2004/1   Central Bank forex interventions assessed using realized moments.
          Michel BEINE, Sébastien LAURENT and Franz C. PALM.

This paper studies and assesses the impact of G3 Central Bank interventions on the DEM/USD exchange rate properties using daily realized moments of exchange rate returns (obtained from intraday data) for the period 1989-2001. Event studies in terms of the realized moments for the intervention day, the days preceding and following the intervention day illustrate the shape of this impact. Rolling regressions results for an ARFIMA model for realized moments are used to measure the intervention impact and characterize its significance.

The analysis confirms previous findings of an increase of volatility after a coordinated Central Bank intervention. It highlights new findings on the timing and the persistence of coordinated interventions on exchange rate volatility, on important volatility spillovers, on the impact on exchange rate covariances and correlations and on skewness coefficients.

JEL Classification: C22, E44, F31, G15
Keywords: Central Bank Interventions, Exchange Rates Realized Moments, Intradaily Dynamics.

2004/2   Transfers to sustain fiscal cooperation in indirect taxation between two countries.
          Magali VERDONCK

We analyze the two-country model of fiscal competition of Kanbur and Keen (1993) where countries differ in size and use a commodity tax to reach their objective of revenue maximization. Due to fiscal externalities, the non-cooperative outcome is inefficient. Besides, the international optimum could be individually irrational for the smaller country compared to the non-cooperative equilibrium.

The purpose of this paper is to examine whether the international optimum can be reached and sustained by means of financial transfers between the countries as suggested in another context by Chander and Tulkens (1995, 1997).

We show that with transfers of a specific form internationally optimal fiscal cooperation is indeed individually rational for both countries and, in that sense, sustainable. Furthermore, we show that these transfers can be such that the optimal outcome is, under some conditions, a dominant strategy for both countries.

JEL Classification: H23, H26, H3, H73
Keywords: Indirect Taxation, Asymmetric Countries, Tax Competition, Transfers, Cooperation, Nash Equilibrium.

2004/3   Teaching versus research: a multi-tasking approach to multi-department universities
          Axel GAUTIER and Xavier WAUTHY

The budget of a university essentially depends on the number of students it enrols. In multi-department universities resources created in one department may be redistributed to other departments. This redistribution affects the way academics share their working time between research and teaching activities. Redistribution creates free-riding on teaching efforts. In this paper, we show that by designing internal financial rules which create yardstick competition for research funds, a multi-department university may induce better teaching quality *and* research, as compared to the performance of independent departments.

JEL Classification: D21, D82, G31, I20
Keywords: multi-task, incentive, university, conglomerate.

2004/4   Rounding of convex sets and efficient gradient methods for linear programming problems
          Yu. NESTEROV

In this paper we propose new efficient gradient schemes for two non-trivial classes of linear programming problems. These schemes are designed to compute approximate solutions with relative accuracy δ. We prove that the upper complexity bound for both schemes is $O(\frac{\sqrt{n \ln m}}{\delta} \ln n)$ iterations of a gradient-type method, where n and m, $(n < m)$, are the sizes of the corresponding linear programming problems. The proposed schemes are based on preliminary computation of an ellipsoidal rounding for some polytopes in R^n. In both cases this computation can be performed very efficiently, in $O(n^2 m \ln m)$ operations at most.
Keywords: nonlinear optimization, convex optimization, complexity bounds, relative accuracy, fully polynomial approximation schemes, gradient methods, optimal methods.

2004/5   The role of mediation in peacemaking and peacekeeping negotiations
          Ester CAMINA and Nicolas PORTEIRO

We develop a model of bargaining that provides a rationality for the difference in the method of negotiation, depending on the nature of the conflict. We distinguish negotiations previous to a potential conflict, and negotiations during a conflict. In these contexts, we study the role of a mediator that tries to achieve a certain balance between the efficiency of the agreement and the equality of the sharing. We show that the credibility of the mediator comes from his willingness to impose delays in the negotiation, even if that implies costs. We also find how the "weak" player in the conflict can strategically profit from the mediator's quest for equity. Finally, we show how the capacity of the mediator to induce a higher equality in the sharing is always higher in a peacemaking situation than in a peacekeeping one.
JEL Classification: C72, C78
Keywords: bargaining, mediation, Rubinstein.

2004/6   Mergers, innovation, and inequality
          Guido COZZI and Ornella TAROLA

This paper presents a standard endogenous growth framework in which the source of growth is represented by vertical innovation. The crucial assumption we introduce is that there is a positive information gap concerning the discovery of innovation. The aim of reducing the information dissemination lag provides incentives for firms to decide to merge their research efforts. At the same time we find that the skilled/unskilled wage gap is strongly related to this phenomenon. We prove that changing antitrust attitudes toward efficienc-motivated mergers in contestable industries may simultaneously explain observed changes in the industry structure, in qualitative innovation, in wage inequality, and in labor supply composition.
JEL Classification: L25, L40, O31
Keywords: Growth; Firm-Size; Innovation Process; Antitrust Policy.

2004/7   Invariants in the Riemannian geometry of convex sets
          Roland HILDEBRAND

In this contribution we study some aspects of the Riemannian geometry induced on a convex set by a barrier function of the set. Using Noether's theorem, we link the symmetries of the set to invariants of the geodesic flow. This allows to lower the dimension of the differential system defining the geodesics and gives insights in the structure of the geodesic flow, specifically on the configuration of geodesic submanifolds. We use the developed apparatus to completely integrate the geodesic equations for the convex hulls of the sphere, the paraboloid, the hyperboloid and the standard symmetric cones and to obtain explicit formulae for the geodesics on these sets.
JEL Classification: C69
Keywords: Riemannian geometry, barrier function, convexity, symmetry.

2004/8   Imbalance effects in the Lucas model: an analytical exploration
           Raouf BOUCEKKINE and Ramon RUIZ-TAMARIT

           In this note, we use a technique analogous to Xie's method (1994) to solve analytically the
           Lucas model with externality in a specific parametric case. In particular, we characterize the
           shape of imbalance effects in this model. Our results are entirely consistent with the findings of
           the related computational literature. Moreover, our analytical investigation tends to show that
           these findings are robust to the presence of the Lucas externality as long as a unique equilibrium
           path exist
           JEL Classification: C61, C62, O41
           Keywords: imbalance effects, Lucas model, externality, analytical solution.

2004/9   Exports, international investment, and plant performance: evidence from a non-parametric test
           Sourafel GIRMA, Holger GOERG and Eric STROBL

           This paper compares the performance of purely domestic plants, domestic exporters and do-
           mestic multinationals. For our empirical analysis we utilise a non-parametric approach based
           on the principle of first order stochastic dominance. Comparing the cumulative distributions of
           the measures of plant performance across the three types of plants we find that the distributions
           for multinationals dominate that of domestic exporters and non-exporters, while we do not find
           clear differences in plant performance between domestic exporters and non-exporters, although
           the latter finding may be due to the lack of many very small plants in our data set.
           JEL Classification: F23, F14, D21
           **Keywords: exporting, FDI, multinationals, productivity, profitability, plant hetero-
           geneit.**

2004/10   The dynamics of agglomeration: evidence from Ireland and Portugal
           Salvador BARRIOS, Luisito BERTINELLI, Eric STROBL and Antonio Carlos TEIXEIRA

           This paper analyses and compares the dynamics of agglomeration in Portuguese and Irish man-
           ufacturing industries between 1985 and 1998 implementing Dumais, Ellison and Glaeser (2002)'s
           methodology. Using comparable and exhaustive micro-level data sets, we find that industries
           tend to be subject to strong geographical mobility despite little net aggregate changes in ag-
           glomeration in both countries. When the aggregate concentration changes are decomposed into
           portions attributable to the different stages of the plant life cycle, we discover that births con-
           sistently play a deagglomerating role, which continues at least into the early stages of the life
           cycle, whereas deaths have acted to reinforce agglomeration in both countries. Nevertheless,
           there are some differences across countries and industries.
           JEL Classification: R11, R12, R32, L11
           Keywords: agglomeration, path dependence, plant's life cycle, Ireland, Portugal.

2004/11   Foreign direct investment, competition and industrial development in the host country
           Salvador BARRIOS, Holger GOERG and Eric STROBL

           This paper analyses the impact of foreign direct investment (FDI) on the development of local
           firms. We focus on two likely of FDI: a competition effect which deters entry of domestic
           firms and positive market externalities which foster the development of local industry. Using
           a simple theoretical model to illustrate how these forces work we show that the number of
           domestic firms follows a u-shaped curve, where the competition effect first dominates but is
           gradually outweighed by positive externalities. Evidence for Ireland tends to support this result.
           Specifically, applying semi-parametric regression techniques on plant level panel data for the
           manufacturing sector we find that while the competition effect may have initially deterred local
           firms' entry, this initial effect has been outpaced by positive externalities making the overall
           impact of FDI largely positive for the domestic industry.
           JEL Classification: F2, L6, O1
           **Keywords: foreign direct investment, spillovers, industrial development, firm entry,
           semi-parametric estimations.**

2004/12   Bridging the gap between Ox and Gauss using OxGauss
           Sébastien LAURENT and Jean-Pierre URBAIN

           The purpose of this paper is to review and discuss the key improvements brought to OxGauss.
           Without having to install Gauss on his or her machine, the OxGauss user can run under Ox a
           wide range of Gauss programs and codes. Even with the *console* Ox version (free for academics),
           Gauss codes can either be called from Ox programs or run and executed on their own. While
           the new OxGauss version is very powerful in most circumstances, it is of little use once the
           purpose is to execute programs that attempt to solve optimization problems using Cml, Maxlik
           or Optmum. In this paper we propose a set of additional procedures that contribute to bridge
           the gap between Ox and three well-known Gauss application modules: Cml, Maxlik or Optmum.
               The effectiveness of our procedures is illustrated by revisiting a large number of freely
           available Gauss codes in which numerical optimization relies on the above Gauss application
           modules. The Gauss codes include many programs dealing with non-linear models such as
           the Markov regime-switching models STAR models and various GARCH-type models. These
           illustrations highlight a further potentially interesting implication of OxGauss: it enables non-
           Gauss users to replicate existing empirical results using freely available Gauss codes.

2004/13   Liberal regulation: privatization of natural monopolies with adverse selection
           Emmanuelle AURIOL and Pierre M. PICARD

           This paper studies the effect of soft-budget constraints in a pure adverse selection model of
           monopoly regulation. We consider a government maximizing total surplus but incurring some
           cost of public funds à la Laffont Tirole (1993). We propose a regulatory set-up in which firms
           are free to enter natural monopoly markets and to choose their price and output levels as in the
           laisser-faire. In addition, the government proposes ex-post contracts to the private firms. We
           show that this regulatory set-up allows governments to avoid re-funding money-loosing firms
           and that welfare is larger than under traditional regulation where governments commits to both
           investment and operation cash-flows.
           JEL Classification: L43, L51, D82, L33
           **Keywords: privatization, soft-budget contraint, adverse selection, regulation, nat-
           ural monopolies.**

2004/14   Strategic R&D investment, competitive toughness and growth
           Claude D'ASPREMONT, Rodolphe DOS SANTOS FERREIRA and Louis-André GERARD-VARET

           We develop an overlapping generations model, where firms (as consumers) have a two-period
           life, investing in R&D during the first period and competing in the product market in the
           second period. The number of firms is endogenously determined and the set of successful
           firms by a Bernoullian random process. We show the possibility of an inverted-U relationship
           between innovation and product market competition for an individual industry, based on the
           possibility for non-successful firms to remain productive. When the relative cost advantage of
           successful firms is large (large innovation step or small spillovers) this possibility results from
           the probabilistic nature of the model.
           JEL Classification: L11, L16, O32, O41
           **Keywords: competitive toughness, R&D incentives, strategic investment, endoge-
           nous growth.**

2004/15   Economic integration and agglomeration in a middle product economy
Shin-Kun PENG, Jacques-François THISSE and Ping WANG

The paper examines the interactions between economic integration and population agglomeration in a middle product economy displaying neoclassical growth. There are two vertically integrated economies. Each consists of a large number of final good competitive firms operating plants in both regions, and a large number of intermediate goods monopolistically competitive firms operating each in only one region. While immobile workers are employed with intermediate goods to produce the final good, mobile workers are used to design the line of differentiated intermediate-good inputs. Capital is immobile, the final good is non-traded, whereas the intermediate goods are traded. We find that employment agglomeration and output growth need not be positively related. Furthermore, trade is not necessarily beneficial to regional growth, whereas trade between the two regions need not be associated with a widened skilled-unskilled wage gap.
Keywords: economic integration, agglomeration, intermediate goods trade, growth.

2004/16   Spectral functions on Jordan algebras: differentiability and convexity properties
Michel BAES

A spectral function on a formally real Jordan algebra is a real-valued function which depends only on the eigenvalues of its argument. One convenient way to create them is to start from a function $f : \mathbb{R}^r \mapsto \mathbb{R}$ which is symmetric in the components of its argument, and to define the function $F(u) := f(\lambda(u))$ where $\lambda(u)$ is the vector of eigenvalues of u. In this paper, we show that this construction preserves a number of properties which are frequently used in the framework of convex optimization: differentiability, convexity properties and Lipschitz continuity of the gradient for the Euclidean norm with the same constant as for f.
Keywords: spectral function, formally real Jordan algebras, convex functions, symmetric functions.

2004/17   Complementarity, coordination, and credit
Alessandro FEDELE and Andrea MANTOVANI

We consider a start-up firm which applies for a bank loan to implement a project based on complementarity activities. The firm has the possibility to improve the complementarity effect by coordinating the activities. Coordination is costly and can be made either by using internal human resources or by hiring a consulting firm. In the former case the choice of coordination is not verifiable by the bank and a moral hazard problem arises, while in the latter information is symmetric. The role of consulting services is thus to mitigate the informational problem. Without consulting, the firm does not coordinate and either obtains no funding or the surplus of the project is not maximized.
JEL Classification: D21, D82, O32
Keywords: complementarity, inside and outside coordination, moral hazard.

2004/18   Congestion and tax competition in a parallel network
Bruno DE BORGER, Stef PROOST and Kurt VAN DENDER

The purpose of this paper is to study the effects of tolling road use on a parallel road network where each link can be tolled by a different government. Using both theoretical and numerical models, the paper analyses the potential tax competition between countries that each maximise the surplus of local users plus tax revenues in controlling local and transit transport. Three types of tolling systems are considered: (i) toll discrimination between local traffic and transit, (ii) only uniform tolls on local and transit transport are acceptable, (iii) tolls on local users only. The results suggest that the welfare effects of introducing transit tolls are large, but that differentiation of tolls between local and transit transport as compared to uniform tolls does not yield large welfare differences. Also, the welfare effects of toll cooperation between countries are relatively small in comparison with the welfare gains of non-cooperative tolling of transit. The numerical model further illustrates the effects of different transit shares and explicitly considers the role of asymmetries between countries. Higher transit shares strongly raise the transit toll and slightly decrease local tolls. With asymmetric demands, the welfare gains of introducing differentiated tolling rise strongly for the country with lower local demand.
JEL Classification: H23, H71, R41, R48
Keywords: congestion pricing, transit traffic.

2004/19   Efficiency of competitive equilibria with hidden action: the role of separable preferences
Luca PANACCIONE

In the present paper we study the efficiency properties of competitive equilibria in economies with hidden action and multiple goods. We borrow the description of the economy from Lisboa [3] and we apply a method of proof close in spirit to the one used in the literature on incomplete financial markets economies. We are then able to show that Lisboa's original result of constrained efficiency rests crucially on the assumption of separable preferences and on the structure of uncertainty.
JEL Classification: D52, D61, D82
Keywords: hidden action, separable preferences, constrained efficiency.

2004/20   When redistribution leads to regressive taxation
Cyril HARITON and Gwenaël PIASER

We introduce labor contracts, in a framework of optimal redistribution: firms have some local market power and try to discriminate among heterogeneous workers. In this setting we show that if the firms have perfect information, i.e., they perfectly discriminate against workers and take all the surplus, the best tax function is flat. If the firms have imperfect information, i.e., if they offert incentive contracts, then (under some assumptions) the best redistributive taxation is regressive.
JEL Classification: D21, D82, H21, L14
Keywords: income taxation, redistribution, labor market, multi-prin- cipals, adverse selection, mechanism design.

2004/21   Trade costs versus urban costs. Do jobs move to the suburbs or to the sticks ?
Jean CAVAILHÈS, Carl GAIGNÉ and Jacques-François THISSE

We analyze how the interplay between urban costs, wage wedges, and trade costs may affect the *interregional location of firms as well as the intraurban location*, within the central business district or in a secondary employment center (SEC) of the selected region. In this way, we investigate, on the one hand, *how trade may affect the internal structure of cities* and, on the other hand, *how decentralizing the production and consumption of goods to subcenters changes the intensity of trade* by allowing large metropolitan areas to maintain their predominance.

We show that, despite low commuting costs, SECs may emerge when the urban population is large and communication technologies are efficient, two features that seem to characterize modern economies. Moreover, when trade costs fall from high levels, the economy moves gradually from dispersion to agglomeration, favoring the formation of SECs. However, in an integrating world, the center of a small monocentric city could be more attractive than subcenters of large polycentric cities. Nevertheless, the core retains its predominance through the relative growth of its main center, which occurs at the expense of its subcenters.
JEL Classification: F12 F22, R12, R14
Keywords: city structure, polycentric city, commuting costs, trade costs, relocation.

2004/22   The evolution of the firm size distribution and nationality of ownership
Salvador BARRIOS, Holger GOERG and Eric STROBL

It has recently been shown that the firm size distribution is initially skewed to the right and then evolves over time to become more lognormal, and argued that this is likely due to firms initially facing financial constraints, see Cabral and Mata (2003). We conjecture that, it this is true, then such a pattern should be much less apparent for multinational companies for which financial constraints arer generally considered to be lower than non-multinationals. Moreover, such a difference may be re-enforced by the fact that multinationals are less likely to face selection issues. These propositions are confirmed using plant level Irish manufacturing data.
JEL Classification: F23, L11, L60
Keywords: firm size distribution, national of ownership, financial constraints.

2004/23   The impact of minimum wages on hours and employment revisited
Eric STROBL and Frank WALSH

Using a standard production function the equilibrium hours per worker wage locus is shown to be u-shaped in a competitive labour market. A minimum wage may thus either increase or decrease hours per worker and, by extension, the number of workers. We provide supporting evidence for this using data from Trinidad and Tobago. We argue that examining total employment or full-time equivalents is not a meaningful way to measure the employment response to a minimum wage.
JEL Classification: J30
Keywords: minimum wages, hours, employment.

2004/24   Political support for tax decentralisation
Susana PERALTA

This paper presents a spatial model of a city with two unequally productive jurisdictions. City residents bear a commuting cost to work in either of the two jurisdictions. In each jurisdiction, a fixed public budget must be financed with a wage tax and a head-tax. We compare the first best optimum to tax decentralisation equilibria. From the total welfare viewpoint, tax competition is always inefficient. Inefficiency may be higher under utilitarian governments or majoritarian ones. If local governments are utilitarian, the more productive jurisdiction is better off at the first best than with tax competition, while the other is worst off. If they are majoritarian, both jurisdictions will under some conditions prefer the tax decentralisation to the first best.
JEL Classification: H23, H71, H73, R23, R5
Keywords: tax competition, commuting, median voter equilibria.

2004/25   Population growth and manufacturing real wages in 18th century England: a spatial perspective
Kristian BEHRENS

We develop a two-region population growth model of economic geography and show that a process of urbanization has a substantial impact on the evolution of manufacturing real wages. Whereas real wages decline as the population increases when the spatial structure of the economy is fixed, they actually rise in the long-run when factors are mobile. Agglomeration may hence be seen as a rational response to declining real wages and provides a new explanation of why manufacturing real wages did not decline prior to the Industrial Revolution in England, despite a historically unprecedented population growth.
JEL Classification: N13, N33, R11, R12
Keywords: population growth, real wages, economic geography, agglomeration, Industrial Revolution.

2004/26   The determination of the equilibrium exchange rate in a simple general equilibrium model
Cuong LE VAN, Cécile COUHARDE and Thai BAO LUONG

In this article, we develop an analytical general equilibrium model of the equilibrium exchange rate. This theoretical framework allows us to identify the relevant set of variables which determinate the equilibrium exchange rate and to explore how theses variables influence the trajectory of the equilibrium exchange rate.
Keywords: equilibrium exchange rate, purchasing power parity, Balasso-Samuelson effect, general equilibrium model.

2004/27   Production and financial policies under asymmetric information
Jacques H. DREZE, Enrico MINELLI and Mario TIRELLI

We propose an extension of the standard general equilibrium model with production and incomplete markets to situations in which (i) private investors have limited information on the returns of specific assets, (ii) managers of firms have limited information on the preferences of individual shareholders. The extension is obtained by the assumption that firms are not traded directly but grouped into 'sectorial' funds. In our model the financial policy of the firm is not irrelevant; we define a decision criterion for the firm that takes into account both its production and financial decisions. With this criterion, we prove the existence of equilibria. Then we discuss the nature of the inefficiencies introduced by the presence asymmetric information. In an appendix we illustrate the properties of the model in the CAPM framework.
JEL Classification: D52, D81, D82

2004/28   Vertical differentiation, wage bargaining and intra-industry trade liberalization
Emanuele BACCHIEGA

This article analyzes the effects of trade liberalization between two asymmetric industries. Asymmetries concern consuemers' masses and labor endowments. The latter, together with human capital specificity in the production of the variants of a vertically differentiated good, determine market form and the range of products available in each industry. We show that market integration benefits or harms the agents in the industries following on industry-specific parameters. As the conditions on gains and losses from trade are independent between countries, bilateral losses from trade can emerge at equilibrium.
JEL Classification: L11, J00, F14
Keywords: vertical differentiation, workers' skills, wage bargaining, trade liberalization, industry asymmetries.

2004/29   Market size and urban hierarchy
Kristian BEHRENS

We investigate the importance of market size as a determinant for industrial location patterns. In order to focus on a broad range of sectors, including the service industries, both traded and non-traded goods are taken into consideration. In our model, traded goods industries always exhibit a 'home market effect' (HME), whereas the existence of such an effect for non-traded goods and services crucially hinges on the degree of product differentiation. High degrees of product differentiation generally support a HME, whereas a reverse HME may arise when products are sufficiently close substitutes.

      Our results point to the existence of some market size dependent 'industrial urban' hierarchy: highly differentiated non-traded services are more sensitive to market size than manufacturing activities and traded services, which in turn are more sensitive to market size than closely substitutable non-traded services.
JEL Classification: F12, L80, R11, R12
Keywords: reverse home market effect, traded goods, non-traded goods, service industries, urban hierarchy.

2004/30   Two-sided markets and price competition with multi-homing
Jean J. GABSZEWICZ and Xavier Y. WAUTHY

We model duopoly competition between two platforms. They operate in a two-sided market where agents are heterogeneous on both sides of the market and are allowed to multihome. Network effects are captured within a vertical differentiation framework. Under single-homing there exists an interior equilibrium where networks exhibit asymmetric sizes and both firms enjoy positive profits. When all agents are allowed to patronize the two platforms, we show that in equilibrium multi-homing takes place on one side of the market only. Moreover, the only equilibrium exhibiting positive profits for both platforms replicates the collusive outcome.
JEL Classification: L13
Keywords: two-sided markets, networks, vertical differentiation.

2004/31   PAYG pension systems with capital mobility
Maurice MARCHAND, Pierre PESTIEAU and Gwenaël PIASER

Consider an overlapping generation growth model involving identical countries whose fiscal policy reduces to a pay-as-you-go system with flat rate benefits and uniform payroll tax rate. In autarky, the tax rate is chosen so as to achieve a compromise between intragenerational and intergenerational redistribution. Assume now that there is capital mobility in a setting where national government act more cooperatively. This paper studies how the tax is affected by this combination of capital mobility and non cooperation. It shows that the tax rate increases and henceforth capital accumulation decreases as the number of countries involved increases.
JEL Classification: H55, H73, R23
Keywords: vpay-as-you-go pension, tax competition, capital mobility.

2004/32   Multivariate reduced rank regression in non-Gaussian contexts, using copulas
           Andréas HEINEN and Erick RENGIFO

           We propose a new procedure to perform Reduced Rank Regression (RRR) in non-Gaussian con-
           texts, based on Multivariate Dispersion Models. Reduced-Rank Multivariate Dispersion Models
           (RR-MDM) generalise RRR to a very large class of distributions, which include continuous dis-
           tributions like the normal, Gamma, Inverse Gaussian, and discrete distributions like the Poisson
           and the binomial. A multivariate distribution is created with the help of the Gaussian copula
           and estimation is performed using maximum likelihood. We show how this method can be
           amended to deal with the case of discrete data. We perform Monte Carlo simulations and show
           that our estimator is more efficient than the traditional Gaussian RRR. In the framework of
           MDM's we introduce a procedure analogous to canonical correlations, which takes into account
           the distribution of the data.
           JEL Classification: C35, C39
           **Keywords: multivariate dispersion model, multivariate statistical analysis, canoni-
           cal correlations, principal component analsysis.**

2004/33   What pieces of limit order book information are informative ?
           Roberto PASCUAL and David VEREDAS

           This paper studies the importance of different pieces of limit order book information in char-
           acterizing order aggressiveness and the timing of trades, order submissions and cancellations.
           Using limit order book information on a representative sample of Spanish stocks, we evidence
           that most of the explanatory power of the book concentrates on the best quotes. However,
           the book beyond the best quotes also matters in explaining the aggressiveness of traders. In
           particular, liquidity providers (limit-order traders) benefit more from an increased degree of
           pre-trade transparency than liquidity consumers (market-order traders). Finally, no piece of
           book information matters in explaining the timing of orders.
           JEL Classification: C41, C35, G14
           **Keywords: open limit order book, order aggressiveness, durations, pre-trade trans-
           parency, order driven markets.**

2004/34   No-arbitrage condition and existence of equilibrium with dividends
           Cuong LE VAN and Nguyen BA MINH

           In this paper we first give an elementary proof of existence of equilibrium with dividends in
           an economy with possibly satiated consumers. We then introduce a no-arbitrage condition and
           show that it is equivalent to the existence of equilibrium with dividends.
           **Keywords: equilibrium with dividends, Walras equilibrium, satiation points, no-
           arbitrage condition.**

2004/35   The predictive success and profitability of chart patterns in the Euro/Dollar foreign exchange market
           Walid BEN OMRANE and Hervé VAN OPPENS

           We investigate the existence of chart patterns in the Euro/Dollar intra-daily foreign exchange
           market. We use two identification methods of the different chart patterns: one built on close
           prices only, and one based on low and high prices. We look for twelve types of chart patterns
           and we study the detected patterns through two criteria: predictability and profitability. We
           run a Monte Carlo simulation to compute the statistical significance of the obtained results. We
           find an apparent existence of some chart patterns in the currency market. More than one half of
           detected charts present a significant predictability. Nevertheless, only two chart patterns imply
           a significant profitability which is however too small to cover the transaction costs. The second
           extrema detection method provides higher but riskier profits than the first one.
           JEL Classification: C13, C14, F31
           **Keywords: foreign exchange market, chart patterns, high frequency data, technical
           analysis.**

2004/36   Ordinal versus cardinal complementarity: The case of Cournot oligopoly
           Rabah AMIR

           While ordinal complementarity is more general than cardinal complementarity, the corresponding global sufficient conditions placed on the primitives of a constrained optimization problem are generally not comparable. We explore this issue in detail for the special case of a Cournot firm. We derive necessary and sufficient conditions for downward-sloping best-responses by imposing the ordinal test only for output levels that are actually reached. Both global tests, cardinal and ordinal, are shown not to be critical sufficient conditions. Finally, we confirm that checking supermodularity of suitably transformed profits can work when the global tests for ordinal and cardinal complementarity both fail.
           JEL Classification: C72, D43, L13
           Keywords: Cournot oligopoly, complementarity, supermodularity, single-crossing property.

2004/37   Second-mover advantage and price leadership in Bertrand oligopoly
           Rabah AMIR and Anna STEPANOVA

           We consider the issue of first versus second-mover advantage in differen- tiated-product Bertrand duopoly with general demand and asymmetric linear costs. We generalize existing results for all possible combinations where prices are either strategic substitutes and/or complements, dispensing with common extraneous assumptions. We show that a firm with a sufficiently large cost lead over its rival has a first mover advantage. For the linear version of the model, we invoke a natural endogenous timing scheme coupled with equilibrium selection according to risk-dominance. This yields sequential play with the low-cost firm as leader as the unique equilibrium outcome.
           JEL Classification: L13, C72, D43
           Keywords: price competition, endogenous timing, first/second-mover advantage, risk dominance.

2004/38   On the effects of banks' equity ownership on credit markets: an antitrust perspective on the Glass-Steagall act
           Rabah AMIR and Michael TROGE

           Recent U.S. legislation (Gramm-Leach-Bliley Act) allows commercial banks to enter merchant banking, i.e. hold equity in non-financial firms. A stylised auction-theoretic model is developed to investigate the effects of bank equity stakes in firms on the competition in bank loans. The main finding is that the largest stake confers a competitive advantage to the holding bank and constitutes a barrier to entry in equity acquisition, resulting in high interest rates charged to firms. This finding unearths an antitrust dimension in the controversial debate on the separation of banking and commerce in the U.S., and provides a theoretical basis for recent empirical evidence on the relationship between bank equity holdings and the cost of debt finance in Germany and Japan.
           JEL Classification: G21, D44, L40
           Keywords: banking and commerce, regulation and antitrust, Glass-Steagall act, Gramm-Leach-Bliley act, auctions.

2004/39   On taxation pass-through for a monopoly firm
            Rabah AMIR, Isabelle MARET and Michael TROGE

            This paper investigates the pass-through of an excise tax imposed on a monopoly firm with
            constant marginal cost. The optimal price increases as tax increases for *any demand func-
            tion*. Tax pass-through is globally under or in excess of 100% according as the direct demand
            function is log-concave or log-convex. The analysis relies on supermodular optimization and
            delivers conclusions based on minimal sufficient assumptions in a simple, broadly accessible and
            self-contained framework. Further results allow for mixed conditions that provide precise and
            local determination of pass-through. Several illustrative examples are given. Policy conclusions
            relating to the relative wisdom of taxing high versus low cost monopoly firms are drawn from
            the results.

2004/40   Information structure and the tragedy of the commons in resource extraction
            Rabah AMIR and Niels NANNERUP

            This paper considers the well-known Levhari-Mirman model of resource extraction, and inves-
            tigates the effects of the information structure of the dynamic game – open-loop, Markovian or
            history-dependent – on the equilibrium consumption path and the overall utility of the agents.
            The open-loop regime yields a Pareto-optimal outcome. The Markovian regime leads to the
            most pronounced version of the tragedy of the commons. History-dependent behavior yields
            an outcome set that is intermediate between the other two cases. The level of efficiency of
            equilibrium behaviour is thus U-shaped as a function of the level of information extraction
            strategies are based on. The analysis suggests that in environments characterized by a dynamic
            (and no market) externality, forcing agents to commit to open-loop behavior would constitute
            welfare-improving regulation.
            JEL Classification: Q20, C73
            **Keywords: dynamic resource games, open-loop, closed-loop and trigger strategies,
            Pareto optimality, regulation.**

2004/41   Technology adoption with forward looking agents
            Paolo COLLA and Filomena GARCIA

            We investigate the effects of forward looking behavior in technology adoption. The setup is
            an overlapping generation model where agents choose between two alternative networks taking
            in consideration both the installed base and the expected base. The latter element is the
            distinctive feature of our approach. We use results from the global games literature to select the
            unique equilibrium on which agents coordinate their expectations. We consider both the cases
            of incompatible and compatible technologies, and show that technologies cannot lock-in, while
            the adoption path exhibits hysteresis. Network choices are characterized both in terms of their
            long run properties and expected time of adoption.
            JEL Classification: C73, L0, O3
            Keywords: technology adoption, network externalities, global game, hysteresis.

2004/42   Imperfect competition, integer constraints and industry dynamics
            Rabah AMIR and Val E. LAMBSON

            Amir and Lambson (2003) developed an infinite-horizon, stochastic model of entry and exit by
            integer numbers of firms facing sunk costs and uncertain market conditions. Here, as examples of
            the model's usefulness, special cases are applied to the following three issues: (1) the relationship
            between sunk costs and industry concentration, (2) entry when current profits are negative, and
            (3) the relationship between entry and the length of the product cycle.
            JEL Classification: C73, D43, L13
            Keywords: entry and exit, dynamic games, integer constraints.

2004/43   A formal model of Krugman's intuition on the J-curve
           Olivier CARDI and Luisito BERTINELLI

           We use a two-good dynamic intertemporal general equilibrium model to formalize the economic
           intuition of Krugman about the explanation of the J-curve phenomenon in terms of habit per-
           sistence in consumption and sluggishness in capital adjustment. The results differ markedly
           according to the permanence or temporary nature of the shock. A short-lived terms of trade
           worsening may give rise to a once-for-all decrease in the marginal utility of wealth, a hump-
           shape response of real expense when the perturbation is at work and a definitely higher level of
           consumption at the new steady-state. Habitual standard of living and welfare are raised through
           the combination of an intertemporal speculation, habit persistence, and hysteresis effects. In ac-
           cordance with recent empirical results, investment is procyclical, H-L-M effect holds, net foreign
           assets adjustment exhibits a J-curve, current account surplus is associated with a fall in real
           income. From an analytical viewpoint, a new consistent procedure to study temporary shocks
           in continuous time leads to formal solutions that allow to investigate accurately transitional
           dynamics in a complex dynamic system, comparing transitory and permanent perturbations
           analytically, underscoring hysteresis phenomenon, and bringing out the determinants of short
           and long-term reactions of macroeconomic aggregates.
           JEL Classification: F41, E22, E21, F32
           Keywords: current account, habit formation, temporary shock, J-curve.

2004/44   On the location and 'lock-in' of cities: geography vs. transportation technology
           Kristian BEHRENS

           We investigate where cities are located in a spatial economy and why they tend to get 'locked-
           in' at particular sites. Building on Fujita and Krugman (1995) we show that geography and/or
           transportation technology must exhibit some 'non-smoothness' for cities to possibly become
           'locked-in' in location space.
                 Our results establish that no asymmetric monocentric equilibrium can be generically sus-
           tained when space is homogenous and transportation technologies are 'smooth', whereas it can
           in the presence of transportation hubs and/or concave transport cost functions. This suggests
           that cities are drawn to transportation hubs during the early stages of economic development,
           whereas they can be sustained almost everywhere during later stages.
           JEL Classification: C61, C62, F12, R12
           **Keywords: transport hubs, transport costs, economic geography, location theory,
           smoothness.**

2004/45   On inverse utility and third-order effects in the economics of uncertainty
           Rabah AMIR and Marcin CZUPRYNA

           We prove that the coefficient of absolute prudence is greater than k - times coefficient of absolute
           risk aversion for the utility function if and only if the coefficient of absolute prudence is (3-k)
           times the coefficient of absolute risk aversion for the inverse utility function. Moreover this is
           also equivalent to (k-2)-concavity of the first derivative of the inverse utility function.
           JEL Classification: D80, D81
           Keywords: absolute prudence, absolute risk aversion, inverse utility function.

2004/46   Asymmetric regulation of identical polluters in oligopoly models
            Rabah AMIR and Niels NANNERUP

            Studies of second-best environmental regulation of identical polluting agents have invariably ig-
            nored potentially welfare-improving asymmetric regulation by imposing equal regulatory treat-
            ment of identical firms at the outset. Yet, cost asymmetry between oligopoly firms may well
            give rise to private as well as social gains. A trade-off is demonstrated for the regulator, between
            private costs savings and additional social costs when asymmetric treatment is allowed. Asym-
            metry is indeed optimal for a range of plausible parameter values. Further, it is demonstrated
            that for a broad class of abatement cost functions, there is scope for increasing welfare while
            keeping both total output and total emission constant. Some motivating policy issues are dis-
            cussed in light of the results, including international harmonization and global carbon dioxide
            reduction.
            JEL Classification: Q2, D8
            **Keywords: asymmetric emissions regulation, polluting oligopolists, EU harmoniza-
            tion.**

2004/47   Modelling vintage structures with DDEs: principles and applications
            Raouf BOUCEKKINE, David DE LA CROIX and Omar LICANDRO

            A comprehensive study of the linkages between demographic and economic variables should not
            only account for vintage specificity but also incorporate the relevant economic and demographic
            decisions in a complete optimal control set-up. In this paper, a methodological set-up allowing to
            reach these objectives is described. In this framework, time is continuous but agents take discrete
            timing decisions. The mixture of continuous and discrete time yields differential-difference
            equations (DDEs). This paper shows clearly that the approach allows for a relatively complete
            and rigorous analytical exploration in some special cases (mainly linear or quasi linear models),
            and for an easy computational appraisal in the general case.
            **Keywords: demography, economic growth, vintage structures, optimal control,
            differential-difference equations, state-dependence.**

2004/48   Using intra annual information to forecast the annual state dificits. The case of France
            Laurent MOULIN, Matteo SALTO, Andrea SILVESTRINI and David VEREDAS

            We develop a methodology for using intra-annual data to forecast annual budget deficits. Our
            approach aims at improving the accuracy of the deficit forecasts, a relevant issue to policy mak-
            ers in the Eurozone and at proposing a replicable methodology using at best public quantitative
            information on budgetary data. Using French data on government (State) revenues and ex-
            penditures, we estimate intra-annual monthly ARIMA models for all the items of the central
            government revenues and expenditures. Next, applying temporal aggregation techniques, we in-
            fer parameters of the annual models from the estimated parameters of the intra-annual models.
            These parameters incorporate all the intra-annual information. Finally, we do one period ahead
            predictions. We are able to update the annual deficit forecast as soon as new monthly data are
            available. This allows us to detect possible slippages in central government finances.
            JEL Classification: C22, C53, E62, H60
            Keywords: French State deficit, temporal aggregation, intra-annual, forecasting.

2004/49   Testing weak exogeneity in the exponential family: an application to financial point processes
            Juan J. DOLADO, Juan RODRIGUEZ-POO and David VEREDAS

            In this paper, two tests for weak exogeneity in the econometric modelling of financial point pro-
            cesses are proposed. They are motivated by the common practice in many econometric studies
            of tick-by-tick data of making inference on the joint density of durations and marks through
            the conditional (marks given durations) density. However, this inference is only valid if the
            process of the marginal (durations) is weakly exogenous for the parameters of the conditional
            density, a hypothesis which is often left untested. Under standard pseudo-maximum likelihood
            conditions, we first derive a simple parametric score/LM test statistic when the potential de-
            pendence between the parameters of interest in the conditional model and the marginal process
            is assumed to be linear. Next, an alternative consistent test is proposed when the functional
            form of the dependence is left unspecified. To illustrate the use of these tests, we analyze two
            types of financial point processes, linked with market microstructure theory and stealth trading
            hypothesis, for five stocks traded at NYSE: (i) the relationship between trade size and trade
            durations and (ii) the relationship between volume and price durations. In general we reject the
            null hypothesis of weak exogeneity, therefore questioning some results in the literature which
            rely on separate estimation of each density.
            JEL Classification: C12, C41, C52, G10
            **Keywords: weak exogeneity, pseudo-maximum likelihood, semiparametric models,
            point processes, high-frequency data, stealth trading, mixture of distribution hy-
            pothesis.**

2004/50   Pure strategy and no-externalities with multiple agents: A comment.
            Andrea ATTAR, Eloisa CAMPIONI Gwenael PIASER and Uday RAJAN

            In this note we consider a basic property of common agency models: pure strategy equilibria of
            games where principals compete in direct mechanisms are robust to the possibility that principals
            might deviate and use more complex indirect mechanisms to design their contracts. We show
            that this property can be generalized to multi-principal multi-agent models.
            JEL Classification: D82

2004/51   The Environmental Kuznets Curve semi-parametrically revisited
            Luisito BERTINELLI and Eric STROBL

            This paper re-examines the existence of an Environmental Kuznets Curve (EKC) across countries
            using a semi-parametric regression estimator, which places no restrictions on the functional form.
            Our results using cross-country panel data on Sulfur and Carbon Dioxide strongly suggest that
            the relationship between wealth and environmental degradation is not bell-shaped, as suggested
            by an EKC. Rather that there is a positive link for the very poorest countries and no clear
            relationship for richer countries.
            JEL Classification: O13, Q32, Q56
            Keywords: environmental Kuznets curve, semi-parametric kernel regression.

2004/52   Centralization and political accountability
           Jean HINDRIKS and Ben LOCKWOOD

In this paper we abstract from the usual gains and costs of decentralization (e.g. preference matching, spillovers and economies of scale). Instead we compare the political accountability of decentralized governments relative to centralized ones when there is a risk of "bad" governance. We study both the selection and incentive effects of accountability. A key aspect of centralization is to make the politician answerable to multiple constituencies subject to a common budget constraint. Our main findings are that (a) when politicians differ in competence, decentralization unambiguously dominates; and (b) when politicians differ in honesty, decentralization and centralization have conflicting accountability effects (when one provides better discipline, the other gives better selection). The analysis then identifies the circumstances under which centralization may increase voter welfare. The more general lesson that we can draw is that different institutional forms give rise to different information to the voters on which electoral accountability can be based. Therefore they differ on how effective elections can be in disciplining and selecting policymakers.

2004/53   Input-output linkages, proximity to final demand and the location of manufacturing industries
           Giordano MION

In this paper I develop an empirical framework to estimate the role of agglomeration externalities, especially those stemming from input-output linkages, in the location process of US manufacturing plants. Furthermore, drawing on the model of Holmes and Stevens (2004b), I propose a way to reconciliate some previous puzzling results about proximity to consumers' demand and the scope of agglomeration forces. Results suggest that intermediate flows have a positive impact, especially for big plants, on local specialization. By contrast, consumers' demand has a negative effect and this result is consistent with the model of Holmes and Stevens (2004b). However, the majority of both effects comes from very local interactions, with spatial spill-overs being quite weak, but with a very large geographical scope. This result suggests some kind of strong non-linearity in the underlying spatial process. While, very close interactions are extremely important, when considering what is beyond the limit of local markets then distance does not matter so much.
           JEL Classification: L60, R12, R15, R31, R34
           Keywords: manufacturing concentration, input-output linkages, agglomeration externalities, market proximity.

2004/54   Competition, incomplete discrimination and versioning
           Khaled DIAW and Jerome POUYET

Two producers offer differentiated goods to a representative consumer. The buyer has distinct marginal valuations for the quality of the products. Each producer perfectly knows the consumer's taste for its own product, but remains uninformed about its taste for the rival's product.
When each product cannot be purchased in isolation of the other one, a phenomenon of endogenous preferences arises since a firm's offer to the consumer depends on the information unknown by the rival firm. Multiple equilibria emerge and the consumer's rent increases with his valuation for one product and decreases with the valuation for the other product. This provides some foundations for the phenomenon of versioning which has been observed in some digital goods markets. By contrast, when each product can be purchased in isolation of the other one, at the unique equilibrium consumers with larger valuations for a product earn higher rents.
The analysis is undertaken under two alternative pricing policies: in the partially-discriminatory case, producers make use of the known information only; in the fully-discriminatory case, each producer offers second-degree price discriminates the consumer according to the unknown information. We show that, sometimes, firms prefer partial to full discrimination to soften competition.
           JEL Classification: L13, D82
           Keywords: price competition, price discrimination, versioning.

2004/55   Competition over piratable goods
           Paul BELLEFLAMME and Pierre M. PICARD

The effects of (private, small-scale) copying on the pricing behavior of producers of information goods are studied within a unified model of vertical differentiation. Although information goods are assumed to be perfectly horizontally differentiated, demands are interdependent because the copying technology exhibits increasing returns to scale. We characterize the symmetric Nash equilibria of the pricing game played by n producers of information goods. We show thereby how the producers' attitudes towards piracy are interdependent and evolve with the relative attractiveness of copies.
JEL Classification: L13, L82, L86, K11, O34
Keywords: information goods, piracy, copyright, pricing.

2004/56   A characterization of stochastically stable networks
           Olivier TERCIEUX and Vincent VANNETELBOSCH

Jackson and Watts [*J. of Econ. Theory* 71 (2002), 44-74] have examined the dynamic formation and stochastic evolution of networks. We provide a refinement of pairwise stability, p-pairwise stability, which allows us to characterize the stochastically stable networks without requiring the "tree construction" and the computation of resistance that may be quite complex. When a $\frac{1}{2}$-pairwise stable network exists, it is unique and it coincides with the unique stochastically stable network. To solve the inexistence problem of p-pairwise stable networks, we define its set-valued extension with the notion of p-pairwise stable set. The $\frac{1}{2}$-pairwise stable set exists and is unique. Any stochastically stable networks is included in the $\frac{1}{2}$-pairwise stable set. Thus, any network outside the $\frac{1}{2}$-pairwise stable set must be considered as a non-robust network. We also show that the $\frac{1}{2}$-pairwise stable set can contain no pairwise stable network and we provide examples where a set of networks is more "stable" than a pairwise stable
JEL Classification: C70, D20
Keywords: network formation, pairwise stability, stochastic stability.

2004/57   Dynamic optimal portfolio selection in a VaR framework
           Erick RENGIFO and Jeroen ROMBOUTS

We propose a dynamic portfolio selection model that maximizes expected returns subject to a Value-at-Risk constraint. The model allows for time varying skewness and kurtosis of portfolio distributions estimating the model parameters by weighted maximum likelihood in a increasing window setup. We determine the best daily investment recommendations in terms of percentage to borrow or lend and the optimal weights of the assets in the risky portfolio. Two empirical applications illustrate in an out-of-sample context which models are preferred from a statistical and economic point of view. We find that the APARCH(1,1) model outperforms the GARCH(1,1) model. A sensitivity analysis with respect to the distributional innovation hypothesis shows that in general the skewed-t is preferred to the normal and Student-t.
JEL Classification: C32, C35, G10
Keywords: portfolio selection, Value-at-Risk, skewed-t distribution, weighted maximum likelihood.

2004/58   Trading activity and liquidity supply in a pure limit order book market
           Joachim GRAMMIG, Andréas HEINEN and Erick RENGIFO

           In this paper we perform an empirical analysis of the trading process in a pure limit order
           book market, the Xetra system which operates at various European exchanges. We study how
           present and past liquidity supply and demand as well as price volatility affect future trading
           activity and market resiliency, and discuss the results in the light of predictions implied by
           theoretical models of financial market microstructure. Using time series of reconstructed limit
           order books we identify latent factors which explain future order submission and cancelation
           decisions, according to hypotheses put forth by microstructure theory. We test these hypotheses
           with a new econometric methodology for the analysis of multivariate count processes.
           JEL Classification: C32, C35, G10
           **Keywords: market microstructure, liquidity, trading activity, multivariate count
           process.**

2004/59   Interactive unawareness
           Aviad HEIFETZ, Martin MEIER and Burkhard C. SCHIPPER

           The standard state-spaces of asymmetric information preclude non-trivial forms of unawareness
           (Dekel, Lipman and Rustichini, 1998). We introduce a generalized state-space model that allows
           for non-trivial unawareness among several individuals, and which satisfies strong properties of
           knowledge as well as the desiderata on unawareness proposed this far in the literature.
           JEL Classification: C70, C72, D80, D82
           **Keywords: unawareness, awareness, knowledge, interactive epistemology, specula-
           tive trade, bounded perception.**

2004/60   On blocking coalitions: linking Mas-Colell with Grodal-Schmeidler-Vind
           Joseph GREENBERG, Shlomo WEBER and Akira YAMAZAKI

           *This paper was dedicated to the memory of Birgit Grodal, to whom the authors owe an unlimited
           debt of gratitude. Her wisdom, guidance and friendship is already so sorely missed. Sadly,
           during the writing of the paper we lost Karl Vind, whose quiet and towering presence can never
           be replaced.*

           In this paper we investigate the question of how many coalitions of a given relative size would
           block a non-Warlasian allocation in large finite economies. It is shown that in finite economies,
           if a Pareto optimal allocation is bounded away from being Walrasian, then, for any two numbers
           α, β between 0 and 1, the proportion of blocking coalitions in the set of all coalitions with relative
           size between α and β, is arbitrarily close to $\frac{1}{2}$, as the number of individuals in the economy
           becomes large.

2004/61   The Rawlsian principle and secession-proofness in large heterogeneous societies
           Michel LE BRETON, Shlomo WEBER and Jacques DREZE

           This paper examines a model of multi-jurisdictional formation considered by Alesina and Spo-
           laore (1997) and Le Breton and Weber (2003), where the distribution of individuals is given by
           Lebesgue measure over the (finite or infinite) interval. Every jurisdiction chooses a location of
           a public good and shares the cost of production among its residents. Each individual covers
           transportation cost to the location of the public good, and contributes towards the production
           of the public good. We consider a notion of a *secession-proof allocation* where no group of indi-
           viduals can make all its members better off by choosing both a location of the public good and
           a cost-sharing mechanism among its own members. We show that if the society's population is
           distributed over the real line $\Re$, the only secession-proof allocation is *Rawlsian*, which equalizes
           the utilities of all individuals in the society. In the case of bounded support, we show that there
           is a degree of approximation to the Rawlsian solution that reconciles the secession-proofness
           and the weakened Rawlsian principle.
           JEL Classification: D70, H20, H73
           Keywords: optimal jurisdictions, secession-proofness, rawlsian allocations, efficiency.

2004/62   The tax treatment of intergenerational wealth transfers
Helmuth CREMER and Pierre PESTIEAU

This paper to surveys the theoretical literature on wealth transfer taxation. The focus is normative: we are looking at the design of an optimal tax structure from the standpoint of both equity and efficiency. The gist of this survey is that the optimal design crucially depends on the assumed bequest motives. Alternative bequest motives are thus analyzed either in isolation or combined.

2004/63   Herd behaviour, strategic complementarities and technology adoption
Cecilia VERGARI

In technology adoption, herd behaviour can lead to a suboptimal outcome. An example is given by Choi (1997): it is a model of technology choice under uncertainty where herding arises because of strategic complementarities and risk aversion. It causes a positive experimenting bias against the adoption of a more efficient (in terms of expected value) technology. We introduce in his model an additional element upon which firms base their technology decision: the economic environment. We investigate how this additional source of uncertainty can affect herding and so the efficiency of the technology choice. The result is that, under certain conditions, the experimenting bias decreases and in the limit it is possible to induce firms to experiment with the new technology thus improving social welfare.
JEL Classification: D62, D80, D83, L15
Keywords: herding, information and network externalities, public information social learning, technology adoption.

2004/64   Fast Fourier Transform and its applications to integer knapsack problems
Yu. NESTEROV

In this paper we suggest a new efficient technique for solving integer knapsack problems. Our algorithms can be seen as application of Fast Fourier Transform to generating functions of integer polytopes. Using this approach, it is possible to count the number of boolean solutions of a single n-dimensional Diophantine equation $\langle a, x \rangle = b$ in $O(\|a\|_1 \ln \|a_1\| \ln n)$ operations. Another application example is an integer knapsack optimization problem of volume b, which can be solved in $O(\|a\|_1 \ln \|a_1\| \ln n + b \ln^2 n)$ operations of exact real arithmetics. These complexity estimates improve by a factor of n the complexity of the traditional Dynamic Programming technique.
Keywords: integer programming, knapsack problem, Fast Fourier Transform, Dynamic Programming.

2004/65   New economic geography: what about the N ?
Gianmarco I.P. OTTAVIANO and Jacques-François THISSE

Since its very appearance, probably due to its provocative name, New Economic Geography has stirred a debate on whether it is economic geography proper or rather geographical economics. In both cases, its real novelty has been questioned. We focus on this last issue. In particular, we argue that many of the NEG ideas have been around for a long time in the works of economic geographers and location theorists. However, NEG has the fundamental merit of having framed those ideas within a general equilibrium model encompassing most of these ideas. This has drawn economic geography and location theory from the periphery to the center of mainstream economic theory. More importantly, it has made already existing ideas more amenable to empirical scrutiny and policy analysis.

2004/66   International integration and regional inequalities: how important is national infrastructure ?
           Kristian BEHRENS

           We investigate how international trade and trade policy possibly affect the regional distribution
           of economic activities within a country involved in a process of economic integration. Our
           analysis reveals that the impact of decreasing international trade costs on the spatial distribution
           of economic activities strongly depends on the structure of trade flows and the value of transport
           costs internal to the country. Whereas trade liberalization in developing countries with poor
           infrastructure and mostly autarkic regions may exacerbate spatial inequalities, countries with
           better infrastructure and larger volumes of interregional trade may experience a more balanced
           geographical development.
           JEL Classification: D11, F12, L13, R12
           **Keywords: trade liberalization, regional integration, transport costs, trade costs,
           economic geography.**

2004/67   Pensions with endogenous and stochastic fertility
           Helmuth CREMER, Firouz GAHVARI and Pierre PESTIEAU

           This paper studies the design of a pay-as-you-go social security system in a society where
           fertility is in part stochastic and in part determined through capital investment. If parents'
           investments in children are publicly observable, pension benefits must be linked positively to
           the level of investment, and payroll taxes negatively to the number of children. The outcome is
           characterized by full insurance with all parents, regardless of their number of children, enjoying
           identical consumption levels. Without observability, benefits must increase, and payroll taxes
           decrease, with the number of children. The second-best level of investment in children, and the
           resulting average fertility rate, are less than their corresponding first-best levels.
           JEL Classification: H55, J13
           **Keywords: pay-as-you-go social security, endogenous fertility, storage, moral haz-
           ard, Samuelson's condition.**

2004/68   Public and private environmental spending. A political economy approach
           Pierre-André JOUVET, Philippe MICHEL and Pierre PESTIEAU

           This paper studies the determination of public investment in environmental quality when there
           are private alternatives. Public investment is chosen by majority voting. When consumption and
           environmental quality are complementary one may observe a solution of the type "ends against
           the middle."

2004/69   Transfer pricing and enforcement policy in oligopolistic markets
           Oscar AMERIGHI

           In this paper we set up a symmetric two-country model with trade costs and international
           ownership to study the transfer pricing decisions by two multinationals operating in markets with
           Cournot competition. We let governments choose both the corporate profit tax rate and the level
           of enforcement of the "arm's length" principle and we examine how enforcement policies affect
           the tax competition game. Furthermore, we analyze in what direction economic integration, in
           terms of a reduction in trade costs and/or a larger international ownership of multinationals,
           influences the symmetric equilibrium level of the two policy instruments. We show that increased
           economic integration may lead to *higher* equilibrium tax rates, and that, as governments increase
           the level of enforcement, equilibrium tax rates *increase* as well. Moreover, we find that, when
           the two MNEs are not fully owned by domestic residents, trade liberalization *decreases* the
           equilibrium enforcement policy, while increased international ownership *increases* the level of
           enforcement.
           JEL Classification: H87, F02, F15, F23
           **Keywords: multinational enterprises, transfer pricing, tax competition, enforce-
           ment policy, economic integration.**

2004/70   Are differential co-payment rates appropriate in the health sector ?
           Louis EECKHOUDT, Maurice MARCHAND, Pierre PESTIEAU and Gwenael PIASER

In this paper we discuss the interest of applying differential co-payment rates across alternative medical treatments. Two treatment strategies are considered: a "long term strategy" in which patients apply preventive measures before knowing if they have the desease and an "emergency strategy" where patients are treated on contraction of the desease. We show that the second approach should be more generously subsidized by the regulator.

2004/71   R&D networks among unionized firms
           Ana MAULEON, José SEMPERE-MONERRIS and Vincent J. VANNETELBOSCH

We develop a model of strategic networks in order to analyze how trade unions will affect the stability and efficiency of R&D collaboration networks in an oligopolistic industry with three firms. Whenever firms settle wages, the complete network is always pairwise stable and the partially connected network is stable if and only if spillovers are large enough. If spillovers are small, the complete network is the efficient network; otherwise, the efficient network is the partially connected network. Thus, a conflict between stability and efficiency may occur: efficient networks are pairwise stable, but the reverse is not true. Strong stability even reinforces this conflict. However, once unions settle wages such conflict disappears: the complete network is the unique pairwise and strongly stable network and is the efficient network whatever the spillovers.
           JEL Classification: C70, L13, L20, J50, J52
           Keywords: R&D collaboration, oligopoly, unions.

2004/72   Environmental performance and equilibrium
           Thierry BRECHET and Philippe MICHEL

Firms' or industries' ranking in terms of environmental performance may be influenced by equilibrium and not only by ex ante technological characteristics. We adopt a natural definition of relative eco-efficiency between two industries operating within the same environmental constraint: the more eco-efficient one is the one that has the higher output level. We compare the relative eco-efficiency of two technologies characterizing two industries, and then of two firms within the same industry. We show that all these comparisons depend, through the equilibrium, on the environmental constraint imposed at the industry level. We also show that firm's profitability at the equilibrium depends on its eco-efficiency, but also on its labour elasticity and permits allocation: the more eco-efficient firm is not necessarily the more profitable one.
           JEL Classification: D20, Q50
           Keywords: eco-efficiency, benchmarking, tradable permits.

2004/73   Smoothing technique and its applications in semidefinite optimization
           Yu. NESTEROV

In this paper we extend the smoothing technique [7], [9] onto the problems of Semidefinite Optimization. For that, we develop a simple framework for estimating a Lipschitz constant for the gradient of some symmetric functions of eigenvalues of symmetric matrices. Using this technique, we can justify the Lipshitz constants for some natural approximations of maximal eigenvalue and the spectral radius of symmetric matrices. We analyze the complexity of the problem-oriented gradient-type schemes onto the problems of minimizing the maximal eigenvalue or the spectral radius of the matrix, which depends linearly on the design variables. We show that in the first case the number of iterations of the method is bounded by $O(\frac{1}{\varepsilon})$, where ε is the required *absolute* accuracy of the problem. In the second case, the number of iterations is bounded by $\frac{4}{\delta}\sqrt{(1+\delta)r\ln r}$, where δ is the required *relative* accuracy and r is the maximal rank of corresponding linear matrix inequality. Thus, the latter method is a fully polynomial approximation scheme.
           Keywords: convex optimization, non-smooth optimization, complexity theory, black-box model, optimal methods, structural optimization, smoothing technique.

2004/74   Education and growth with endogenous debt constraints
           David DE LA CROIX and Philippe MICHEL

When future human capital cannot be alienated, households are allowed to borrow up to the point where it is in their own interest not to default. In such a framework, endogenous borrowing limits arise as the outcome of individual rationality constraint. In a model where education is the engine of growth, we show that endogenous borrowing constraints imply global indeterminacy. Comparing outcomes across the various equilibria we show that the relation between growth and yields is hump-shaped. Maximum growth can arise in an equilibrium with binding borrowing constraints, specially if the elasticity of human capital to education spending is large. Deepening financial markets promotes long-run growth in the case of a poverty trap, but not necessarily otherwise.
JEL Classification: O410, O160, J240, D310
Keywords: financial depth, borrowing constraints, indeterminacy, incentive compatibility.

2004/75   Core-stable and equitable allocations of greenhouse gas emission permits
           Vincent VAN STEENBERGHE

This paper deals with the issue of how to allocate greenhouse gas emission permits to nations in the long run. The so-called 'equitable' rules to allocate such permits under a global agreement (per capita or grandfathering allocation rules for instance) do not necessarily ensure stability in the sense of the core of a cooperative game: some nations and groups of nations may typically be worse off under the global agreement than in alternative non-cooperative situations. We present a way to compute allocations of permits satisfying core constraints at *each commitment period*, while being as close as possible to any given 'equitable' allocation. Then a simple world simulation model is used to analyze the long run welfare effects of these allocations.
Keywords: climate change negotiations, tradable permits, dynamic games, core, equity, Shapley value, nucleolus.

2004/76   A full heteroscedastic one-way error components model allowing for unbalanced panel: Pseudo-maximum likelihood estimation and specification testing
           Bernard LEJEUNE

This paper proposes an extension of the standard one-way error components model allowing for heteroscedasticity in both the individual-specific and the general error terms, as well as for unbalanced panel. On the grounds of its robustness to distributional misspecification, its robustness to possible misspecification of the assumed scedastic structure of the data, its computational convenience and its potential efficiency, we argue for estimating this model by Gaussian pseudo-maximum likelihood of order two. Further, we review how, taking advantage of the powerful m-testing framework, the correct specification of the prominent aspects of the model may be tested. So are surveyed potentially useful nested, non-nested, Hausman and information matrix type diagnostic tests of both the mean and the variance specification of the model. Finally, we illustrate the practical relevance of our proposed model and estimation and diagnostic testing procedures through an empirical example in the production analysis field.
JEL Classification: C12, C22, C52
Keywords: error components model, heteroscedasticity, unbalanced panel data, pseudo-maximum likelihood estimation, m-testing.

2004/77   Time-to-market in vertically differentiated industries
           Emanuele BACCHIEGA, Jean J. GABSZEWICZ and Ornella TAROLA

           We study the introduction of new products in a vertically differentiated industry. Innovative
           firms have to engage into reducing time-to-market investments in order to shorten the time inter-
           val between innovation and sales. Still, these investments generate irreversible costs which have
           to be put in balance with profits accruing to the firm when starting its sales earlier than oth-
           erwise. We characterize the optimal investment policies under various assumptions concerning
           the market structure.
           JEL Classification: L11, L13, O31
           Keywords: time-to-market, market structure, vertical product differentiation.

2004/78   B2M marketplaces: emergence and entry
           Paul BELLEFLAMME and Eric TOULEMONDE

           In a successive vertical oligopoly, a set of "sellers" produce some input to be transformed into
           a final product by a set of "buyers". On this two-sided market, a firm's profit increases with
           the number of firms of the other type and decreases with the number of firms of its own type.
           We examine the emergence or the entry of a new marketplace sponsored by a profit-maximizing
           intermediary who targets buyers and sellers in sequential way by setting membership fees (or
           subsidies).
           JEL Classification: L11, L13, L23
           Keywords: two-sided markets, vertical oligopoly, B2B.

2004/79   Why do people learn foreign languages ?
           Victor GINSBURGH, Ignacio ORTUNO-ORTIN and Shlomo WEBER

           We suggest a demand model for foreign languages and estimate demand functions for English,
           French, German and Spanish in 13 European countries. We show that three variables explain
           reasonably well the share of people who learn a foreign language: the larger the native population
           in the country, the less its citizens are prone to learn another language; the more the foreign
           language is spoken, the more it attracts others to learn it; the larger the distance between two
           languages, the smaller the proportion of people who will learn it.

2004/80   Disenfranchisement in linguistically diverse societies. The case of the European Union
           Victor GINSBURGH, Ignacio ORTUNO-ORTIN and Shlomo WEBER

           This paper introduces the notion of *language disenfranchisement* which arises if the number
           of EU working languages is reduced and some EU citizens are denied the usage of their own
           language for official purposes. We use data on language proficiency in the EU and show that, in
           spite of the widespread knowledge of English, the retention of French and Germain as working
           languages is essential to avoid a high degree of disenfranchisement of EU citizens. We also argue
           that even though French is the second leading language within the EU, the recent enlargement
           could change the situation.
           JEL Classification: D70, O52, Z13
           Keywords: languages, disenfranchisement, European Union.

2004/81   The Clean Development Mechanism under the Kyoto Protocol and the 'low-hanging fruits' issue
Thierry BRECHET, Marc GERMAIN and Vincent VAN STEENBERGHE

The Kyoto Protocol has introduced the so-called Clean Development Mechanism (CDM) under which industrialized countries are allowed to fulfill part of their obligations through the use of emission credits generated by emission reduction projects undertaken in developing countries. Developing countries have been reluctant to participate in the CDM, fearing that the CDM will use up most of their cheap abatement options (the 'low-hanging fruits' problem). In this paper we show that developing countries should in general participate in the CDM, unless the credit prices are relatively low. Moreover, these countries always gain by participating in the CDM when banking of credits is allowed. Nevertheless, three effects that are likely to limit the extent of such a participation are identified. A case-study (South Africa) reveals that these effects may play a significant role.

2004/82   Long term care: the state, the market and the family
Pierre PESTIEAU and Motohiro SATO

In this paper we study the optimal design of a long term care policy in a setting that includes three types of care to dependent parents: public nursing homes, financial assistance by children and assistance in time by children. The instruments are public nursing homes and subsidies to aiding children, both financed by a flat tax on earnings. The only source of heterogeneity is children's productivity. Parents can influence their children by leaving them gifts before they know whether or not they will need long term care, yet knowing the productivity of the children. We show that the quality of nursing homes and the level of tax-transfer depend on their effect on gifts, the distribution of wages and the various inequalities in consumption. We also consider the possibility of private insurance. **JEL Classification:** D64, H55, I118
Keywords: long term care, altruism, bequests.

2004/83   Social insurance and redistribution with moral hazard and adverse selection
Robin BOADWAY, Manuel LEITE-MONTEIRO, Maurice MARCHAND and Pierre PESTIEAU

Rochet (1989) showed that with distortionary income taxes, social insurance is a desirable redistributive device when risk and ability are negatively correlated. This finding is reexamined when ex post moral hazard and adverse selection are included, and under different informational assumptions. Individuals can take actions influencing the size of the loss in the event of accident (or ill health). Social insurance can be supplemented by private insurance, but private insurance markets are affected by both adverse selection and moral hazard. We study how equity and efficiency considerations should be traded off in choosing the optimal coverage of social insurance when those features are introduced. The case for social insurance is strongest when the government is well informed about household productivity.
JEL Classification: H23, H51
Keywords: social insurance, redistribution, market failures.

2004/84   Special functions for the study of economic dynamics: The case of the Lucas-Uzawa model
Raouf BOUCEKKINE and Ramon RUIZ-TAMARIT

The special functions are intensively used in mathematical physics to solve differential systems. We argue that they should be most useful in economic dynamics, notably in the assessment of the transition dynamics of endogenous growth models. We illustrate our argument on the Lucas-Uzawa model, which we solve by the means of Gaussian hypergeometric functions. We show how the use of Gaussian hypergeometric functions allows for an explicit representation of the equilibrium dynamics of the variables **in level**. In contrast to the preexisting approaches, our method is global and does not rely on dimension reduction.
JEL Classification: C61, C62, O41
Keywords: special functions, hypergeometric functions, optimal control, Lucas-Uzawa model, economic dynamics.

2004/85   Adoption and diffusion of cost reducing innovations: Cournot competition in duopoly
           Raouf BOUCEKKINE, Omar LICANDRO and Antonio MINNITI

           This note analyses the adoption and diffusion of innovations in a horizontally differentiated
           Cournot duopoly in which firms have to choose the dates for adopting a cost-reducing new
           technology like in Reinganum (1981a). We prove that product differentiation crucially matters
           in the diffusion pattern of the innovation and in the comparison between the adoption timing
           in the decentralized economy Vs the social optimum.
           JEL Classification: O31
           Keywords: adoption, diffusion, differentiated duopoly.

2004/86   Internal capital market efficiency of Belgian holding companies
           Axel GAUTIER and Malika HAMADI

           In this paper, we raise the following two questions: (1) do Belgian holding companies operate
           an internal capital market to transfer financial resources in between their subsidiaries? And if
           yes, (2) is the internal capital market efficient? To answer the first question, we check if the
           group cash flow is a determinant of the investment's spending of group members. The answer
           is positive if the holding's subsidiary is affiliated to a coordinate center and negative otherwise.
           To answer the second question, we evaluate if internal transfers are driven by efficiency. From
           our estimations, we cannot conclude that Belgian Holding companies have an efficient internal
           capital market.
           JEL Classification: G31
           Keywords: investment, holding, internal capital market.

2004/87   Inter-governmental competition: market solutions to political problems
           Jean HINDRIKS

           In normative public economics, inter-governmental competition is usually viewed as harmful.
           Although empirical support for this position does not abound, market integration has intensified
           competition among developed countries. In this paper we argue that when assessing welfare
           effects of inter-governmental competition for various forms of government imperfections (the
           public choice critique), the outcome is ambiguous and competition can be welfare improving.

2004/88   Price-quantity competition with varying toughness
           Claude D'ASPREMONT and Rodolphe DOS SANTOS FERREIRA

           In order to formalize the variety of oligopolistic competition regimes, we adopt an approach (pi-
           oneered by Shubik, 1959) where firms behave strategically both in price and quantity. The cor-
           responding concept of oligopolistic equilibrium allows for a parameterized continuum of regimes
           with varying competitive toughness. In particular, the Cournot and the competitive outcomes
           coincide, respectively, with the softest and the toughest oligopolistic equilibrium outcome. The
           set of all equilibrium outcomes are compared with those obtained in three alternative approaches,
           respectively based on pricing-schemes, conjectural variations and supply functions. Finally, we
           explore the possibility of endogenizing strategically the choice of competitive toughness by the
           firms.

2004/89   Optimal control in infinite horizon problems: A Sobolev space approach
           Cuong LE VAN, Raouf BOUCEKKINE and Cagri SAGLAM

           In this paper, we make use of the Sobolev space $W^{1,1}(\mathbb{R}_+, \mathbb{R}^n)$ to derive at once the Pontryagin
           conditions for the standard optimal growth model in continuous time, including a necessary
           and sufficient transversality condition. An application to the Ramsey model is given. We use
           an order ideal argument to solve the problem inherent to the fact that L^1 spaces have natural
           positive cones with no interior points.
           JEL Classification: C61
           Keywords: optimal control, Sobolev spaces, transversality conditions, order ideal.

2004/90   Inefficiencies in European congestion management proposals
                 Andreas EHRENMANN and Yves SMEERS

An efficient congestion management system is a necessary condition to remove obstacles to the cross border trade of electricity in Europe and hence to move towards an internal electricity market. Locational marginal pricing (LMP) is progressively becoming the benchmark of congestion management in the United States. It is conceptually simple, compatible with basic economic theory and physical realities, and effective in practice. Proposals for congestion management in Europe depart in several ways from this benchmark. We discuss these proposals and illustrate some of their inefficiencies. A special emphasis is placed on the restrictions to trade implied by the implementation of zonal approaches.