CAHIERS DE RECHERCHE / WORKING PAPERS

02-09

**Poverty-reducing
tax reforms with
heterogeneous agents**

Jean-Yves DUCLOS
et
Paul MAKDISSI
et
Quentin WODON

UNIVERSITÉ DE SHERBROOKE
Faculté des lettres et sciences humaines
Département d'économique

CAHIERS DE RECHERCHE / WORKING PAPERS

02-09

**Poverty-reducing
tax reforms with
heterogeneous agents**

Jean-Yves DUCLOS
et
Paul MAKDISSI
et
Quentin WODON

UNIVERSITÉ DE SHERBROOKE
Faculté des lettres et sciences humaines
Département d'économique

Poverty-Reducing Tax Reforms with Heterogeneous Agents*

Jean-Yves Duclos[†], Paul Makdissi[‡] and Quentin Wodon[§]

February 2002

Abstract

The poverty impact of indirect tax reforms is analyzed using sequential stochastic dominance methods. This allows agents to differ in dimensions that cannot always be precisely captured within the usual money-metric indicators of living standards. Examples of such dimensions include household size and composition, temporal or spatial variation in price indices, and individual needs and “merits”.

Keywords: Poverty, Efficiency, Tax Reform, Stochastic Dominance, Equivalence scales

JEL Numbers: D12, D63, H21, I32

* This paper was funded through the World Bank Research Support Budget under the research project “The impact of changes in prices, taxes, subsidies and stipends on poverty when households differ in needs” and has also benefitted from the support of SSHRC, the MIMAP programme of IDRC and Bureau de la recherche of Université de Sherbrooke.

[†] CRÉFA, Université Laval, Québec. Corresponding address: CRÉFA, Département d’économique, Pavillon De Sève, Université Laval, Sainte-Foy, Québec, Canada, G1K 7P4. Email: jyves@ecn.ulaval.ca

[‡] Département d’économique and CEREF, Université de Sherbrooke, 2550 boulevard de l’Université, Sherbrooke, Québec, Canada, J1K 2R1; email: paul.makdissi@courrier.usherb.ca

[§] LCSPR, World Bank, 1818 H Street, NW, Washington, DC 20433, USA, Email: qwodon@worldbank.org.

1 Introduction

Analyzing the social impact of tax reforms can be done in two ways. The first specifies a particular form for the social evaluation function (SEF) and then searches for an optimal tax structure. The nature of that optimal tax structure is then conditional on the choice of the specific SEF. The second route assumes that we do not know precisely what the SEF is (or should be). The search is then for tax reforms that can improve on the existing tax system for a whole class of SEF – *viz*, it is a search for “socially-efficient” reforms.

Searches for socially-efficient *marginal* tax reforms have been recently carried out using marginal stochastic dominance tests. Two tests have been proposed. The first test was introduced by Yitzhaki and Slemrod (1991) and compares the concentration curves of two commodities. The second test was proposed by Makdissi and Wodon (2002) and Duclos, Makdissi and Wodon (2002) and compares “consumption dominance” curves. The first of these two tests covers the class of all SEF that are averse to inequality – namely, it tests for marginal second-order dominance. The second test can be designed to cover the social impact of tax reforms at any order of dominance.

This note extends the poverty results of Makdissi and Wodon (2002) to allow agents to differ in dimensions that cannot always be precisely captured within the usual money-metric indicators of living standards. Examples of such dimensions include temporal or spatial variation in price indices, varying individual needs, or heterogenous social or political “merits”. All such dimensions have the common property of often being difficult to measure precisely. For expositional simplicity, we follow in this paper much of the previous literature on multidimensional dominance and focus on the difficulty involved in *equivalizing* living standards in the presence of heterogenous household size and composition (on this, see *inter alia* Buhman *et al.*, 1987, Atkinson and Bourguignon (1982, 1987), Atkinson (1991), and Jenkins and Lambert (1993)).

In the spirit of Mayshar and Yitzhaki (1996), we thus derive sequential stochastic dominance conditions that can be used to check whether an indirect tax reform is efficient over classes of SEF and over general classes of assumptions on the shape of equivalence scales. Unlike Mayshar and Yitzhaki (1996), who consider second-order dual social-welfare tests, we consider poverty dominance of arbitrary ethical order using primal tests. Robustness is then also obtained over ranges of poverty line for each household

type.

2 Measuring poverty

Individuals are members of households that are heterogenous in size k . There are n different household sizes. For expositional simplicity, we assume that individuals are otherwise homogenous. We denote by $f_k(y)$ the density function of *per capita* income among individuals who are members of group k , and assume it to be nil outside of the interval $[0, a]$ – where a is greater than the maximum *per capita* income of all household types and is also greater than the maximum conceivable individual poverty line. Hence, $\int_0^a f_k(y) dy = 1$ for all k . Denote by θ_k the population share of individuals who are members of households of size k . We suppose that the government wishes to reduce an additive aggregate poverty index denoted generally by

$$P = \sum_{k=0}^n \theta_k \int_0^a p_k(y^E(q, y, k; q^R)) f_k(y) dy, \quad (\text{A1})$$

where $p_k(y^E)$ is the finite contribution to aggregate poverty of an individual who is member of group k and whose real *per capita* income is given by y^E . For anyone in poverty, $p_k(y^E) \geq 0$, but $p_k(y^E) = 0$ whenever y^E exceeds the poverty line of group k , given by z_k . We further denote by z_k^+ the maximum conceivable poverty line that we may wish to consider for each group k . It must therefore be that $z_k \leq z_k^+$ for all k .

y^E is implicitly defined by

$$v(q^R, y^E, k) = v(q, y, k), \quad (1)$$

where q is the vector of consumption prices that equals production prices e (normalized to one and assumed constant) plus indirect taxes t , $q = e + t$, q^R is a reference price vector, and $v(\cdot)$ is the indirect utility function.

In order to develop sequential stochastic dominance conditions of order s , we further require that the poverty measure $p_k(\cdot)$ be a continuous function that is s -time differentiable over $[0, a]$. This, we call assumption A2. We also require that

$$(-1)^l p_1^{(l)}(y^E) \geq (-1)^l p_2^{(l)}(y^E) \geq \dots (-1)^l p_n^{(l)}(y^E) \geq 0 \quad \forall l \in \{1, 2, \dots, s\} \quad (\text{A3})$$

where $p_k^{(l)}(\cdot)$ is the l -th derivative of $p_k(\cdot)$. The class of all poverty measures that obey assumptions A1, A2 and A3 is denoted by Π^s .¹ Note that this formulation is very general with respect to the choice of poverty lines z_k . All that is required is that $z_k \leq z_k^+$ and that the choices of the implicit z_k in the $p_k(\cdot)$ do not contradict assumptions A1, A2 and A3.

The normative interpretation of the various orders of *unidimensional* poverty dominance is discussed in some detail in Duclos, Makdissi and Wodon (2002). Note that assumption A2 for $s = 1$ implies that an increase in *per capita* real income weakly reduces poverty, whatever the value of k . Living in small households presumably reduces, however, the opportunities for sharing resources and thus for benefitting from economies of scales in the production of welfare. At a given value of *per capita* income y^E , individuals living in small households can then be considered to have a lower overall level of welfare than for those living in larger ones. For a given real income y^E , the potential for significant poverty reduction is then assumed by A2 to be greater for individuals living in smaller households. As pointed out in Duclos and Makdissi (2001), this is a relatively straightforward application of Sen's (1997) Weak Equity Axiom.

For $s = 2$, assumption A2 says that the potential for poverty reduction decreases as we move toward the poverty line. This implies that an equalizing transfer from a richer to a poorer individual of the same group will weakly decrease poverty. Assumption A2 also implies that (*ceteris paribus*) this decreasing effect is stronger for equalizing transfers across individuals who are members of smaller households. Poverty indices that are members of Π^3 are sensitive to "favorable composite transfers" (see Kolm (1976) and Kakwani (1980)), and the more so, the smaller the size of the households from which the individuals involved in these transfers are drawn. The interpretation of the normative content of higher orders of Π^s can be done using the generalized transfers of Fishburn and Willig (1984) together with a "weak version" (analogous to Sen's Weak Equity Axiom) of a higher-order normative principle.

¹The continuity assumption A2 together with the assumption that $p_k(y^E) = 0$ for the non-poor excludes s -related levels of discontinuities at the poverty line, a point which is clearly discussed in Zheng (1999).

3 Poverty-reducing fiscal reforms

We wish to find a commodity j whose tax rate can be increased for the benefit of a revenue-neutral fall in the tax rate of a commodity i . This fiscal reform should reduce poverty. Let $x_{ik}(q, y)$ be the consumption of the i th commodity by an individual with *per capita* income y in a household of size k and facing prices q . Average consumption of the i th commodity is denoted by X_i :

$$X_i = \sum_{k=1}^n \theta_k \int_0^a x_{ik}(q, y) dF_k(y). \quad (2)$$

Per capita commodity tax revenue, R , can be expressed as

$$R = \sum_{l=1}^I t_l X_l \quad (3)$$

where I is the number of commodities in the economy. Revenue neutrality of the marginal tax reform requires that

$$dR = \left[X_i + \sum_{l=1}^I t_l \frac{\partial X_l}{\partial q_i} \right] dq_i + \left[X_j + \sum_{l=1}^I t_l \frac{\partial X_l}{\partial q_j} \right] dq_j = 0. \quad (4)$$

It is simple to show that equation (4) may be rewritten as

$$dq_j = -\alpha \left(\frac{X_i}{X_j} \right) dq_i, \quad (5)$$

where

$$\alpha = \frac{1 + \frac{1}{X_i} \sum_{l=1}^I t_l \frac{\partial X_l}{\partial q_i}}{1 + \frac{1}{X_j} \sum_{l=1}^I t_l \frac{\partial X_l}{\partial q_j}}. \quad (6)$$

Following Wildasin (1984), we may interpret the parameter α as the differential economic efficiency cost of raising one dollar of public funds by taxing the j th *versus* the i th commodity.

The impact of the tax reform on the poverty indicator $p_k(y^E(q, y, k; q^R))$ is

$$\begin{aligned} & dp_k(y^E(q, y, k; q^R)) \\ &= p_k^{(1)}(y^E(q, y, k; q^R)) \left[\frac{\partial y^E(q, y, k; q^R)}{\partial t_i} dt_i + \frac{\partial y^E(q, y, k; q^R)}{\partial t_j} dt_j \right] \end{aligned} \quad (7)$$

Setting q^R to q , the change in real income induced by a marginal change in the tax rate of good i is given by (see among others Besley and Kanbur (1988))

$$\left. \frac{\partial y^E(q, y, k; q^R)}{\partial t_i} \right|_{q^R=q} = -x_{ik}(q, y). \quad (8)$$

Using (5) and (6), we can then rewrite (7) as

$$dp_k(y^E) = -p_k^{(1)}(y^E(q, y, k; q^R)) \left[\frac{x_{ik}(q, y)}{X_i} - \alpha \frac{x_{jk}(q, y)}{X_j} \right] X_i dt_i. \quad (9)$$

We can now introduce Consumption Dominance (CD) curves, $CD_{ik}^s(y)$. We start with $s = 1$ and define

$$CD_{ik}^1(y) = \frac{x_{ik}(q, y)}{X_i} f_k(y), \quad (10)$$

which gives the density of the consumption of good i by individuals of type k (this is because $\sum_k \theta_k \int_0^a CD_{ik}^1(y) dy = 1$). Next, we define

$$CD_{ik}^s(y) = \int_0^y CD_{ik}^{s-1}(u) du, \quad s = 2, 3, \dots \quad (11)$$

We can then show that

$$CD_{ik}^s(y) = \int_0^y (y-u)^{s-2} \frac{x_{ik}(q, u)}{X_i} f_k(u) du, \quad s = 2, 3, \dots \quad (12)$$

Note that $\theta_k CD_{ik}^2(y)$ gives the share of the total consumption of commodity i found among individuals whose income is less than y and who are members of group k . Since the impact of the tax reform on aggregate poverty is

$$dP = \sum_{k=1}^n \theta_k \int_0^a dp_k(y^E(q, y, k; q^R)) f_k(y) dy, \quad (13)$$

we can, using (9) and (10), rewrite (13) as

$$dP = -X_i dq_i \sum_{k=1}^n \theta_k \int_0^a p_k^{(1)}(y^E(q, y, k; q^R)) [CD_{ik}^1(y) - \alpha CD_{jk}^1(y)] dy. \quad (14)$$

(14) suggests that the difference between two CD curves can be important in determining whether a tax reform involving the two goods can be deemed good for poverty alleviation for a particular P . This result is in fact considerably more general, as the following theorem formalizes (its proof is shown in the appendix).

Theorem 1 *A revenue-neutral marginal tax reform, $dq_j = -\alpha \left(\frac{x_i}{x_j} \right) dq_i > 0$, will reduce poverty for all $P \in \Pi^s$, for any given $s = 1, 2, 3, \dots$, and for all $z_k \leq z_k^+, k = 1, \dots, n$, if*

$$\sum_{k=1}^l \theta_k [CD_{ik}^s(y) - \alpha CD_{jk}^s(y)] \geq 0, \quad \forall y \leq z_l^+, \quad \forall l \in \{1, 2, \dots, n\}. \quad (15)$$

Note that, for a given s , Theorem 1 allows for considerable freedom in the choice of particular poverty indices to use for each subgroup k , in the selection of poverty lines to apply to each of these subgroups, in the precise ways in which household size enters into the $p_k(\cdot)$ functions, in the manner in which *per capita* income and household size combine to generate individual welfare, *etc....* Yet, if condition (15) holds, we are assured that the tax reform will be beneficial whatever these precise choices may be, so long as they conform to the general assumptions that define Π^s .

4 Conclusion

We have shown in this note how CD curves can be used to test for sequential stochastic dominance in an environment in which there are heterogeneous households as well as uncertainty on the exact equivalence scale to be used to compare the welfare of the individuals living in these households. Taking into account household heterogeneity is obviously more demanding than otherwise. The extra demands, however, can be handled empirically in ways analogous to those described in Duclos, Makdissi and Wodon and Makdissi and Wodon (2002) in a unidimensional setting. More generally, the tools can be extended to deal with comparisons of social welfare (where we let the maximum poverty lines extend to infinity), and to cases in which there are uncertain cardinal differences in prices, needs or merits (by ordering individuals in decreasing order of price indices, needs or merits).

References

- [1] Atkinson, A.B. (1991), Measuring Poverty and Differences in Family Composition, *Economica*, 59, 1-16.
- [2] Atkinson, A.B. and F. Bourguignon (1982), The Comparison of Multidimensioned Distributions of Economic Status, *Review of Economic Studies*, 49, 183-201.
- [3] Atkinson, A.B. and F. Bourguignon (1987), Income Distribution and Differences in Needs, in G.R. Fewel, ed., *Arrow and the Foundations of the Theory of Economic Policy*, Macmillan, London, 350-370.
- [4] Besley, T. and R. Kanbur (1988), Food Subsidies and Poverty Alleviation, *The Economic Journal*, 98, 701-719.
- [5] Buhmann, B., L. Rainwater, G. Schmaus and T. Smeeding (1987), Equivalence Scales, Well-Being, Inequality and Poverty: Sensitivity Estimates Across Ten Countries Using the Luxembourg Income Study (LIS) Database, *Review of Income and Wealth*, 34, 115-142.
- [6] Duclos, J.Y. and P. Makdissi (2001), Sequential Stochastic Dominance and the Robustness of Poverty Orderings, mimeo, Université de Sherbrooke.
- [7] Duclos, J.Y., P. Makdissi and Q. Wodon (2002), Socially-Efficient Tax Reforms, mimeo, Université de Sherbrooke.
- [8] Fishburn, P.C. and R.D. Willig (1984), Transfer Principles in Income Redistribution, *Journal of Public Economics*, 25, 323-328.
- [9] Jenkins, S.P. and P.J. Lambert (1993), Ranking Income Distributions When Needs Differ, *Review of Income and Wealth*, 39, 337-356.
- [10] Kakwani, N. (1980), On a Class of Poverty Measures, *Econometrica*, 48, 437-446.
- [11] Kolm, S.C. (1976), Unequal Inequality: I, *Journal of Economic Theory*, 12, 416-442.

- [12] Makdissi, P. and Q. Wodon (2002), Consumption Dominance Curves: Testing for the Impact of Indirect Tax Reforms on Poverty, *Economics Letters*, 75, 227-235.
- [13] Mayshar, J. and S. Yitzhaki (1996), Dalton-Improving Indirect Tax Reforms When Households Differ in Ability and Needs, *Journal of Public Economics*, 62, 399-412.
- [14] Sen, A.K. (1997), *On Economic Inequality*, Clarendon Press, Oxford.
- [15] Wildasin, D. (1984), On Public Good Provision With Distortionary Taxation, *Economic Inquiry*, 22, 227-243.
- [16] Yitzhaki, S. and J. Slemrod (1991), Welfare Dominance: An Application to Commodity Taxation, *American Economic Review*, 81, 480-496.
- [17] Zheng, B. (1999), On the Power of Poverty Orderings, *Social Choice and Welfare*, 3, 349-371.

A Proof of Theorem 1

We first find a general expression for $\int_0^a p_k^{(1)}(y) CD_{ik}^1(y) dy$. Integrating by parts, we obtain

$$\begin{aligned}
& \int_0^a p_k^{(1)}(y^E(q, y, k; q^R)) CD_{ik}^1(y) dy \\
&= p_k^{(1)}(y^E(q, y, k; q^R)) CD_{ik}^2(y) \Big|_0^a \\
&\quad - \int_0^a p_k^{(2)}(y^E(q, y, k; q^R)) CD_{ik}^2(y) dy.
\end{aligned} \tag{16}$$

We know that $CD_{ik}^2(0) = 0$ by definition and, from our assumptions, $p_k^{(1)}(y^E(q, a, k; q^R)) = 0$. The first term on the right hand side of the equation is then equal to 0. We can thus rewrite (16) as

$$\int_0^a p_k^{(1)}(y^E(q, y, k; q^R)) CD_{ik}^1(y) dy = - \int_0^a p_k^{(2)}(y^E(q, y, k; q^R)) CD_{ik}^2(y) dy. \tag{17}$$

Let us now assume that

$$\begin{aligned} & \int_0^a p_k^{(1)}(y^E(q, y, k; q^R)) CD_{ik}^1(y) dy \\ &= (-1)^{s-2} \int_0^a p_k^{(s-1)}(y^E(q, y, k; q^R)) CD_{ik}^{s-1}(y) dy. \end{aligned} \quad (18)$$

Integrating by parts (18), we obtain

$$\begin{aligned} & \int_0^a p_k^{(1)}(y^E(q, y, k; q^R)) CD_{ik}^1(y) dy \\ &= (-1)^{s-2} p_k^{(s-1)}(y^E(q, y, k; q^R)) CD_{ik}^s(y) \Big|_0^a \\ &\quad - (-1)^{s-2} \int_0^a p_k^{(s)}(y^E(q, y, k; q^R)) CD_{ik}^s(y) dy. \end{aligned} \quad (19)$$

We know that $CD_{ki}^s(0) = 0$ by definition and, from our assumptions, $p_k^{(s-1)}(y^E(q, a, k; q^R)) = 0$. The first term on the right-hand side of (19) is then equal to 0. We can rewrite (19) as

$$\begin{aligned} & \int_0^a p_k^{(1)}(y^E(q, y, k; q^R)) CD_{ik}^1(y) dy \\ &= (-1)^{s-1} \int_0^a p_k^{(s)}(y^E(q, y, k; q^R)) CD_{ik}^s(y) dy. \end{aligned} \quad (20)$$

Equations (17) and (20) obey the relation assumed in equation (18). We have shown that if (18) is true then (20) is true. This implies that equation (20) is true for all $s \in \{2, 3, 4, \dots\}$. From equation (14) and equation (20), we obtain

$$dP = (-1)^s X_i dq_i \int_0^a \sum_{k=1}^n p_k^{(s)}(y^E(q, y, k; q^R)) \theta_k [CD_{ik}^s(y) - \alpha CD_{jk}^s(y)] dy. \quad (21)$$

Using Abel's Lemma² and our assumptions on $p_k(\cdot)$, it is easy to see that if $\sum_{k=1}^l \theta_k [CD_{ik}^s(y) - \alpha CD_{jk}^s(y)] \geq 0 \quad \forall y \leq z_l^+$ and $\forall l \in \{1, 2, \dots, n\}$, then $dP \leq 0$.

² Abel's lemma is proved in Jenkins and Lambert (1993):

Abel's Lemma: If $x_n \geq x_{n-1} \geq \dots \geq x_2 \geq x_1 \geq 0$, a sufficient condition for $\sum_{i=1}^n x_i y_i \geq 0$ is $\sum_{i=j}^n y_i \geq 0$ for each j . If $x_n \leq x_{n-1} \leq \dots \leq x_2 \leq x_1 \leq 0$, the same condition is sufficient for $\sum_{i=1}^n x_i y_i \leq 0$.

- 94-01 BILODEAU, Marc et AI SLIVINSKI, *Toilet Cleaning and Department Chairing: Volunteering a Public Service.*
- 94-02 ASCAH, Louis, *Recent Retirement Income System Reform: Employer Plans, Public Plans and Tax Assisted Savings.*
- 94-03 BILODEAU, M. et AI SLIVINSKI, *Volunteering Nonprofit Entrepreneurial Services.*
- 94-04 HANEL, Petr, *R&D, Inter-Industry and International Spillovers of Technology and the Total Factor Productivity Growth of Manufacturing Industries in Canada, 1974-1989.*
- 94-05 KALULUMIA, Pene et Denis BOLDUC, *Generalized Mixed Estimator for Nonlinear Models: A Maximum Likelihood Approach.*
- 95-01 FORTIN, Mario et Patrice Langevin, *L'efficacité du marché boursier face à la politique monétaire.*
- 95-02 HANEL, Petr et Patrice Kayembe YATSHIBI, *Analyse de la performance à exporter des industries manufacturières du Québec 1988.*
- 95-03 HANEL, Petr, *The Czech Republic: Evolution and Structure of Foreign Trade in Industrial Goods in the Transition Period, 1989-1994.*
- 95-04 KALULUMIA, Pene et Bernard DÉCALUWÉ, *Surévaluation, ajustement et compétitivité externe : le cas des pays membres de la zone franc CFA.*
- 95-05 LATULIPPE, Jean-Guy, *Accès aux marchés des pays en développement.*
- 96-01 ST-PIERRE, Alain et Petr HANEL, *Les effets directs et indirects de l'activité de R&D sur la profitabilité de la firme.*
- 96-02 KALULUMIA, Pene et Alain MBAYA LUKUSA, *Impact of budget deficits and international capital flows on money demand: Evidence From Cointegration and Error-Correction Model.*
- 96-03 KALULUMIA, Pene et Pierre YOUROUGOU, *Money and Income Causality In Developing Economies: A Case Study Of Selected Countries In Sub-Saharan Africa.*
- 96-04 PARENT, Daniel, *Survol des contributions théoriques et empiriques liées au capital humain (A Survey of Theoretical and Empirical Contributions to Human Capital).*
- 96-05 PARENT, Daniel, *Matching Human Capital and the Covariance Structure of Earnings.*
- 96-06 PARENT, Daniel, *Wages and Mobility : The Impact of Employer-Provided Training*
- 97-01 PARENT, Daniel, *Industry-Specific Capital and the Wage Profile : Evidence From the NLSY and the PSID.*
- 97-02 PARENT, Daniel, *Methods of Pay and Earnings: A Longitudinal Analysis.*
- 97-03 PARENT, Daniel, *Job Characteristics and the Form of Compensation.*
- 97-04 FORTIN, Mario et Michel BERGERON, Jocelyn DUFORT et Pene KALULUMIA, *Measuring The Impact of Swaps on the Interest Rate Risk of Financial Intermediaries Using Accounting Data.*
- 97-05 FORTIN, Mario, André LECLERC et Claude THIVIERGE, *Testing For Scale and Scope Effects in Cooperative Banks: The Case of Les Caisses populaires et d'économie Desjardins.*
- 97-06 HANEL, Petr, *The Pros and Cons of Central and Eastern Europe Joining the EU*
- 00-01 MAKDISSI, Paul et Jean-Yves DUCLOS, *Restricted and Unrestricted Dominance Welfare, Inequality and Poverty Orderings*

- 00-02 HANEL, Petr, John BALDWIN et David SABOURIN, *Les déterminants des activités d'innovation dans les entreprises de fabrication canadiennes : le rôle des droits de propriété intellectuelle*
- 00-03 KALULUMIA, Pene, *Government Debt, Interest Rates and International Capital Flows: Evidence From Cointegration*
- 00-04 MAKDISSI, Paul et Cyril TÉJÉDO, *Problèmes d'appariement et politique de l'emploi*
- 00-05 MAKDISSI, Paul et Quentin WODON, *Consumption Dominance Curves: Testing for the Impact of Tax Reforms on Poverty.*
- 00-06 FORTIN, Mario et André LECLERC, *Demographic Changes and Real Housing Prices in Canada.*
- 00-07 HANEL, Petr et Sofiene ZORGATI, *Technology Spillovers and Trade: Empirical Evidence for the G7 Industrial Countries.*
- 01-01 MAKDISSI, Paul et Quentin WODON, *Migration, poverty, and housing: welfare comparisons using sequential stochastic dominance.* Avril 2001, 23 p.
- 01-02 HUNG Nguyen Manh et Paul MAKDISSI, *Infantile mortality and fertility decisions in a stochastic environment.* Mars 2001, 12 p.
- 01-03 MAKDISSI, Paul et Quentin WODON, *Fuel poverty and access to electricity: comparing households when they differ in needs.* Juin 2001, 19 p.
- 01-04 MAKDISSI, Paul et Yves GROLEAU, *Que pouvons-nous apprendre des profils de pauvreté canadiens ?* Juillet 2001, 47 p.
- 01-05 MAKDISSI, Paul et Quentin WODON, *Measuring poverty reduction and targeting performance under multiple government programs.* Août 2001, 16 p.
- 01-06 DUCLOS, Jean-Yves et Paul MAKDISSI, *Restricted inequality and relative poverty.* Août 2001, 31 p.
- 01-07 TÉJÉDO, Cyril et Michel TRUCHON, *Serial cost sharing in multidimensional contexts.* Septembre 2001, 37 p.
- 01-08 TÉJÉDO, Cyril, *Strategic analysis of the serial cost sharing rule with symmetric cost function.* Février 2001, 25 p.
- 01-09 HANEL, Petr, *Current intellectual protection practices by manufacturing firms in Canada.* Septembre 2001, 57 p.
- 02-01 DUCLOS, Jean-Yves, Paul MAKDISSI et Quentin WODON, *Socially-efficient tax reforms,* Janvier 2002, 47 p.
- 02-02 MAKDISSI, Paul, *La décroissance démographique : Pourquoi pas?,* Février 2002, 20 p.
- 02-03 LECLERC, André et Mario FORTIN, *Production et rationalisation des intermédiaires financiers : leçons à tirer de l'expérience des caisses populaires acadiennes,* Février 2002, 24 p.
- 02-04 HANEL, Petr et Snezana VUCIC, *L'impact économique des activités de recherche de l'Université de Sherbrooke,* Février 2002, 44 p.
- 02-05 TÉJÉDO, Cyril et Michel TRUCHON, *Monotonicity and bounds for cost shares under the path serial rule,* Mars 2002, 18 p.
- 02-06 PORET, Sylvaine et Cyril TÉJÉDO, *Analyse horizontale du marché des biens illicites,* Mai 2002, 15 p.
- 02-07 KALULUMIA, Pene, *Effects of government debt on interest rates : evidence from causality tests in Johansen-type models,* Juillet 2002, 21 p.
- 02-08 MAKDISSI, Paul et Quentin WODON, *Can safety nets offset the impact of risk on wage inequality and social welfare?* Août 2002, 12 p.

- 02-09 DUCLOS, Jean-Yves, Paul MAKDISSI et Quentin WODON, *Poverty-reducing tax reforms with heterogeneous agents*, Février 2002, 10 p.
- 02-10 MAKDISSI, Paul et Quentin WODON, *Fuzzy targeting indices and orderings*, Mai 2002, 11 p.
- 02-11 DUCLOS, Jean-Yves, Paul MAKDISSI et Quentin WODON, *Poverty-efficient transfer programs : the role of targeting and allocation rules*, Mai 2002, 25 p.
- 02-12 MAKDISSI, Paul et Quentin WODON, *Environmental regulation and economic growth under education externalities*, Août 2002, 8 p.

* Tous ces cahiers de recherche sont disponibles sur notre site WEB (www.usherbrooke.ca/economique) ou au Centre de documentation de la FLSH A3-330 (UdeS).

Prière d'adresser vos commentaires ou demandes d'exemplaires d'un cahier de recherche antérieur (1976 à 1990) à monsieur Cyril TÉJÉDO, coordonnateur des Cahiers de recherche du Département d'économie, Tél : (819) 821-7233 Télécopieur : (819) 821-7237 Courriel : Cyril.Tejed@USherbrooke.ca

Comments or requests for copies of previous Working Papers (1976 to 1990) should be made to the Working Papers Coordinator at the Département d'économie, Mr. Cyril TÉJÉDO. Tel: (819) 821-7233 FAX:819) 821-7237 E-mail: Cyril.Tejed@USherbrooke.ca.

Révisé le 30-10-02