigidities in the labor market in a very simple way (however, most results would go through also under different assumptions concerning rigidities in wage setting). I assume that effort can take two values: 0 in case of shirking and e if no shirking occurs. The probability of detecting a shirker equals x . If workers discount the future at a rate r , it is shown in Appendix 3 that the real wage fulfilling the no-shirking condition for this economy equals:

$$w_s = \frac{e}{x} \cdot (a_s + b + x + r)$$

where a_s and b are respectively the prevailing hiring and firing rates on the labor market in country s . As in most efficiency wage model, I will assume that the firing rate is given by a constant b so that firms adjust their labor force by reducing/increasing the hiring rate.

At each moment in time, the equilibrium of flows must hold on the labor market: the amount of new hired workers must equal the amount of fired workers. Therefore, I can define the hiring rate as follows:

$$a_s = b \cdot \frac{L_s}{N_s - L_s}$$

with $L_s = n_s \cdot l_{js}$ and N_s being country s ' labour force. From this definition of the hiring rate, I obtain that $a_s + b = b \cdot \frac{N_s}{N_s - L_s}$. I can now plug this expression for the hiring and firing rates into the first order condition from profit maximization that I derived in the previous section.

By solving for the level of employment, I easily obtain:

$$L^* = N \cdot \left(1 - \frac{b \cdot e \cdot n}{n \cdot (x \cdot \alpha - e \cdot (r + x)) - x \cdot \alpha \cdot \epsilon} \right) \quad (2)$$

where I dropped the subscript s because of symmetry across countries. As one can see, equilibrium employment is a function of competition (i.e. the number n of firms competing on national markets) as well as the level of technology α . It can be shown that, as expected:

$$\begin{aligned} \frac{\partial L}{\partial n} &> 0 \\ \frac{\partial L}{\partial \alpha} &> 0 \end{aligned}$$

These results clearly show that increased competition -by reducing profit margins and rents- improves equilibrium employment, as expected. At the same time, a drop in the productivity parameter is shown to push unemployment up. In what follows, a shift in α will be taken to represent the effects of shocks to EMU multi-sector economy.

3 Role of fiscal policies

I now turn to investigate the role of fiscal consumption within this simple neo-keynesian framework. Fiscal policy has reemerged as an issue in recent economic debate, mostly in relation to a perceived need to ensure some income stabilization in the presence of cross-country shocks, uncertainty and risk-aversion (Andersen, 1998). However, it has also been argued that, in an open economy set-up, equilibrium employment might be affected by demand factors such as fiscal spending (Carlin and Soskice, 2000). The model proposed in this paper adds one important element to the debate as it defines a clear channel by which public consumption might affect employment, namely via demand externalities and their impact on firms' market power. To see how this works in my model, let me now integrate fiscal policies in the simple economy described in previous sections.

3.1 Alternative scenarios for public consumption

I assume that fiscal authorities collect taxes at the national level and then use public consumption to contribute to demand. This can be done either through "local" spending (i.e. contributing to the sheltered component of national demand directly addressed to national goods) or through a contribution to the final demand for the international consumption good. The latter scenario is motivated by the idea that one crucial outcome of European markets integration is the increase in cross-country externalities stemming from national fiscal spending. As a consequence of this, an increase in public consumption should be expected to benefit national production through the induced increase in aggregate "global" demand rather than through a purely national channel. This scenario seems the most interesting as it pictures one likely evolution in the role of fiscal policies within EMU; moreover, it casts some light on a possible positive role to be played by public consumption in the EMU economy, as it will be shown below. In the following, I will analyse both scenarios in turn¹.

If one integrates the government's taxes and spending into the definition of national income, one can easily see that the part of country s ' net national income, which respectively contributes to the international (*national*) demand for national goods, is given by:

¹Of course, I could also envisage and analyze intermediate scenarios where fiscal spending is distributed via both channels. However, I feel that I can gain more clarity in the analysis if I focus on the two extreme cases; this will help better clarifying my argument, without any significant loss in the generality of my results.

$$\begin{aligned} I_s^i &= \beta \cdot (I_s - T_s) + G_s^i \\ I_s^n &= (1 - \beta) \cdot (I_s - T_s) + G_s^n \end{aligned}$$

G_s being national public expenditure and T_s national taxes financed via wage taxes (see Appendix 1).

Under a first scenario (I), national fiscal authorities collect taxes and then directly spend their tax revenue on national sheltered markets. Hence, $G_s^i = 0$ and $G_s^n = G_s$; one thus obtains:

$$I_s^i = \beta \cdot I_s - \beta \cdot G_s$$

where I make use of the hypothesis of balanced budget i.e. $G_s = T_s$. Under an alternative scenario (II), fiscal authorities use their tax revenue to contribute to international demand for national goods as intermediates. In this case, $G_s^n = 0$ and $G_s^i = G_s$; therefore, by imposing the hypothesis of balanced budget $G_s = T_s$, one has:

$$I_s^i = \beta \cdot I_s + (1 - \beta) \cdot G_s$$

These two expressions can be summarized as follows:

$$I_s^i = \beta \cdot I_s + \xi \cdot G_s \quad (3)$$

where $\xi = -\beta$ under the "national spending" scenario (I), and $\xi = 1 - \beta$ in the "international spending" scenario (II).

As Y_s^i must equal the part of national income that contributes to international demand, one can write $Y_s^i \equiv I_s^i = \beta \cdot I_s + \xi \cdot G_s$. Moreover, by definition national income equals national production, $I_s \equiv Y_s$. One can thus rewrite Y_s^i as $Y_s^i = \beta \cdot Y_s + \xi \cdot G_s$. This mechanism introduces a wedge between, on the one side, the international demand for national goods as intermediate and on the other, total national production; this wedge is indeed a function of public consumption thus generating some room for fiscal policy to affect the distribution of national income across national sheltered goods and the international consumption good. As it will be shown below, in this framework public consumption is able to affect firms' market shares and their monopolistic rents. To see this, let me go back again to the firm's profit maximization problem.

3.2 Public consumption, market power and equilibrium employment

From Equation (1), one has $\frac{P_s}{P} \cdot \alpha \cdot \left(1 - \beta \cdot \frac{\varepsilon}{n_s} \cdot \frac{Y_s}{Y_s^i}\right)$ which, by recalling that $Y_s^i = \beta \cdot Y_s + \xi \cdot G_s$, can be rewritten as:

$$\alpha \cdot \left(1 - \frac{\varepsilon}{n} \cdot \frac{1}{1 + \frac{\xi}{\beta} \cdot g} \right) = w \quad (4)$$

where I defined $g = \frac{G}{Y}$ and $\varepsilon = \frac{1}{\eta}$ and eliminated all subscripts s as all countries are similar². To simplify the matter, public expenditure is specified as a proportion of aggregate production therefore g is considered to be the control variable for fiscal authorities.

The above condition clearly shows that fiscal authorities can affect firms' profit margins by varying the ratio of public expenditure to total production. I am now in a position to establish the first result concerning the role of public consumption in the economy.

Proposition 1 *An increase in public consumption respectively reduces (increases) the mark-up imposed over wages by imperfectly competitive firms if $\xi = 1 - \beta$ ($\xi = -\beta$).*

The proof of the result is straightforward and simply derives from the first order condition written above. The rationale of the result follows. If $\xi = 1 - \beta$, an increase in g leads to an increase in the labor demand faced by imperfectly competitive firms. This is a common result in neo-keynesian models with demand externalities (Matsuyama [1995] provides a similar result). In my model, this effect stems from the fact that public expenditure can affect firms' production shares via Y^i and its impact on international demand. In fact, because a part of net national income does not go through international demand, this introduces a "wedge" between (the international component of) demand and total production. Moreover, because a part of national income is determined by the exogenous level G of public expenditure, when firms maximize their profits they consider that an increase in individual production will only increase demand by a factor β . A similar reasoning holds for the case where $\xi = -\beta$. However, under this scenario the prevailing impact of public consumption on demand stems from the negative effects of taxes on the share of disposable income which goes to the international good.

I can now proceed as in Section 1.2 and solve the complete model to obtain the equilibrium level of employment. Equation (2) becomes:

$$L^* = N \cdot \left(1 - \frac{b \cdot e \cdot \left(1 + \frac{\xi}{\beta} \cdot g \right) \cdot n}{\left(1 + \frac{\xi}{\beta} \cdot g \right) \cdot n \cdot (x \cdot \alpha - e \cdot (r + x)) - x \cdot \alpha \cdot \varepsilon} \right) \quad (5)$$

From the above definition of equilibrium employment, one can see that:

$$\begin{aligned} \frac{\partial L}{\partial g} &> 0 \text{ if } \xi = 1 - \beta \\ \frac{\partial L}{\partial g} &< 0 \text{ if } \xi = -\beta \end{aligned}$$

²I will partially remove this assumption in Section 3 where I will come to the problem of fiscal coordination and strategic behavior by individual member countries.

These results are due to fact that, by boosting public consumption, fiscal authorities generate a distortionary effect, i.e. they reduce (respectively, increase) the profit margins and rises firms' labor demand if $\xi = 1 - \beta$ ($\xi = -\beta$). This suggests that in a context of imperfect competition and "monopoly rents", national governments can play a crucial role in appropriating those rents and use them "more efficiently", at least with respect to employment.

Given the above results, it appears that national fiscal authorities might have a positive role to play in EMU if they act according to a scenario where public consumption primarily contributes to increase the national consumption propensity via international rather than national, demand channels. This portrays a scenario where public consumption has a positive role to play with respect to the equilibrium employment. Then, recalling that equilibrium employment is given by (5) and $\xi = 1 - \beta$, one can show that:

$$\frac{\partial^2 L}{\partial \alpha \partial g} < 0$$

This means that an increased ratio of public expenditure -besides improving equilibrium employment- also flattens the response of employment to productivity shocks. Hence, an important consequence follows from the above results.

Proposition 2 *Under a "international spending" scenario, an increase in the ratio of public consumption to national production increases equilibrium employment and reduces employment's reaction to productivity shocks*

In an imperfectly competitive environment there exists some room for public consumption to produce *beneficial* distortions that partially offset the adverse employment effects imposed by market power (this result is present in other similar models, see Matsuyama [1995]). These beneficial distortions take the form of reduced profit margins (and increased equilibrium employment) and reduced employment volatility as a response to shocks. These two results point out that national fiscal authorities have a point in pursuing a policy of public consumption, which indeed reduces the adverse impact of common productivity shocks.

4 Political economy of public consumption

The analysis above pictures a scenario where EMU national fiscal authorities might indeed have reasons to adopt a policy of public consumption, which contrasts monopoly rents and their adverse effects on employment. I will now stick to this scenario by assuming that $\xi = 1 - \beta$ and pursue the line of investigation by asking what would be the optimal level of g that minimizes the loss function characterizing EMU national governments. For the sake of simplicity, I will assume that national governments aim at keeping employment close to a given target, and that they are ready to use public consumption to meet their target. On the other hand, there might be some costs in expanding public consumption; hence, equilibrium employment will not exactly

equal the target level. To represent this situation in a simple way, let me define a loss function such as:

$$U_G = \tilde{L} - L + c \cdot g$$

This loss function states that national governments have an employment target \tilde{L} and that some costs c are associated to expanding public consumption. It can easily be shown that $\frac{\partial^2 L}{\partial^2 g} < 0$. Hence, equilibrium employment is a concave function of public consumption; this ensures that the second order condition associated to the minimization of the loss function is met. Therefore, the loss function above can be used to define an optimal level of g by imposing $\frac{\partial U_G}{\partial g} = -\frac{\partial L}{\partial g} + c = 0$.

The optimal level of g can be shown to amount to the following:

$$g^* = \frac{\beta}{1 - \beta} \cdot \left(\frac{x \cdot \alpha \cdot \epsilon + \sqrt{\frac{1-\beta}{\beta \cdot c} \cdot N \cdot x \cdot \alpha \cdot \epsilon \cdot n \cdot b \cdot e}}{n \cdot (x \cdot \alpha - e \cdot (r + x))} - 1 \right)$$

As expected, the optimal level of public consumption is a function of productivity shocks with the following property:

$$\frac{\partial g^*}{\partial \alpha} < 0$$

that is, a negative (positive) productivity shock generates an increase (decrease) in the level of public consumption.

This result generalizes what I already noted in the previous section regarding the role of public consumption in reducing the impact of shocks. In fact, one sees here that -if governments care about employment- they will rationally decide to run counter cyclical fiscal policies, which translate into employment stabilization. To see that this public consumption rule indeed generates employment stabilization, one can simply compare the reactivity of employment to shocks in the presence and in the absence of reaction from the fiscal authority. In fact, it can be shown that:

$$\frac{dL}{d\alpha} = \frac{\partial L}{\partial \alpha} + \frac{\partial L}{\partial g^*} \cdot \frac{\partial g^*}{\partial \alpha} < \frac{\partial L}{\partial \alpha}$$

where $\frac{dL}{d\alpha}$ represents employment's reaction to shocks with active public consumption while $\frac{\partial L}{\partial \alpha}$ provides the partial reaction without considering active public consumption⁽³⁾. This proves that public consumption plays a significant stabilizing role (see also figure 2 below).

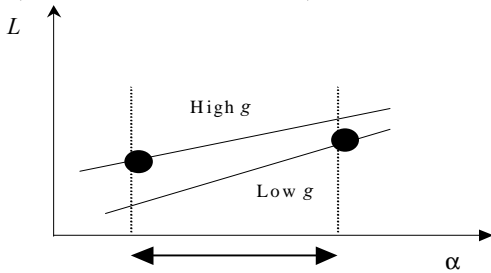


Figure 1. Optimal spending and stabilisation

³Note however that $\frac{dL}{d\alpha} > 0$, that is fiscal spending does not over-stabilize employment.

4.1 Competition and public consumption

I now turn to the crucial issue of the interaction between the macroeconomic policy regime and the structure of product markets. As already noted, the question here mostly deals with the impact of market integration on public consumption: is market integration really going to reduce the scope and extent for national governments' intervention? Building on the results above, an answer to this question can be derived by directly studying the impact of increased competition on the optimal level of public consumption. In this respect, it can be shown that $\frac{\partial^2 L}{\partial g \partial n} < 0$. This means that the "marginal ability" of governments in improving employment via public consumption decreases when competition becomes fiercer, thus reducing the associated optimal level of g . This mechanism explains why the optimal level of g^* is such that:

$$\frac{\partial g^*}{\partial n} < 0$$

The result clearly illustrates the importance of the interactions between fiscal policy and markets' structure: competition and public spending indeed prove to be two alternative policies to reduce market power and foster employment. This shows that there exist reasons to believe that competition policies might be a substitute for public consumption in the fight against unemployment.

However, if one turns to investigate the impact of increased competition on employment given the above result, one can easily see that:

$$\frac{dL}{dn} = \frac{\partial L}{\partial n} + \frac{\partial L}{\partial g^*} \cdot \frac{\partial g^*}{\partial n} < \frac{\partial L}{\partial n}$$

This shows that the overall positive effect of increased competition on employment proves to be weakened by the side-effect of competition on public consumption. This is stated in the proposition below.

Proposition 3 *Increased competition induces a contraction in public spending which has an adverse effect on equilibrium employment*

The result stems from the fact that $\frac{\partial g^*}{\partial n} < 0$ and $\frac{\partial L}{\partial g} > 0$. On the other hand, it also exists a direct positive effect of competition on employment (recall $\frac{\partial L}{\partial n} > 0$). Hence, all in all $\frac{dL}{dn} > 0$ still holds. However, the fact that competition indeed *substitutes* itself to public consumption leads to a weakening of the overall impact of competition policies on macroeconomic performance i.e. employment. The model thus shows that views relating market integration to a reduced scope for government spending as well as to better employment opportunities are probably correct⁴; however, it should further be noted that the net macroeconomic consequence of the process of integration -notably in terms of improved employment- will prove to be dramatically weakened by the fact that competition actually *crowds out* beneficial public consumption.

⁴However, Amable and Gatti [2001] show that the consequences on employment of an increase in product market competition might be negative if one considers the impact of product market competition on endogenous job turnover. In this case, increased competition induces stronger turnover which might result in lower employment.

4.2 The issue of fiscal coordination

The analysis of optimal public consumption provided in the previous section has overlooked some crucial problems linked to the issue of strategic interactions across independent fiscal "players" in a context of global demand externalities. I now turn to this issue and try to point out some possible concerns about the role of strategic considerations in relation to EMU macroeconomic policy regime.

To do that, I will now assume that g_s is a country-specific variable that can be set by each national fiscal authority by modifying its own level of spending given the other players' level of spending. Hence, I assume that $g_i = \bar{g}$ for $\forall i \neq s$. To set optimal public consumption for each individual country in this new setup, one has to consider the problem faced by one single fiscal authority in country s .

From the first order condition for profit maximization one has:

$$\alpha \cdot \left(1 - \beta \cdot \frac{\epsilon}{n_s} \cdot \frac{Y_s}{Y/m} \right) = w_s$$

One can then show that the mark-up term equals:

$$\frac{\epsilon}{n_s} \cdot \left[\frac{1}{m} \cdot \left(\left(1 + \frac{1-\beta}{\beta} \cdot g_s \right)^{\frac{\eta-1}{\eta}} + \Psi \right) \right]^{\eta/(1-\eta)}$$

where Ψ is a function of other countries' level of production and public consumption (see Appendix 4).

As one can see, increasing g_s will now only impact the mark-up according to a factor $\frac{1}{m}$ which means that a government will only consider its own part in global demand when increasing national fiscal spending.

This consideration bears important consequences in relation to our previous analysis concerning the political economy of public consumption. In fact, it can be shown that the level of public consumption, minimizing the loss function, now reads:

$$\hat{g}^* = \frac{\beta}{1-\beta} \cdot \left(\frac{x \cdot \alpha \cdot \epsilon + \sqrt{\frac{1-\beta}{\beta \cdot c} \cdot m \cdot N \cdot x \cdot \alpha \cdot \epsilon \cdot n \cdot b \cdot e}}{n \cdot m \cdot (x \cdot \alpha - e \cdot (r+x))} - 1 \right)$$

from which it can easily be shown that $\frac{\partial \hat{g}^*}{\partial m} < 0$. Moreover, one can also show that $\hat{g}^* < g^*$ as stated in the proposition below.

Proposition 4 *The level of public consumption selected by independent individual fiscal authorities is lower than the optimal level g^**

This result stems from the fact that national governments -by acting as individual independent players- will not consider the response of other "players" to their own increase in public consumption. As a consequence, each national fiscal authority will underestimate the overall effect of fiscal expenditure on employment. Hence, the marginal benefit of increasing public consumption for an *individual* fiscal authority is lower than the *aggregate* marginal benefit, which points to one important source of coordination failure in a multi-sector economy such as EMU.

In fact, this result underlines a possible "race-to-the-bottom" effect in public consumption that would stem from the progressive "dilution" of individual country

impact on global demand and the subsequent reduced awareness of fiscal decision-makers about the benefits from their fiscal spending.

5 Conclusion

This paper suggests that the changing structure of product markets has a crucial impact on the role of public spending in a multi-sector economy such as EMU. In the presence of imperfections on the product market, which prevent the absorption of rents generated by firms' market power, public spending constitutes a possible way to re-appropriate those rents and use them more "efficiently" - at least from the point of view of equilibrium employment. Hence, the paper argues that fiscal policy could in principle play a constructive role within EMU macroeconomic policy regime, by contributing to improve employment levels. On the other hand, my model also shows that market integration, by increasing the intensity of product market competition, might induce a contraction of rent-reducing public consumption thus generating a negative side-effect on employment. Moreover, the paper submits that, due to the existence of global demand externalities that are not necessarily integrated by independently interacting fiscal players, a forms of fiscal coordination is needed to ensure a satisfactory exploitation of the benefits from fiscal expenditure. Complementary policies (by the ECB for instance) might be needed to reduce the scope for fiscal coordination failures among member countries.

Appendix

.1 Consumption

I assume that individuals consume a "global" final good that is produced using all the "national" goods as intermediates. Instantaneous utilities for individual consumers are defined as follows.

For employed workers:

$$ut_w = u_w - e$$

The term u_w is the utility associated to consumption and e is the disutility of effort.

For unemployed there is no unemployment benefits, therefore instantaneous utility is zero. "Rentiers" only earn profits and their utility is equal to:

$$ut_r = u_r$$

I further assume that $u = \left(\frac{f}{\beta}\right)^\beta \cdot \left(\frac{h}{1-\beta}\right)^{1-\beta}$ where f represents the consumption of the cross-country consumption good and h the purchase of the national good. Utility maximization under the individual budget constraint (that is $f_w + h_w = w^t$ for workers and $f_r + h_r = \pi$ for rentiers) leads to:

$$f = f_w + f_r = \beta \cdot (w^t + \pi)$$

$$h = h_w + h_r = (1 - \beta) \cdot (w^t + \pi)$$

where β represents the "consumption propensity" and w^t is the individual wage net of tax. Ex-post utility for individuals is given by:

$$u_w = w^t$$

$$u_r = \pi$$

One can therefore simply proceed to solve the efficiency wage part of the model holding instantaneous utility equal to $ut_w = w^t - e$ (see Appendix 3 below). One can see that employed workers utilities (determined by consumption decisions) depend on net wage and therefore on taxes. However, it is possible to specify the tax rate in such a way that it is non distortionary with respect to the efficiency wage solution. I will adopt this specification as I am not interested in allowing for tax distortions in this paper.

.2 Setup and equilibrium

Utility maximization leads to the result that both rentiers and employed workers use a proportion β of their net revenue for the consumption of the final good while a proportion $1 - \beta$ of their revenue goes to the purchase of the national good. Fiscal authorities collect taxes at the national level and then use public consumption to contribute to final demand. Hence, as shown in the paper, the part of net national income that contributes to international demand for intermediate national goods is given by:

$$I_s^i = \beta \cdot (I_s - T_s) + G_s = \beta \cdot I_s + \xi \cdot G_s$$

where I make use of the hypothesis of balanced budget i.e. $G_s = T_s$; G_s is national public expenditure and T_s is national taxes financed via wage taxes; I_s is equal to total revenue in country s that is $n_s \cdot \pi_s + w_s \cdot L_s$. It should be noted that the

non-consumed part of national income is assumed to be kept "sheltered" and thus directly goes to the purchase of the national good.

To derive the international demand function faced by imperfectly competitive firms I assume that there is one final consumption good that is produced using all national intermediates according to a constant returns to scale technology:

$$\tilde{Y} = m^{1/(1-\eta)} \cdot \left(\sum_{s=1}^m (Y_s^i)^{\frac{\eta-1}{\eta}} \right)^{\frac{\eta}{\eta-1}}$$

Y_s^i is the part of national production going to the production of the international consumption good. Recalling that by definition $I_s \equiv Y_s \equiv \sum_{j=1}^n y_{js}$, one obtains that

Y_s^i equals the net national income devoted to international demand:

$$Y_s^i \equiv \beta \cdot Y_s + (1 - \beta) \cdot G_s$$

Profit maximization in the competitive final good market yields:

$$Y_s^i = \left(\frac{P_s}{P} \right)^{-\eta} \cdot \frac{\tilde{Y}}{m}$$

with the price index defined as follows:

$$P = \left(\frac{1}{m} \cdot \sum_{s=1}^m P_s^{1-\eta} \right)^{\frac{1}{1-\eta}}$$

Therefore, one has:

$$\frac{P_s}{P} = \left(\frac{Y_s^i}{Y/m} \right)^{-\frac{1}{\eta}}$$

Firms on national good markets maximize profits given the above inverse demand function. Profit maximization leads to the following first order condition:

$$\frac{P_s}{P} \cdot \frac{\partial y_{is}}{\partial l_{is}} \cdot \left(1 + \frac{\partial P_s}{\partial l_{is}} \cdot \frac{l_{is}}{P_s} \right) = w_s$$

The left side can be rewritten as:

$$\frac{P_s}{P} \cdot \alpha \cdot \left(1 - \beta \cdot \frac{\varepsilon}{n_s} \cdot \frac{Y_s}{Y/m} \right)$$

Considering that $\frac{P_s}{P} = 1$, that $Y_s = Y$ and $G_s = G$ for all s one can easily see that $\frac{\tilde{Y}}{m} = Y^i = \beta \cdot Y + (1 - \beta) \cdot G$. Substituting one finally obtains:

$$\alpha \cdot \left(1 - \frac{\varepsilon}{n} \cdot \frac{1}{1 + \frac{1-\beta}{\beta} \cdot g} \right) = w$$

where I defined $g = \frac{G}{Y}$.

One can see that fiscal authorities can affect firms' profit margins by varying the ratio of public expenditure to total production. In particular, an increase in g leads to an increase in the labor demand faced by imperfectly competitive firms.

.3 Efficiency wage and taxes

I assume that taxes are specified on the wage surplus:

$$T = t \cdot (w - e)$$

where w = real wage and e = effort. Hence:

$$w^t - e = w - e - t \cdot (w - e) = (1 - t) \cdot (w - e)$$

I assume that effort can take two values: 0 in case of shirking and e if no shirking occurs. Therefore, $w^t - e$ becomes

$(1-t) \cdot w$ when $e = 0$. The probability of detecting a shirker equals x . The flows probability in and out unemployment are respectively given by b and a , the latter being the value of the endogenous hiring rate.

The efficiency wage is fixed by the no-shirking condition given the following definition of intertemporal utilities associated with the alternative strategies of shirking and non-shirking:

1. $r \cdot U = a \cdot (V_{NS} - U)$
2. $r \cdot V_S = (1-t) \cdot w + (x+b) \cdot (U - V_S)$
3. $r \cdot V_{NS} = (1-t) \cdot (w-e) + b \cdot (U - V_{NS})$

One can easily see that the no-shirking condition $V_S = V_{NS}$ implies:

4. $V - U = \frac{e}{x} \cdot (1-t)$

From (1) one also has:

$$U = \frac{a}{a+r} \cdot V$$

I can now substitute this result into (4) thus obtaining:

$$V = \frac{e}{x} \cdot (1-t) \cdot \frac{a+r}{r}$$

If one substitutes this into (2), one finally has:

$$\frac{e}{x} \cdot (1-t) \cdot (a+r) = w \cdot (1-t) - (x+b) \cdot \frac{e}{x} \cdot (1-t)$$

where $(1-t)$ simplifies away, which yields:

$$w = \frac{e}{x} \cdot (a+b+r+x)$$

.4 Coordination

The first order condition for profit maximization yields:

$$\alpha \cdot \left(1 - \beta \cdot \frac{\varepsilon}{n_s} \cdot \frac{Y_s}{\tilde{Y}/m} \right) = w_s$$

$$\text{with } \tilde{Y} = m^{1/(1-\eta)} \cdot \left((\beta \cdot Y_s + (1-\beta) \cdot G_s)^{\frac{\eta-1}{\eta}} + \sum_{\forall i \neq s} (\beta \cdot Y_i + (1-\beta) \cdot G_i)^{\frac{\eta-1}{\eta}} \right)^{\frac{\eta}{\eta-1}}$$

(see Appendix 2 for the definition of \tilde{Y}).

Dividing by $\beta \cdot Y_s$ one can rewrite the markup term as follows:

$$\frac{\varepsilon}{n_s} \cdot \left[\frac{1}{m} \cdot \left(\left(1 + \frac{1-\beta}{\beta} \cdot g_s \right)^{\frac{\eta-1}{\eta}} + \Psi \right) \right]^{\eta/(1-\eta)}$$

with $\Psi = \sum_{\forall i \neq s} \left(1 + \frac{1-\beta}{\beta} \cdot g_{is} \right)^{\frac{\eta-1}{\eta}}$, $g_{is} = \frac{G_i}{Y_s}$ and $\frac{Y_i}{Y_s} = 1$ in equilibrium.

Equilibrium employment can thus be written as follows:

$$L = N \cdot \left(1 - \frac{b \cdot e \cdot \frac{1}{m} \cdot \left(\left(1 + \frac{1-\beta}{\beta} \cdot g_s \right)^{\frac{\eta-1}{\eta}} + \Psi \right)^{\eta/(\eta-1)} \cdot n}{\frac{1}{m} \cdot \left(\left(1 + \frac{1-\beta}{\beta} \cdot g_s \right)^{\frac{\eta-1}{\eta}} + \Psi \right)^{\eta/(\eta-1)} \cdot n \cdot (x \cdot \alpha - e \cdot (r+x)) - x \cdot \alpha \cdot \varepsilon} \right)$$

Given this expression for L , to derive the value for optimal fiscal expenditure given in the main text one just has to minimize the individual fiscal authority loss function keeping Ψ as given.

References

- [1] Allsopp, C. and D. Vines [1998] ‘The Assessment: Macroeconomic Policy after EMU’, *Oxford Review of Economic Policy*, **14**:1-23.
- [2] Amable, B. and D. Gatti [2001] Macroeconomic effects of product market competition in a dynamic efficiency wage model, *Economics Letters*, forthcoming
- [3] Andersen, T.M. [1999] International Integration, Risk and the Welfare State, *EPRU Working Paper* 2000-2.
- [4] Artis, M. J. and Winkler, B. (1997). ‘The Stability Pact: Safeguarding the Credibility of the European Central Bank’, *CEPR Discussion Paper* 1688.
- [5] Beetsma, R. and Uhlig, H. (1999). ‘An Analysis of the Stability and Growth Pact’, *The Economic Journal*, **109**, 546-71.
- [6] Buti, M., Franco, D. and Ongena, H. (1998). ‘Fiscal Discipline and Flexibility in EMU: the Implementation of the Stability and Growth Pact’, *Oxford Review of Economic Policy* **14**, 81-97.
- [7] Canzoneri, M. and Diba, B.T. (1999). ‘The Stability and Growth Pact: A Delicate Balance or an Albatross?’, Paper prepared for the Austrian National Bank’s Workshop on ‘Challenges for Economic Policy Coordination within EMU’, January 22 (Second Draft February).
- [8] Carlin, W. and D. Soskice [2000] Unique or Multiple NAIRUs: Modern versus Heckscher-Ohlin Theories of Trade, *mimeo*, WZB.
- [9] Gatti, D. and C. van Wijnbergen [2002] Co-ordinating Fiscal Authorities in the Euro-zone. A Key Role for the ECB, *Oxford Economic Papers*, **1**.
- [10] Matsuyama, K. [1995] Complementarities and Cumulative Processes in Models of Monopolistic Competition, *Journal of Economic Literature*, **XXXIII**:701-729.
- [11] Soskice, D. and T. Iversen [1998] Multiple Wage-Bargaining Systems in the Single Currency Area, *Oxford Review of Economic Policy*, **14**, 110-24.