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Fiscal Decentralization, Redistribution and Growth

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Abstract

This paper analyzes the welfare implications of a transfer mechanism in a fiscally decentralized economy where local governments select their tax collection effort to maximize their lifetime utility. We consider a transfer rule that both punishes for the lack of efficiency in tax-collection and compensates for the deviation of pre-tax or transfer income from a target level; in addition, a portion of transfers is considered to be directed towards investment.

Simulations of the model's optimal solution reveal that increasing punishment always results in increased steady state effort, despite the disincentives that increasing income compensation or directed investment may generate. Increasing punishment also improves capital accumulation the lower the rate of directed investments and the lower the tax rate. Further, efficiency in tax collection is achieved the lower the rate of directed investment and the higher the punishment rate.

Key Terms: *Fiscal decentralization, redistribution*

JEL Codes*: E62, H71, O23*

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1 Introduction

Fiscal decentralization (FD), defined as the devolution of fiscal power and responsibilities from central towards local governments, has potential advantages and disadvantages that have been discussed widely in the literature following the seminal work of Oates (1972). If FD improves fiscal efficiency, one conjectures that it contributes to social welfare. The literature suggests that the effectiveness of FD is related with various institutional and structural factors that vary across countries (see, for example, Tanzi, 2000, de Mello, 2000, and Neyapti, 2010). Accordingly, among the growing number of studies that investigate the effects of FD, empirical studies that focus on the growth implications of FD also show mixed evidence (see, for example, Davoodi and Zou, 1998, Lin and Liu, 2000, Martinez-Vazquez and McNab, 2006, Thiessen, 2003). More recently, a number of studies focuses on the welfare implications of FD and reveals the importance of the design of a redistribution mechanism that is crucial for the effective implementation of FD (see, for example, Sanguinetti and Tomassi, 2004, Stowhase and Traxler, 2005 and Akin et al., 2010).

In view of the large vertical imbalances that exist in less developed and developed countries alike[3], the design of a redistributive rule appears crucial in setting the incentives for local governments. In a recent study, Akin et al. (2010) investigate the effectiveness of FD under a transfer mechanism that both punishes the inefficiency in tax collection and compensates for the deviation from target income levels.[4] The authors show that, under such a redistributive rule, while FD increases efficiency in tax collection, the objective of improving equity across localities is only attained in case of an explicit convergence target.

The current paper investigates the role of redistributive mechanism in generating incentives for local government efficiency in a dynamic framework. We propose a dynamic model of local government decision-making in view of the redistributive rule *a la* Akin et al. (2010) and, in addition, assume that part of the transfers is centrally decided to be directed towards local capital accumulation. Facing this type of a fiscal rule, a representative local government chooses its tax-collection effort to maximize its lifetime utility. In order to have

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[3] Although developing countries have greater vertical imbalances, on average, than developed countries, even in developed countries that are federal states, such as Canada, Switzerland, US and Germany, central government transfers constitute 50% to 70% of local budgets.

[4] Ma (1997) points out that among the transfer systems observed in practice, those that take into account both revenue capacities and expenditure needs are the most developed, although also the most demanding, ones.

some redistribution to take place across localities, simulations are performed such that local incomes are differentiated by their income shares of capital. To close the model, it is further considered that general government budget constraint holds.

Battaglini et al. (2010) propose a dynamic behavioral model to investigate the extent of free riding problem arising from short-sightedness, where the central versus decentralized decision making are analyzed with regards to the investment and consumption choices. The authors conclude that the mechanism characterized by the central government decision on investment and redistribution is superior to the decentralized decision in terms of higher steady state level of investment and the public good. The results are supported by experimental analysis and shed light on the dynamic aspects of public good provision. The current paper is in lines with Battaglini et al.'s findings with regard to the centralization of the decision to allocate a portion of public resources towards investment.

The model is solved for the steady state. The simulation analysis reveals that while the steady state income, capital or welfare decreases in the tax rate and the income compensation component of the transfer rule, it increases in the rate of directed investments. The welfare improving effect of the punishment rate, however, is observed to decrease in the investment rate.

The paper is organized as follows. Section 2 describes the model. Section 3 discusses the comparative statistics and reports the results of the simulation analysis. Section 4 concludes.

2 The Model

A representative local government maximizes its lifetime utility:

$$\underset{A_i}{Max} \quad \sum_{t=1}^{\infty}\left(\alpha \ln \mathrm{C}_{i,t} + \beta \ln \mathrm{G}_{i,t}\right) \tag{1}$$

where i =1…n stands for i^{th} local government. α and β represent the relative weights of private (C_i) and government spending (G_i) in utility. C_i and G_i are given by:

$$C_{i,t} = (1 - t_i) y_{i,t} \tag{2}$$

$$G_{i,t} = (1 - c)\, t_i y_{i,t} + \gamma TR_{i,t} \tag{3}$$

where y_i stands for (per capita) income in the i^{th} locality. t is the tax rate and c is the ratio of local tax revenue remitted to the central government for the purposes of transfers; both of which are assumed to be fixed across localities. $t_i = t.A_i$ is the effective tax rate for local government i, where A_i is the tax collection effort ($0 \leq A_{it} \leq 1$); A_i taking the value of 1 means that full effort is spent in tax collection. γTR shows that γ portion of transfers are used as part of the current expenses of local governments, while the remaining transfers [$(1-\gamma)TR$] are invested locally. This type of transfers, where the end use is determined when transfers are disbursed, is referred to as *directed*- or *closed-ended* budget transfers.

The constraint of a representative local government is that it receives transfers according to the redistributive rule that both punishes inefficiency in tax collection and compensates for the deviation from target income levels (Equation 4).

$$TR_{i,t} = p\, t\, y_{i,t}(A_{i,t} - 1) + m\,(y_{i,t}^{*} - y_{i,t}) \tag{4}$$

where y_i^* stands for the target income level in the i^{th} locality. The rate of punishment for the inefficiency in tax collection is indicated by p, wheras the rate of compensation of the deviation of income from its target is m. Hence, we explore the implications of a transfer rule that is given by equation (4) that is accompanied by the closed-ended nature of transfers**.**

A Cobb-Douglass type of production function (Equation 5) is assumed, where the income share of capital is given by $0<\theta<1$. The capital stock follows the usual accumulation rule, shown in Equation (6):

$$y_{i,t} = k_{i,t}^{\theta} \tag{5}$$

$$k_{i,t} = (1-\delta)\, k_{i,t-1} + (1-\gamma) TR_{i,t}\ , \tag{6}$$

where δ is the rate of depreciation ($0<\delta<1$). k is the per capita level of capital.

A representative local government maximizes (1) subject to (4). After substituting for C_i and G_i by the information provided in (2) and (3), the first order conditions are (see Appendix 1.a):

$$-\frac{\alpha}{C_{it}}\left(\frac{ptk_{it}^{\theta}}{c}\right) + \frac{\beta}{G_{it}}\left((\frac{1}{c} - 1)\, ptk_{it}^{\theta} + \gamma ptk_{it}^{\theta}\right) - \lambda_t = 0 \tag{7}$$

$$A_{it} \leq 1 \; ; \quad \lambda_t \geq 0 \; ; \quad \lambda_t(1 - A_{it}) = 0 \tag{8}$$

where λ_t is the value of Lagrange multiplier at time t. One can easily observe that the second order conditions are also satisfied (see Appendix 1.b). Based on the complementary slackness condition, there are two cases arising, the first one being A_{it}<1 (and λ_t =0) and the other is the full effort case. We consider the first case to be the interesting one from an intuitive point of view (the latter case is also summarized in the Appendix 1). In that case, (7) becomes: $(C_{it}/G_{it}) = (\alpha/\beta)$.

The optimal solutions for A_i (for the case A_{it}<1) is given by:

$$A_{it} = \frac{\alpha\gamma m}{t(\alpha(1-c) + \alpha\gamma p + \beta(1-c+\gamma c))}\left(1 - \frac{y_{it}^*}{k_{it}^\theta}\right) + \left(\frac{\alpha\gamma pt + \beta(1-c+\gamma c)}{t(\alpha(1-c) + \alpha\gamma p + \beta(1-c+\gamma c))}\right) \tag{9}$$

where y_{it}^* is the income target that we assume, without loss of generality, to be 10% higher than the past period's income level: $y_{it}^* = (1.1)k_{it-1}^\theta$. Substituting this expression in (2) we find the optimum TR:

$$TR_{it} = pt\left[\frac{[\alpha\gamma pt + \beta(1-c+\gamma c) + \alpha\gamma m]k_{it}^\theta - \alpha\gamma m((1.1)k_{it-1}^\theta)}{t(\alpha(1-c) + \alpha\gamma p + \beta(1-c+\gamma c))} - 1\right] + m\left((1.1)k_{it-1}^\theta - k_{it}^\theta\right) \tag{10}$$

Substituting this expression in (6) yields the evolution of capital under optimality.

We define the *steady-state* as the per capita level of capital (and income) k^* (and y^*) that exhibit no growth. Taking $k_{it} = k_{it-1}$ for all t, k^* is given by:

$$k^* = \left[\left[\frac{p\left(\beta(1-c+\gamma c)(1-t) - \alpha t(1-c) - 0.1\alpha\gamma m\right)}{\alpha(1-c) + \alpha\gamma p + \beta(1-c+\gamma c)} + 0.1m\right]\left(\frac{1-\gamma}{\delta}\right)\right]^{\frac{1}{1-\theta}} \tag{11}$$

Using this expression, the steady state levels of transfers, income and utility are also found (see Appendix 1).

3 Simulation Analysis

In this section we examine the effects of policy parameters p, m and γ on the steady state levels of capital, income, consumption, transfers, utility and government spending. The findings are conjectured to shed light on the optimal design of a redistribution policy under fiscal decentralization. Since the comparative static analysis does not yield closed-form solutions for the partial derivatives with respect to these parameters, simulation analysis is necessary. We assign the following values to the underlying parameters of the model:

Table 1: Parameter values

δ	0.1	Depreciation rate
α	0.7	Utility share of private consumption
β	0.3	Utility share of public consumption
t	0.4	Tax rate
c	0.1	The rate of local tax revenue transfer to the central government[5]

The utility shares α and β are chosen to represent the relative sizes of private and public sectors. In addition, the tax rate accords with the average tax revenue to GDP ratio in the advanced economies. [6]

For redistribution to take place in the economy described above, some heterogeneity needs to be introduced for the differential treatment of the local governments. This can be done via different capital shares of income: θ_i. For simplicity, the current analysis assumes two localities, for which we consider that θ_1=0.1 and θ_2 =0.3, assuming that the second region is richer in capital than the first.[7] Equation 9 indicates, however, that the steady-state effort is the same across localities, as it is unaffected by the level of capital or income. In view of the different local incomes, transfers are determined according to the following general government budget constraint:

[5] The figure is selected based on the information on Turkish budget practices; since this data is not easily available for other countries to get a representative figure, a range of other values are also used in the simulations.
[6] The information is based on the 2009 data; source: Government Financial Statistics, the IMF, 2011. The average tax rate for US is about 30%, for Norway it is 56%, whereas it is usually lower for developing countries.
[7] Mankiw et al. (1992) show that θ=1/3 for the case of the US.

$$TR_t = (TR_{1,t}+TR_{2,t}) \leq ct(A(y_{1,t}+y_{2,t})) \qquad (12)$$

Equation (12) indicates that total transfers cannot exceed total tax submissions to the central government, allowing for positive or negative transfer flows to an individual locality.

4 Implications

Table 2 summarizes the results of the comparative static analysis that are based on the simulations of the optimal steady state values of k and A. The response of the steady-state levels of capital and effort to the main fiscal policy parameters: p, m, γ and t can be summarized as follows. First, the negative relationship between m and both k and A points at the well-expected moral hazard result: the higher the rate of compensation for income deviation from a target, the lower is the local tax collection effort. Second, increasing the tax rate reduces the tax effort, as well as capital, which is consistent with the Laffer-curve relationship.

Table 2: Comparative Statics Results

	m	***p***	***t***	***γ***
k	-	?	-	?
A	-	+	-	+

(? indicates ambiguity of sign, to be explained below)

Table 2 also indicates that efficiency in tax collection (A) increases in the punishment rate, as was reported for the static case in Akin et al. (2010) as well, while it decreases in the investment rate (or, increases in γ). The first of these effects is straightforward. The latter effect can be interpreted as the wealth effect: the lower the rate of transfers that are directed towards investment (the higher the γ), the lower are capital and income, that increases the incentive for tax collection. In other words, tax collection effort decreases in wealth that is caused by higher directed investment rate.

Proposition 1: Increasing the punishment for the lack of tax collection effort (p) leads to increased effort ($\partial A/\partial p>0$), notwithstanding the disincentives that arise from income compensation or high investment rates.

Simulations reveal that the effects of p and γ on the steady state level of capital depend on the rest of the model parameters. In particular, it s observed that the tax rate is a key parameter for the positive effect of punishment on capital accumulation. For tax rates above 0.40, greater punishment for the lack of effort (p) is associated with lower steady-state capital (see Appendix 2, Figure 3). The positive effect of increasing p on k also seems to increase in p the higher is c and the lower is m. Increasing the income compensation rate (m) leads to a higher threshold for p for which the positive relationship between p and k is observed, indicating that increasing m hinders the positive incentives p generates on optimal effort (that is, $\partial^2 k/\partial p \partial m < 0$). In addition, the higher is c, the lower the range of t for which $\partial k/\partial p > 0$, suggesting that c and t can be treated as substitute policy parameters.

Simulations also reveal that steady-state capital decreases in γ as well. Indeed, the positive impact of p on k is only observed for high levels of p and γ (in case $p > 0.5$ and $\gamma > 0.5$ for t=0.4; for all p and γ for $t \leq 0.3$). This suggests that punishment is incentive-compatible only if the rate of directed transfers is low; hence, the higher the γ, the more it pays to punish. This is because of the negative association of the rate of directed investment and the optimum effort. This observation suggests that a social planner could employ a transfer rule such as the one indicated here, especially where that a transfer system where directed investments is not prevalent, ın order to effectively impose punishment on the lack of tax collection.

Proposition 2: Increasing the punishment rate improves the steady state welfare. capital and growth) the lower the rates of taxes and directed investments ($\partial^2 k/\partial p \partial t < 0$ and $\partial^2 k/\partial p \partial \gamma > 0$).

Additional simulation results reported in Appendix 3 reveal the following. First, *horizontal imbalances* are narrowed (measured by comparing the income ratios before and after-redistribution) as p increases, the lower are the rates of m, (1-γ), and t. The same conditions hold for the welfare effects of increasing p. As consistent with the observations on A and k, welfare also decreases in t; for low t, it decreases in γ and increases in p (for higher t, it is non monotonic in both γ and p). Also in accordance with the results for capital, welfare increases in p only when γ is high and t is low. In case the investment rate (and t) is high, government surpluses (that may be interpreted as *deadweight loses* in the current model) increase with punishment. Deficits increase (deadweight losses decrease) when t is low and γ and p are high (reaching to about 7 percent of GDP in case t=0.3; m=0.5; p=0.8 and γ=0.8, see Appendix 3).

5 Conclusion

This paper presents an original model to explore the efficiency of fiscal decentralization in a dynamic framework, where local governments face a redistributive rule, announced by the central government, that punishes lack of effiency in tax copllection and compansates for the deviation from a target income. The redistributive rule is coupled by a policy of directed transfers that alocate an exogenously specifed (by the central government) portion of transfers to capital accumulation.

Besides the finding that the steady state capital stock increases in the portion of directed investment spending, that is consistent with expectations, simulations indicate that it increases in the punishment rate, while decreasing in the compansation rate and the tax rate. The analysis provided in the paper suggests that the incentives generated for tax collection effort through the proposed redistributive rule improves welfare – provided that it is combined with the policy of directed transfers. The policy proposal that emerges in the paper is that a transfer mechanism such as the one proposed here leads to important welfare gains especially in economies where a system of investment-ended transfers does not prevail.

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Appendix 1

1.a First order analysis:

The constraint qualification is obviously satisfied since the constraints are linear. Also note that objective function is concave. So we can apply the Kuhn Tucker's theorem. The Lagrangean expression is obtained after substituting Equation 4 into 3 and substituting Equations 2 and 3 into 1:

$$L=\sum_{t=1}^{\infty}\left(\begin{array}{l}\alpha \ln (y_{i,t} - \dfrac{pty_{i,t}(A_{i,t}-1)+m(y^*_{i,t}-y_{i,t})}{c})+ \\ \beta \ln ((1-c)\dfrac{pty_{i,t}(A_{i,t}-1)+m(y^*_{i,t}-y_{i,t})}{c}+\gamma(pty_{i,t}(A_{i,t}-1)+m(y^*_{i,t}-y_{i,t})))+ \\ \lambda_t(1-A_{i,t})\end{array}\right)$$

Maximizing this expression yields the following first order conditions:

with respect to $A_{i,t}$: $\dfrac{\alpha pty_{i,t}}{cC_{i,t}}+\dfrac{\beta}{G_{i,t}}(\dfrac{1-c}{c}pty_{i,t}+\gamma pty_{i,t})-\lambda_t=0$

with respect to λ_t: $A_{i,t}\le 1$, $\lambda_t \ge 0$, $\lambda_t(1-A_{i,t})=0$

<u>Case 1</u>: $\lambda_t = 0$ implies $A_{i,t} < 1$

$$\frac{\alpha pty_{i,t}}{c(1-tA_{i,t})k^{\theta}_{i,t}}+\frac{\beta}{((1-c)tA_{i,t}k^{\theta}_{i,t}+\gamma ptk^{\theta}_{i,t}(A_{i,t}-1)+\gamma m(y^*_{i,t}-y_{i,t})}(\frac{1-c}{c}pty_{i,t}+\gamma pty_{i,t})=0$$

Then the optimal tax effort is:

$$A_{it}=\frac{\alpha\gamma m}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}\left(1-\frac{y^*_{it}}{k^{\theta}_{it}}\right)+\left(\frac{\alpha\gamma pt+\beta(1-c+\gamma c)}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}\right)$$

Assuming the target income to be 10% higher than the past period's income level: $y^*_{it}=(1.1)k^{\theta}_{it-1}$.

$$A_{it} = \frac{\alpha\gamma m}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}\left(1-\frac{1.1k^{\theta}_{i,t-1}}{k^{\theta}_{it}}\right)+\left(\frac{\alpha\gamma pt+\beta(1-c+\gamma c)}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}\right)$$

In order for this case to hold, we must have

$$1.1\left(\frac{k^{\theta}_{i,t-1}}{k^{\theta}_{it}}\right) > 1+\left(\frac{\beta(1-t)(1-c+\gamma c)-\alpha t(1-c)}{\alpha\gamma m}\right)$$

From Equation 4:

$$TR_{i,t} = ptk^{\theta}_{it}\left(\frac{\alpha\gamma m+\alpha\gamma pt+\beta(1-c+\gamma c)}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}-1-\frac{m}{pt}\right) -1.1mk^{\theta}_{i,t-1}\left(\frac{\alpha\gamma pt}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}+1\right)$$

From Equation (6), one finds today's capital in terms of previous capital:

$$k_{i,t}-(1-\gamma)ptk^{\theta}_{it}\left(\frac{\alpha\gamma m+\alpha\gamma pt+\beta(1-c+\gamma c)}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}-1-\frac{m}{pt}\right) = (1-\delta)k_{i,t-1}-1.1(1-\gamma)mk^{\theta}_{i,t-1}\left(\frac{\alpha\gamma pt}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}+1\right)$$

The steady-state implies that, at each period in time, tax effort, capital and the other time-dependent variables are equal with each other:

$$A_{i,t} = A_{i,t-1} = A; \qquad k_{i,t} = k_{i,t-1} = k$$

Hence,

$$A = \frac{\alpha\gamma pt+\beta(1-c+\gamma c)-1.1\alpha\gamma m}{t(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))};$$

$$k=\left(\frac{1-\gamma}{\delta}\left(p\frac{\alpha\gamma m+\alpha\gamma pt+\beta(1-c+\gamma c)}{(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}-pt-m+1.1\left(m-p\frac{\alpha\gamma m}{(\alpha(1-c)+\alpha\gamma p+\beta(1-c+\gamma c))}\right)\right)\right)^{\frac{1}{1-\theta}}$$

The steady state utility is

$$\begin{aligned}U &= \alpha \ln \mathrm{C} + \beta \ln \mathrm{G} \\ &= \alpha \ln\left((1-\mathrm{tA})k^{\theta}\right) + \beta \ln\left((1-\mathrm{c})\mathrm{tA}k^{\theta} + \gamma ptk^{\theta}(A-1) + 0.1\gamma mk^{\theta}\right)\end{aligned}$$

<u>Case 2</u>: $\lambda_t > 0$ implies $A_{i,t} = 1$

$$TR_{i,t} = m(1.1k_{i,t1}^{\theta} - k_{i,t}^{\theta})$$

At the steady state:

$$A{=}1; \quad k = \left(0.1\frac{1-\gamma}{\delta}m\right)^{\frac{1}{1-\theta}}$$

In the full effort case, steady state capital depends only on $m, \gamma, \delta, \theta$. However, this case can not hold each period since the local government has an incentive to reduce his tax effort while getting the same utility.

1.b Second order analysis:

Because the constraint qualification and first order condition are satisfied, then

$$D^2 L(x^*, \lambda^*) = D^2 f(x^*) + \sum_{i=1}^{j} \lambda_i^* D^2 g_i(x^*)$$

where *f* is the objective function and *j* is the number of constraints.

Since the model's inequality constraint is linear, its second order derivative is zero, that is, the second part of the above equation disappears.

So,

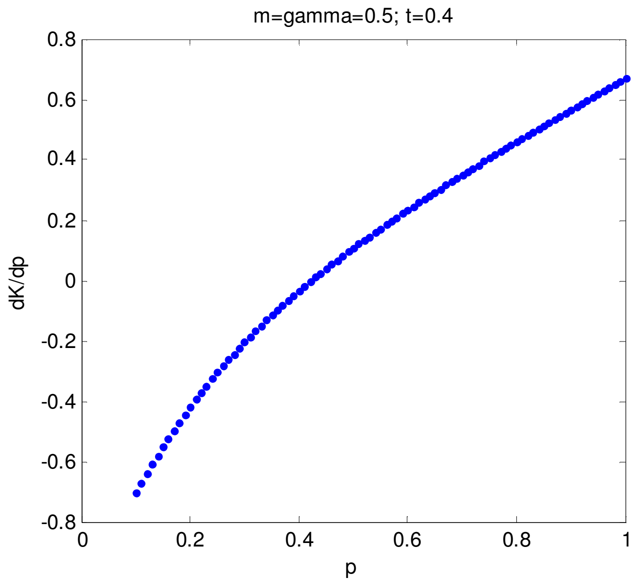
$$D^2L(A^*,\lambda^*) = -\underbrace{\frac{\alpha p}{c}(\frac{ty_{i,t}}{C_{i,t}})^2}_{>0} - \beta\underbrace{(\frac{1}{G_{i,t}})^2}_{>0}(\underbrace{\frac{(1-c)^2}{c}p(ty_{i,t})^2}_{>0} + \underbrace{(1-c)\gamma p(ty_{i,t})^2}_{>0} + \underbrace{\frac{1-c}{c}\gamma(pty_{i,t})^2}_{>0} + \underbrace{(\gamma pty_{i,t})^2}_{>0})$$

Therefore, $D^2L(A^*,\lambda^*) < 0$.

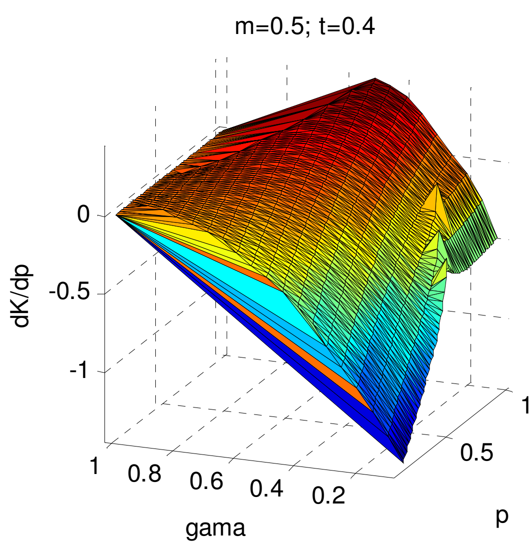
As a result, the second order condition is satisfied without any condition.

Appendix 2 Critical policy parameters

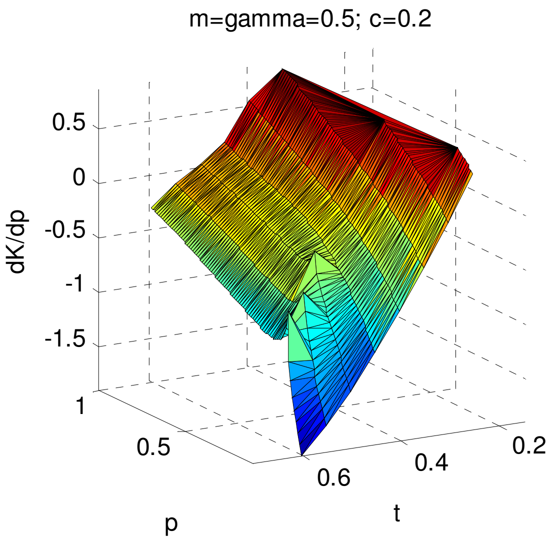
1. Punishment rate:



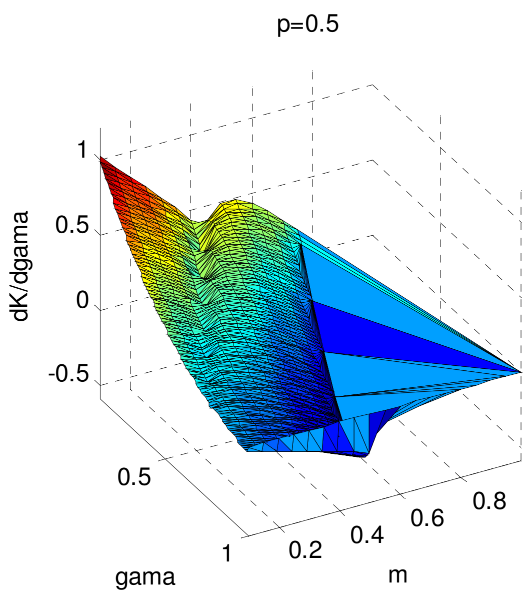
2. Gama: (highest impact of p is achieved for lower values of gama)



3. Tax rate:



4. The rate of directed investment



Appendix 3: Simulations of the Model's *Aggregates* (t=0.4; θ_1=0.1; θ_2=0.3, c=0.1)

(U: utility; Y: income; C: consumption; G: government spending; A: local tax collection effort; DWL/Y: deadweight loss in percentage of income; TR: transfers; k: capital stock).

t=0.4; theta1=0.1; theta2=0.3, c=0.1												***t=0.3; theta1=0.1; theta2=0.3, c=0.1***				
m	***0.5***	***0.5***	***0.5***			***0.4***	***0.4***	***0.4***			***0.5***	***0.5***	***0.5***			
p	***0.2***	***0.5***	***0.8***	*Impact of 0.3 increase in p*		***0.2***	***0.5***	***0.8***	*Impact of 0.3 increase in p*		***0.2***	***0.5***	***0.8***	*Impact of 0.3 increase in p*		
Gamma=0.8																
Capital	0.070	0.068	0.111	*-0.03*	*0.64*	0.048	0.048	0.091	*0.01*	*0.89*	0.118	0.177	0.285	*0.51*	*0.61*	
A	0.790	0.912	0.995	*0.15*	*0.09*	0.803	0.922	1.005	*0.15*	*0.09*	1.018	1.144	1.230	*0.12*	*0.08*	
U	-2.453	-2.488	-2.317	*-0.01*	*0.07*	-2.605	-2.623	-2.398	*-0.01*	*0.09*	-2.237	-2.078	-1.888	*0.07*	*0.09*	
Deficit	0.002	-0.004	0.010	*-3.61*	*3.29*	-0.008	-0.012	0.001	*-0.58*	*1.11*	0.024	0.046	0.093	*0.95*	*1.00*	
DWL/Y	-0.002	0.004	-0.009	*3.62*	*-3.10*	0.008	0.012	-0.001	*0.58*	*-1.10*	-0.021	-0.037	-0.068	*-0.81*	*-0.84*	
Y	1.052	1.047	1.140	*-0.01*	*0.09*	0.988	0.990	1.102	*0.00*	*0.11*	1.152	1.240	1.354	*0.08*	*0.09*	
Y1	0.740	0.738	0.772	*(Effect on: Y1/Y2):*		0.714	0.715	0.758	*(Effect on: Y1/Y2):*		0.776	0.806	0.841	*(Effect on: Y1/Y2):*		
Y2	0.313	0.309	0.368	*1.01*	*0.88*	0.273	0.274	0.344	*1.00*	*0.85*	0.376	0.435	0.513	*0.90*	*0.88*	
C	0.720	0.665	0.686	*-0.08*	*0.03*	0.670	0.624	0.659	*-0.07*	*0.06*	0.800	0.815	0.854	*0.02*	*0.05*	
G	0.448	0.511	0.597	*0.14*	*0.17*	0.432	0.494	0.585	*0.14*	*0.18*	0.474	0.569	0.673	*0.20*	*0.18*	
TR	0.035	0.034	0.055	*-0.03*	*0.64*	0.024	0.024	0.046	*0.01*	*0.89*	0.059	0.089	0.143	*0.51*	*0.61*	
Gamma=0.5																
Capital	0.204	0.135	0.174	*-0.34*	*0.29*	0.123	0.077	0.117	*-0.37*	*0.52*	0.358	0.490	0.653	*0.37*	*0.33*	
A	0.776	0.864	0.932	*0.11*	*0.08*	0.817	0.872	0.938	*0.07*	*0.08*	1.012	1.101	1.171	*0.09*	*0.06*	
U	-2.072	-2.243	-2.161	*-0.08*	*0.04*	-2.278	-2.457	-2.313	*-0.08*	*0.06*	-1.851	-1.734	-1.575	*0.06*	*0.09*	
Deficit	0.001	-0.014	-0.011	*-11.37*	*0.19*	0.773	-0.022	-0.020	*-1.03*	*0.10*	0.029	0.048	0.091	*0.68*	*0.88*	
DWL/Y	-0.001	0.012	0.009	*12.18*	*-0.22*	0.017	0.021	0.017	*0.24*	*-0.16*	-0.020	-0.032	-0.056	*-0.58*	*-0.73*	
Y	1.273	1.180	1.236	*-0.07*	*0.05*	1.161	1.070	1.151	*-0.08*	*0.08*	1.414	1.502	1.629	*0.06*	*0.09*	
Y1	0.816	0.786	0.804	*(Effect on: Y1/Y2):*		0.786	0.746	0.776	*(Effect on: Y1/Y2):*		0.859	0.883	0.916	*(Effect on: Y1/Y2):*		
Y2	0.457	0.394	0.432	*1.11*	*0.94*	0.394	0.323	0.375	*1.16*	*0.90*	0.555	0.619	0.713	*0.92*	*0.90*	
C	0.877	0.772	0.775	*-0.12*	*0.00*	0.793	0.697	0.719	*-0.12*	*0.03*	0.985	1.005	1.057	*0.02*	*0.05*	
G	0.477	0.502	0.557	*0.05*	*0.11*	0.450	0.476	0.536	*0.06*	*0.13*	0.505	0.574	0.653	*0.14*	*0.14*	
TR	0.041	0.027	0.035	*-0.34*	*0.29*	0.018	0.015	0.023	*-0.12*	*0.52*	0.072	0.048	0.148	*-0.33*	*2.07*	
	0.5															
Gamma=0.3	**0.3**															
Capital	0.221	0.122	0.073	*-0.45*	*-0.40*	0.123	0.040	0.006	*-0.67*	*-0.84*	0.540	0.671	0.932	*0.24*	*0.39*	
A	0.787	0.825	0.874	*0.05*	*0.06*	0.792	0.830	0.879	*0.05*	*0.06*	1.007	1.067	1.117	*0.06*	*0.05*	
U	-2.058	-2.284	-2.483	*-0.11*	*-0.09*	-2.278	-2.696	-3.398	*-0.18*	*-0.26*	-1.720	-1.640	-1.518	*0.05*	*0.07*	
Deficit	-0.009	-0.021	-0.027	*-1.30*	*-0.28*	-0.019	-0.026	-0.025	*-0.36*	*0.06*	0.031	0.045	0.076	*0.45*	*0.70*	
DWL/Y	0.007	0.018	0.025	*1.56*	*0.40*	0.017	0.027	0.034	*0.64*	*0.25*	-0.020	-0.028	-0.045	*-0.38*	*-0.59*	
Y	1.291	1.159	1.059	*-0.10*	*-0.09*	1.161	0.960	0.723	*-0.17*	*-0.25*	1.531	1.598	1.707	*0.04*	*0.07*	
Y1	0.845	0.778	0.742	*(Effect on: Y1/Y2):*		0.811	0.703	0.591	*(Effect on: Y1/Y2):*		0.891	0.908	0.935	*(Effect on: Y1/Y2):*		
Y2	0.522	0.381	0.317	*1.26*	*1.15*	0.446	0.257	0.132	*1.51*	*1.64*	0.640	0.690	0.772	*0.95*	*0.92*	
C	0.885	0.777	0.689	*-0.12*	*-0.11*	0.793	0.641	0.469	*-0.19*	*-0.27*	1.068	1.086	1.135	*0.02*	*0.04*	
G	0.475	0.468	0.470	*-0.02*	*0.01*	0.450	0.422	0.375	*-0.06*	*-0.11*	0.508	0.552	0.604	*0.09*	*0.09*	
TR	0.032	0.017	0.010	*-0.45*	*-0.40*	0.018	0.006	0.001	*-0.67*	*-0.84*	0.077	0.096	0.133	*0.24*	*0.39*	