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Abstract

The paper studies the effect that skilled labour mobility has on efficient education policy. The model is one of two periods in which a representative taxpayer decides on labour, education, and saving. The government can only use linear tax and subsidy instruments. It is shown that the mobility of skilled labour well constrains government's choice of policy instruments. The mobility does not however affect second best education policy in allocational terms. In particular, education should be effectively subsidized if, and only if, the elasticity of the earnings function is increasing in education. This rule applies regardless of whether labour is mobile or immobile.

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1. Introduction

As a result of globalization capital and labour have become more and more mobile. The increased mobility of tax bases constrains governments' use of revenue raising instruments. With lacking international harmonization of taxes, there are strong pressures to shift the burden of taxation away from mobile bases towards immobile ones. By doing so, governments aim at keeping productive mobile factors within the country. With regard to physical capital, the effect of mobility on optimal tax policy is, by now, well understood. For surveys of the literature see e.g. Wilson (1999) or Wilson and Wildasin (2004). Less clear is how governments should react efficiently when mobility relates to human capital. The aim of the present paper is to close the gap and to investigate the implications of skilled labour mobility for efficient tax policy. It is shown that the mobility of skilled labour well constrains governments' choice of policy instruments. By contrast, it does not however mean that governments should change the policy target in allocational terms. More precisely, it is shown that the same rule characterizing second-best education policy when labour is immobile also characterizes second-best education policy when labour is mobile.

The model which allows us to show this is a straightforward extension of the standard two-period life-cycle representative taxpayer model as used by Richter (2009, 2010). The analysis of optimal policy follows Ramsey's tradition. This means that the government can only use linear policy instruments and that the analysis has a pure focus on efficiency. Equity considerations are entirely ignored. The interested reader is asked instead to refer to the literature as surveyed, e.g., by Carneiro and Heckman (2003). Moreover, the present paper focuses on taxation and on the effects the use of potentially distortive instruments has on education. Hence, market failures are not modelled. Specifically, the potential need to intervene in education because of market failures is not taken into account.

The most closely related study is Schuppert (2007). Relying on a model with social mobility, she proves that the characterization of efficient education policy is not really affected by the mobility of skilled labour. The planner's first-order conditions are the same. The degree of mobility is irrelevant for the characterization of efficient education policy. The present paper extends Schuppert's irrelevance result and proves its general nature. The irrelevance does not rely on social mobility. It is obtained instead when mobility is the result of costly investment and when the set of distortionary policy instruments is sufficiently rich.

The results of the present paper and of Schuppert (2007) stand in some marked contrast with the literature. Most previous studies dealing with education policy stress the strong effect that

mobility has on optimal government policy. The rule is that mobility has a reducing effect on the strength of intervention. There are however differences with regard to the reason. According to one reason, the strength of intervention is reduced because of a reduced need. The typical scenario is one where the government intervenes because of market failure and mobility has an own efficiency enhancing effect. This may be so in the presence of production externalities (Stark and Wang, 2002), earning risks (Wildasin, 2000) or time inconsistent taxation (Andersson and Konrad, 2003). According to a second reason, the strength of intervention is reduced because of some diminished incentives to correct market failures. This may be so as a result of tax competition for high-skilled workers (Wildasin, 2000) or in the presence of intragenerational spillovers between students (Poutvaara and Kannainen, 2000). By contrast, the present paper makes the point that mobility is per se no reason to change education policy in allocational terms. The degree of mobility is irrelevant when characterizing second-best education policy.

The paper is structured as follows. Section 2 sets up the model of a representative taxpayer. In Section 3 second-best education policy is characterized. It is shown that the second-order elasticity rule derived by Richter (2010) for the small open economy equally holds for the closed economy. According to this rule, education should be effectively subsidized if, and only if, the elasticity of the earnings function is increasing in education. In the following sections it is shown that the second-order elasticity rule continues to characterize second-best education policy even if labour becomes mobile upon qualification. Various scenarios are studied. In Section 4 households only supply qualified labour abroad but they continue to consume at home ("labour mobility"). In Section 5 households work and consume abroad ("household mobility"). Both Sections 4 and 5 assume taxation according to the residence principle. This is different in Section 6 studying efficient tax policy subject to the source principle. The planner is then no longer free in her choice of tax instruments. It is clearly not efficient to tax mobile labour income at source. However, consumption can be taxed instead. It is shown that the switch to the source principle impacts the choice of tax instruments but not the planner's first-order condition of second-best education policy. Section 7 summarizes and points out connections to the literature.

2. The model

The model is taken from Richter (2009, 2010). It assumes a representative taxpayer living for two periods and deriving strictly increasing utility U from consumption C_i and strictly

decreasing disutility from non-leisure time L_i in periods *i*=1,2. $U=U(C_1, C_2, L_1, L_2)$ is strictly quasi-concave. L_2 is identical with second-period labour supply. By contrast, only $L_1 - E$ is time spent in the market, while *E* is time spent on education. First-period labour supply earns a constant wage rate ω_1; the return to second-period labour depends on the amount of education. It is paid $\omega_2 G(E)$, where ω_2 is constant while the earnings function *G*(*E*) displays positive but diminishing returns, $G'>0>G''$. The quantity L_2 is interpreted as qualified labour. Likewise, the quantities $L_1 - E$ and L_1 are interpreted as nonqualified labour and nonqualified non-leisure, respectively. Education causes an opportunity cost in forgone earnings and a monetary cost of tuition. Both costs are assumed to be linear in time. The cost of foregone earnings is denoted by $\omega_1 E$ and the cost of tuition is denoted by φE. The taxpayer has to respect the lifetime budget constraint,

$$C_1 + C_2 / \rho = \omega_1 (L_1 - E) + \omega_2 G(E) L_2 / \rho - \varphi E \,. \qquad (1)$$

In order to simply the analysis, consideration is restricted to utility functions which are quasi linear in first-period consumption and additive in periodic sub-utilities:

$$U(C_1, C_2, L_1, L_2) \;=\; C_1 - V_1(L_1) + U(C_2, L_2) \qquad (2)$$

The function *V* is strictly increasing and strictly convex. The representative taxpayer maximizes (2) in $C_1, C_2, L_1, L_2,$ and *E* subject to (1). This constrained maximization is obviously equivalent to the unconstrained one,

$$\max \; [\, \omega_1 (L_1 - E) + \omega_2 G(E) L_2 / \rho - \varphi E - C_2 / \rho - V_1(L_1) + U(C_2, L_2) \,] \qquad (3)$$

in C_2, L_1, L_2, and *E*. In what follows it is assumed that this maximization is well behaved. This means that there exists a unique interior solution which is differentiable in $\omega_1, \omega_2, \rho, \varphi$. The first-order conditions are:

$$\omega_1 = V_1'(L_1) \qquad (\lambda_1) \qquad (4)$$

$$\omega_2 G(E) / \rho = -U_L \qquad (\lambda_2) \qquad (5)$$

$$U_C = 1/\rho \qquad (\beta) \qquad (6)$$

$$\omega_2 G'(E) L_2 / \rho = \omega_1 + \varphi \qquad (\mu) \qquad (7)$$

The bracketed variables $\lambda_1, \lambda_2, \beta$, and μ are Lagrange multipliers of the planner's optimization we are going to set up. Equations (4) and (5) are the FOCs associated with optimal choices of non-leisure. Equations (6) and (7) characterize the optimal choice of second-period consumption and education, respectively. The price and cost variables $\omega_1, \omega_2, \rho, \varphi$ are quoted after taxes and subsidies. The prices before taxes and subsidies are denoted by w_1, w_2, r, f. For the sake of simplicity, first-period prices w_1, f are assumed to be exogenous while second-period prices w_2 and *r* are determined endogenously. The production of second period commodities, $F = F(H, K)$, is assumed to be linear homogeneous in human capital *H* and physical capital *K*. Profit maximization obviously implies:

$$F_H = w_2 \qquad (\alpha_w) \qquad (8)$$

$$F_K = r \qquad (\alpha_r) \qquad (9)$$

The government faces the need to raise a constant amount of revenue *T*. There are four linear tax instruments, each of which is distorting. The taxes are levied on period *i*'s labour income, on capital income, and on the cost of tuition. They are modelled implicitly as the difference between prices before and after tax. The tax on period *i*'s labour income is modelled by $w_i - \omega_i$, the tax on capital income by $r - \rho$, and the tax on the cost of tuition by $\varphi - f$. It goes without saying that each tax can well take on a negative value so that it is effectively a subsidy. We first look at second-best policy in the closed economy. This gives us a benchmark for second-best policies in the open economy.

3. Second-best policy for the closed economy

In the closed economy, factor supplies have to equate factor demands:

$$G(E)L_2 = H \qquad (\alpha_H) \qquad (10)$$

$$S = K \qquad (\alpha_K) \qquad (11)$$

According to equation (10), human capital is equated with the effective supply of qualified labour. According to equation (11), physical capital equals savings defined by

$$[C_2 - \omega_2 G(E)L_2]/\rho = S\,. \qquad (\sigma) \qquad (12)$$

In the closed economy, the planner maximizes the representative taxpayer's utility function (3) in the quantities $C_2, L_1, L_2, E, S, H, K$ and the prices $\omega_1, \omega_2, \rho, \varphi, w_2, r$ subject to the

behavioural constraints (4) – (9), the factor market clearing conditions (10) - (12), and the government's budget constraint,

$$(w_1 - \omega_1)(L_1 - E) + (\varphi - f)E$$

$$+ [(w_2 - \omega_2)G(E)L_2 + (r - \rho)S]/r = T. \qquad (\gamma) \qquad (13)$$

The budget constraint (13) implicitly assumes the existence of government bonds promising a rate of return of *r*. We shall refer to the stated maximization as *Problem CE* where *CE* stands for the closed economy. Assume that this maximization and all others still to follow are well behaved. This means that the planner's maximization has an interior solution which can be characterized by the first-order conditions. The sole objective of this paper is to study the effect that the mobility of labour and capital have on the first-order conditions characterizing efficient education policy.

Efficient policy is characterized in terms of wedges. Denote by

$$\Delta_{L_1} \equiv \frac{w_1 - \omega_1}{\omega_1} \qquad (14)$$

the tax wedge on non-qualified labour. It is the wedge with which we are going to relate the wedge on education defined by

$$\Delta_E \equiv \frac{w_2 G' L_2 / r - w_1 - f}{\omega_1 + \varphi} \underset{(7)}{=} \frac{w_2 / r}{\omega_2 / \rho} - \frac{w_1 + f}{\omega_1 + \varphi}. \qquad (15)$$

According to the right-hand side of (15), the wedge on education equals the difference between two ratios. The first ratio relates present returns before and after taxes and subsidies and the second ratio relates costs before and after taxes and subsidies. Hence the wedge vanishes if the ratio in returns equals the ratio in costs. Let us speak of effective subsidization if Δ_E is negative. According to (15), a negative value of Δ_E is the combined result of all four policy instruments. Effective subsidization is clearly reached by the statutory subsidization of the cost of tuition. This is however not the only way of reducing Δ_E. Other effective means are (i) increasing the tax on nonqualified labour and thus reducing the opportunity cost of education, (ii) reducing the tax on qualified labour and thus increasing the return to education, and finally (iii) taxing saving and thus increasing the return to education.

Denote by

$\nu_1 \equiv L_1 V_1'' / V_1' > 0$ the elasticity of marginal disutility of nonqualified labour, i.e. the inverse of the wage elasticity. Set

$\eta \equiv EG'/G$ the elasticity and

$\eta_\eta \equiv E\eta'/\eta$ the second-order elasticity of the earnings function.

Proposition 1 ("*Elasticity Rule for Education*"): If $\omega_1, \omega_2,$ and φ are optimally chosen,

$$\frac{\Delta_E}{\Delta_{L_1}} = -\frac{\eta_\eta}{\nu_1} . \tag{16}$$

Condition (16) has been derived before by Richter (2010) for the small open economy and taxes levied according to the residence principle. The condition is shown here to extend to the closed economy. This result is a corollary to Proposition 2 derived below. A straightforward implication of (16) is that education should not be distorted, Δ_E=0, if the elasticity of the earnings function, η, is constant. This well-known result - also named the Education Efficiency Proposition (Richter, 2009) - has been derived before in more elaborate models with heterogeneous taxpayers by Bovenberg and Jacobs (2005) and Jacobs and Bovenberg (2008). If η fails to be constant, then condition (16) requires distorting the choice of education in second best. To be more precise assume that that nonqualified labour income is taxed, Δ_{L_1} >0, and that the elasticity of the earnings function is increasing. In this case, (16) suggests that education should be effectively subsidized and that the effective rate of subsidization should increase monotonically in the second-order elasticity of the earnings function.

4. The small open economy and the residence principle

In the open economy home factor markets need not be cleared. Hence conditions (10) and (11) are no constraints to the planner's maximization. We begin studying efficient policy for the open economy by assuming that the residence principle applies in taxation. This means that all income earned on savings, rS, is liable to taxation at home. Equally, all qualified labour income, $w_2 G(E) L_2$, is taxed at home. We restrict consideration to the small open economy where the factor prices before taxes w_2 and r are exogenous and determined on world markets. The planner is assumed to maximize the representative taxpayer's utility function (3) in the quantities C_2, L_1, L_2, E, S and the prices $\omega_1, \omega_2, \rho, \varphi$ subject to the

behavioural constraints (4) – (9), the definition of savings (12), and the government's budget constraint (13). We shall refer to this maximization as *Problem OE-RP* where *OE* stands for the small open economy and *RP* for the residence principle.

Proposition 2: If returns to scale are constant, the efficient tax structure is independent of the production side. Hence, any solution of problem *CE* is necessarily a solution of problem *OE-RP*.

Proof: Let $\Lambda^{CE}, \Lambda^{OE-RP}$ be the Lagrangean objective functions associated with the problems *CE* and *OE-RP*, respectively. Then

$$\Lambda^{CE} = \Lambda^{OE-RP} + \alpha_w[F_H(H,K) - w_2] + \alpha_r[F_K(H,K) - r] + \alpha_H(GL_2 - H) + \alpha_K(S - K).$$

Taking partial derivatives of Λ^{CE} with respect to w_2 and r yields $\gamma GL_2/\rho = \alpha_w$ and $\gamma S/\rho = \alpha_r$. Relying on these conditions, on the factor-market clearing conditions, and on linear homogeneity of F one obtains

$$0 = \frac{\partial}{\partial x}\Lambda^{CE} = \alpha_w F_{Hx} + \alpha_r F_{Kx} - \alpha_x = \gamma[GL_2 F_{Hx} + SF_{Kx}]/\rho - \alpha_x = -\alpha_x.$$

for $x = H, K$. As a result,

$$0 = \frac{\partial}{\partial x}\Lambda^{CE} = \frac{\partial}{\partial x}\Lambda^{OE-RP} \quad \text{for all variables } x \neq w_2, r, H, K.$$

This proves Proposition 2.□

Proposition 2 is best interpreted as a corollary to the Production Efficiency Theorem of Diamond and Mirrlees (1971). *A priori* it is not perfectly clear whether the Production Efficiency Theorem applies in the present context where the taxpayer earns quasi-pure ability rent income, $Y(L_2) \equiv \max_E[\omega_2 GL_2/\rho - (\omega_1 + \varphi)E] > 0$. Notice that Proposition 2 is obtained without requiring Y to be skimmed off by taxation.

Proposition 1 is proved by evaluating

$$0 = \frac{\partial}{\partial x}\Lambda^{OE-RP} \quad \text{for } x = \varphi, \omega_1, \omega_2, L_1, E, \text{ and } S.$$

Note that the Elasticity Rule holds even if the planner does not optimize with respect to ρ. Saving does not need to be taxed efficiently and yet education policy should respect (16). Furthermore, the derivation of (16) does not rely on the first-order conditions associated with C_2 and L_2. These two observations will be exploited below.

5. Qualified household mobility

Problem *OE-RP* considers households supplying qualified labour abroad without migrating. They are immobile and their qualified labour income earned abroad is taxed at home. Compare this scenario with the one in which households become mobile upon qualification. This means that they are perfectly mobile in the second period. As before, their income is taxed in the country of residence. This scenario can be modelled by adding

$$U(C_2, L_2) = \bar{u} \qquad (17)$$

as an additional constraint to the planner's problem *OE-RP*.

Proposition 3: The Elasticity Rule for Education continues to characterize second best policy even if households become mobile upon qualification.

The proof follows from recognizing that the derivation of (16) makes no use of the first-order conditions associated with C_2 and L_2.

6. The small open economy and the source principle

According to the source principle factor incomes are taxed in the country where they are earned. Consider the scenario in which households are immobile and in which capital and qualified labour are perfectly mobile and taxed at source. As before, the home economy is assumed to be small. Hence factor prices before taxes, w_2 and r, are exogenous and determined on world markets. As a result, it is inefficient to tax savings or qualified labour effectively at source. The planner has instead to respect

$$\omega_2 = w_2 \text{ and } \rho = r \qquad (18)$$

as additional constraints. It seems fairly obvious that the Elasticity Rule (16) is not obtained if (18) is simply added as an additional constraint to *OE-RP*. The derivation of (16) relies on the assumption that ω_1, ω_2 and φ are feasible policy instruments. This means in particular that qualified labour income can be taxed at some rate that may differ from the tax on nonqualified labour and also from the subsidy paid to the cost of tuition. However, the planner may consider substituting the non-available tax on qualified labour by a consumption tax. As households are immobile by assumption they cannot evade this tax by migrating. Hence, consider the case where consumption is taxed. Two variants are conceivable. According to the first, consumption is taxed at rates that may differ between periods. According to the second variant, consumption is taxed uniformly. Obviously, uniform taxation is more constraining for the planner. Without loss of generality, we only study the uniform case.

The consumption tax is modelled implicitly by introducing a consumer price *q*. The difference to one, $q-1$, stands for the consumption tax rate. The household's budget constraint (1) is replaced with

$$q[C_1 + C_2 / r] = \omega_1(L_1 - E) + w_2 G(E) L_2 / r - \varphi E \,. \qquad (1')$$

The difference to (1) is that ω_2, ρ have been replaced with w_2, r and that *q* appears on the left-hand side. The implicit assumption is that payments for tuition are not liable to the consumption tax. The planner's new objective function is

$$\max\ [\frac{\omega_1}{q}(L_1 - E) + \frac{w_2}{q} G(E) L_2 / r - \frac{\varphi}{q} E - C_2 / r - V_1(L_1) + U(C_2, L_2)] \qquad (3')$$

and the control variables are the quantities C_2, L_1, L_2, E and the prices ω_1, φ and *q*.

The planner's constraints are (6),

$$\frac{\omega_1}{q} = V_1^{'}(L_1) \qquad (\lambda_1) \quad (4')$$

$$\frac{w_2}{q} G(E) / r = -U_L \qquad (\lambda_2) \quad (5')$$

$$\frac{w_2}{q} G'(E) L_2 / \rho = \frac{\omega_1}{q} + \frac{\varphi}{q} \qquad (\mu) \quad (7')$$

and the government's budget constraint,

$$(w_1 - \omega_1)(L_1 - E) + (\varphi - f)E + (q-1)[C_1 + C_2 / r] =$$

$$(w_1-\omega_1)(L_1-E)+(\varphi-f)E+\frac{q-1}{q}[\omega_1(L_1-E)+w_2G(E)L_2/r-\varphi E]\ =$$

$$(w_1-\frac{\omega_1}{q})(L_1-E)+(\frac{\varphi}{q}-f)E\ +\ (w_2-\frac{w_2}{q})G(E)L_2/r\ =T\,. \qquad (\gamma) \qquad (13')$$

We refer to this maximization as *Problem OE-SP* where *SP* stands for the source principle.

Proposition 4: Replace the non-feasible tax on mobile qualified labour by a consumption tax. The Elasticity Rule for Education then continues to characterize second-best policy even if capital and qualified labour are perfectly mobile and taxed at source.

Proof: Remember that (16) follows from solving

$$\max\ \Lambda^{OE-RP}\ \text{in}\ L_1, E, \omega_1, \omega_2, \varphi, \text{ and } S.$$

In particular, (16) does not rely on an optimal choice of ρ. Hence it is feasible to set $\rho = r$ and to treat (12) as a defining equation of *S*. Therefore, (16) follows after setting $\rho = r$ from solving

$$\max\ \Lambda^{OE-RP}\ \text{in}\ L_1, E, \omega_1, \omega_2, \text{ and } \varphi. \qquad (19)$$

Now set $\omega_1', \omega_2', \varphi'$ for $\omega_1/q, w_2/q, \varphi/q$. Solving (19) is obviously equivalent to

$$\max\ \Lambda^{OE-SP}\ \text{in}\ L_1, E, \omega_1', \omega_2', \varphi'. \qquad (20)$$

Hence, (16) follows from (20) just as (16) follows from (19).□

Propositions 3 and 4 imply that mobility of high skills does not affect second-best policy in allocational terms but only the choice of policy instruments. In particular, the tax on qualified labour income should be replaced with a tax on consumption when allowing for perfect mobility and when taxing according to the source principle. This result clearly generalizes previous findings by Schuppert (2007) who shows that the degree of international mobility of skilled labour is irrelevant for the characterization of efficient education policy when allowing for social mobility. The present study shows that the irrelevance result does not hinge on social mobility and that it holds in a much more general sense. More specifically, it holds when international mobility is the result of costly investment and when the set of distortionary policy instruments is sufficiently rich.

7. Summary

Economists have only recently started to understand the optimal setting of tax incentives for education. A major breakthrough is by Bovenberg and Jacobs (2005). The present paper contributes to the literature by studying the effect that skilled labour mobility has on efficient education policy in Ramsey's tradition. It does so by relying on the standard two-period life-cycle model of a representative household with endogenous consumption, labour, and education. The sole focus is on efficiency. Equity concerns as well as potential reasons of market failure are ruled out.

For such a setting Richter (2010) derives the second-order elasticity rule of education. According to this rule, education should be effectively subsidized if, and only if, the elasticity of the earnings function is increasing in education. More precisely, the effective subsidization should increase if the second-order elasticity – the elasticity of the elasticity - of the earnings function increases. If the elasticity of the earnings function is constant, education should not be distorted in second best. The latter result has become known as the Education Efficiency Proposition (Richter, 2009). It has been derived before by Bovenberg and Jacobs (2005), and Jacobs and Bovenberg (2008), and Richter (2009) in more elaborate models with heterogeneous taxpayers.

In the present paper it is shown that the second-order elasticity rule of education holds in various settings which only differ with respect to the assumed mobility of skilled labour. The original version of Richter (2010) is reinterpreted as a version characterizing second-best policy for a small open economy in which households are taxed according to the Residence Principle while supplying qualified labour abroad but consuming at home. Such a scenario is best described as a regime of “qualified labour mobility”. If production displays constant returns to scale, the second-order elasticity extends from the small open economy to the closed one with immobile labour (Proposition 2). Section 5 looks at “qualified household mobility” which means that households become mobile upon qualification and that they both work and consume abroad if they migrate. Assuming taxation according to the residence principle, it is shown again that the second-order elasticity rule characterizes the efficient education policy of the home country (Proposition 3).

In a regime in which income is taxed according to the source principle, mobility plays a more critical role when designing optimal government policy. For well-known reasons it is not efficient to tax mobile income at source. The burden of taxation is shifted backwards on

immobile factor incomes and this shifting is costly in terms of efficiency. However, consumption can be taxed instead. Accordingly, we argue that the switch to the source principle well impacts the choice of tax instruments but not necessarily the planner's first-order condition characterizing second-best education policy in allocational terms. More specifically, the second order elasticity rule continues to characterize the efficient education policy and the rule can be implemented by replacing the tax on mobile labour income with a tax on consumption (Proposition 4). The second best is however only sustained if the consumption tax is combined with instruments targeting immobile labour income and the cost of tuition. The optimal signs of these additional instruments deserve specific notice. One may be inclined to speculate that immobile labour income should be subsidized in a regime in which mobile labour income is not taxed. However, such a speculation is driven by equity concerns while the present paper' sole focus is on efficiency. As Richter (2009) demonstrates for a model of differentiated labour taxation, it is second best to distort qualified labour less than nonqualified labour. The reason is that the supply of qualified labour is governed by a double margin. The tax on qualified labour not only distorts the supply of labour but also the choice of education. Applying this result to the present context suggests that the immobile labour income should bear a positive tax in second best when the tax on mobile labour income is replaced with a tax on consumption financed by both, mobile and immobile labour income.

The bottom line of the present paper is that the question of qualified labour mobility is irrelevant when characterizing efficient government policy in allocational terms. This result generalizes previous findings by Schuppert (2007). While she relates her irrelevance result to social mobility, the present study shows that the irrelevance is obtained if international mobility is the result of costly investments and if the government's set of policy instruments is sufficiently rich. The irrelevance does not hinge on social mobility. Note however that two critical assumptions are made. Concerns with regard to equity and market failure have been fully ignored. Hence the irrelevance result is one of pure tax efficiency. Further research will have to clarify whether the irrelevance result has a chance of surviving when allowing for concerns of equity and market failure.

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