Working Paper
On the Incidence of a Tax on Pure Rent with Infinite Horizons

Nota di Lavoro, Fondazione Eni Enrico Mattei, No. 160.2004

Provided in Cooperation with:
Fondazione Eni Enrico Mattei (FEEM)


This Version is available at:
http://hdl.handle.net/10419/73988

Terms of use:
Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.
On the Incidence of a Tax on Pure Rent with Infinite Horizons
Alberto Petrucci

DECEMBER 2004
KTHC - Knowledge, Technology, Human Capital

Alberto Petrucci, Department of Economics LUISS G. Carli

The opinions expressed in this paper do not necessarily reflect the position of Fondazione Eni Enrico Mattei
Corso Magenta, 63, 20123 Milano (I), web site: www.feem.it, e-mail: working.papers@feem.it
On the Incidence of a Tax on Pure Rent with Infinite Horizons

Summary
This paper studies the incidence of a tax on pure rent within an intertemporal optimizing model of capital accumulation and endogenous labor with infinite-lived agents. Two cases are considered for the labor market: the neoclassical theory, characterized by perfectly competitive wages and no unemployment, and the incentive-wage theory of the labor-turnover type, characterized by real wage rigidity and structural unemployment. In the neoclassical equilibrium, the land rent tax is unshifted when consumers are lump-sum compensated for the tax. If tax revenues are used to finance government spending, pure rent taxation increases employment, boosts capital accumulation and reduces real wage as well as land yield. In the incentive-wage economy, the land rent tax, regardless of the way in which tax proceeds are employed, always increases employment, capital stock, and land reward, but exerts an ambiguous effect on the wage rate.

Keywords: Pure rent taxation, Capital formation, Land, Structural unemployment

JEL Classification: E21, E62, H22

This paper was written while I was visiting the Economics Department of Stanford University. I am grateful to Ned Phelps for intellectual stimulation, and Alberto Pozzolo for useful comments. Financial support from CNR is gratefully acknowledged.

Address for correspondence:
Alberto Petrucci
Department of Economics
LUISS G. Carli
via Tommasini 1
00161 Rome
Italy
Phone: +39 06 8650 6770
Fax: +39 06 8650 6513
E-mail: albpetru@luiss.it
1 Introduction

Within a finite-lived economy with endogenous capital formation and inelastic labor supply, the Ricardian proposition that a tax on pure rent is unshifted does not hold. The imposition of a tax on land rental income, by reducing the value of unimproved land, diverts saving from the fixed asset toward reproducible capital, i.e. the alternative asset, spurring capital formation and raising output. The rate of interest falls, while the wage rate and the marginal productivity of land increase. The price of land, after the initial drop, may increase in the final equilibrium because of the interest rate decline. These results, discovered by Feldstein (1977), are very robust as they are independent of alternative uses of the land tax revenues.

The Feldstein results, however, hinge on the crucial assumption of non-altruistic overlapping-generations demographics. Calvo, Kotlikoff and Rodriguez (1979) (henceforth CKR) demonstrate that in an intertemporal optimizing model of saving and capital formation with Ricardian demographics, like a dynamic life-cycle model with bequests and intergenerational transfers (as in Barro, 1974), the Ricardian effects of a compensated rent tax are confirmed. Although the CKR analysis assumes that the tax revenues are returned to consumers in a lump-sum fashion, the way in which rent tax proceeds are employed is fundamentally immaterial for the incidence of the land rent tax.\footnote{This result (which holds provided that agent preferences are strongly separable in consumption and the utility of future generations) comes about because, as labor supply is inelastic, capital stock is pinned down by the "modified golden rule". See also Kotlikoff and Summers (1987).}

1
Does an elastic labor supply or a variable employment level matter for the land rent tax shifting and the resource allocation in a Barro–Ramsey–Ricardo economy?

The purpose of this paper is to answer this question by investigating the effects of a rent tax in a model of optimal saving with infinite-lived agents and different labor market structures. Two cases are considered for the labor market: the neoclassical theory, characterized by perfectly competitive wages, variable labor hours and no unemployment, and the incentive-wage theory, characterized by real wage rigidity, fixed labor hours per worker and a structural rate of unemployment due to labor-turnover considerations.

In the neoclassical analysis, we show that the consequences of a rent tax depend on the way in which the tax proceeds are used by the government. A land rent tax is neutral for the macroeconomic equilibrium (except for the price of land) when consumers are lump-sum compensated for the tax, as in CKR. If the tax revenues are spent unproductively by the government, instead, a "Feldstein effect" on capital stock and output is obtained. We depart from CKR, as government spending, by changing consumption, affects labor-leisure choices and hence capital stock.

In a labor-turnover economy, where firms are motivated to adopt an incentive-wage policy to curtail labor-turnover costs (as in Hoon and Phelps, 1992, and Phelps, 1994), the imposition of a rent tax stimulates employment and boosts capital accumulation regardless of the use of the tax proceeds.

---

2Since our objective is to study an economy that exhibits "Ricardian debt neutrality", we directly use a Ramsey-Ricardo immortal economy (instead of a life-cycle economy with intergenerational transfers à la Barro).
These effects stem from the fall in the land value induced by the tax, which, by decreasing income from wealth, dampens employee quits and hence reduces the natural rate of unemployment. In the labor-turnover case, our findings differ substantially from the CKR ones.

The paper is organized as follows. Section 2 analyzes the implications of the land rent tax in the neoclassical economy. The effects of the rent tax within the labor-turnover economy are investigated in Section 3. Section 4 briefly concludes.

2 Neoclassical economy

2.1 The model

Consider a real economy populated by infinite-lived consumers that decide on consumption $C$, labor supply $L$, accumulation of nonhuman wealth $W$, and portfolio composition. Population is constant.

Assuming logarithmic preferences, the consumers’ behavior is described by the following set of relationships\textsuperscript{3}

\[
\frac{\dot{C}}{C} = r - \rho \tag{1a}
\]

\[
1 - L = \frac{(1 - \alpha)C}{\alpha v} \tag{1b}
\]

\[
C + W = rW + vL + S \tag{1c}
\]

\textsuperscript{3}See, for example, Judd (1987).
where $r$ is the rate of return on wealth, $\rho$ the exogenous rate of time preference, $v$ the real wage, $S$ lump-sum transfers from the government and $\alpha$ a preference parameter. Equation (1a) is the Euler law of motion of consumption, (1b) is a Cobb-Douglas labor supply, and (1c) the consumers’ budget constraint.

Nonhuman wealth is composed of two perfectly substitutable assets, physical capital $K$ and unimproved land $T$; that is, $W = K + qT$, where $q$ is the price of land. Perfect asset substitutability requires

$$qr = (1 - \tau)R + \dot{q},$$

where $R$ is the land reward, $\tau$ is a proportional tax rate on land rent and perfect foresight has been assumed.

Firms operate in competitive output and factor markets. They produce output $X$ through capital, land and labor by means of a linearly homogeneous production function of the usual type: $X = F(K, T, L)$. Factors of production are Edgeworth complementary. Maximum profit requires that the factors of production are paid their marginal products

$$F_K(K, T, L) = r \quad (3a)$$

$$F_T(K, T, L) = R \quad (3b)$$

$$F_L(K, T, L) = v. \quad (3c)$$

The economy is endowed with a fixed quantity of unimproved land $\tilde{T}$, fully used in production. The normalization $\tilde{T} = 1$ is used.
The government maintains a balanced budget. Tax revenues are either rebated back to consumers or spent unproductively; that is
\[
\tau RT = S + G, \quad (4)
\]
where \(G\) represents unproductive government spending.

The good market equilibrium requires that output always equals consumption plus investment plus government spending; that is
\[
Y = C + \dot{K} + G. \quad (5)
\]

2.2 Effects of the tax on pure rent

Our analysis considers the comparative statics effects of an exogenous change in \(\tau\), accompanied alternatively, in order to preserve the government budget balance, by the compensatory accommodation of either \(S\) or \(G\).

Since in the long-run \(F_K(\bar{K}, \bar{L}) = \rho\) (overbars denote long-run variables), we can express capital as an implicit function of labor as follows
\[
\bar{K} = K(\bar{L}), \quad K' = \frac{F_{KL}}{F_{KK}} > 0. \quad (6)
\]
Using (6), the core model of the economy can be specified as follows
\[
1 - \bar{L} = \frac{(1 - \alpha)[Y(\bar{L}) - G]}{\alpha v(\bar{L})}, \quad Y' > 0, \quad v' < 0 \quad (7a)
\]
\[
\bar{q} \rho = (1 - \tau)R(\bar{L}), \quad R' > 0 \quad (7b)
\]
\[ \tau R(\bar{L}) = S + G, \quad (7c) \]

where \( Y(\bar{L}) = F[K(\bar{L}), \bar{L}], v(\bar{L}) = F_L[K(\bar{L}), \bar{L}], \) and \( R(\bar{L}) = F_T[K(\bar{L}), \bar{L}]. \)

Consider the case in which consumers are lump-sum compensated for the rent tax, i.e. \( S = \tilde{S} \) and \( G = \tilde{G} \); \( \tilde{G} \) is the exogenous level of government spending. The increase in the land tax leaves labor hours unchanged, as \((7a)\), which uniquely determines \( \bar{L} \), is independent of \( \tau \) and \( \tilde{S} \). Capital stock, consumption and factor prices are also unaltered. The sole effect of the rent tax is to reduce the price of land.

Thus, the tax on pure rental income is unshifted. This result, which confirms the CKR discovery, is not surprising since saving is not modified (because of the "Ricardian equivalence") and the land tax does not affect labor-leisure choices.

When the compensatory finance is based on the endogenous adjustment of government spending, i.e. \( G = \tilde{G} \) and \( S = \tilde{S} \) (where \( \tilde{S} \) represents exogenous lump-sum transfers), the consequences of a rise in \( \tau \) on the allocation of resources differ. Substituting \( \tilde{G} \) from \((7c)\) into \((7a)\) and totally differentiating, we get

\[ \frac{d \bar{L}}{d \tau} = \frac{(1 - \alpha) \tilde{R}}{\Delta} > 0, \]

where \( \Delta = (1 - \alpha)(Y' - \tau R') + \alpha [\tilde{v} - (1 - \bar{L})v'] > 0. \)

\textsuperscript{4}The derivatives of the functions \( Y(\bar{L}), v(\bar{L}) \) and \( R(\bar{L}) \) have the following expressions:
\[
Y' = \frac{(F_L F_{KK} - F_K F_{KL})}{F_{KK}} > 0, \quad v' = \frac{(F_{KK} F_{LL} - F_{KL}^2)}{F_{KK}} < 0, \quad \text{and} \quad R' = -\frac{\bar{L} (F_{KK} F_{LL} - F_{KL}^2)}{F_{KK}} > 0.
\]
Thus, a rise in the land tax increases labor hours and, through (6), capital stock. Output is pulled up, while consumption is crowded out. The before-tax return on land increases and the wage rate falls. The price of land falls less than the capitalized amount of the tax, because of the rise in $\bar{R}$.

When tax revenues are used to increase government spending, the consideration of an endogenous labor supply invalidates the Ricardian result on the incidence of a pure rent tax, giving support to a "Feldstein effect" on capital stock and output.\(^5\) The endogenous adjustment of government spending alters the allocation of resources and results in the land tax shifting because the induced change in consumption affects labor supply.\(^6\)

3 Labor-turnover economy

3.1 The model

In the neoclassical economy, there is no unemployment, since labor supply and demand instantaneously adjust, so as to eliminate any kind of disequilibrium that may arise in the labor market.

In this section, we consider a labor-turnover economy, which offers an explanation for the natural rate of unemployment. The analysis is based on the works of Hoon and Phelps (1992 and 1996) and Phelps (1994, ch. 7), which originate from Phelps (1968) and Salop (1979). According to such an

\(^5\)Contrary to Feldstein (1977), in this case the wage rate falls, while the interest rate remains constant.

\(^6\)If the government budget constraint were maintained balanced through the compensatory change in consumption taxation, the effects of a $\tau$ shock would be qualitatively the same as those obtained under the endogenous adjustment of government spending.
approach, firms find it optimal to set wages above the competitive level with the scope of raising the cost of employees being fired, as a result discouraging quittings among employees and reducing the firm’s labor-turnover costs. The firms’ incentive-wage policy results in involuntary unemployment.

Output $X$ is produced by atomistic firms by means of the production function $X = F(K, T, N)$, where $N$ represents the stock of employees. $F(\cdot)$ retains all the properties postulated before.

Workers, who are prone to quit their work-place in order to find a ”better” job, base quitting decisions on the wage policy of the firm, the prospects of the labor market and their nonwage income. After the workers quit, firms face turnover costs for recruiting and training new employees. Suppose, as in Hoon and Phelps (1996), that the unit cost of training a new worker is $\beta h$, where $\beta$ is a positive parameter and $h$ the gross hiring rate as a fraction of the workforce; labor-turnover costs are given by $\beta h N$.

Each firm decides on hirings, wages and factor use by maximizing the present discounted value of its cash-flow subject to the accumulation constraint for the stock of employees. The relative change in the stock of employees is given by the difference between the number of workers hired, $hN$, and the number of workers that quit, $\zeta N$, where $\zeta$ is the quittig rate; that is

$$\dot{N} = N[h - \zeta\left(\frac{\bar{z}}{v} - \frac{y^W}{v}\right)],$$

(8)

where $\bar{z}$ represents the expected value of real earnings of a quitting worker, $v$ the real wage per worker and $y^W$ nonwage income per capita. The quitting rate is assumed to be a positive convex function of the wage paid elsewhere in the economy in comparison with the wage paid by the firm and the nonwage
income in comparison with the firm’s wage, i.e. $\zeta_i > 0$, $\zeta_{ii} > 0$ for $i = 1, 2$; we assume for simplicity that $\zeta_{12} = 0$.

The representative firm’s intertemporal optimization problem is

$$\max \int_0^\infty [F(K, T, N) - rK - RT - vN - \beta hN] e^{-rt} dt$$

subject to (8) and the initial condition $N(0) = N_0$. $z$ and $y^W$ are taken as given by the firm. The first-order conditions for maximum profit imply\(^7\)

$$F_K(K, T, N) = r$$

$$F_T(K, T, N) = R$$

$$b = \beta$$

$$\dot{b} - rb = -F_N(K, T, N) + v + (\beta - b)h + b\zeta\left(\frac{z}{v^2}, \frac{y^W}{v^2}\right)$$

$$1 = b\left(\zeta_1\frac{z}{v^2} + \zeta_2\frac{y^W}{v^2}\right),$$

together with (8) and the transversality condition $\lim_{t \to \infty} bNe^{-rt} = 0$.

The shadow price of trained employees $b$ is constant according to (9c). Equation (9d) represents the firm’s labor demand. Using (9c), the labor demand can be rewritten as

\(^7\)The concavity of the production function and the assumed signs of the second derivatives of the quitting function ensure that the second-order conditions of the firm’s optimality problem are satisfied.
\[ v = F_N(K, T, N) - \beta[\zeta((\frac{z}{v}, \frac{y^W}{v}) + r)]. \] (9d’)

In a labor-turnover economy, the demand for labor depends on the marginal productivity of labor, the quitting rate and the rate of interest.

Equation (9e) represents the incentive-wage equation. It states that the optimal wage set by firms ensures that the marginal cost of a wage rise is just equal to the marginal benefit (in terms of reduced quitting-turnover costs).

According to Calvo (1979) and Salop (1979), the expected real wage of a quitting worker in (9d’) and (9e) can be specified as \( z = Nv \). Nonwage income is given by the interest income earned on wealth, i.e. \( y^W = rW \). In this labor-turnover economy, wealth is given by the sum of physical capital, the value of land and the value of trained employees \( \beta N \); that is, \( W = K + qT + \beta N \).

The resource constraint implies that output less labor-turnover costs must be equal to aggregate demand; that is

\[ X - \beta hN = C + K + G. \] (10)

The demand-side of the economy and the government budget constraint are the same as before, once \( L \) is replaced by \( N \).

---

8In the expression for \( z \), the labor force has been normalized to one and unemployment benefits have been disregarded.

9This is because \( \beta \) can be interpreted as the value of one unit of labor asset and \( N \) is the amount of an asset held by the average worker. See Hoon and Phelps (1992 and 1996).
3.2 Effects of the tax on pure rent

The steady state model can be summarized as follows

$$\tilde{v} = F_N(\tilde{K}, \tilde{N}) - \beta \zeta \left[ \tilde{N}, \frac{\rho(\tilde{K} + \tilde{q} + \beta \tilde{N})}{\tilde{v}} \right] - \beta \rho \quad (11a)$$

$$\tilde{v} = \beta \left[ \zeta_1(\cdot, \cdot) \tilde{N} + \zeta_2(\cdot, \cdot) \frac{\rho(\tilde{K} + \tilde{q} + \beta \tilde{N})}{\tilde{v}} \right] \quad (11b)$$

$$\tilde{q} \rho = (1 - \tau) F_T(\tilde{K}, \tilde{N}) \quad (11c)$$

$$F_{K}(\tilde{K}, \tilde{N}) = \rho, \quad (11d)$$

where the expression for $\tilde{v} = \tilde{N} \tilde{v}$, the definition of $\tilde{y}^W$ and $\tilde{T}=1$ have been used.

Consumption and, according to the compensatory public financing scheme, either lump-sum transfers or government spending can be computed residually through (10) or the government budget constraint (7c), respectively.

Using (11d), we can express capital stock as a function of the stock of the employees, i.e. $\tilde{K} = K(\tilde{N})$ (where $K' = -\frac{F_{KN}}{F_{KK}} > 0$). Employing this relationship, we can eliminate capital from (11a)-(11c) and obtain

10 The expressions for the derivatives of the $\Omega(\cdot)$, $\Gamma(\cdot)$, and $R(\cdot)$ functions are given in the Appendix. Equation (12a) gives the demand price of labor. Given $\tilde{q}$, an increase in $N$ (and hence in $\tilde{K}$), in raising quitings of employees (because of the improved labor market prospects and the higher non-wage income), decreases the demand wage. An increase in the land price, by increasing non-wage income and hence quitings, likewise reduces the demand wage at a given $\tilde{N}$ (and hence $\tilde{K}$).

Equation (12b) represents the equilibrium labor supply price. The supply wage is increasing in $\tilde{N}$, given $\tilde{q}$, and in $\tilde{q}$, given $\tilde{N}$. An increase in employment pushes the supply
\[ \bar{v} = \Omega(N, \bar{q}), \quad \Omega_N < 0, \quad \Omega_q < 0; \] (12a)

\[ \bar{v} = \Gamma(N, \bar{q}), \quad \Gamma_N > 0, \quad \Gamma_q > 0; \] (12b)

\[ \bar{q} \rho = (1 - \tau) R(\bar{N}), \quad R' > 0. \] (12c)

Differentiating (12a)-(12c) yields

\[ \frac{d\bar{N}}{d\tau} = \frac{\tilde{R}(\Gamma_q - \Omega_q)}{\Pi} > 0, \]

\[ \frac{d\bar{v}}{d\tau} = \frac{\tilde{R}(\Gamma_q \Omega_N - \Gamma_N \Omega_q)}{\Pi} \leq 0, \]

\[ \frac{d\bar{q}}{d\tau} = -\frac{\tilde{R}(\Gamma_N - \Omega_N)}{\Pi} < 0, \]

where \( \Pi = (1 - \tau) R'(\Gamma_q - \Omega_q) + \rho(\Gamma_N - \Omega_N) > 0 \).

A rise in the land rent tax stimulates employment, exerts an ambiguous effect on the wage rate, and lowers the land price. The rationale for these effects is as follows. The reduction of the land value, induced by the rent tax, causes a fall in nonwage income, thereby dampening quittings of employees. This stimulates the demand for labor and gives firms the incentive to pay lower wages. As a consequence, employment rises, while the wage rate may rise given that quittings are stimulated via the expected wage of quitting workers and nonwage income. \( \bar{v} \) is increasing in \( \bar{q} \) since a higher land value implies a higher nonwage income, which in stimulating quittings requires firms to raise their wage supply at a given \( \bar{N} \) (and \( \bar{K} \)).

14
rise or fall.\footnote{The ambiguous effect on the wage rate is due to the upward shift of the labor demand and the simultaneous downward shift of the incentive-wage equation.} Higher employment in turn implies higher capital stock from (11d) and hence output. The land reward is pulled up. Despite the rise in employment and capital, income from wealth drops unambiguously because of the fall in the land price.

These results hold independently of whether rent tax revenues are distributed to consumers or spent unproductively by the government. The compensatory financing scheme for the government budget, instead, matters for the consequence of the rent tax on consumption. If the tax revenues are rebated to consumers, consumption goes up; otherwise if tax revenues are employed to finance a rise in government spending, consumption falls.\footnote{A compensatory reduction of the consumption tax rate that may alternatively accompany the rise in \( \tau \) would increase consumption, but leave the other qualitative effects of the rent tax unaffected.}

\section{Conclusions}

We have studied the consequences of a land rent tax within an infinite-lived economy, paying special attention to the role of the labor market structure.\footnote{The ambiguous effect on the wage rate is due to the upward shift of the labor demand and the simultaneous downward shift of the incentive-wage equation.} Two types of labor market have been explored: one with competitive wages and no unemployment, and one with incentive-wages and structural unemployment.

In the case of an endogenous labor supply and competitive wages, we have shown that the connection between Ricardian demographics and the Ricardian incidence of a tax on pure rent, discovered by CKR, requires an
additional element to be satisfied: a special compensatory financing scheme for the government budget. When tax revenues are transferred back to consumers, such a connection is preserved. If the higher land rent taxes are, instead, accompanied by a rise in government spending, capital stock, labor and output are spurred, the wage rate declines, and the pre-tax land reward is pulled up. In this case, the connection identified by CKR no longer holds.

In a model with structural unemployment, we have found that the land rent tax increases employment and capital stock, while it reduces income from wealth and the stock of nonhuman wealth because of the fall in the land value. Precisely, the mechanics of these effects are as follows. The tax-induced reduction in the price of land, by lowering income from wealth compared to the workers’ wage, decreases the quittings of employees. Firms then find it optimal to pay lower wages in order to dampen quittings and curtail labor-turnover costs. Lower wages and quittings stimulate labor demand. Employment is increased and therefore capital formation is spurred. The effect on the wage rate is ambiguous, while the land reward is increased.
References


Hoon, H.T. and Phelps, E.S. (1992), ”Macroeconomic Shocks in a Dynamized Model of the Natural Rate of Unemployment”, American Economic Review, 82, 889-900.


APPENDIX

Derivatives of the $\Omega(\ , \ )$, $\Gamma(\ , \ )$ and $R(\ )$ functions

The derivatives of the $\Omega(\ , \ )$, $\Gamma(\ , \ )$ and $R(\ )$ functions in system (12) are given by the following expressions

$$\Omega_{\chi} = \frac{\bar{v} \left( \frac{v'}{\beta} - \xi_1 \right) - \xi_2 \rho (K' + \beta)}{\xi_1 \bar{N}} < 0; \quad \Omega_q = -\frac{\xi_2 \rho}{\xi_1 \bar{N}} < 0;$$

$$\Gamma_{\chi} = \frac{\left( \xi_1 + \bar{N} \xi_{11} \right) + \left( \frac{\xi_2}{v} + \frac{\bar{y}^W}{v^2} \xi_{22} \right) \rho (K' + \beta)}{\left[ \frac{1}{\beta} + \left( \xi_2 + \frac{\bar{y}^W}{v} \xi_{22} \right) \frac{\bar{y}^W}{v^2} \right]} > 0;$$

$$\Gamma_q = \frac{\rho \left( \frac{\xi_2}{v} + \frac{\bar{y}^W}{v^2} \xi_{22} \right)}{\left[ \frac{1}{\beta} + \left( \xi_2 + \frac{\bar{y}^W}{v} \xi_{22} \right) \frac{\bar{y}^W}{v^2} \right]} > 0;$$

$$R' = -\frac{\bar{N} \left( F_{KK} F_{NN} - F_{KN}^2 \right)}{F_{KK}} > 0,$$

where $K' = -\frac{F_{KN}}{F_{KK}} > 0$ and $v' = \frac{(F_{KK} F_{NN} - F_{KN}^2)}{F_{KK}} < 0.$
NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI
Fondazione Eni Enrico Mattei Working Paper Series

Our Note di Lavoro are available on the Internet at the following addresses:
http://www.feem.it/Feem/Pub/Publications/WPapers/default.html

NOTE DI LAVORO PUBLISHED IN 2003

PRIV 2.2003 Ibolya SCHINDELE: Theory of Privatization in Eastern Europe: Literature Review
PRIV 3.2003 Wietze LISE, Claudia KEMFERT and Richard S.J. TOL: Strategic Action in the Liberalised German Electricity Market
KNOW 5.2003 Reyer GERLAGH: Induced Technological Change under Technological Competition
ETA 6.2003 Efrem CASTELNUOVO: Squeezing the Interest Rate Smoothing Weight with a Hybrid Expectations Model
SIEV 7.2003 Anna ALBERINI, Alberto LONGO, Stefania TONIN, Francesco TROMBETTA and Margherita TURVANI: The Role of Liability, Regulation and Economic Incentives in Brownfield Remediation and Redevelopment: Evidence from Surveys of Developers
NRM 8.2003 Elissaios PAPYRAKIS and Reyer GERLAGH: Natural Resources: A Blessing or a Curse?
CLIM 9.2003 A. CAPARRÓS, J.-C. PEREAU and T. TAZDAÏT: North-South Climate Change Negotiations: a Sequential Game with Asymmetric Information
KNOW 10.2003 Giorgio BRUNELLO and Daniele CHECCHI: School Quality and Family Background in Italy
CLIM 11.2003 Efrem CASTELNUOVO and Marzio GALEOTTI: Learning By Doing vs Learning By Researching in a Model of Climate Change Policy Analysis
KNOW 15.2003 Tuzin BAYCAN LEVENT, Enso MASUREL and Peter NIJKAMP (lx): Diversity in Entrepreneurship: Ethnic and Female Roles in Urban Economic Life
KNOW 16.2003 Alexandra BITUSIKOVA (lx): Post-Communist City on its Way from Grey to Colourful: The Case Study from Slovakia
KNOW 17.2003 Billy E. VAUGHN and Katarina MLEKOV (lx): A Stage Model of Developing an Inclusive Community
KNOW 18.2003 Selma van LONDEN and Arie de RUIJTER (lx): Managing Diversity in a Glocalizing World Coalition Theory Network
PRIV 20.2003 Giacomo CALZOLARI and Alessandro PAVAN (lx): Monopoly with Resale
PRIV 22.2003 Marco LiCalzi and Alessandro PAVAN (lx): Tilting the Supply Schedule to Enhance Competition in Uniform-Price Auctions
PRIV 23.2003 David ETTINGER (lx): Bidding among Friends and Enemies
PRIV 24.2003 Hannu VARTIAJEN (lx): Auction Design without Commitment
PRIV 26.2003 Christine A. PARLOUR and Uday RAJAN (lx): Rationing in IPOs
PRIV 27.2003 Kjell G. NYBORG and Illya A. STREBULAEV (lx): Multiple Unit Auctions and Short Squeezes
PRIV 28.2003 Anders LUNANDER and Jan-Eric NILSSON (lx): Taking the Lab to the Field: Experimental Tests of Alternative Mechanisms to Procure Multiple Contracts
PRIV 30.2003 Emiel MAASLAND and Sander ONDERSTAL (lx): Auctions with Financial Externalities
ETA 31.2003 Michael FINUS and Bianca RUNDSHAGEN: A Non-cooperative Foundation of Core-Stability in Positive Externality NTU-Coalition Games
KNOW 32.2003 Michele MORETTO: Competition and Irreversible Investments under Uncertainty
PRIV 33.2003 Philippe QUIRION: Relative Quotas: Correct Answer to Uncertainty or Case of Regulatory Capture?
KNOW 34.2003 Giuseppe MEDA, Claudio PIGA and Donald SIEGEL: On the Relationship between R&D and Productivity: A Treatment Effect Analysis
ETA 35.2003 Alessandra DEL BOCA, Marzio GALEOTTI and Paola ROTA: Non-convexities in the Adjustment of Different Capital Inputs: A Firm-level Investigation
GG 36.2003  Matthieu GLACHANT: Voluntary Agreements under Endogenous Legislative Threats
PRIV 37.2003  Narjess BOUBAKRI, Jean-Claude COSSET and Omrane GUEDHAM: Postprivatization Corporate Governance: the Role of Ownership Structure and Investor Protection
CLIM 38.2003  Rolf GOLOMBEK and Michael HOEIJ: Climate Policy under Technology Spillovers
KNOW 39.2003  Slim BEN YOUSSEF: Transboundary Pollution, R&D Spillovers and International Trade
CTN 40.2003  Carlo CARRARO and Carmen MARCHIORI: Endogenous Strategic Issue Linkage in International Negotiations
KNOW 42.2003  Tino GOESCHL and Timothy SWANSON: On Biology and Technology: The Economics of Managing Biotechnologies
CLIM 44.2003  Katrin MILLOCK and Céline NAUGES: The French Tax on Air Pollution: Some Preliminary Results on its Effectiveness
PRIV 45.2003  Bernardo BORTOLOTTI and Paolo PINOTTI: The Political Economy of Privatization
SIEV 46.2003  Elbert DJIKGRAAF and Herman R.J. VOLLEBERGH: Burn or Bury? A Social Cost Comparison of Final Waste Disposal Methods
ETA 47.2003  Jens HORBACH: Employment and Innovations in the Environmental Sector: Determinants and Econometrical Results for Germany
CLIM 48.2003  Lori SNYDER, Nolan MILLER and Robert STAVINS: The Effects of Environmental Regulation on Technology Diffusion: The Case of Chlorine Manufacturing
CTN 50.2003  László A. KÖCZY and Luc LAUWERS (lxix): The Minimal Dominant Set is a Non-Empty Core-Extension
CTN 51.2003  Matthew O. JACKSON (lxix): Allocation Rules for Network Games
CTN 52.2003  Ana MAULEON and Vincent VANNETELBOSCH (lxii): Farsightedness and Cautiousness in Coalition Formation
CTN 54.2003  Matthew HAAG and Roger LAGUNOFF (lxii): On the Size and Structure of Group Cooperation
CTN 55.2003  Taiji FURUSAWA and Hideo KONISHI (lxii): Free Trade Networks
CTN 56.2003  Halis Murat YILDIZ (lxii): National Versus International Mergers and Trade Liberalization
CTN 57.2003  Santiago RUBIO and Alistair ULPH (lxii): An Infinite-Horizon Model of Dynamic Membership of International Environmental Agreements
KNOW 58.2003  Carole MAIGNAN, Dino PINELLI and Gianmarco I.P. OTTAVIANO: ICT, Clusters and Regional Cohesion: A Summary of Theoretical and Empirical Research
KNOW 59.2003  Giorgio BELLETTINI and Gianmarco I.P. OTTAVIANO: Special Interests and Technological Change
ETA 60.2003  Ronnie SCHOB: The Double Dividend Hypothesis of Environmental Taxes: A Survey
CLIM 61.2003  Michael FINUS, Ekko van Ierland and Robert DELLINK: Stability of Climate Coalitions in a Cartel Formation Game
SIEV 63.2003  Alberto PETRUCCI: Taxing Land Rent in an Open Economy
CLIM 64.2003  Joseph E. ALDY, Scott BARRETT and Robert N. STAVINS: Thirteen Plus One: A Comparison of Global Climate Policy Architectures
SIEV 65.2003  Edi DEFRANCESCO: The Beginning of Organic Fish Farming in Italy
SIEV 66.2003  Klaus CONRAD: Price Competition and Product Differentiation when Consumers Care for the Environment
CLIM 68.2003  Zhongxiang ZHANG: Open Trade with the U.S. Without Compromising Canada’s Ability to Comply with its Kyoto Target
KNOW 69.2003  David FRANTZ (lxii): Lorenzo Market between Diversity and Mutation
KNOW 70.2003  Ercole SORI (lxii): Mapping Diversity in Social History
KNOW 71.2003  Lilijana DERU SIMIC (lxii): What is Specific about Art/Cultural Projects?
KNOW 72.2003  Natalya V. TARANOVA (lxii): The Role of the City in Fostering Intergroup Communication in a Multicultural Environment: Saint-Petersburg’s Case
KNOW 73.2003  Kristine CRANE (lxii): The City as an Arena for the Expression of Multiple Identities in the Age of Globalisation and Migration
KNOW 74.2003  Kazuma MATOBA (lxii): Glocal Dialogue- Transformation through Transcultural Communication
KNOW 75.2003  Catarina REIS OLIVEIRA (lxii): Immigrants’ Entrepreneurial Opportunities: The Case of the Chinese in Portugal
KNOW 76.2003  Sandra WALLMAN (lxii): The Diversity of Diversity - towards a typology of urban systems
KNOW 77.2003  Richard PEARCE (lxii): A Biologist’s View of Individual Cultural Identity for the Study of Cities
KNOW 78.2003  Vincent MERK (lxii): Communication Across Cultures: from Cultural Awareness to Reconciliation of the Dilemmas
KNOW 79.2003  Giorgio BELLETTINI, Carlotta BERTI CERONI and Gianmarco I.P. OTTAVIANO: Child Labor and Resistance to Change
ETA 80.2003  Michele MORETTO, Paolo M. PANTEGHINI and Carlo SCARPA: Investment Size and Firm’s Value under Profit Sharing Regulation
NOTE DI LAVORO PUBLISHED IN 2004

IEM 1.2004  Anil MARKANDYA, Suzette PEDROSO and Alexander GOLUB: Empirical Analysis of National Income and So2 Emissions in Selected European Countries

ETA 2.2004  Masahisa FUJITA and Shlomo WEBER: Strategic Immigration Policies and Welfare in Heterogeneous Countries

PRA 3.2004  Adolfo DI CARLUCCIO, Giovanni FERRI, Cecilia FRALE and Ottavio RICCHI: DoPrivatizations Boost Household Shareholding? Evidence from Italy

ETA 4.2004  Victor GINSBURGH and Shlomo WEBER: Languages Disenfranchisement in the European Union


PRA 7.2004  Sandro BRUSCO, Giuseppe LOPOMO and S. VISWANATHAN (Ixxv): Merger Mechanisms

PRA 8.2004  Wolfgang AUSSENEG, Pegaret PICHLER and Alex STOMPER (Ixxv): IPO Pricing with Bookbuilding, and a When-Issued Market

PRA 9.2004  Pegaret PICHLER and Alex STOMPER (Ixxv): Primary Market Design: Direct Mechanisms and Markets


PRA 11.2004  Bjarni BRENDSTRUP and Harry J. PAARSCH (Ixxv): Nonparametric Identification and Estimation of Multi-Unit, Sequential, Oral, Ascending-Price Auctions With Asymmetric Bidders

PRA 12.2004  Ohad KADAN (Ixxv): Equilibrium in the Two Player, k-Double Auction with Affiliated Private Values

PRA 13.2004  Maarten C.W. JANSEN (Ixxv): Auctions as Coordination Devices

PRA 14.2004  Gadi FIBICH, Arieh GAVIOUS and Aner SELA (Ixxv): All-Pay Auctions with Weakly Risk-Averse Buyers

PRA 15.2004  Orly SADE, Charles SCHNITZLEIN and Jaime F. ZENDER (Ixxv): Competition and Cooperation in Divisible Good Auctions: An Experimental Examination

PRA 16.2004  Maria STRYSZOWSKA (Ixxv): Late and Multiple Bidding in Competing Second Price Internet Auctions

CCMP 17.2004  Slim Ben YOUSSEF: R&D in Cleaner Technology and International Trade

NRM 18.2004  Angelo ANTOCI, Simone BORGHESI and Paolo RUSSU (Ixxv): Biodiversity and Economic Growth: Stabilization Versus Preservation of the Ecological Dynamics

SIEV 19.2004  Anna ALBERINI, Paolo ROSATO, Alberto LONGO and Valentina ZANATTA: Information and Willingness to Pay in a Contingent Valuation Study: The Value of S. Erasmo in the Lagoon of Venice


NRM 21.2004  Jacqueline M. HAMILTON (Ixxv): Climate and the Destination Choice of German Tourists


NRM 23.2004  Pius ODUNGA and Henk FOLMER (Ixxv): Profiling Tourists for Balanced Utilization of Tourism-Based Resources in Kenya

NRM 24.2004  Jean-Jacques NOWAK, Mondher SAHLI and Pasquale M. SGRO (Ixxv): Tourism, Trade and Domestic Welfare


NRM 26.2004  Juan Luis EUGENIO-MARTÍN, Noelia MARTÍN MORALES and Riccardo SCARPA (Ixxv): Tourism and Economic Growth in Latin American Countries: A Panel Data Approach

NRM 27.2004  Raúl Hernández MARTÍN (Ixxv): Impact of Tourism Consumption on GDP. The Role of Imports


NRM 29.2004  Marian WEBER (Ixxv): Assessing the Effectiveness of Tradable Landuse Rights for Biodiversity Conservation: an Application to Canada's Boreal Mixedwood Forest

NRM 30.2004  Trond BJORNDAL, Phoebe KOUNDOURI and Sean PASCOE (Ixxv): Output Substitution in Multi-Species Trawl Fisheries: Implications for Quota Setting


CTN 33.2004  Wilson PEREZ: Divide and Conquer: Noisy Communication in Networks, Power, and Wealth Distribution


ETA 39.2004  Alberto CAVALIERE: Price Competition with Information Disparities in a Vertically Differentiated Duopoly

PRA 40.2004  Andrea BIGANO and Stef PROOST: The Opening of the European Electricity Market and Environmental Policy: Does the Degree of Competition Matter?

CCMP 41.2004  Micheal FINUS (Ixxv): International Cooperation to Resolve International Pollution Problems

KTHC 42.2004  Francesco CRESPI: Notes on the Determinants of Innovation: A Multi-Perspective Analysis
compiled
Kenji ELIZA, Debaj Ray and Ronny RAZIN (lx): Group Decision-Making in the Shadow of Disagreement

Sanjeev GOYAL, Marco van der LEIJ and José Luís MORAGA-GONZÁLEZ (lx): Economics: An Emerging Small World?

Edward CARTWRIGHT (lx): Learning to Play Approximate Nash Equilibria in Games with Many Players

Finn R. FØRSUND and Michael HOEL: Properties of a Non-Competitive Electricity Market Dominated by Hydroelectric Power

Elissatos PAPYRKIS and Reyer GERLAGH: Natural Resources, Investment and Long-Term Income

Marzio GALEOTTI and Claudia KEMFERT: Interactions between Climate and Trade Policies: A Survey

A. MARKANDYA, S. PEDROSO and D. STREIMIKIENĖ: Energy Efficiency in Transition Economies: Is There Convergence Towards the EU Average?

Rolf GOLOMBEK and Michael HOEL: Climate Agreements and Technology Policy

Sergei IZMALKOV (lx): Multi-Unit Open Ascending Price Efficient Auction

Gianmarco I.P. OTTAVIANO and Giovanni PERSI: Cities and Cultures

Massimo DEL GATTO: Agglomeration, Integration, and Territorial Authority Scale in a System of Trading Cities. Centralisation versus devolution

Pierre-André JOUVEY, Philippe MICHEL, and Gilles ROTILLON: Equilibrium with a Market of Permits

Bob van der ZWAAN and Reyer GERLAGH: Climate Uncertainty and the Necessity to Transform Global Energy Supply

Francesco BOSELLO, Marco LAZZARIN, Roberto ROSON and Richard S.J. TOL: Economy-Wide Estimates of the Implications of Climate Change: Sea Level Rise

Siddhartha BANDYOPADHYAY and Mandar OAK: Party Formation and Coalitional Bargaining in a Model of Proportional Representation

Hans-Peter WEIZKAR, Michael FINUS and Juan-Carlos ALTAMIRANO-CABRERA: The Impact of Surplus Sharing on the Stability of International Climate Agreements

Chiara M. TRAVISI and Peter NIKAMP: Willingness to Pay for Agricultural Environmental Safety: Evidence from a Survey of Milan, Italy, Residents

Chiara M. TRAVISI, Raymond J. G. M. Florax and Peter NIKAMP: A Meta-Analysis of the Willingness to Pay for Reductions in Pesticide Risk Exposure

Valentina BOSETTI and David TOMBERLIN: Real Options Analysis of Fishing Fleet Dynamics: A Test

Alessandra GORIA e GEMBARELLI: Economic Evaluation of Climate Change Impacts and Adaptability in Italy

Massimo FLORIO and Mara GRASSENI: The Missing Shock: The Macroeconomic Impact of British Privatisation

John BENNETT, Saul ESTRIN, James MAW and Giovanni URGĀ: Privatisation Methods and Economic Growth in Transition Economies

Kira BØRNER: The Political Economy of Privatization: Why Do Governments Want Reforms?

Pehr-Johan NORBÄCK and Lars PERSSON: Privatization and Restructuring in Concentrated Markets

Angela GRANZOTTO, Fabio PRANOVI, Simone LIBRALATO, Patrizia TORRICELLI and Danilo PRA: The Political Economy of Privatization: Why Do Governments Want Reforms?

Valentina PAPONETTI and Dino PINELLI: Scientific Advice to Public Policy-Making

Paolo A.L.D. NUNES and Laura ONOFRI: The Economics of Warm Glow: A Note on Consumer’s Behavior and Public Policy Implications

Patrick CAYRADE: Investments in Gas Pipelines and Liquefied Natural Gas Infrastructure. What is the Impact on the Security of Supply?

Valeria COSTANTINI, Francesco GRACCEVA, Anil MARKANDYA and Giorgio VICINI: The Cooperative Theory of Two Sided Matching Problems: A Re-examination of Some Results

Chiara M. TRAVISI, Raymond J. G. M. Florax and Peter NIKAMP: Willingness to Pay for Agricultural Environmental Safety: Evidence from a Three-Country Contingent Valuation Study

Valeria PAPONETTI and Dino PINELLI: Scientific Advice to Public Policy-Making

Paulo A.L.D. NUNES and Laura ONOFRI: The Economics of Warm Glow: A Note on Consumer’s Behavior and Public Policy Implications

Patrick CAYRADE: Investments in Gas Pipelines and Liquefied Natural Gas Infrastructure. What is the Impact on the Security of Supply?

Valeria COSTANTINI and Francesco GRACCEVA: Oil Security. Short- and Long-Term Policies

Valeria COSTANTINI and Francesco GRACCEVA: Social Costs of Energy Disruptions

Christian EGGENHOFER, Kyriakos GIALOLOU, Giacomo LUCIANI, Marcoes BOOTS, Martin SCHEEPERS, Valeria COSTANTINI, Francesco GRACCEVA, Anil MARKANDYA and Giorgio VICINI: Market-Based Options for Security of Energy Supply

David FISK: Transport Energy Security. The Unseen Risk?

Giacomo LUCIANI: Security of Supply for Natural Gas Markets. What is it and What is it not?

L.J. de VRIES and R.A. HAKVOORT: The Question of Generation Adequacy in Liberalised Electricity Markets

Alberto PETRUCCI: Asset Accumulation, Fertility Choice and Nondegenerate Dynamics in a Small Open Economy

Carlo GIUPPONI, Jaroslav MYSLIK and Anita FASSIO: An Integrated Assessment Framework for Water Resources Management: A DSS Tool and a Pilot Study Application

Paul MENSINK: Instant Efficient Pollution Abatement Under Non-Linear Taxation and Asymmetric Information: The Differential Tax Revisited

Mauro FABIANO, Gabriella CAMARSA, Rosanna DURSI, Roberta IVALDI, Valentina MARIN and Francesca PALMISANI: Integrated Environmental Study for Beach Management: A Methodological Approach

Irena GROSFIELD and Iraj HASHI: The Emergence of Large Shareholders in Mass Privatized Firms: Evidence from Poland and the Czech Republic

Maria BERRITTELLA, Andrea BIGANO, Roberto ROSON and Richard S.J. TOL: A General Equilibrium Analysis of Climate Change Impacts on Tourism

Royer GERLAGH: A Climate-Change Policy Induced Shift from Innovations in Energy Production to Energy Savings

Elissios PAPYRakis and Reyer GERLAGH: Natural Resources, Innovation, and Growth

Bernardo BORTOLOTTI and Mara FACCIO: Reluctant Privatization

Riccardo SCARPA and Mara THIENE: Destination Choice Models for Rock Climbing in the Northeast Alps: A Latent-Class Approach Based on Intensity of Participation


Santiago J. RUBIO: On Capturing Oil Rents with a National Excise Tax Revisited

Ascensión ANDINA DIAZ: Political Competition when Media Create Candidates’ Charisma

Anna ALBERINI: Robustness of VSL Values from Contingent Valuation Surveys

Gernot KLEPPER and Sonja PETERSON: Marginal Abatement Cost Curves in General Equilibrium: The Influence of World Energy Prices

Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEV: Cheap Talk, Gullibility, and Welfare in an Environmental Taxation Game

ZhongXiang ZHANG: The World Bank’s Prototype Carbon Fund and China

Reyer GERLAGH and Marjan W. HOFKES: Time Profile of Climate Change Stabilization Policy

Chiara D’ALPAOS and Michele MORETTO: The Value of Flexibility in the Italian Water Service Sector: A Real Option Analysis

Patrick BAJARI, Stephanie HOUGHTON and Steven TADELIS: Bidding for Incomplete Contracts

Susan ATHEY, Jonathan LEVIN and Enrique SEIRA: Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions

David GOLDREICH: Behavioral Biases of Dealers in U.S. Treasury Auctions

Roberto BURGUET: Optimal Procurement Auction for a Buyer with Downward Sloping Demand: More Simple Economics


Victor GINSBURGH, Patrick LEGROS and Nicolas SAHUQUET: How to Win Twice at an Auction. On the Incidence of Commissions in Auction Markets

Claudio MEZZETTI, Aleksandar PEKEČ and Ilia TSETLIN: Sequential vs. Single-Round Uniform-Price Auctions

John ASKER and Estelle CANTILLON: Equilibrium of Scoring Auctions

Philip A. HAILE, Han HONG and Matthew SHUM: Nonparametric Tests for Common Values in First-Price Sealed-Bid Auctions

François DEGEORGE, François DERRIEN and Kent L. WOMACK: Quid Pro Quo in IPOs: Why Bookbuilding is Dominating Auctions

Barbara BUCHNER and Silvia DALL’OLIO: Russia: The Long Road to Ratification. Internal Institution and Pressure Groups in the Kyoto Protocol’s Adoption Process

Carlo CARRARO and Marzio GALEOTTI: Does Endogenous Technical Change Make a Difference in Climate Policy Analysis? A Robustness Exercise with the FEEM-RICE Model

Alejandro M. MANELLI and Daniel R. VINCENT: Environmental Innovation, War of Attrition and Investment Grants

Valentina ROSETTI, Marzio GALEOTTI and Alessandro LANZA: How Consistent are Alternative Short-Term Climate Policies with Long-Term Goals?


William BROCK and Anastasios XEPAPADEAS: Spatial Analysis: Development of Descriptive and Normative Methods with Applications to Economic-Ecological Modelling

Alberto PETRUCHI: On the Incidence of a Tax on PureRent with Infinite Horizons
2003 SERIES

CLIM  Climate Change Modelling and Policy  (Editor: Marzio Galeotti)
GG    Global Governance  (Editor: Carlo Carraro)
SIEV  Sustainability Indicators and Environmental Valuation  (Editor: Anna Alberini)
NRM   Natural Resources Management  (Editor: Carlo Giupponi)
KNOW  Knowledge, Technology, Human Capital  (Editor: Gianmarco Ottaviano)
IEM   International Energy Markets  (Editor: Anil Markandya)
CSRM  Corporate Social Responsibility and Management  (Editor: Sabina Ratti)
PRIV  Privatisation, Regulation, Antitrust  (Editor: Bernardo Bortolotti)
ETA   Economic Theory and Applications  (Editor: Carlo Carraro)
CTN   Coalition Theory Network

2004 SERIES

CCMP  Climate Change Modelling and Policy  (Editor: Marzio Galeotti)
GG    Global Governance  (Editor: Carlo Carraro)
SIEV  Sustainability Indicators and Environmental Valuation  (Editor: Anna Alberini)
NRM   Natural Resources Management  (Editor: Carlo Giupponi)
KTHC  Knowledge, Technology, Human Capital  (Editor: Gianmarco Ottaviano)
IEM   International Energy Markets  (Editor: Anil Markandya)
CSRM  Corporate Social Responsibility and Management  (Editor: Sabina Ratti)
PRIV  Privatisation, Regulation, Antitrust  (Editor: Bernardo Bortolotti)
ETA   Economic Theory and Applications  (Editor: Carlo Carraro)
CTN   Coalition Theory Network