Structural shocks and investment subsidies in an overlapping generations model with perfect foresight*

by

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Abstract

The paper is concerned with investment subsidies and their effect on structural adjustments. We construct a two-sector overlapping generations model where consumers live for two periods, both consumers and firms have perfect foresight, and prices and wages are perfectly flexible, so that the economy is always at full-employment. The structural shock is represented by an unanticipated permanent change in consumers' preferences. This change induces firms to scrap part of their capital stock in one sector and to invest in the other. Because adjustment costs make capital imperfectly mobile across sectors, this structural change implies a loss of welfare for the generations living at the moment of the shock. The question is whether the scrapping and investment rates generated by the market are optimal, or whether there is room for government intervention.

It is shown by means of a numerical example, that investment subsidies alone cannot improve each generation's welfare. This result can be achieved however if the government combines its investment incentives with an appropriate system of compensatory transfers from future to current generations.


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1. INTRODUCTION

In most countries, and especially in Europe, the post-1974 recession has been accompanied by deep structural changes resulting from the collapse of traditionally important sectors like steel and textiles. This evolution was probably the outcome of several factors (raw materials' price changes, increased competition from newly industrialized countries, exogenous changes in habits and in production technologies, etc.). As a consequence, European economies were characterized by huge excess capacities in declining sectors and by capacity shortages in expanding sectors. At the same time, investment rates were abnormally low. This has raised concern about the appropriate way to stimulate capital formation and accelerate the return to full-employment. The issue was taken up in one of the reports prepared by the Macroeconomic Policy Group of the Center for European Policy Studies (CEPS). We quote (see Modigliani and al.(1987), pp. 28-29):

"Given our previous discussion, we must ensure that the requisite savings emerge to finance the construction of new capacity.(...) Incentives to investment in the form of tax provisions and subsidies have apparently proved to be not very effective in stimulating investment. In addition, they have the serious drawback of encouraging substitution of labour with capital at the time when labour is abundant and capital is presumably scarce. So we see little use in trying more of that medicine except for an investment tax credit of relatively short duration. In this case the dominant effect of such a measure is the desirable one of shifting investment forward in time. (...) What has to be stressed, in the context of our proposed strategy, is that financial support by governments seems to go to a large extent to the protection of unproductive capacity at old firms in sectors facing declining demand, to the detriment of the creation of new firms and of capital formation in sectors facing high demand". (emphasis is ours)

The objective of this paper is not to analyze the various factors responsible for the structural changes just mentioned nor their impact on unemployment, but rather to consider again the issue raised by investment subsidies, and more specifically their role in shifting investment forward in time and in promoting welfare. To this end, we have constructed a two-sector overlapping generations model where consumers live for two periods. Every young generation inelastically supplies its labour force, consumes and saves; every old generation finances its consumption with the savings of the previous period and does not leave bequests to its descendants. At variance with consumers, firms optimize over an infinite horizon. All agents are endowed with perfect foresight, and prices and wages are perfectly flexible, so that the economy is always at full-employment. Since
we are mostly interested by the transition to the stationary state, we have to solve the model numerically.

In this setting, the structural shock is represented by an unanticipated permanent change in consumers' preferences, which shifts consumption from good 2 to good 1.\textsuperscript{1} This change induces firms to scrap part of their capital stock in sector 2 and to invest in sector 1. Because adjustment costs make capital imperfectly mobile across sectors, the shock implies a loss of welfare for the two generations living at the moment of the shock. As time goes on and investment takes place, the distribution of capital across sectors is adjusted and progressively reaches its new equilibrium value, while consumers' welfare increases again and eventually returns to normal.

The question that we consider is whether the scrapping and the investment rates so generated are "optimal," or whether government intervention can improve every generation's welfare with respect to "laisser faire." We look at the effects of an investment subsidy that decreases the adjustment costs borne by firms, without changing the equilibrium capital intensity. In this way, we avoid the usual criticisms against government intervention (see the above quotation). We show that investment subsidies financed by consumption taxes are not sufficient to improve each generation's welfare. Such subsidies are successful in speeding up the adjustment of production capacities to their new equilibrium values, at the expense of the two generations living at the moment of the shock. Through its effect on financial markets, the subsidy works like a transfer from current to future generations and worsens the problem created by the structural change. We then show that it is possible to improve every generation's welfare, provided that the government combines investment incentives with compensatory transfers from future to current generations. In our case, these transfers imply a temporary public deficit, later compensated by a surplus, and produce a temporary and substantial increase in the interest rate. Because of the subsidy, the net effect on investment remains positive.

The use of overlapping generations models to analyse the intertemporal effects of fiscal policy is not new (see for instance Auerbach and Kotlikoff (1987)), from which many of our specifications are inspired). The novelty\textsuperscript{2} of our paper lies in the analysis of structural shocks and in the explicit distinction between two sectors, where Auerbach and Kotlikoff have only one. The paper is organized as follows. The model is set up and its

\textsuperscript{1} This shift can be interpreted as the consequence of the emergence of newly industrialized countries in sectors like the textile or the steel industry. We could also have considered a shock on the supply side and interpret it as the consequence of the oil crisis.

\textsuperscript{2} The recent paper by Davies, Whalley and Hamilton (1989) came known to us after our paper was almost completed.
stationary equilibrium is analyzed in section 2. Section 3 describes the dynamic effects of the structural shock, which provides the reference path used in section 4 to measure the effects of alternative government policies. We end up in section 5 with a few concluding remarks.

2. THE MODEL

We consider a closed economy with three types of agents: firms, consumers and the government. There are four markets: two goods, labor and a financial asset. Labor is thus homogeneous across sectors and the financial assets sold by firms (to finance their investment) and by the government (to finance its deficit) are perfect substitutes. There is no uncertainty. Consumers live for two periods. They work only when young and inelastically supply their labor. Their second period consumption is entirely financed by the net (after taxes and transfers) income accrued from their savings. We first describe each agent's behavior, and next turn to the market demand and supply functions and the equilibrium conditions.

Firms' behavior

The technology is represented by a Cobb-Douglas function with constant returns to scale and two inputs, labor and capital (K and L). The parameters of the production function are the same for the two sectors:

\[ Y_{it} = (K_{it})^\varepsilon (L_{it})^{1-\varepsilon}, \quad i = 1, 2. \]

We set \( \varepsilon \) to 0.25. Firms behave competitively and adjust labor costlessly. Since labor is homogeneous and perfectly mobile, the wage rate must be the same in the two sectors. Firms will hire labor up to the point where the marginal productivity is equal to the real wage rate (\( W \) in sector 1, \( W/P_2 \) in sector 2).

Each firm maximizes its profits subject to its technology; this leads to the following demand functions for labor:

\[ L_{1t} = K_{1t} \left( \frac{1-\varepsilon}{W_{1t}} \right)^{1/\varepsilon}, \]

\[ L_{2t} = K_{2t} \left( \frac{1-\varepsilon}{W_{1t}/P_{2t}} \right)^{1/\varepsilon}. \]
The capital stocks of the two firms, $K_1$ and $K_2$, consist of good 1 only and depreciate at a rate $d = 0.20$. As in the $q$-theory of investment, we assume that changing the capital stocks generates (quadratic) adjustment costs:

$$C(\Delta K_{it}) = [1 + \frac{(1-z_{it})b_{it}}{2} \frac{\Delta K_{it}}{K_{it}}] \Delta K_{it}, \; i = 1, 2;$$

this implies the following marginal cost function:

$$C'(\Delta K_{it}) = 1 + (1-z_{it})b_{it} \frac{\Delta K_{it}}{K_{it}}, \; i = 1, 2,$$

where $b_{it}$ represents the adjustment costs parameter and $z_{it}$ the subsidy rate. The optimal investment rate in each sector is such that the marginal cost of investment defined in (2.2) (which takes into account the subsidy rate) is equal to the price of existing capital goods $Q_{it}$. The adjustment cost parameter $b_{it}$ is defined in the same way for the two sectors and is smaller for capital accumulation than for capital scrapping:

$$b_{it} = 2 \; \text{if} \; \Delta K_{it} > 0 \; \text{and} \; b_{it} = 5 \; \text{if} \; \Delta K_{it} < 0.$$  

$z_{it}$ represents the share of the total adjustment costs borne by the government. The total investment subsidy to sector $i$ at time $t$ is, by definition, equal to:

$$\text{(2.3)} \quad \text{IS}_{it} = z_{it}b_{it} \frac{\Delta K_{it}}{K_{it}} \Delta K_{it}, \; i = 1, 2.$$  

Because only adjustment costs are subsidized, this type of government intervention does not affect the stationary value of the capital stock, though it speeds up the adjustment process to a new equilibrium value.

Demand for investment is given by:

$$I_{it} = [1+b_{it}\frac{\Delta K_{it}}{K_{it}}] \Delta K_{it} + dK_{it}, \; i = 1, 2,$$

where net investment $\Delta K_{it}$ is defined by the marginal condition

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3 This is admittedly a much too low value for a model where one period of time represents thirty years. It would seem more realistic to assume that the capital stock is completely depreciated within the period and set $d$ equal to $1$. This however would preclude the analysis of the consequences of imperfect capital mobility across sectors after a structural shock in a simple two period overlapping generations model.
\[ \Delta K_{it} = \frac{1}{b_{it}(1-z_{it})} (Q_{it} - 1)K_{it}, \quad i = 1, 2, \]

as in the q-theory of investment. It can be shown that \( Q_{it} = 1 \) at the stationary state, so that \( \Delta K_{it} = 0 \).

**Consumers' behavior**

Consumers born at time \( t \) maximize the following two-period utility function:

\[
U = \frac{1}{1-1/\gamma} \left[ (U^y_t)^{1-1/\gamma} + \frac{1}{1+\delta} (U^o_{t+1})^{1-1/\gamma} \right]
\]

where \( U^y \) and \( U^o \) represent the utility when young and old respectively. Utility is thus assumed to be additive over time, with a constant intertemporal elasticity of substitution \( \gamma \) and a rate of time preference \( \delta \). \( \gamma \) is set at 0.25. With individuals living only for two periods, one period of time represents something like twenty-five or thirty years; in this perspective, a discount rate \( \delta \) equal to 1 seems a reasonable value.

The within-period utility is itself a CES function of the quantities consumed of each good, with an elasticity of substitution between goods equal to \( \rho \); in the following expressions, \( C \) stands for consumption (the upper index \( y \) or \( o \) refers to young and old consumers, the lower index 1 or 2 to good 1 or 2):

\[
U^y_t = \left[ (C^y_{1t})^{1-1/\rho} + \alpha (C^y_{2t})^{1-1/\rho} \right]^{1/(1-1/\rho)}
\]

and

\[
U^o_{t+1} = \left[ (C^o_{1,t+1})^{1-1/\rho} + \alpha (C^o_{2,t+1})^{1-1/\rho} \right]^{1/(1-1/\rho)}.
\]

\( \rho \) is set equal to 0.8; \( \alpha \) which represents the intensity of consumers' preferences for good 2 relative to good 1 is initially set to 1 (both goods receive the same weight). Leisure is not an argument of the utility function: consumers' labor supply is independent of the wage rate. We assume that every generation of consumers works only when young and retires when old. Units of labor are chosen in such a way that the supply of labor is equal to 1.

The intertemporal budget constraint of the consumer reads:
The price of good 1 is normalized to one in every period; $P_2$ is the price of good 2 and $W$ stands for the wage income received by the young. $R_{t+1}$ represents the real interest rate (in terms of goods 1) between period $t$ and period $t+1$. Government transfers received when young and old are denoted by $TR_y$ and $TR_o$ respectively, while $T$ represents the consumption tax rate.

Demands of (young $y$ and old $o$) consumers on both markets (1 and 2) are obtained as the solution of maximizing (2.4) subject to (2.5). This leads to:

$$C^y_{1t} = 1 \frac{1 + T_t}{\beta_t (1-\sigma_t)} (W_t + TR^y_t + \frac{1}{1+R_{t+1}} TR^o_{t+1})$$
$$C^o_{1t} = 1 \frac{1 + T_t}{\beta_t} (WW_t + TR^o_t)$$

and

$$C^y_{2t} = 1 \frac{(1+T_t)P_2}{(1+T_t)P_2} (1-\beta_t(1-\sigma_t)(W_t + TR^y_t + \frac{1}{1+R_{t+1}} TR^o_{t+1})$$
$$C^o_{2t} = 1 \frac{1}{(1+T_t)P_2} (1-\beta_t)(WW_t + TR^o_t)$$

for young and old consumers on both markets 1 and 2. In these expressions, $\beta$ stands for the marginal propensity to spend on good 1, $\sigma$ is the marginal propensity to save out of current and future income and $WW$ represents the financial wealth of each old generation with:

$$\beta_t = [1 + \alpha(1-\rho)]^{-1} \leq 1,$$

and

$$\sigma_t = \left[ 1 + (1+R_{t+1}) \frac{1+T_t}{(1+T_{t+1})} (1-\gamma) (1+\delta)(1-\gamma)(1-\rho) \right]^{-1} \leq 1,$$

and

$$WW_t = Q_{1t}K_{1t} + Q_{2t}K_{2t} + D_t + (\varepsilon Y_{1t} - dK_{1t}) + (\varepsilon P_2 Y_{2t} + dK_{2t}) + R_tD_t.$$
dividends paid out by firms in both sectors; the last one represents interest payments on the public debt.

**Government behavior**

The government collects consumption taxes (IT) and issues bonds (D_{t+1} - D_t); the proceeds are distributed to consumers under the form of (positive or negative) lump sum transfers (TR) and interest payments (R_tD_t) on the outstanding debt, while firms collect investment subsidies (IS) - see eq. (2.11).

**Market equilibrium conditions**

On the markets for good 1 and 2, the equilibrium conditions state that demand (left-hand side) is equal to supply (right-hand side):

\[(2.7)\] \[C^1_{yt} + C^0_{yt} + I_{t1} + I_{t2} = Y_{1t},\]
\[(2.8)\] \[C^2_{yt} + C^0_{yt} = Y_{2t}\]

where \(Y_{it}\) is defined by (2.1).

Likewise, on the labor market demand is equal to supply (normalized to 1):

\[(2.9)\] \[L_{t1} + L_{t2} = 1.\]

Finally, since bonds issued by the government and shares issued by the firms in each sector are perfect substitutes, there is only one equilibrium condition on the market for assets, which reads:

\[(2.10)\] \[Q_{t1,K_{1,t+1}} + Q_{t2,K_{2,t+1}} + D_{t+1} = \alpha_t \left[ W_t + TR_t^Y + \frac{TR^0_t + 1}{1+R^0_t + 1} \right], \]

the left-hand side represents demand (defined as the value of assets issued by the firms in the two sectors and the government) while the right-hand side represents supply (the savings of the young generation, defined as the difference between its total expenditure and its current income). The stocks of assets are defined by:

\[K_{i,t+1} = K_{i,t} + \Delta K_{i,t}, \quad i = 1, 2\]

and
(2.11) \[ D_{t+1} = D_t + TR^Y_t + TR^O_t + IS_{1t} + IS_{2t} + R_tD_t - IT_t; \]

By Walras's law, (2.7) will always be satisfied, and the price on the market for good 1 is set to 1 by normalization; (2.8) defines \( P_2 \), the price of good 2; (2.9) defines \( W \), the wage rate and (2.10) the interest rate \( R_{t+1} \). We assume that agents have perfect foresight, except for the structural shock to be considered later on, which is unanticipated. With this assumption, the relationship between the prices of shares \( (Q_{1t} \text{ and } Q_{2t}) \) and the interest rate \( R_{t+1} \) is simply:

\[
Q_{1t} = (1+R_{t+1})^{-1} \left[ Q_{1,t+1} + (\varepsilon \frac{Y_{1,t+1}}{K_{1,t+1}} - d) \right]
\]

and

\[
Q_{2t} = (1+R_{t+1})^{-1} \left[ Q_{2,t+1} + (\varepsilon \frac{P_{2,t+1}Y_{2,t+1}}{K_{2,t+1}} - d) \right].
\]

The stationary values of \( P_2, Q_1 \) and \( Q_2 \) can be shown to be equal to 1, no matter the values of the parameters.

3. THE CONSEQUENCES OF A STRUCTURAL SHOCK

We now consider the consequences of an unanticipated structural shock, which takes the form of an unanticipated change in the preference parameter \( \alpha \). For generations born before time \( t = 1 \), the preference parameter \( \alpha \) is equal to 1, i.e., goods 1 and 2 have the same weight in the utility function. For generations born at time \( t = 1 \) and afterwards, \( \alpha \) is set to 0.5, which implies a substantial increase in the relative preference for good 1 and will induce a reallocation of capital from sector 2 to sector 1.

The idea is thus to (numerically) examine the transition path from the "old" stationary state (i.e. with \( \alpha = 1 \)) to the "new" one (\( \alpha = 0.5 \)); this can be done by solving the set of equations described in section 2. We first consider the case where the government plays no role \( (D_t = IT_t = IS_{1t} = TR^Y_t = TR^O_t = 0 \text{ for all } t) \) and postpone to the next section the analysis of the effects of government transfers and subsidies.

The main consequences of the structural shock in the absence of government intervention are illustrated in Figures 1 to 3. Figure 1 describes the deviations of the price of shares and of good 2 from their stationary state values (equal to 1) during the first ten

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4 To compute these values, we assumed that the adjustment process to the new stationary state was completed after 40 periods, which proved to be more than what was actually needed for the economy to stabilize.
periods following the shock. The lower demand for good 2 produces a temporary fall of its price, which reaches a maximum of 11% one period after the shock. At the same time, there are substantial capital gains (10% in period 1) on the equities issued by sector 1, and substantial capital losses (over 20%) on the equities issued by sector 2. These changes in equity prices stimulate investment in sector 1 and capital scrapping in sector 2. As the allocation of capital progressively approaches its new stationary value, the price of good 2 increases again, and the price of shares in each sector returns to normal.

Figure 2 shows that this adjustment process implies a temporary increase in the interest rate and, consequently, a temporary decrease in the real wage rate (not shown). The value of the interest rate at time $t = 1$ is not given in Figure 2, because it is different for the two assets. This is the result of the unanticipated capital gains and losses: the interest rate on shares issued by sector 1 is equal to 1.08 at time $t = 1$, while it is only 0.48 for sector 2. From time $t = 2$ onwards, there is no new unanticipated shock and both interest rates are again equal.

Figure 3 shows the progressive adjustment of the capital stocks in the two sectors. The capital stock in sector 2 is initially 37% larger than its new equilibrium value; after ten periods, the excess capacity in sector 2 is brought down to 6.5%. A similar but opposite adjustment is observed for sector 1. There is initially a capital shortage of some 20%, reduced to 3% after ten periods. More than half the adjustment is realized after five periods. Figure 3 also reproduces the welfare of each generation of consumers, compared to what it would be in the stationary state. The figure is constructed so that the welfare reported for time $t$ refers to the old generation living during that period. The unanticipated change in preferences implies a substantial loss of welfare for the old living at the time of the shock. This is the result of the huge capital loss experienced by the holders of sector 2 equities, which is not compensated by the capital gains on sector 1 equities. Taking all that into account, the (unexpected) loss of financial wealth for the old generation living at time $t = 1$ is equal to 5%. Although there is no unexpected financial loss for the subsequent generations, their welfare remains abnormally low for some time. It progressively returns to normal as the process of capital reallocation goes on. Note the slight overshooting after time $t = 6$.

5 Note that the stationary state value of the interest rate remains almost unchanged at 0.73 before and after the shock.

6 This may seem too slow an adjustment process. The speed of adjustment would be faster with a larger depreciation rate. We explained above (see footnote 1) why we chose a depreciation rate of only 20%.
4. THE EFFECTS OF TRANSFERS AND INVESTMENT SUBSIDIES

The aim of this section is to examine how government intervention modifies the adjustment path of the economy after a structural shock of the type described in section 3. We are especially interested in the effect of government intervention on welfare. We compare two types of policies:

In **policy 1**, the government subsidizes investment by paying to the firms 20% of the adjustment cost when investment is positive (that is, \( z_{it} = 0.20 \) when \( \Delta K_{it} > 0 \), and \( z_{it} = 0 \) otherwise). These subsidies are financed period by period by a consumption tax and the government budget is always in equilibrium;

In **policy 2**, investment subsidies are paid in period 1 by issuing bonds while consumption taxes are levied afterwards. The public debt is reabsorbed at time \( t = 2 \) by levying lump-sum taxes on the young generation. This policy is accompanied by transfers from younger to older generations; that is, in every period, the old generation receives an amount equal to 10% of the discrepancy between the current value of its financial wealth and what this financial wealth would be in a stationary state. Given that the structural shock creates substantial financial losses for the older generation living at time \( t = 1 \), this policy essentially amounts to transferring money from future to current generations.

Both policies leave the stationary state unchanged, affecting only the transition path; the way they are set up ensures that both subsidies and transfers are progressively phased out. The consequences are illustrated in Figures 4 to 7, where the variables are measured with reference to the situation without government intervention described in the previous section. We consider each policy in turn.

**POLICY 1: INVESTMENT SUBSIDIES WITHOUT TRANSFERS**

Investment subsidies financed by consumption taxes have the effect of speeding up capital accumulation in sector 1 (Figure 4) and of slowing down capital scrapping in sector 2 (Figure 5). They also have a negative impact on the interest rate,\(^7\) at least after period 2 (Figure 6). As time goes on, the capital stocks and the interest rate move back to the same stationary state as in the reference case. This looks like the sort of result one may desire. Figure 7 shows however that this increased investment effort is done at the expense

\(^7\) As indicated before, the (ex post) period 1 interest rate is not reported because it differs widely for sector 1 and sector 2 equities.
of the old generation living and holding the assets at the moment of the shock. Their welfare is substantially lower than what it would have been in the absence of government intervention. This is because the investment subsidy has a negative impact on the price of sector 1 equities and increases the financial losses of the old from 4.9 to 5.2%. The increased investment effort is obviously to the advantage of future generations who inherit a larger capital stock in both sectors. The investment subsidy succeeds in shifting investment forward in time, but, from the consumer's point of view, it works like a transfer from current to future generations. Given that the generations living at the moment of the shock (time $t = 1$) are those which are mostly hit by the shock, this seems a very undesirable result, and suggests that it might be useful to supplement the investment subsidies by a policy aiming at transferring from future to current generations part of the benefits derived from investment. This is precisely what the type 2 policy does.

**POLICY 2: INVESTMENT SUBSIDIES WITH TRANSFERS**

Policy 2 is less demanding for the generations living at time $t = 1$ because of the systematic transfers described above and also because investment subsidies in period 1 are financed by a larger government debt, rather than by consumption taxes. The effects of this combination of subsidies and transfers are clear. Compared to the case without government intervention, there is faster capital accumulation in sector 1 (Figure 4) and faster capital scrapping in sector 2 (Figure 5). There is also a strong positive impact on the interest rate (Figure 6), due to government borrowing in period 1. In the longer run, the capital stocks and the interest rate return to the same stationary state values as in the reference case. When this is compared to the effects of policy 1, one observes that the impulse given to investment in the expanding sector is weaker, but that the adjustment in the declining sector is much faster. In terms of welfare, Figure 7 shows that, compared to policy 1, policy 2 has the advantage of being beneficial to all, and not only to future generations. The figure also makes it clear that policy 2 "transfers" welfare from future to current generations.\(^8\)

5. CONCLUDING REMARKS

We have shown that the welfare deteriorating consequences of a structural shock can be alleviated with investment subsidies that shift investment forward in time without affecting the equilibrium capital stocks. We have also shown that such a policy should

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\(^8\) It may be useful here to remind the reader that policy 2 is "uniformly" better than the reference solution without government intervention.
preferably be accompanied by transfers from future to current generations, so that the benefits of the increased investment effort can be shared by all. There is no doubt that our results crucially depend on the way we have modelled the economy. The problem is not so much the value of the parameters chosen in our example, but rather the representation of the behavior of agents. Our results would probably change if we were to assume that each generation takes into account its descendents' welfare as well as its own, or if we postulated a single representative consumer with infinite horizon. The approach taken here seemed, to us at least, more appropriate.

The model can of course be sophisticated in many useful ways. A most interesting research direction would be to introduce labor mobility costs in the same way as capital adjustment costs. It may seem odd (especially to European economists) to discuss the effects of structural shocks in a model where there is no sales constraints and no unemployment. Erlich, Ginsburgh and Van der Heyden (1987) conclude their analysis (based on a two-period computable general equilibrium model with 24 sectors) by writing that "in the short run, real wage policies can only do very little to alleviate the burden of unemployment. They however have strong effects in the medium and in the long run, provided that they are supported by fairly large capacity increases." In other words, there may be more than simple real wage problems behind Europe's unemployment; real wage policies should be accompanied by policies promoting an adequate allocation of production capacities across sectors. Two-sector overlapping generations models seem a natural framework to investigate further this sort of question.
Figure 1: Goods and share prices (deviations from stationary state values, in percentage points)

Figure 2: Interest rate (deviations from stationary state value, in percentage points)
Figure 3: Capital stocks and welfare (deviations from new stationary state values, in percentage points)

Figure 4: Effect of investment subsidy on capital accumulation in sector 1 (deviations from reference path in %)
**Figure 5**: Effect of investment subsidy on capital scrapping in sector 2 (deviations from reference path in %)

**Figure 6**: Effect of investment subsidy on the interest rate (deviations from reference path in percentage points)
Figure 7: Effect of investment subsidy on welfare
(deviations from reference path)
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