

- 2006/1 Labor market integration and migration: Impacts on skill formation and the wage structure.
Kristian BEHRENS and Yasuhiro SATO

We analyze the impacts of labor market integration and migration on skill formation, wage structures, and per capita GDP of host and source countries. To do so, we propose a model in which heterogeneous agents invest in the acquisition of skills, and in which final good production exhibits increasing returns to scale in the range of available skills. Labor market integration, by allowing for migration in response to wage differentials, changes the wage structures and, therefore, the incentives to become skilled in both host and source countries.

We show that our model can largely replicate the empirical evidence concerning international migration, the widening international income dispersion, the narrowing national income dispersion, and the divergence in the rates of skill formation in host and source countries.

JEL Classification: F22, J24, J31, J61

Keywords: labor market integration, migration, skill heterogeneity, skill formation, income inequalities.

- 2006/2 Asymmetric information, word-of-mouth and social networks:
from the market for lemons to efficiency
Noemí NAVARRO

I analyze a market where there is a homogeneous good, which quality is chosen, and therefore known, by a single producer. Consumers do not know the quality of the good but they use their acquaintances in order to obtain information about it. Information transmission exhibits decay and consumers assign a common initial willingness-to-pay before information transmission takes place. I define an equilibrium concept for this type of situation and characterize the set of resulting equilibria for any possible social network. The main conclusion from this characterization is that, if there is a maximal level of quality (given by technological knowledge) that can be chosen, then, the producer may choose lower levels of quality as the population of consumers is getting more internally connected, due to free-riding on information by consumers when quality levels are low. This “adverse-selection” effect vanishes if consumers are expected to coordinate on the most favorable equilibria for the producer, if there is zero initial willingness-to-pay or if there are no technological constraints.

JEL Classification: D4, D8, L1

Keywords: networks, word-of-mouth communication, asymmetric information.

- 2006/3 Cooperation, stability and self-enforcement in international environmental agreements:
a conceptual discussion
Parkash CHANDER and Henry TULKENS

In essence, any international environmental agreement (IEA) implies cooperation of a form or another. The paper seeks for logical foundations of this. It first deals with how the need for cooperation derives from the public good aspect of the externalities involved, as well as with where the source of cooperation lies in cooperative game theory. In either case, the quest for efficiency is claimed to be at the root of cooperation.

Next, cooperation is considered from the point of view of stability. After recalling the two competing concepts of stability in use in the IEA literature, new insights on the nature of the gamma core in general are given as well as the Chander-Tulkens solution within the gamma core. Free riding is also evaluated in relation with the alternative forms of stability under scrutiny.

Finally, it is asked whether with the often mentioned virtue of “self enforcement” any conceptual gain is achieved, different from what is meant by efficiency and stability. A skeptical answer is offered, as a reply to Barrett’s (2003) attempt at giving the notion a specific content.

- 2006/4 Contests with heterogeneous agents
Sergio O. PARREIRAS and Anna RUBINCHIK-PESSACH

We study tournaments with many ex-ante asymmetric contestants, whose valuations for the prize are independently distributed. First, we characterize the equilibria in monotone strategies, second, we provide sufficient conditions for the equilibrium uniqueness and, finally, we reconcile the experimental evidence documenting the ‘workaholic’ behavior in contests with the related theory by introducing heterogeneity among participants. It is a ‘weak’ participant that might become a ‘workaholic’ in an equilibrium, that is, his effort density might *crease* at the highest valuation - weak, either because he is more risk averse or because his rivals consider that it is very unlikely that he has a high value for the prize. In contrast, effort densities are always decreasing in case of symmetry with identically distributed values for the prize and identical attitudes towards risk in case of CARA, as well as in contests with only two participants. Moreover, we show that for low valuations more risk averse agents are less likely to exert low effort than their ‘strong’ rivals, while those with dominated distribution of the prize valuation are more likely to do so. An explicit solution for the uniform distribution case with contestant-specific support is provided as well.

- 2006/5 The optimality of hospital financing system: the role of physician-manager interactions
David CRAINICH, Hervé LELEU and Ana MAULEON

In a paper published by Ma (1994) it was argued that the prospective payment system in the hospital industry was superior to the cost based reimbursement system to achieve both cost reduction and quality improvement objectives. In the analysis, it was assumed that quality and costs decisions were made by a single agent. Our paper compares these two financing systems assuming that the main decisions taken within the hospital are shared between physicians (quality of treatment) and hospital managers (cost reduction). If Ma’s conclusions hold in the US context (where the hospital managers bear the whole cost of treatment), we show that the ability of a prospective payment system to achieve both objectives is very depending of the type of interaction between the agents when physicians bear a part of the treatment cost as it is the case in many European countries.

JEL Classification: H51, I18, D21

Keywords: hospital’s financing system, strategic interaction, prospective payment system.

- 2006/6 Habit in pollution. A challenge for intergenerational equity
Ingmar SCHUMACHER and Benteng ZOU

In this article we extend the recent literature on overlapping generations and pollution by allowing each generation’s utility to depend on past levels of pollution. To conform with the literature on habit in consumption we call this extension habit in pollution. Habit in pollution can visualize itself as either a concern for the flow of pollution only, or for the stock, or anything in between.

We show that habit in pollution has not only significant consequences for the level of pollution and capital, but also for the evolution of utility over time. We observe that habit in pollution can lead to violations of two standard criteria of sustainability, which suggests that habit in pollution can be another source of intergenerational inequity.

JEL Classification: Q20, I31

- 2006/7 Stability under unanimous consent, free mobility and core
Anna BOGOMOLNAIA, Michel LE BRETON, Alexei SAVVATEEV and Shlomo WEBER
- In this paper we consider an urban population represented by a continuum of individuals uniformly distributed over the real line that faces a problem of location and financing of multiple public facilities. We examine three notions of stability of emerging jurisdiction: stability under unanimous consent, free mobility and core and provide a characterization of stable partitions under these notions of stability.
- JEL Classification:** D70, H20, H73
- Keywords:** jurisdiction structures, admission unde unanimous consent, equal share, core, free mobility.
- 2006/8 Endogenous heterogeneity in strategic models:
symmetry-breaking via strategic substitutes and nonconcavities
Rabah AMIR, Filomena GARCIA and Malgorzata KNAUFF
- This paper is an attempt to develop a unified approach to endogenous heterogeneity by constructing general class of two-player symmetric games that always possess only asymmetric pure-strategy Nash equilibria. These classes of games are characterized in some abstract sense by two general properties: payoff non-concavities and some form of strategic substitutability. We provide a detailed discussion of the relationship of this work with Matsuyama's symmetry breaking framework and with business strategy literature. Our framework generalizes a number of models dealing with two-stage games, with long term investment decisions in the first stage and product market competition in the second stage. We present the main examples that motivate this study to illustrate the generality of our approach.
- JEL Classification:** C72, C62, L11
- Keywords:** inter-firm heterogeneity, submodular games, business strategy, innovation strategies.
- 2006/9 Hedge markets for executives and corporate agency
Saltuk OZERTURK
- This paper analyzes the implications of executive hedge markets for firm value maximization in an optimal contracting framework. The main results are as follows: without any hedging ability, the manager underinvests in risk at the firm level to diversify his own compensation risk. If the manager can trade a security correlated with firm specific risk, the underinvestment in risk is reduced, optimal managerial share ownership and equilibrium effort increase. If the manager can hedge by simulating the sale of his shares, however, he can completely undo any incentive scheme. The model predicts that a higher degree of financial market development implies higher managerial share ownership and more efficient risk taking at the firm level.
- JEL Classification:** G30, G32
- Keywords:** managerial hedge markets, inefficient risk reduction, effort provision, optimal managerial share ownership, security innovation.
- 2006/10 Intra-daily FX optimal portfolio allocation
Luc BAUWENS, Walid BEN OMRANE and Erick RENGIFO
- We design and implement optimal foreign exchange portfolio allocations. An optimal allocation maximizes the expected return subject to a Value-at-Risk (VaR) constraint. Based on intradaily data, the optimization procedure is carried out at regular time intervals. For the estimation of the conditional variance from which the VaR is computed, we use univariate and multivariate GARCH models. The result for each model is given by the best intradaily investment recommendations in terms of the optimal weights of the currencies in the risky portfolio.
- JEL Classification:** C32, C53, G11
- Keywords:** optimal portfolio selection, Value-at-Risk, GARCH models, foreign exchange markets.

- 2006/11 Regime switching GARCH models
Luc BAUWENS, Arie PREMINGER and Jeroen V.K. ROMBOUTS

We develop univariate regime-switching GARCH (RS-GARCH) models wherein the conditional variance switches in time from one GARCH process to another. The switching is governed by a time-varying probability, specified as a function of past information. We provide sufficient conditions for stationarity and existence of moments. Because of path dependence, maximum likelihood estimation is infeasible. By enlarging the parameter space to include the state variables, Bayesian estimation using a Gibbs sampling algorithm is feasible. We apply this model using the NASDAQ daily return series.

JEL Classification: C11, C22, C52

Keywords: GARCH, regime switching, Bayesian inference.

- 2006/12 Multivariate mixed normal conditional heteroskedasticity
Luc BAUWENS, Christian HAFNER and Jeroen V.K. ROMBOUTS

We propose a new multivariate volatility model where the conditional distribution of a vector time series is given by a mixture of multivariate normal distributions. Each of these distributions is allowed to have a time-varying covariance matrix. The process can be globally covariance-stationary even though some components are not covariance-stationary. We derive some theoretical properties of the model such as the unconditional covariance matrix and autocorrelations of squared returns. The complexity of the model requires a powerful estimation algorithm. In a simulation study we compare estimation by maximum likelihood with the EM algorithm and Bayesian estimation with a Gibbs sampler. Finally, we apply the model to daily U.S. stock returns.

JEL Classification: C11, C22, C52

Keywords: multivariate volatility, finite mixture, EM algorithm, Bayesian inference.

- 2006/13 Smoothing techniques in Euclidean Jordan algebras
Michel BAES

We extend the powerful smoothing techniques of Yu. Nesterov to the framework of Euclidean Jordan algebras. This study allows us to design a new scheme for minimizing the largest eigenvalue of an affine function on a Euclidean Jordan algebra. We prove that its complexity is in the order of $O(1/\varepsilon)$, where ε is the absolute tolerance on the value of the objective. Particularizing our result, we propose a new algorithm to minimize a sum of Euclidean norms and we perform its complete complexity analysis.

- 2006/14 Incentives to innovate in oligopolies
Paul BELLEFLAMME and Cecilia VERGARI

In the spirit of Arrow (1962), we examine, in an oligopoly model with horizontally differentiated products, how much a firm is willing to pay for a process innovation that it would be the only one to use. We show that different measures of competition (number of firms, degree of product differentiation, Cournot vs Bertrand) affect incentives to innovate in non-monotonic, different, and potentially opposite ways.

JEL Classification: L13, O31

Keywords: innovation, profit incentive, oligopoly, product differentiation.

- 2006/15 Pensions with heterogenous individuals and endogenous fertility
Helmuth CREMER, Firouz GAHVARI and Pierre PESTIEAU

This paper studies the design of pension schemes in a society where fertility is endogenous and parents differ in their ability to raise children. In a world with perfect information, a pay-as-you-go social security system is characterized by equal pensions for all but different contributions which may or may not increase with the number of children. Additionally, fertility must be subsidized at the margin to correct for the externality that accompanies fertility. In a world of asymmetric information, incentive-related distortions supplement the Pigouvian subsidy. These may either require an additional subsidy or an offsetting tax on fertility depending on whether the redistribution is towards people with more or less children. In the former case, pensions are decreasing in the number of children; in the latter case, they are increasing.

- 2006/16 Disability testing and retirement
Helmuth CREMER, Jean-Marie LOZACHMEUR and Pierre PESTIEAU

This paper studies the design of retirement and disability policies. It illustrates the often observed exit from the labor force of healthy workers through disability insurance schemes. Two types of individuals, disabled and leisure-prone ones, have the same disutility for labor and cannot be distinguished. However, they are not counted in the same way in social welfare. Benefits depend on retirement age and on the (reported) health status. We determine first- and second-best optimal benefit levels and retirement ages and focus on the distortions which may be induced in the individuals' retirement decision. Then we introduce the possibility of testing which sorts out disabled workers from healthy but retirement-prone workers. We show that such testing can increase both social welfare and the rate of participation of elderly workers; in addition disabled workers are better taken care of. It is not optimal to test all applicants. Surprisingly, the (second-best) solution *may* imply later retirement for the disabled than for the leisure prone. In that case, the disabled are compensated by higher benefits.

- 2006/17 Social desirability of earnings tests
Helmuth CREMER, Jean-Marie LOZACHMEUR and Pierre PESTIEAU

In many countries pension systems involve some form of earnings test; i.e., an individual's benefits are reduced if he has labor income. This paper examines whether or not such earning tests emerge when pension system and income tax are optimally designed. We use a simple model with individuals differing both in productivity and their health status. The working life of an individual has two "endings": an official retirement age at which he starts drawing pension benefits (while possibly supplementing them with some labor income) and an effective age of retirement at which professional activity is completely given up. Weekly work time is endogenous, but constant in the period before official retirement and again constant (but possibly at a different level), after official retirement. Earnings tests mean that earnings are subject to a higher tax after official retirement than before. We show under which conditions earnings tests emerge both under a linear and under a nonlinear tax scheme. In particular, we show that earning tests will occur if heterogeneities in health or productivity are more significant after official retirement than before.

- 2006/18 Piracy prevention and the pricing of information goods
Helmuth CREMER and Pierre PESTIEAU

This paper develops a simple model of piracy to analyze its effects on prices and welfare and to study the optimal enforcement policy. A monopolist produces an information good (involving a large development cost and a small reproduction cost) that is sold to two groups of consumers differing in their valuation of the good. We distinguish two settings: one in which the monopoly is regulated and one in which it maximizes profits and is not regulated, except that the public authority may be responsible for the control of piracy. We show that copying or piracy might be welfare enhancing because it is a way to provide the good to some individuals (those with a low willingness to pay) without undermining the firm's ability to finance the development cost via the pricing scheme applied to high valuation consumers. The level of piracy control differs according to the regulatory environment. Three levels of piracy control emerge. The highest is the one chosen by the private monopoly. The next level is the one chosen by the regulated monopoly. The lowest, that can be zero, is the level of control chosen by the public authority when the good is sold (and priced) by a private monopoly.

JEL Classification: L11, L86, D82

Keywords: piracy, copying, intellectual property, information good.

- 2006/19 Social security and retirement decision: A positive and normative approach
Helmuth CREMER, Jean-Marie LOZACHMEUR and Pierre PESTIEAU

Social insurance for the elderly is judged responsible for the widely observed trend towards early retirement. In a world of laissez-faire or in a first-best setting, there would be no such trend. However, when first-best instruments are not available, because health and productivity are not observable, the optimal social insurance policy may imply a distortion on the retirement decision. The main point we make is that while there is no doubt that retirement systems induce an excessive bias towards early in many countries, a complete elimination of this bias (i.e., a switch to an actuarially fair system) is not the right answer. This is so and for two reasons. First, some distortions are second-best optimal. This is the normative argument. Second, and on the positive side, the elimination of the bias might be problematic from a political perspective. Depending on the political process, it may either not be feasible or alternatively it may tend to undermine the political support for the pension system itself.

JEL Classification: J26, H55, H21

Keywords: social security, early retirement, optimal income taxation, majority voting.

- 2006/20 Political information acquisition for social exchange
Gani ALDASHEV

We model political information acquisition in large elections, where the probability of being pivotal is negligible. Our model builds on the assumption that informed citizens enjoy discussing politics with other informed citizens. The resulting information acquisition game exhibits strategic complementarities. We find that information acquisition depends negatively on the social distance between citizens. Next, we build an application of the model to the distributive politics game. Equilibrium policies are biased towards regions/groups with lower social distance between citizens. Finally, we present evidence for the basic model's main prediction based on the data from the 2000 U.S. National Elections Study. Citizens with a shorter residence span (thus having a less developed local social network, i.e. facing a larger social distance) acquire significantly less political information than the otherwise similar long-term residents.

JEL Classification: D72, Z13

Keywords: information acquisition, social interactions, global games.

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- 2006/21 General to specific modelling of exchange rate volatility: a forecast evaluation
Luc BAUWENS and Genaro SUCCARAT
- The general-to-specific (GETS) approach to modelling is widely employed in the modelling of economic series, but less so in financial volatility modelling due to computational complexity when many explanatory variables are involved. This study proposed a simple way of avoiding this problem and undertakes an out-of-sample forecast evaluation of the methodology applied to the modelling of weekly exchange rate volatility. Our findings suggest that GETS specifications are especially valuable in conditional forecasting, since the specification that employs actual values on the uncertain information performs particularly well.
- JEL Classification:** C53, F31
Keywords: exchange rate volatility, general to specific, forecasting.
- 2006/22 Intertemporal equilibrium with a resource bequest motive
Thierry BRECHET and Stéphane LAMBRECHT
- In this paper we question the role of a joy-of-giving bequest motive of a privately-owned renewable resource for sustainability. We model an overlapping generations economy in which individuals are endowed with a renewable resource. This resource can be exploited at no cost by the young households and provided to production or bequeathed to the next generation. We highlight two main results. First, the mere existence of a bequest motive does not guarantee a sustainable outcome. Second, when the resource is preserved in equilibrium, its level does not necessarily coincide with the efficient one. Whether the resource stock is too high or too low the capital stock should be lower than the golden rule level.
- JEL Classification:** D91, Q20, D64
Keywords: overlapping generations, joy-of-giving, natural resource, sustainability.
- 2006/23 Fertility choice and semi-endogenous growth: where Becker meets Jones
Jakub GROWIEC
- Introducing fertility choice into an R&D-based semi-endogenous growth model makes it possible for the economy's long-run growth rate to be again fully endogenously determined. A positive growth rate along the balanced growth path requires a certain knife-edge assumption, though. In the usual framework, it would be the assumption that the intertemporal elasticity of substitution in consumption be exactly unity ($IES=1$). We argue that such an assumption constitutes the ultimate source of long-run growth in these models; thus, we analyze the alternatives. If one relaxes the $IES=1$ assumption, and introduces a minimum "subsistence" fertility level to the model, there may (but may not) emerge an asymptotic balanced growth path with positive growth rates, to which the economy eventually converges as levels of variables diverge to infinity. This balanced growth path is either saddle-path stable or completely stable. We also address the issue of the economy's invariance towards fertility-promoting policy within the semi-endogenous growth framework. We conclude that such policy can bring long-run effects only in the knife-edge case of $IES=1$ type. Jones' policy invariance result is typically consistent with endogenous fertility.
- JEL Classification:** J13, O41
Keywords: fertility choice, semi-endogenous growth, R&D, long-run dynamics, knife-edge conditions.
- 2006/24 Vintage capital
Raouf BOUCEKKINE, David DE LA CROIX and Omar LICANDRO
- We highlight the salient characteristics and implications of the seminal contributions in the field of vintage capital growth theory (proposed entry for the new Palgrave dictionary of economics, 2nd edition).
- JEL Classification:** O41, E22, E32, J24
Keywords: obsolescence, embodiment, technology diffusion, vintage human capital.

- 2006/25 Instrumental regression in partially linear models
Jean-Pierre FLORENS, Jan JOHANNES and Sébastien VAN BELLEGEM

We consider the semiparametric regression $X^t\beta + \phi(\cdot)$ where β is an unknown slope coefficient vector and $\phi(\cdot)$ is an unknown function, and where the variables (X, Z) are endogenous. We propose necessary and sufficient conditions for the identification of the parameters in the presence of instrumental variables. We also focus on the estimation of β . An incorrect parametrization of ϕ generally leads to an inconsistent estimator of β , whereas consistent nonparametric estimators for β have a slow rate of convergence. An additional complication is that the solution of the equation necessitates the inversion of a compact operator which can be estimated nonparametrically. In general this inversion is not stable, thus the estimation of β is ill-posed. In this paper, a \sqrt{n} -consistent estimator for β is derived under mild assumptions. One of these assumptions is given by the so-called *source condition* which we explicitly state and interpret in the paper. Finally we show that the estimator achieves the semiparametric efficiency bound, even if the model is heteroskedastic.

JEL Classification: Primary C14, secondary C30

Keywords: partially linear model, semiparametric regression, instrumental variables, endogeneity, ill-posed inverse problem, Tikhonov regularization, root- N consistent estimation, semiparametric efficiency bound.

- 2006/26 Is it fair to ‘make work pay’?
Roland Iwan LUTTENS and Erwin OOGHE

The design of the income transfer program for the lower incomes is a hot issue in current public policy debate. Should we stick to a generous welfare state with a sizeable basic income, but high marginal tax rates for the lower incomes and thus little incentives to work? Or should we ‘make work pay’ by subsidizing the work of low earners, but possibly at the cost of a smaller safety net? We think it is difficult to answer this question without making clear what individuals are (held) responsible for and what not. First, we present a new fair allocation, coined a Pareto Efficient and Shared resources Equivalent (PESE) allocation, which compensates for different productive skills, but not for different tastes for working. We also characterize a fair social ordering, which rationalizes the PESE allocation. Second, we illustrate the optimal second-best allocation in a discrete Stiglitz (1982, 1987) economy. The question whether we should have subsidies for the low earners or not crucially depends on whether the low-skilled have a strictly positive or zero skill. Third, we simulate fair taxes for a sample of Belgian singles. Our simulation results suggest that ‘making work pay’ policies can be optimal, according to our fairness criterion, but only in the unreasonable case in which none of the unemployed are ever willing to work.

JEL Classification: D63, H21

Keywords: make work pay, optimal income taxation, fairness.

- 2006/27 Technological progress, obsolescence and depreciation
Raouf BOUCEKKINE, Fernando DEL RIO and Blanca MARTINEZ

We construct a vintage capital model *à la* Whelan (2002) with both exogenous embodied and disembodied technical progress, and variable utilization of each vintage. The lifetime of capital goods is endogenous and it relies on the associated maintenance costs. We study the properties of the balanced growth paths. First, we show that the lifetime of capital is an increasing (resp. decreasing) function of the rate of disembodied (resp. embodied) technical progress. Second, we show that both the use-related depreciation rate and the scrapping rate increase when embodied technical progress accelerates. However, the latter drops when disembodied technical progress accelerates while the former remains unaffected. A key feature of our model is that the age-related depreciation rate does not depend on the obsolescence rate in sharp contrast to the neoclassical model.

JEL Classification: E22, E32, O40

Keywords: vintage capital, operation costs, embodied technical progress, age-related depreciation, obsolescence.

2006/28 Towards nonsymmetric conic optimization
Yu. NESTEROV

In this paper we propose a new interior-point method, which is based on an extension of the ideas of self-scaled optimization to the general cases. We suggest using the primal correction process to find a *scaling point*. This point is used to compute a strictly feasible primal-dual pair by simple projection. Then, we define an affine-scaling direction and perform a prediction step. This is the only moment when the dual barrier is used. Thus, we need only to compute its value, which can even be done approximately. In the second part of the paper we develop a $4n$ -self-concordant barrier for n -dimensional p -cone, which can be used for numerical testing of the proposed technique.

Keywords: convex optimization, conic problems, interior-point methods, long-step path-following methods, self-concordant barriers, self-scaled barriers, affine-scaling direction, p -norm minimization.

2006/29 Hospital's activity-based financing system and manager-physician interaction
David CRAINICH, Hervé LELEU and Ana MAULEON

Hospital financing systems determine major decisions made by physicians and managers within hospitals. This paper examines the impact of the transition toward an activity-based reimbursement system that has emerged in most OCDE countries. We consider two initial situations, one for a private for-profit sector where both hospitals and physicians are paid on a fee-for-service basis and the other for a public sector under prospective budget and salaried physicians. For the private sector, our model focuses on the type of interaction (simultaneous, sequential or joint decision-making games) that should emerge between agents after the introduction of the activity-based financing system. In the public sector, the elasticity of the demand to the level of inputs seems to play a more crucial rôle in the transition.

JEL Classification: I11, D4, D2

Keywords: hospital's financing system, strategic interaction, activity-based payment system.

2006/30 Constructing self-concordant barriers for convex cones
Yu. NESTEROV

In this paper we develop a technique for constructing self-concordant barriers for convex cones. We start from a simple proof for a variant of standard result [1] on transformation of a ν -self-concordant barrier for a set into a self-concordant barrier for its conic hull with parameter $(3.08\sqrt{\nu} + 3.57)^2$. Further, we develop a convenient composition theorem for constructing barriers directly for convex cones. In particular, we can construct now good barriers for several interesting cones obtained as a conic hull of epigraph of a univariate function. This technique works for power functions, entropy, logarithm and exponent function, etc. It provides a background for development of polynomial-time methods for separable optimization problems. Thus, our abilities in constructing barriers for convex sets and cones become now identical.

Keywords: primal-dual conic optimization problem, self-concordant barriers, interior-point methods, barrier calculus.

- 2006/31 Political budget cycles and fiscal decentralization
Paula GONZALEZ, Jean HINDRIKS, Ben LOCKWOOD and Nicolas PORTEIRO

In this paper, we study a model à la Rogoff (1990) where politicians distort fiscal policy to signal their competency, but where fiscal policy can be centralized or decentralized. Our main focus is on how the equilibrium probability that fiscal policy is distorted in any region (the political budget cycle, PBC) differs across fiscal regimes. With centralization, there are generally two effects that change the incentive for pooling behavior and thus the probability of a PBC. One is the possibility of *selective distortion*: the incumbent can be re-elected with the support of just a majority of regions. The other is a *cost distribution* effect, which is present unless the random cost of producing the public goods is perfectly correlated across regions. Both these effects work in the same direction, with the general result that overall, the PBC probability is larger under centralization (decentralization) when the rents to office are low (high). Voter welfare under the two regimes is also compared: voters tend to be better off when the PBC probability is lower, so voters may either gain or lose from centralization. Our results are robust to a number of changes in the specification of the model.

- 2006/32 Does propitious selection explain why riskier people buy less insurance?
Philippe DE DONDER and Jean HINDRIKS

Empirical testing of asymmetric information in the insurance market has uncovered a negative correlation between risk levels and insurance purchases, rather than the positive correlation predicted by the standard insurance theory. Hemenway (1990) proposes an explanation for this negative correlation, called “propitious selection”. He argues that potential insurance buyers have different tastes for risk and that “individuals who are highly risk avoiding are more likely both to try to reduce the hazard and to purchase insurance” (p. 1064). Chiappori and Salanié (2000) also suggest that this line of argument, which they call “cherry picking”, may explain the observed negative correlation.

In this paper, we show that the propitious selection argument does not imply negative correlation between risk levels and insurance purchases, because it fails to take into account the supply side of the insurance market. To illustrate this claim, we provide a model where, although we assume that individuals differ in risk aversion and that the more risk averse individuals exert more precaution and buy more insurance, we end up with a positive correlation between risk and insurance purchases at equilibrium. The reason is that, in any separating equilibrium, the more risk averse individuals face insurance overprovision which, combined with moral hazard, increases their risk relative to the less risk averse individuals. To obtain the negative correlation between risk and insurance purchases, one further needs the extra condition of decreasing marginal willingness to pay for the less risk averse individuals. Finally, we find that propitious selection has profound policy implications for social insurance.

JEL Classification: D82, G22

Keywords: preference-based adverse selection, cherry picking, precaution, social insurance.

- 2006/33 Equilibrium social insurance with policy-motivated parties
Philippe DE DONDER and Jean HINDRIKS

We study the political economy of social insurance with double heterogeneity of voters (e.e., different income and risk levels). Social insurance is financed through distortionary taxation and redistributes across income and risks. Individuals vote over the extent of social insurance, which they can complement on the private market. Private insurance suffers from adverse selection which results into insurance rationing. We model political competition a la Wittman, with two parties maximizing the utility of their members. Party membership is endogenously determined. We show that although individuals differ in two dimensions, their preference for social insurance can be aggregated into a single dimensional type function. We then resort to numerical simulations to solve the political equilibrium outcome as a function of the distribution of income and risk.

We obtain equilibrium policy differentiation with the Left party proposing more social insurance than the Right party. The Left party's equilibrium membership is made of low risk and high income individuals, with high risk and low income individuals forming the Right party's constituency. In equilibrium, each party is trying for winning. Unlike the median voter outcome, our equilibrium outcome depends on the whole income and risks distribution, and increasing income polarization leads both parties to propose *less* social insurance. We also compare the political equilibrium outcome with the Rawlsian and utilitarian outcomes.

JEL Classification: H23, H50

Keywords: electoral competition, endogenous parties, Wittman equilibrium, social insurance, adverse selectio.

- 2006/34 Nonsymmetric potential-reduction methods for general cones
Yu. NESTEROV

In this paper we propose two new nonsymmetric primal-dual potential-reduction methods for conic problems. The methods are based on the primal-dual lifting [5]. This procedure allows to construct a strictly feasible primal-dual pair related by an exact scaling relation even if the cones are not symmetric. It is important that all necessary elements of our methods can be obtained from the standard solvers for primal Newton system. The first of the proposed schemes is based on the usual affine-scaling direction. For the second one, we apply a new first-order affine-scaling direction, which incorporates in a symmetric way the gradients of primal and dual barriers. For both methods we prove the standard $O(\sqrt{\nu} \ln \frac{1}{\epsilon})$ complexity estimate, where ν is the parameter of the barrier and ϵ is the required accuracy.

Keywords: convex optimization, conic problems, interior-point methods, potential-reduction methods, self-concordant barriers, self-scaled barriers, affine-scaling direction.

- 2006/35 Family altruism with a renewable resource and population growth
Thierry BRECHET and Stéphane LAMBRECHT

We develop an overlapping-generation model *à la* Diamond with a non-constant population growth in which households privately own a natural renewable resource and have a family-altruism resource bequest motive. The natural resource can be either extracted and sold to the producing firms as a production factor, or bequeathed to the offspring to increase his adult disposable income. With a numerical application, we analyze how family altruism interplays with population growth to shape the dynamics of the whole economy. We also highlight the role of altruism in the case of a temporary negative demographic shock. The simulations we present show that a fall in the size of families increases the family natural resource stock but reduces resource extraction on the transition, through a reinforcement of family altruistic links. Hence, family altruism plays a key role in the recovery of the economy after the shock.

- 2006/36 Heterogeneity gap in stable jurisdiction structures
Anna BOGOMOLNAIA, Michel LE BRETON, Alexei SAVVATEEV and Shlomo WEBER
- This paper examines a model of multi-jurisdiction formation where individuals' characteristics are uniformly distributed over a finite interval. Every jurisdiction locates a public facility and distributes its cost equally among the residents. We consider two notions of stability: Nash stability and its refinement local Nash stability, and examine the existence and characterization of stable partitions. The main feature of this analysis is that, even under the uniform distribution, there are stable structures that exhibit a high degree of heterogeneity of jurisdiction sizes.
JEL Classification: D70, H20, H73
Keywords: stability, jurisdictions, public projects, heterogeneity gap.
- 2006/37 Market transparency and Bertrand competition
Malgorzata KNAUFF
- We investigate the effects of market transparency on prices in the Bertrand duopoly model for both the cases of strategic complementarities and strategic substitutes. For the former class of games "conventional wisdom" concerning prices is confirmed, since they decrease. The consumers are always better off with higher transparency but changes in firm's profits are ambiguous. For the latter class of games, an increase in market transparency may lead to an increase in one of the prices, which implies ambiguity in consumers' utility and firms' profits.
JEL Classification: L13, L15, L40
Keywords: Bertrand duopoly, market transparency.
- 2006/38 The global chilling effects of antidumping proliferation
Hylike VANDENBUSSCHE and Maurizio ZANARDI
- Advocates of antidumping (AD) laws downplay their effects by arguing that the trade flows that are subject to AD are small and their distortions negligible. This paper is the first to counter that notion by quantifying the worldwide effect of AD laws on aggregate trade flows. The recent proliferation of AD laws across countries provides us with a natural experiment to estimate the trade effects of adopting versus using AD laws; differences in the intensity of use among countries with older AD laws allow us to investigate reputation effects. For this purpose, we estimate worldwide trade flows using a gravity equation spanning 21 years (1980-2000) of annual observations. Our estimates confirm that AD effects are not small. Among other findings, new tough users have their aggregate imports depressed by 15.7 billion US\$ a year (or 6.7%) as a result of the AD measures they have imposed. For a traditional user like the United States, current AD measures depress annual imports by almost 20 billion US\$ on top of the cumulative negative effect of reputation. For some countries, the dampening effects of AD laws on trade flows are found to nearly offset the gains from trade liberalization.
JEL Classification: F13, F14
Keywords: antidumping, gravity equation, trade liberalization, trade flows.
- 2006/39 Cubic regularization of Newton's method for convex problems with constraints
Yu. NESTEROV
- In this paper we derive efficiency estimates of the regularized Newton's method as applied to constrained convex minimization problems and to variational inequalities. We study a one-step Newton's method and its multistep accelerated version, which converges on smooth convex problems as $O(\frac{1}{k^3})$, where k is the iteration counter. We derive also the efficiency estimate of a second-order scheme for smooth variational inequalities. Its global rate of convergence is established on the level $O(\frac{1}{k})$.
Keywords: convex optimization, variational inequalities, Newton's method, cubic regularization, worst-case complexity, global complexity bounds.

- 2006/40 Environmental innovation and the cost of pollution abatement
Thierry BRECHET and Pierre-André JOUVET

The impact of environmental innovation on the marginal pollution abatement cost at the firm level is investigated. We show that the common assumption that innovation reduces the marginal abatement cost is wrong. We draw some implications about the incentives to innovate under environmental regulation. In particular, we find that adopting an environmental friendly technology may lead to more pollution and less profit at the firm level.

JEL Classification: H23, L51

Keywords: innovation, pollution abatement cost, production function, environmental regulation.

- 2006/41 Correlated equilibrium in games with incomplete information revisited
Françoise FORGES

A mistake in “Five legitimate definitions of correlated equilibrium in games with incomplete information” motivates a re-examination of some extensions of the solution concept that Aumann introduced.

- 2006/42 Deciding between GARCH and stochastic volatility via strong decision rules
Arie PREMINGER and Christian M. HAFNER

The GARCH and stochastic volatility (SV) models are two competing, well-known and often used models to explain the volatility of financial series. In this paper, we consider a closed form estimator for a stochastic volatility model and derive its asymptotic properties. We confirm our theoretical results by a simulation study. In addition, we propose a set of simple, strongly consistent decision rules to compare the ability of the GARCH and the SV model to fit the characteristic features observed in high frequency financial data such as high kurtosis and slowly decaying autocorrelation function of the squared observations. These rules are based on a number of moment conditions that is allowed to increase with sample size. We show that our selection procedure leads to choosing the best and simple model with probability one as the sample size increases. The finite sample size behaviour of our procedure is analyzed via simulations. Finally, we provide an application to stocks in the Dow Jones industrial average index.

JEL Classification: C13, C22, C53

Keywords: GARCH, stochastic volatility, model selection.

- 2006/43 Upstream market foreclosure
Jean J. GABSZEWICZ and Skerdilajda ZANAJ

This paper investigates how an incumbent monopolist can weaken potential rivals or deter entry in the output market by manipulating the access of these rivals in the input market. We analyze two polar cases. In the first one, the input market is assumed to be competitive with the input being supplied inelastically. We show that this situation opens the door to entry deterrence. Then, we assume that the input is supplied by a single seller who chooses the input price. In this case, we show that entry deterrence can be reached only through merger with the seller of the input.

JEL Classification: D20, D43, L42

Keywords: entry deterrence, foreclosure, overinvestment, bilateral monopoly.

- 2006/44 Lot-sizing on a tree
Marco DI SUMMA and Laurence A. WOLSEY

For the problem of lot-sizing on a tree with constant capacities, or stochastic lot-sizing with a scenario tree, we present various reformulations based on mixing sets. We also show how earlier results for uncapacitated problems involving (Q, S_Q) inequalities can be simplified and extended. Finally some limited computational results are presented.

Keywords: lot-sizing, scenario tree, mixing sets.

- 2006/45 A theory of medicine effectiveness, differential mortality, income inequality and growth for pre-industrial England
David DE LA CROIX and Alessandro SOMMACAL

We study how mortality reductions and income growth interact, looking at their relationship prior to the Industrial Revolution, when income per capita was stagnant. We first present a model of individual medical spending giving a rationale for individual health expenditures even when medicine was not effective in postponing death. We then explain the rise of effective medicine by a learning process function of expenditures in health. The rise in effective medicine can then be linked to the take-off of the eighteenth century through life expectancy increases, and fostered capital accumulation. The rise of effective medicine has also an impact on the relation between growth and inequality and on the intergenerational persistence of differences in income. These channels are operative through differential mortality induced by medicine effectiveness that turns out to determine a differential in the propensity to save among income groups.

JEL Classification: J10, I12, D91, E13, N33

Keywords: differential mortality, life expectancy, propensity to save, health expenditures.

- 2006/46 Climatic change and rural-urban migration: the case of sub-Saharan Africa
Salvador BARRIOS, Luisito BERTINELLI and Eric STROBL

We investigate the role that climatic change has played in the pattern of urbanization in sub-Saharan African countries compared to the rest of the developing world. To this end we assemble a cross-country panel data set that allows us to estimate the determinants of urbanization. The results of our econometric analysis suggest that climatic change, as proxied by rainfall, has acted to change urbanization in sub-Saharan Africa but not elsewhere in the developing world. Moreover, this link has become stronger since decolonization, which is likely due to the often simultaneous lifting of legislation prohibiting the free internal movement of native Africans.

JEL Classification: O18, O55, Q54, R23

Keywords: urbanization, climate change, rainfall, rural-urban migration, Africa.

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- 2006/47 Designing a linear pension scheme with forced savings and wage heterogeneity
Helmuth CREMER, Philippe DE DONDER, Dario MALDONADO and Pierre PESTIEAU
- This paper studies the optimal linear pension scheme when society consists of rational and myopic individuals. Myopic individuals have, ex ante, a strong preference for the present even though, ex post, they would regret not to have saved enough. While rational and myopic persons share the same ex post intertemporal preferences, only the rational agents make their savings decisions according to these preferences. Individuals are also distinguished by their productivity. The social objective is “paternalistic”: the utilitarian welfare function depends on ex post utilities. We examine how the presence of myopic individuals affects both the size of the pension system and the degree of redistribution it operates. The relationship between proportion of myopic individuals and characteristics of the pension system turns out to be much more complex than one would have conjectured. Neither the impact on the level of pensions nor the effect on their redistributive degree are unambiguous. Nevertheless, we show that under some plausible assumptions adding myopic individuals increases the level of pension benefits and leads to a shift from a flat or even targeted scheme to a partially contributory one. However, we also provide an example where the degree of redistribution is not a monotonic function of the proportion of myopic individuals.
- JEL Classification:** H55, D91
Keywords: social security, myopia, dual-self model.
- 2006/48 Information revelation in markets with pairwise meetings: dynamic case with constant entry flow
Tanguy ISAAC
- We study information revelation in markets with pairwise meetings. We focus on the one sided case and perform a dynamic analysis of a constant entry flow model. The same question has been studied in an identical framework in Serrano and Yosha (1993) but they limit their analysis to the stationary steady states. Blouin and Serrano (2001) study information revelation in a one-time entry model and obtain results different than Serrano and Yosha (1993). We show that there is dramatically loss when restricting the analysis of a constant flow entry model to stationary steady states. Nevertheless, we show that this loss might not explain completely the difference in the results presented in the two papers.
- JEL Classification:** D49, D82, D83
- 2006/49 Gains from trade and efficiency under monopolistic competition: a variable elasticity case
Kristian BEHRENS and Yasusada MURATA
- We present a general equilibrium model of monopolistic competition with variable demand elasticities and investigate the impact of free trade on welfare and efficiency. First, contrary to the constant elasticity case, in which all gains from trade are due to increasing product diversity, our model features gains from pro-competitive effects. Second, we prove that the market outcome is not efficient because too many firms operate at an inefficiently small scale. Last, we illustrate that free trade raises efficiency by reducing the gap between the equilibrium utility and the optimal utility.
- JEL Classification:** D43, D51, F12
Keywords: international trade, monopolistic competition, variable elasticity, gains from trade, efficiency.

- 2006/50 Bayesian inference in dynamic disequilibrium models: an application to the Polish credit market
Luc BAUWENS and Michel LUBRANO

We review Bayesian inference for dynamic latent variable models using the data augmentation principle. We detail the difficulties of simulating dynamic latent variables in a Gibbs sampler. We propose an alternative specification of the dynamic disequilibrium model which leads to a simple simulation procedure and renders Bayesian inference fully operational. Identification issues are discussed. We conduct a specification search using the posterior deviance criterion of Spiegelhalter, Best, Carlin and van der Linde (2002) for a disequilibrium model of the Polish credit market.

JEL Classification: C11, C32, C34, E51

Keywords: latent variables, disequilibrium models, Bayesian inference, Gibbs sampler, credit rationing.

- 2006/51 Research and higher education in economics: can we deliver the Lisbon objectives ?
Jacques DREZE with Fernanda ESTEVAN

Can European economics become “the most dynamic and competitive in the world”? Using readily accessible data, the paper documents the following aspects: (i) today, the US outperform Europe by a factor of the order of 3, with no clear trend; the Lisbon goal is not in sight; (ii) Europe is not homogeneous; the UK and the small countries in North-central Europe outperform significantly the Big 4 continental countries (France, Germany, Italy, Spain); the Big 4 should accept English as the lingua franca of economics, and implement major institutional reforms; (iii) some 30 leading economics departments (ten from each of these three areas) account for some 70-75% of Europe’s research output; (iv) the concentration of research in leading departments is substantial but not exclusive; it is comparable in Europe and the US, but leading US departments have incomparably more resources and benefit from access to an integrated labour market; (v) few PhD programs are of efficient size, especially in Europe, calling for further concentration; (vi) second-best funding of higher education calls for block grants to efficient programs; in Europe, these should be organised at EU level. I conclude with a modest proposal (15 million euros per year) consisting of block grants to leading departments and to young academic researchers. My optimistic verdict is that substantial progress towards the Lisbon goal is at hand, but requires significant departures from current practices.

- 2006/52 Polluting technologies and sustainable economic development
Luisito BERTINELLI, Eric STROBL and Benteng ZOU

We study how the import of older and more polluting technologies alters the relationship between output and environmental quality in developing countries within a vintage capital framework. Our results show that old technologies prolong the period until which pollution may eventually decrease and cause this turning point to be reached at a higher level of pollution. An empirical analysis using export data of vintage technologies from the US and Europe to developing countries supports our theoretical findings.

JEL Classification: O13, O33, Q01, Q56

Keywords: environmental quality, sustainable development, vintage technologies.

- 2006/53 Networks of free trade agreements among heterogeneous countries
Ana MAULEON, Huasheng SONG and Vincent VANNETELBOSCH

The paper examines the formation of free trade agreements as a network formation game. We consider a three-country model in which international trade occurs between economies with imperfectly competitive product markets. Labor markets can be unionized and non-unionized in each country. We show that if all countries are of the same type (all of them are either unionized or non-unionized), the global free trade network is both the unique pairwise stable network and the unique efficient network. If some countries are unionized while others are non-unionized, other networks apart from the global free trade network are likely to be pairwise stable. However, the efficient network is always the global free trade network. Thus, a conflict between stability and efficiency may occur. Moreover, starting from the network in which no country has signed a free trade agreement, all sequences of networks due to continuously profitable deviations do not lead (in most cases) to the global free trade network, even when global free trade is stable.

JEL Classification: F15, F16, C70

Keywords: free-trade agreements, network formation game, unionization.

- 2006/54 Longevity and Pay-as-you-Go pensions
Pierre PESTIEAU, Gregory PONTIERE and Motohiro SATO

This paper aims at investigating whether or not a utilitarian social planner should subsidize longevity-enhancing expenditures in an economy with a PAYG pension system. For that purpose, a simple two-period OLG model is developed, in which the length of the second period of life can be raised by private health spendings. Focussing on the steady-state, it is shown that the sign of the optimal subsidy on health expenditures tends to be negative when the replacement ratio is sufficiently large. Moreover, the optimal health subsidy is also shown to depend significantly on the longevity production process and on the production technology.

JEL Classification: E13, E21

Keywords: longevity, health care, PAYG social security.

- 2006/55 Industrial location: a synthesis of Chamberlin and Ricardo
Pierre M. PICARD and Dao-Zhi ZENG

This paper investigates the joint impact of Chamberlinian monopolistic competition and Ricardian comparative advantages on the structure of trade and industries. We develop a trade model with several industries employing local factors. We then investigate the structure of trade and industries as well as the possibilities of catastrophic changes and endogenous asymmetries in industry distribution. Three configurations are studied: multiple industries with local factor advantages at small trade costs, single industry with local factor advantage and two industries with comparative advantages for any trade costs. The last setting synthesizes the traditional results of Chamberlin and Ricardo.

JEL Classification: R10, R13, F12

Keywords: dispersion, comparative advantage, industrial specialization.

- 2006/56 A new class of production functions and an argument against purely labor-augmenting technical change
Jakub GROWIEC

This paper follows Jones (2005) in his approach to deriving the global production function from microfoundations. His framework is generalized by allowing for dependence between the Pareto distributions of labor- and capital-augmenting developments. Using the Clayton copula family to capture this dependence, we derive a “Clayton-Pareto” class of production functions that nests both the Cobb-Douglas and the CES. Embedding the resultant production function in a neo-classical growth framework, we draw conclusions for the long-run direction of technical change. Jones’s result of Cobb-Douglas global production functions and purely labor-augmenting technical change hinges on the assumption of *independence* of marginal Pareto distributions. In our more general case, the shape of local production functions matters for the shape of the global production function, and technical change augments both factors in the long run. Furthermore, the elasticity of substitution between capital and labor may exceed unity and thus yield endogenous growth.

JEL Classification: E23, O30, O40

Keywords: global production function, technology frontier, CES, Pareto distribution, Clayton copula.

- 2006/57 Sustainable economic development and the environment: theory and evidence
Luisito BERTINELLI, Eric STROBL and Benteng ZOU

The relationship between growth and pollution is studied through a vintage capital model, where new technologies are more environmentally friendly. We find that once the optimal scrapping age of technologies is reached, an economy may achieve two possible cases of sustainable development, one in which pollution falls and another in which it stabilizes, or a catastrophic outcome, where environmental quality reaches its lower bound. The outcome will depend on countries’ investment path and their propensity to innovate in environmentally clean technologies, both of which are likely to differ across economies. Empirical results using long time series for a number of developed and developing countries indeed confirm heterogeneous experiences in the pollution-output relationship.

JEL Classification: O13, Q01, Q55

Keywords: environmental quality, sustainable economic development, vintage capital model, EKC.

- 2006/58 Capital maintenance Vs technology adoption under embodied technical progress
Raouf BOUCEKKINE, Blanca MARTINEZ and Cagri SAGLAM

We study an optimal growth model with one-hoss-shay vintage capital, where labor resources can be allocated freely either to production, technology adoption or capital maintenance. Technological progress is partly embodied. Adoption labor increases the level of embodied technical progress. First, we are able to disentangle the amplification-propagation role of maintenance in business fluctuations: in the short run, the response of the model to transitory shocks on total factor productivity in the final good sector are definitely much sharper compared to the counterpart model without maintenance but with the same average depreciation rate. Moreover, the one-hoss shay technology is shown to reinforce this amplification-propagation mechanism. We also find that accelerations in embodied technical progress should be responded by a gradual adoption effort, and capital maintenance should be the preferred instrument in the short run.

JEL Classification: E22, E32, O40

Keywords: technology adoption, maintenance, vintage capital, dynamics.

- 2006/59 Sustainable collusion on separate markets
Paul BELLEFLAMME and Francis BLOCH

When firms can supply several separate markets, collusion can take two forms. Either firms establish production quotas on all the markets, or they share markets. This paper compares production quotas and market sharing agreements in a Cournot duopoly where firms incur a fixed cost for serving each market. We show that there exists a threshold value of the fixed cost such that collusion is easier to sustain with production quotas below the threshold and with market sharing agreements above the threshold. These results are obtained both under Nash reversion strategies and the globally optimal punishment strategies introduced by Abreu (1986).

JEL Classification: L11, L12

Keywords: implicit collusion, market sharing agreements, production quotas, optimal punishment.

- 2006/60 Labor market pooling, outsourcing and contracts in Chamberlinian regions
Pierre M. PICARD and David E. WILDASIN

Economic regions, such as urban agglomerations, face external demand and price shocks that produce income risk. Workers in large and diversified agglomerations may benefit from reduced wage volatility, while firms may outsource the production of intermediate goods and realize benefits from Chamberlinian externalities. Firms may also protect workers from wage risks through fixed wage contracts. This paper explores the relationships between firms' risks, workers' contracts, and the structure of production in cities.

JEL Classification: R12, R23, J31, J65

Keywords: labor market, labor contracts, Chamberlinian externalities.

- 2006/61 Trade integration, firm selection and the costs of non-Europe
Massimo DEL GATTO, Giordano MION and Gianmarco I.P. OTTAVIANO

In models with heterogeneous firms trade integration has a positive impact on aggregate productivity through the selection of the best firms as import competition drives the least productive ones out of the market. To quantify the impact of firm selection on productivity, we calibrate and simulate a multi-country multi-sector model with monopolistic competition and variable markups using firm-level data and aggregate trade figures on a panel of 11 EU countries. We find that EU trade has a sizeable impact on aggregate productivity. In 2000 the introduction of prohibitive trade barriers would have caused an average productivity loss of roughly 13 per cent, whereas a reduction of intra-EU trade costs by 5 per cent would have generated a productivity gain of roughly 2 per cent. Productivity losses and gains, however, vary a lot across countries and sectors depending on market accessibility and trade costs. We provide evidence that our results are robust to alternative distance and productivity measures.

JEL Classification: F12, R13

Keywords: European integration, firm-level data, firm selection, gains from trade, total factor productivity.

- 2006/62 On the adjudication of conflicting claims: an experimental study
Carmen HERRERO, Juan D. MORENO-TERNERO and Giovanni PONTI

This paper reports an experimental study on three well-known solutions for problems of adjudicating conflicting claims: the constrained equal-awards, the proportional, and the constrained equal-losses rules. We first let subjects play three games designed such that the unique equilibrium allocation coincides with the recommendation of one of these three rules. In addition, we let subjects play an additional game, that has the property that all (and only) strategy profiles in which players coordinate on the same rule constitute a strict Nash equilibrium. While in the first three games subjects' play easily converges to the unique equilibrium rule, in the last game the proportional rule overwhelmingly prevails as a coordination device, especially when we frame the game with an hypothetical bankruptcy situation. We also administered a questionnaire to a different group of students, asking them to act as impartial arbitrators to solve (among others) the same problems played in the lab. Also in this case, respondents were sensitive to the framing of the questions, but the proportional rule was selected by the vast majority of respondents..

JEL Classification: C91, D63, D74

Keywords: claims problems, proportional rule, experimental economics.

- 2006/63 On technical change in the elasticities of resource inputs
Jakub GROWIEC and Ingmar SCHUMACHER

This article considers an economy whose production function takes both renewable and non-renewable resources as inputs. We extend the current literature by allowing for exogenous technical change in the elasticity of substitution between these two types of resources. In addition, we study the consequences of biased technical change which alters the resources' relative productivities. We derive long-run asymptotic results, which we use to compare several cases. In the benchmark case of no technical change, our results are close to those obtained by Dasgupta and Heal (1974). In the case of technical change in the elasticity of substitution, we observe that this kind of technical change helps obtain positive long-run production despite the depletion of non-renewable resources. In the biased technical change case, long-run production is only possible either if non-renewable resources are non-essential or if biased technical change is quick enough to compensate for the decreasing flow of non-renewable resources.

We embed our production function in an optimal growth model and study its dynamics. As a steady state (or a balanced growth path) is only attainable as time goes to infinity, we resort to numerical simulations to convey what is happening during the short and medium run. Our results provide new considerations for the debate on natural resources. We suggest that technical change should be directed to the resource which is most important for production.

JEL Classification: Q20, Q30, O30

Keywords: elasticity of substitution, technical change, biased technical change, non-renewable resources, renewable resources.

- 2006/64 Growth and longevity from the industrial revolution to the future of an aging society
David DE LA CROIX, Thomas LINDH and Bo MALMBERG

Aging of the population will affect the growth path of all countries. To assess the historical and future importance of this claim we use two popular approaches and evaluate their merits and disadvantages by confronting them to Swedish data. We first simulate an endogenous growth model with human capital linking demographic changes and income growth. Rising longevity increases the incentive to get education, which in turn has ever-lasting effects on growth through a human capital externality. Secondly, we consider a reduced-form statistical model based on the demographic dividend literature. Assuming that there is a common DGP guiding growth through the demographic transition, we use an estimate from post-war global data to backcast the Swedish historical GDP growth. Comparing the two approaches, encompassing tests show that each of them contains independent information on the Swedish growth path, suggesting that there is a benefit from combining them for long-term forecasting.

JEL Classification: J11, O41, I20, N33

Keywords: demographic transition, life expectancy, education, income growth.

- 2006/65 Access pricing and entry in the postal sector
Francis BLOCH and Axel GAUTIER

Postal markets have been open to competition for a long time. But, with a few exceptions, the competitors of the incumbent postal operator are active on the upstream segments of the market -preparation, collection, outward sorting and transport of mail products. With the further steps planned in the liberalization process, there are new opportunities to extend competition to the downstream segments of the market -the delivery of mails. In the future, two business models will be possible for the new postal operators: (1) *access*: where the firm performs the upstream operations and uses the incumbent's delivery network and (2) *bypass* where the competing firm controls the entire supply chain and delivers mails with its own delivery network. These two options have different impacts on welfare and the profit of the incumbent operator.

The choice between access and bypass depends on the entrant's delivery cost relative to the cost of buying access to the incumbent operator (the access price). In this paper, we derive optimal -welfare maximizing- stamp and access prices for the incumbent operator when these prices have an impact on the delivery method chosen by the entrant. We show how prices should be re-balanced when the entry method is considered as endogenous i.e. affected by the incumbent's prices.

JEL Classification: L51, L87

Keywords: access, bypass, postal sector.

- 2006/66 Balanced allocation methods for claims problems with indivisibilities
Carme HERRERO and Ricardo MARTINEZ

We study claims problems in which a certain amount of indivisible units (of an homogeneous good) has to be distributed among a group of agents, when this amount is not enough to fully satisfy agents' demands. We are interested in finding solutions satisfying robustness and fairness properties. To do that, we define the *M-down methods*, which are the unique robust (*composition down* and *consistency*) and fair (*balancedness* or *conditional full compensation*) rules. Besides, we also establish the relationships between these *M-down methods* and the *constrained equal awards rule*.

JEL Classification: D63

Keywords: claims problems, indivisibilities, monotonic standard, balancedness, down method.

- 2006/67 A nonparametric ACD model
Antonio COSMA and Fausto GALLI

We carry out a nonparametric analysis of financial durations. We make use of an existing algorithm to describe nonparametrically the dynamics of the process in terms of its lagged realizations and of a latent variable, its conditional mean. The devices needed to effectively apply the algorithm to our dataset are presented. On simulated data, the nonparametric procedure yields better estimates than the ones delivered by an incorrectly specified parametric method. On a real dataset, the nonparametric analysis can convey information on the nature of the data generating process that may not be captured by the parametric specification. In this view, the nonparametric method proposed can be a valuable preliminary analysis able to suggest the choice of a "good" parametric specification, or a complement of a parametric estimation.

JEL Classification: C14, C41, G10

Keywords: ACD, trade durations, local-linear.

- 2006/68 A GARCH (1,1) estimator with (almost) no moment conditions on the error term
Arie PREMINGER and Giuseppe STORTI

A least squares estimation approach for the estimation of a GARCH (1,1) model is developed. The asymptotic properties of the estimator are studied given mild regularity conditions, which require only that the error term has a conditional moment of some order. We establish the consistency, asymptotic normality and the law of iterated logarithm for our estimate. The finite sample properties are assessed by means of an extensive simulation study.

JEL Classification: C13, C15, C22

Keywords: GARCH (1,1), least squares estimation, consistency, asymptotic normality, law of the iterated logarithm.

- 2006/69 International commodity taxation in the presence of unemployment
Simone MORICONI and Yasuhiro SATO

This paper analyses the effect of consumption taxes on unemployment in presence of wage rigidity and compares non-cooperative tax setting under the destination and origin principle of commodity taxation. We show that, in a two country economy, consumption taxes negatively affect domestic employment and cause an employment externality which is negative under the destination and positive under the origin principle. Whereas the non-cooperative tax rate is inefficiently high under both principles, we show that, when the level of rigid wages is high, the origin principle is superior to the destination principle from the viewpoint of employment as well as social welfare.

JEL Classification: F16, H87, J23

Keywords: commodity taxation, destination principle, origin principle and unemployment.

- 2006/70 Desirable misuse of unemployment benefits: the economics of “Canada Dry” retirement
Helmuth CREMER, Jean-Marie LOZACHMEUR and Pierre PESTIEAU

The “Canada Dry” pensions system is in some countries one of the frequent routes to early retirement. It constitutes an informal substitute for early retirement programs. Accordingly, firms lay off aged workers they find costly for what they produce and, to get their support, supplement unemployment benefits by some extra compensation that is paid until formal retirement. Whether the government cannot or does not want to stop these practises is not clear. In this paper we show that these practices may effectively be welfare improving. In other words, it may be desirable to tolerate (or even encourage) some “abusive” uses of unemployment compensation schemes.

- 2006/71 Asymptotic theory for a factor GARCH model
Christian M. HAFNER and Arie PREMINGER

This paper investigates the asymptotic theory for a factor GARCH model. Sufficient conditions for strict stationarity, existence of certain moments, geometric ergodicity and β -mixing with exponential decay rates are established. These conditions allow for volatility spill-over and integrated GARCH. We then show the strong consistency and asymptotic normality of the quasi-maximum likelihood estimator (QMLE) of the model parameters. The results are obtained under the finiteness of the fourth order moment of the innovations.

JEL Classification: C14, C22

Keywords: multivariate GARCH, factor model, geometric ergodicity, maximum likelihood, consistency, asymptotic normality.

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- 2006/72 Bridging the gap between growth theory and the new economic geography: the spatial Ramsey model
Raouf BOUCEKKINE, Carmen CAMACHO and Benteng ZOU
- We study a Ramsey problem in infinite and continuous time and space. The problem is discounted both temporally and spatially. Capital flows to locations with higher marginal return. We show that the problem amounts to optimal control of parabolic partial differential equations (PDEs). We rely on the existing related mathematical literature to derive the Pontryagin conditions. Using explicit representations of the solutions to the PDEs, we first show that the resulting dynamic system gives rise to an *ill-posed problem* in the sense of Hadamard (1923). We then turn to the spatial Ramsey problem with linear utility. The obtained properties are significantly different from those of the non-spatial linear Ramsey model due to the spatial dynamics induced by capital mobility.
JEL Classification: C61, C62, O41
Keywords: Ramsey model, economic geography, parabolic equations, optimal control.
- 2006/73 Prodigality and myopia. Two rationales for social security
Pierre PESTIEAU and Uri POSSEN
- Among the rationales for social security, there is the fact that some people have to be forced to save. To explain undersaving, rational prodigality and hyperbolic preferences are often cited but treated separably. In this paper we study those two particular behaviors that lead to forced saving within an optimal income tax second-best setting.
JEL Classification: H55, D91
Keywords: social security, myopia, dual-self model, prodigality.
- 2006/74 Limiting the number of charities
Pierre PESTIEAU and Motohiro SATO
- We consider a model where creating a charity implies a fixed cost and individual contributions depend on how close donors feel with respect to the charity. In that setting we show that there are an optimal number of charities and an optimal rate of subsidization that depend on the set-up cost and on the attachment of donors to charities that share the same values as theirs. We also consider the case of free-entry and compare it with the second-best solution controlling for the number of charities.
JEL Classification: L31, H41
Keywords: charities, joy of giving.
- 2006/75 Progressivity, inequality reduction and merging-proofness in taxation
Biung-Ghi JU and Juan D. MORENO-TERNERO
- Progressivity, inequality reduction* and *merging-proofness* are three well-known axioms in taxation. We investigate implications of each of the three axioms through characterizations of several families of taxation rules and their logical relations. We also study the preservation of these axioms under two operators on taxation rules, the so-called convexity operator and minimal-burden operator, which give intuitive procedures for determining tax schedules.
JEL Classification: C70, D63, D70, H20
Keywords: taxation, progressivity, inequality reduction, merging-proofness, convexity operator, minimal-burden operator.

- 2006/76 The proportional rule for multi-issue bankruptcy problems
Juan D. MORENO-TERNERO
- We investigate how to extend bankruptcy rules to the general setting in which agents' claims may refer to different issues. We show that the proportional rule is the only one whose extensions according to two natural procedures yield the same outcomes.
- JEL Classification:** D63, D74
- Keywords:** multi-issue bankruptcy problems, proportional rule, characterization result.
- 2006/77 Intradaily seasonality of returns distribution. A quantile regression approach and intradaily VaR estimation
Laura CORONEO and David VEREDAS
- We investigate intradaily seasonal patterns on the distribution of high frequency financial returns. Using quantile regression we show the expansions and shrinks of the probability law through the day for three years of 15 minutes sampled stock returns. Returns are more dispersed and less concentrated around the median at the hours near the opening and closing. We provide intradaily value at risk assessments and we show how it adapts to changes of dispersion over the day.
- JEL Classification:** C14, C22, C53, G10
- Keywords:** high frequency returns, quantile regression, Fourier series, intradaily VaR.
- 2006/78 Stability of nonlinear AR-GARCH models
Mika MEITZ and Pentti SAIKKONEN
- This paper studies the stability of nonlinear autoregressive models with conditionally heteroskedastic errors. We consider a nonlinear autoregression of order p ($AR(p)$) with the conditional variance specified as a nonlinear first order generalized autoregressive conditional heteroskedasticity ($GARCH(1,1)$) model. Conditions under which the model is stable in the sense that its Markov chain representation is geometrically ergodic are provided. This implies the existence of an initial distribution such that the process is strictly stationary and β -mixing. Conditions under which the stationary distribution has finite moments are also given. The results cover several nonlinear specifications recently proposed for both the conditional mean and conditional variance.
- 2006/79 Voting over type and generosity of a pension system when some individuals are myopic
Helmuth CREMER, Philippe DE DONDER, Dario MALDONADO and Pierre PESTIEAU
- This paper studies the determination through majority voting of a pension scheme when society consists of far-sighted and myopic individuals. All individuals have the same basic preferences but myopics tend to adopt a short term view (instant gratification) when dealing with retirement saving. Consequently, they will find themselves with low consumption after retirement and regret their insufficient savings decisions. Henceforth, when voting they tend to commit themselves into forced saving. We consider a pension scheme that is characterized by two parameters: the payroll tax rate (that determines the size or generosity of the system) and the "Bismarckian factor" that determines its redistributiveness. Individuals vote sequentially. We examine how the introduction of myopic agents affects the generosity and the redistributiveness of the pension system. Our main result is that a flat pension system is always chosen when all individuals are of one kind (all far-sighted or all myopic), while a less redistributive system may be chosen if society is composed of both myopic and far-sighted agents. Furthermore, while myopic individuals tend to prefer larger payroll taxes than their far-sighted counterparts, the generosity of the system does not always increase with the proportion of myopics.
- JEL Classification:** H55, D91
- Keywords:** social security, myopia, dual-self model.

- 2006/80 Modelling financial high frequency data using point processes
Luc BAUWENS and Nikolaus HAUTSCH

In this chapter written for a forthcoming *Handbook of Financial Time Series* to be published by Springer-Verlag, we review the econometric literature on dynamic duration and intensity processes applied to high frequency financial data, which was boosted by the work of Engle and Russell (1997) on autoregressive duration models.

JEL Classification: C41, C32

Keywords: duration, intensity, point process, high frequency data, ACD models.

- 2006/81 Population policy through tradable procreation entitlements
David DE LA CROIX and Axel GOSSERIES

Tradable permits are now widely used to control pollution. We investigate the implications of setting up such a system in another area - population control -, either domestically or at the global level. We first generalize the framework with both tradable procreation allowances and tradable procreation exemptions, in order to tackle both over- and under-population problems. The implications of procreation rights for income inequality and education are contrasted. We decompose the scheme's impact on redistribution into three effects, one of them, the tradability effect, entails the following: with procreation exemptions or expensive enough procreation allowances, redistribution benefits the poor. In contrast, cheap procreation allowances redistribute resources to the rich. As far as human capital is concerned, natalist policy worsens the average education level of the next generation, while population control enhances it. If procreation rights are granted to countries in proportion to existing fertility levels (grandfathering) instead of being allocated equally, population control can be made even more redistributive. Our exploratory analysis suggests that procreation entitlements offer a promising tool to control population without necessarily leading to problematic distributive impact, especially at the global level.

JEL Classification: J13, E61, O40

Keywords: tradable permits, population control, pronatalist policy, income inequality, differential fertility, grandfathering.

- 2006/82 The first stage in Hendry's reduction theory revisited
Genaro SUCARRAT

The reduction theory of David F. Hendry provides a comprehensive probabilistic framework for the analysis and classification of the reductions associated with empirical econometric models. However, it is unable to provide an analysis on the same underlying probability space of the first reduction - and hence the subsequent reductions - given a commonplace theory of social reality, namely the joint hypotheses that the course of history is indeterministic, that history does not repeat itself, and that the future depends on the past. As a solution this essay proposes that the elements of the underlying outcome space in Hendry's theory are interpreted as indeterministic worlds made up of historically inherited particulars.

JEL Classification: B40, C50

Keywords: theory of reduction, DGP, possible worlds, measurement error, probabilistic causality.

- 2006/83 Incumbents' interests, voters' bias and gender quotas
Guillaume R. FRECHETTE, François MANIQUET and Massimo MORELLI

The adoption of gender quotas in party lists has been a voluntary decision by many parties in many countries, and is now a subject of discussion in many others. The Parity Law passed in France in 2001 is particularly interesting because for the first time the quota was set at 50 percent, and the deputies passing the reform are elected in single member districts. In this paper we rationalize parity on the basis of the self interest of male incumbent deputies: The existence of a voters' bias in favor of male candidates is sufficient to convince the incumbents to advocate for equal gender representation in party lists, because it *raises* the incumbents chances of being re-elected. We confirm empirically the existence of male bias in the French electorate and we show that parity law may have Assembly composition effects and policy effects that vary with the electoral system.

- 2006/84 Virtual Nash implementation with admissible support
Olivier BOCHET and François MANIQUET

A social choice correspondence (SCC) is virtually implementable if it is ε -close (in the probability simplex) to some (exactly) implementable correspondence. Abreu and Sen (1991) proved that, without restriction on the set of alternatives receiving strictly positive probability at equilibrium, every SCC is virtually implementable in Nash Equilibrium. We study virtual implementation when the supports of equilibrium lotteries are restricted. We provide a necessary and sufficient condition, imposing joint restrictions on SCCs and admissible supports. Then, we discuss how to construct supports. Finally, we study virtual implementation when the support is restricted to the efficient or individually rational alternatives.

- 2006/85 Nonparametric density estimation for positive time series
Taoufik BOUEZMARNI and Jeroen V.K. ROMBOUTS

The Gaussian kernel density estimator is known to have substantial problems for bounded random variables with high density at the boundaries. For i.i.d. data several solutions have been put forward to solve this boundary problem. In this paper we propose the gamma kernel estimator as density estimator for positive data from a stationary α -mixing process. We derive the mean integrated squared error, almost sure convergence and asymptotic normality. In a Monte Carlo study, where we generate data from an autoregressive conditional duration model and a stochastic volatility model, we find that the gamma kernel outperforms the local linear density estimator. An application to data from financial transaction durations, realized volatility and electricity price data is provided.

JEL Classification: C41, C32

Keywords: gamma kernel, nonparametric density estimation, mixing process, transaction durations, realised volatility.

- 2006/86 Advertising and competitive access pricing to internet services or pay-TV
Jean J. GABSZEWICZ, Didier LAUSSEL and Nathalie SONNAC

We study access pricing by platforms providing internet services or pay-TV to users while they allow advertisers to have access to these users against payment via ads or banners. Users are assumed to be ad-haters. It is shown that equilibrium access prices in the users' market are increasing in the dimension of the advertising market: the larger the number of advertisers, the higher the access prices for both platforms.

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- 2006/87 Advertising and the rise of the free daily newspapers
Jean J. GABSZEWICZ, Didier LAUSSEL and Nathalie SONNAC
- We analyze the competition between two newspapers in a vertical differentiation model where the qualities of the journals are determined endogenously in the first stage of the game. We show that when the advertising revenues per reader increase there is a critical value above which the quality of the low quality newspaper discontinuously falls while it becomes simultaneously a free newspaper. This is beneficial to the high quality journal and detrimental to the readers.
JEL Classification: L15, L82
Keywords: advertising, newspapers quality.
- 2006/88 International stock return predictability: statistical evidence and economic significance
Pierre GIOT and Mikael PETITJEAN
- The predictability of stock returns in ten countries is assessed taking into account recently developed out-of-sample statistical tests and risk-adjusted metrics. Predictive variables include both valuation ratios and interest rate variables. Out-of-sample predictive power is found to be greatest for the short-term and long-term interest rate variables. Given the importance of trading profitability in assessing market efficiency, we show that such statistical predictive power is economically meaningless across countries and investment horizons. All in all, no common pattern of stock return predictability emerges across countries, be it on statistical or economic grounds.
- 2006/89 The information content of the Bond-Equity Yield Ratio: better than a random walk ?
Pierre GIOT and Mikael PETITJEAN
- Since the 1990's run up in stock prices and subsequent crashes, the financial community has taken a dim view of the traditional valuation ratios and has instead turned its attention to a new valuation ratio: the Bond-Equity Yield Ratio (BEYR). In this paper we provide the first comprehensive, both in-sample and out-of-sample, statistical assessment of the fundamental short-term reversion dynamics of the BEYR towards its long-term mean. Using cointegrated VAR models, we show that the BEYR can depart from its long-term relationship for an extended period of time before reversion process finally brings it back to equilibrium. The out-of-sample forecasting analysis, based on both equally and superior predictive ability tests, shows that the cointegrated VAR model does not perform better than a naive random walk. As such, we cast doubt on the ability of the BEYR to predict monthly stock return.
- 2006/90 Short-term market timing using the Bond-Equity Yield Ratio
Pierre GIOT and Mikael PETITJEAN
- The Bond-Equity Yield Ratio (BEYR) has recently become a popular relative pricing tool favored by market practitioners. In this paper we compare the short-term profitability of a naive strategy based on the extreme values of the BEYR to the short-term profitability of a more sophisticated strategy relying on regime switches. Although the latter seems to perform better than the former, there is no overwhelming international evidence that these dynamic strategies deliver significantly higher risk-adjusted returns than the buy-and-hold portfolios. In addition, the profitability of these active strategies does not appear to be significantly different when the equity yield, instead of the BEYR, is used as criterion to time the market.

- 2006/91 Intergenerational equity and the discount rate for cost-benefit analysis
Jean-François MERTENS and Anna RUBINCHIK

Current Office of Management and Budget (OMB) guidelines use the interest rate as a basis for the discount rate, and have nothing to say about an intergenerationally fair discount rate. We derive this discount rate by differentiating a social welfare function with respect to perturbations in individual endowments (which induce perturbations of equilibria) in an overlapping generations model with exogenous growth. A traditional utilitarian approach leads to too high values, and in a wide range, while Relative Utilitarianism implies it equals the growth rate of real per-capita consumption, independent of the interest rate.

The differentiation is based on a novel method, applicable to arbitrary policy-variations, and that reveals a deep and very general property of exogenous growth models.

JEL Classification: D61, D63, H43

Keywords: social welfare function, social welfare functional, overlapping generations, exogenous growth, intergenerational fairness, cost-benefit analysis, social discount rate, utilitarianism, relative utilitarianism.

- 2006/92 Farsightedly stable networks
Jean-Jacques HERINGS, Ana MAULEON and Vincent VANNETELBOSCH

We propose a new concept, the pairwise farsightedly stable set, in order to predict which networks may be formed among farsighted players. A set of networks G is pairwise farsightedly stable (i) if all possible pairwise deviations from any network $g \in G$ to a network outside G are deterred by the threat of ending worse off or equally well off, (ii) if there exists a farsightedly improving path from any network outside the set leading to some network in the set, and (iii) if there is no proper subset of G satisfying (i) and (ii). We show that a non-empty pairwise farsightedly stable set always exists and we provide a full characterization of unique pairwise farsightedly stable sets of networks. Contrary to other pairwise concepts, pairwise farsighted stability yields a Pareto dominating network, if it exists, as the unique outcome. Finally, we study the relationship between pairwise farsighted stability and other concepts such as the largest consistent set.

JEL Classification: A14, C70, D20

Keywords: networks, farsighted, stability, pairwise, efficiency.

- 2006/93 Endogenous timing with free entry
Antonio TESORIERE

A free entry model with linear costs is considered where firms first choose their entry time and then compete in the market according to the resulting timing decisions. Multiple equilibria arise allowing for infinitely many industry output configurations encompassing one limit-output dominant firm and the Cournot equilibrium with free entry as extreme cases. Sequential entry is never observed. Both Stackelberg and Cournot-like outcomes are sustainable as equilibria however. When the number of incumbents is given, entry is always prevented, and industry output is sometimes larger than the entry preventing level.

JEL Classification: L11, L13

Keywords: free entry, market leadership, entry prevention.

2006/94 Intermediation and investment incentives
Paul BELLEFLAMME and Martin PEITZ

We analyze whether and how the fact that products are not sold on free, public platforms but on competing for-profit platforms affects sellers' investment incentives. Investments in cost reduction, quality, or marketing measures are here the joint and coordinated efforts by sellers. We show that, in general, for-profit intermediation is not neutral to such investment incentives. As for-profit intermediaries reduce the rents that are available in the market, one might suspect that sellers have weaker investment incentives with competing for-profit platforms. However, this is not necessarily the case. The reason is that investment incentives affect the size of the network effects and thus competition between intermediaries. In particular, we show that whether for-profit intermediation raises or lowers investment incentives depends on which side of the market singlehomed.

JEL Classification: L10, D40

Keywords: two-sided markets, network effects, intermediation, investment incentives.

2006/95 Nation formation and genetic diversity
Klaus DESMET, Michel LE BRETON, Ignacio ORTUNO-ORTIN and Shlomo WEBER

This paper presents a model of nation formation in which *culturally heterogeneous* agents vote on the optimal level of public spending. Larger nations benefit from increasing returns in the provision of public goods, but bear the costs of greater cultural heterogeneity. This tradeoff induces agents' preferences over different geographical configurations, thus determining the likelihood of secession and unification. We provide empirical support for choosing genetic distances as a proxy of cultural heterogeneity. By using data on genetic distances, we examine the stability of the current map of Europe and identify the regions prone to secession and the countries that are more likely to merge. Our framework is further applied to estimate the welfare gains from European Union membership.

JEL Classification: H77, D70, F02, H40

Keywords: nation formation, genetic diversity, cultural heterogeneity, secession, unification, European Union.

2006/96 Inefficiency of competitive equilibrium with hidden action and financial markets
Luca PANACCIONE

In this paper, we study a pure exchange economy with idiosyncratic uncertainty, hidden action and multiple consumption goods. We consider two different market structures: contingent markets on the one hand, and financial and spot markets on the other hand. We propose a competitive equilibrium concept for each market structure. We show that the equilibrium with contingent markets is efficient in an appropriate sense, while the equilibrium with financial and spot markets is inefficient, provided that assumptions on preferences more general than those usually considered in the literature hold.

JEL Classification: D53, D61, D82

Keywords: hidden action, enforcement, constrained efficiency.

- 2006/97 Competition in successive markets: entry and mergers
Jean J. GABSZEWICZ and Skerdilajda ZANAJ

This paper analyses successive markets where the intra-market linkage depends on the technology used to produce the final output. We investigate entry of new firms, when entry obtains by expanding the economy, as well as collusive agreements between firms. We highlight the differentiated effects of entry corresponding to a constant or decreasing returns technology. In particular, we show that, under decreasing returns, free entry in both markets does not entail the usual tendency for the input price to adjust to its marginal cost while it does under constant returns. Then, we analyse collusive agreements by stressing the role of upstream linkage on the profitability of horizontal mergers à la Salant, Switzer and Reynolds.

JEL Classification: D43, L1, L22, L42

Keywords: oligopoly, entry, horizontal collusion, foreclosure.

- 2006/98 Procreation, migration and tradable quotas
David DE LA CROIX and Axel GOSSERIES

First, we briefly discuss the very idea of tradable quotas, looking at a set of cases in which it has been proposed (but not implemented) outside the realm of pollution control and natural resources management. Next we study a proposal of tradable procreation quotas. We generalize Boulding's 1964 idea and discuss a full scheme able to deal both with under and over procreation. We then look more specifically at three effects of the scheme on income inequalities: differential productivity effect, differential fertility effect and tradability effect. Finally, we consider the migration dimension and discuss two possible schemes: (1) a domestic scheme of tradable emigration quotas among skilled people, serving as a possible alternative to a Bhagwati tax (with different properties); (2) a regional or global scheme of tradable immigration quotas of unskilled workers in rich countries, serving as a "burden sharing" mechanism. Special attention is given to some conjectures regarding the impact on education and average income back in the (poor) countries of origin.

JEL Classification: J13, J61, F22, E61

Keywords: Bhagwati tax, emission permits, distributive effect, overpopulation, brain drain, Boulding.

- 2006/99 The spatial sorting and matching of skills and firms
Giordano MION and Paolo NATICCHIONI

Using a matched employer-employee database for Italy we look at the spatial distribution of wages across provinces. This rich database allows us to contribute at opening the black box of agglomeration economies exploiting the micro dimension of the interaction among economic agents, both individuals and firms. We provide evidence that firm size and particularly skills are sorted across space, and explain a large portion of the spatial wage variation that could otherwise be attributed to aggregate proxies of agglomeration externalities. Our data further support the assortative matching hypothesis, that is "good" workers match on the labor market with "good" firms, and we further show that assortative matching is not driven by a co-location of workers and firms of similar quality. Finally, we point out that this assortative matching is negatively related to local market size.

JEL Classification: J31, J61, R23, R30

Keywords: Spatial externalities, panel-data, skills, firms' heterogeneity, sorting, matching.

- 2006/100 Market design in wholesale electricity markets
Maria Eugenia SANIN

As European countries move towards complete unbundling in electricity markets, some issues regarding market design are still under discussion. In particular, which market configuration would give the right incentives to promote efficiency and reduce final prices. In this paper we analyze a design in which prices are binding for more than one market period (like in the former British system or in the Australian system) and we compare price equilibria and collusive incentives under proportional and efficient rationing. To do so, we build on Le Coq (2002) and Crampes and Creti (2003) framework to account for stochastic demand. Our results suggest that with stochastic demand, incentives for strategically withholding capacity are still present but incentives to agree on market share are mitigated by efficient rationing.

JEL Classification: C72, L94

Keywords: electricity markets, market design, pricing behavior, stochastic demand.

- 2006/101 Growth, public investment and corruption with failing institutions
David DE LA CROIX and Clara DELAVALLADE

Corruption is thought to prevent poor countries from catching-up. We analyze one channel through which corruption hampers growth: public investment can be distorted in favor of specific types of spending for which rent-seeking is easier and better concealed. To study this distortion, we propose an optimal growth model where households vote for the composition of public spending subject to an incentive constraint reflecting individuals' choice between productive activity and rent-seeking. At equilibrium, the intensity of corruption and the structure of public investment are determined by the predatory technology and the distribution of political power. Among different regimes, the model shows a possible scenario of distortion without corruption in which there is no effective corruption yet still the possibility of corruption distorts the allocation of public investment, thus hampering growth. We test the implications of the model on a panel of countries estimating a system of equations with instrumental variables. We find that countries with a high predatory technology invest more in housing and physical capital in comparison with health and education. For equal initial conditions, such countries grow slower and have higher corruption, in particular when political power is concentrated.

JEL Classification: O41, H50, D73

Keywords: public investment, optimal growth, corruption, political power.

- 2006/102 Market-wide liquidity co-movements, volatility regimes and market cap sizes
Renaud BEAUPAIN, Pierre GIOT and Mikael PETITJEAN

Liquidity co-movements are studied within three different market capitalization indices, each made up of 100 NYSE stocks. Long-run liquidity co-movements are quantified in each class and compared to short-run liquidity co-movements. To condition the analysis of systematic liquidity upon index volatility, three regimes of volatility are defined using the Markov-switching methodology. Our results show that the magnitude of liquidity co-movements is on average positively related to the market capitalization of the index. There are significant differences between short-run and long-run liquidity co-movements, and between spread-based measures and depth-based measures. Finally, the volatility regime bears on the liquidity co-movements relationships.

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- 2006/103 On optimality, endogenous discounting and wealth accumulation
Ingmar SCHUMACHER
- We endogenize the discount rate via a broad measure of wealth and provide empirical evidence that wealth affects the discount rate negatively.
- We demonstrate that the Pontryagin conditions require positive felicity for intuitive results, whereas the concavity of the Hamiltonian requires negative felicity for optimality. This dilemma also holds for the endogenizations of Obstfeld (1990) and followers.
- We solve the model with positive felicity and resolve when optimality is possible. We discuss the impact on technological change, savings and convergence which are more in line with empirics. Finally, we discuss time consistency of a planner who cannot predict his preferences.
- JEL Classification:** D90, C61, O41
Keywords: endogenous time preference, stability, optimal growth, recursive utility.
- 2006/104 Endogenous discounting via wealth, twin-peaks and the role of technology
Ingmar SCHUMACHER
- The article gives new answers to the two following questions: One, what can be a potential source of the twin-peaks of economic growth? Two, why were some of the countries that were believed to belong to the group of low steady state countries (like Taiwan, South Korea, Japan, etc.) able to reach a convergence path which led them to a high steady state?
- We endogenize the time preference rate via a broad measure of wealth and provide empirical evidence that wealth affects the discount rate negatively. We provide sufficient conditions for multiplicity of equilibria and demonstrate how endogenous discounting via wealth leads to the twin-peaks of economic growth. We prove that improvements in technology can help avoid the Twin-Peaks.
- JEL Classification:** D90, C61, O41
Keywords: endogenous time preference, recursive utility, twin-peaks of economic growth.
- 2006/105 From BAT (best available technique) to BCAT (best combination of available techniques)
Thierry BRECHET and Henry TULKENS
- Technological choices are multi-dimensional and thus one needs a multidimensional methodology to identify best available techniques. Moreover, in the presence of environmental externalities generated by productive activities, 'best' available techniques should be best from Society's point of view, not only in terms of private interests. In this paper we develop a comprehensive modeling tool, based on methodologies appropriate to serve these two purposes, namely linear programming and internalization of external costs. We conclude that in this context there is in general not a single best available technique (BAT), but well a best combination of available techniques to be used (BCAT).
- We take a fictitious but plausible numerical example in the lime industry. For a hypothetical plant that has to meet a given demand, we build an original technical economic model within which two scenarios are considered: minimizing the private costs and minimizing the generalized costs (private costs plus external costs). In the first case, only the cheapest fuel is used in all kilns. But in the second case, where the environmental external costs are included, fuel switches occur and cleaner techniques are used. Extending the analysis to the choice of kilns, we find that the socially best combination of available techniques (S-BCAT) is not a fixed one: it varies as a function of the external costs. We therefore trace in a single diagram the whole profile of these best techniques as successive solutions of our linear programs. We conclude by stressing that external cost internalization does influence not only the choice of techniques, but also their appropriate use. Moreover, local environmental conditions play a major role in that choice and in determining that use.
- JEL Classification:** D20, Q50
Keywords: best available techniques, eco-efficiency, IPPC.

- 2006/106 Dynamics and monetary policy in a fair wage model of the business cycle
David DE LA CROIX, Gregory DE WALQUE and Rafael WOUTERS
- We first build a fair wage model in which effort varies over the business cycle. This mechanism decreases the need for other sources of sluggishness to explain the observed high inflation persistence. Second, we confront empirically our fair wage model with a New Keynesian model based on the standard assumption of monopolistic competition in the labor market. We show that, in terms of overall fit, the fair wage model outperforms the New Keynesian one. The extension of the fair wage model with lagged wage is judged insignificant by the data, but the extension based on a rent sharing argument including firm's productivity gains in the fair wage is not. Looking at the implications for monetary policy, we conclude that the additional trade-off problem created by the inefficient real wage behavior significantly affect nominal interest rates and inflation outcomes.
- JEL Classification:** E4, E5
Keywords: efficiency wage, effort, inflation persistence, monetary policy.
- 2006/107 Solving strongly monotone variational and quasi-variational inequalities
Yu. NESTEROV and Laura SCRIMALI
- In this paper we develop a new and efficient method for variational inequality with Lipschitz continuous strongly monotone operator. Our analysis is based on a new strongly convex merit function. We apply a variant of the developed scheme for solving quasivariational inequality. As a result, we significantly improve the standard sufficient condition for existence and uniqueness of their solutions. Moreover, we get a new numerical scheme, which rate of convergence is much higher than that of the straightforward gradient method.
- Keywords:** variational inequality, quasivariational inequality, monotone operators, complexity analysis, efficiency estimate, optimal methods.
- 2006/108 A quasi-variational inequality approach to the financial equilibrium problem
Laura SCRIMALI
- This paper presents the time-dependent, multi-agent and multi-activity financial equilibrium problem when budget constraints are implicitly defined. Specifically, we assume that total wealth is elastic with respect to the optimal investment. Such a problem is formulated as an infinite-dimensional quasi-variational inequality for which an existence result is given.
- Keywords:** vportfolio optimization, equilibrium condition, quasi-variational inequality.
- 2006/109 Competing in taxes and investment under fiscal equalization
Jean HINDRIKS, Susana PERALTA and Shlomo WEBER
- The paper considers a model of a federation with two heterogeneous regions that try to attract the capital by competing in capital income taxes and public investment that enhance the productivity of capital. The regions' choices determine the allocation of capital across the regions and their revenues under a tax sharing scheme. This framework allows for the examination of different approaches to fiscal equalization schemes (Boadway and Flatters, 1982, and Weingast, 2006). We show that tax competition distorts (downwards) public investments and that the equalization grants discourage public investments with a little effect on equilibrium taxes. However, the equalization schemes remain beneficial for the federation and, provided that the degree of asymmetry is small, for each region as well.
- JEL Classification:** C72, H23, H70
Keywords: heterogeneous regions, fiscal federalism, fiscal equalization, public investments.

- 2006/110 Does the open limit order book matter in explaining long run volatility ?
Roberto PASCUAL and David VEREDAS

This paper evaluates the informational content of an open limit order book by studying its role in explaining long run volatility. We separate liquidity-driven (transitory) volatility from information-driven (long run) volatility using a dynamic state-space co-integration model for ask and bid quotes. We report that changes in immediacy costs precede posterior fluctuations in long run volatility even after controlling for the incoming order flow. The book is less informative for large-caps than for small-caps. Consistently with previous studies, the book beyond the best quotes adds explanatory power to the best quotes. Finally, the explanatory power of the book decreases with the time resolution of the analysis.

JEL Classification: G1

Keywords: limit order book, volatility, electronic order-driven markets, state-space models, price formation, market microstructure.

- 2006/111 Voluntary matching grants can forestall social dumping
Jacques H. DREZE, Charles FIGUIERES and Jean HINDRIKS

The European economic integration leads to increasing mobility of factors, thereby threatening the stability of social transfer programs. This paper investigates the possibility to achieve by means of voluntary matching grants both the optimal allocation of factors and the optimal level of redistribution in the presence of factor mobility. We use a fiscal competition model à la Wildasin (1991) in which states differ in their technologies and preferences for redistribution. We first investigate a simple process in which the regulatory authority progressively raises the matching grants to the district choosing the lowest transfer and all districts respond optimally to the resulting change in transfers all around. This process is shown to increase total production and the level of redistribution. However it does not guarantee that all districts gain, nor that an efficient level of redistribution is attained. Assuming complete information among districts, we first derive the willingness of each district to match the contribution of other districts and we show that the aggregate willingness to pay for matching rates converges to zero when both the efficient level of redistribution and the efficient allocation of factors are achieved. We then describe the adjustment process for the matching rates that will lead districts to the efficient outcome and guarantee that everyone will gain.

JEL Classification: H23, H70

Keywords: fiscal federalism, adjustment process, matching grants.

- 2006/112 Estimation of stable distributions by indirect inference
René GARCIA, Eric RENAULT and David VEREDAS

This article deals with the estimation of the parameters of an α -stable distribution by the indirect inference method with the skewed- t distribution as an auxiliary model. The latter distribution appears as a good candidate for an auxiliary model since it has the same number of parameters as the α -stable distribution, with each parameter playing a similar role. To improve the properties of the estimator in finite sample, we use a variant of the method called Constrained Indirect Inference. In a Monte Carlo study, we show that this method delivers estimators with good properties in finite sample. In particular they are much more efficient than two other prevalent methods based on the characteristic function and the empirical quantiles. We provide an empirical application to hedge fund returns.

JEL Classification: C13, C15, G11

Keywords: stable distribution, indirect inference, constrained indirect inference, skewed- t distribution.

- 2006/113 The interaction between tolls and capacity investment in serial and parallel transport networks
Bruno DE BORGER, Fay DUNKERLEY and Stef PROOST

The purpose of this paper is to compare the interaction between pricing and capacity decisions on simple serial and parallel transport networks. When individual links of the network are operated by different regional or national authorities, toll and capacity competition is likely to result. Moreover, the problem is potentially complicated by the presence of both local and transit demand on each link of the network. We bring together and extend the recent literature on the topic and, using both theory and numerical simulation techniques, provide a careful comparison of toll and capacity interaction on serial and parallel network structures. First, we show that there is more tax exporting in serial transport corridors than on competing parallel road networks. Second, the inability to toll transit has quite dramatic negative welfare effects on parallel networks. On the contrary, in serial transport corridors it may actually be undesirable to allow the tolling of transit at all. Third, if the links are exclusively used by transit transport, toll and capacity decisions are independent in serial networks. This does not generally hold in the presence of local transport. Moreover, it contrasts with a parallel setting where regional authorities compete for transit; in that case, regional investment in capacity leads to lower Nash equilibrium tolls.

JEL Classification: H23, H71, R41, R48

Keywords: congestion pricing, transport investment, transit traffic.

- 2006/114 Do rent-seeking and interregional transfers contribute to urban primacy in sub-Saharan Africa ?
Kristian BEHRENS and Alain PHOLO BALA

We develop an economic geography model in which mobile skilled workers choose between working in the production sector or becoming part of an unproductive political elite. The elite sets tax rates on skilled and unskilled workers to maximize its own welfare by extracting rents, thereby influencing the spatial allocation of production and changing the available range of consumption goods. We show that such behavior increases the likelihood of agglomeration and of urban primacy. In equilibrium, the elite may tax the unskilled workers but will never tax the skilled workers, and there are rural-urban transfers towards the agglomeration. The size of the elite and the magnitude of the tax burden that falls on the unskilled is shown to decrease with product differentiation and, via the tax rates, with the expenditure share for manufacturing goods.

JEL Classification: D58, D72, F12, R12

Keywords: economic geography, rent-seeking, interregional transfers, urban primacy, developing countries.

- 2006/115 Fixed costs and the axiomatization of Shapley's sharing rule
Pierre DEHEZ

The cost sharing rule derived from the Shapley value is the unique sharing rule which allocates fixed costs uniformly.

JEL Classification: C71, D46

Keywords: cost sharing, value, fixed cost.

- 2006/116 Licensing a standard: fixed fee versus royalty
Sarah PARLANE and Yann MENIERE

This paper explores how an inventor should license an innovation that opens new markets for the licensees. Using a model incorporating product differentiation and network externalities we show that fixed fee licenses are optimal either when there is little competition downstream or when it is desirable to restrict entry. By opposition, royalty based licenses allows for more downstream firms (thanks to higher prices) and lead to a revenue which is less sensitive to more product homogeneity. They are optimal when downstream entry is desirable, which occurs either because there are positive network externalities, or for some intermediate values of product differentiation.

- 2006/117 Network formulations of mixed-integer programs
Michele CONFORTI, Marco DI SUMMA, Fritz EISENBRAND and Laurence A. WOLSEY

We consider mixed-integer sets of the type $MIX^{TU} = \{x : Ax \geq b; : x_i \text{ integer}, i \in I\}$, where A is a totally unimodular matrix, b is an arbitrary vector and I is a nonempty subset of the column indices of A . We show that the problem of checking nonemptiness of a set MIX^{TU} is NP-complete when A contains at most two nonzeros per column.

This is in contrast to the case when A is TU and contains at most two nonzeros per row. Denoting the set by MIX^{2TU} , we provide an extended formulation for the convex hull of MIX^{2TU} whose constraint matrix is the dual of a network matrix, and with integer right hand side vector. The size of this formulation depends on the number $|F|$ of distinct fractional parts taken by the continuous variables in the extreme points of $conv(MIX^{2TU})$. When this number is polynomial in the dimension of the matrix A , the formulation is of polynomial size and the optimization problem over MIX^{2TU} lies in \mathcal{P} . We show that there are instances for which $|F|$ is of exponential size, and we also give conditions under which $|F|$ is of polynomial size. Finally we show that these results for the set MIX^{2TU} provide a unified framework leading to polynomial-size extended formulations for several generalizations of mixing sets and lot-sizing sets studied in the last few years.

Keywords: mixed-integer set, totally unimodular matrix, extended formulation, convex hull, dual of network matrix.

- 2006/118 Density and hazard rate estimation for censored and α -mixing data using gamma kernels
Taoufik BOUEZMARNI and Jeroen V.K. ROMBOOTS

In this paper we consider the nonparametric estimation for a density and hazard rate function for right censored α -mixing survival time data using kernel smoothing techniques. Since survival times are positive with potentially a high concentration at zero, one has to take into account the bias problems when the functions are estimated in the boundary region. In this paper, gamma kernel estimators of the density and the hazard rate function are proposed. The estimators use adaptive weights depending on the point in which we estimate the function, and they are robust to the boundary bias problem. For both estimators, the mean squared error properties, including the rate of convergence, the almost sure consistency and the asymptotic normality are investigated. The results of a simulation demonstrate the excellent performance of the proposed estimators.

Keywords: gamma kernel, Kaplan Meier, density and hazard function, mean integrated squared error, consistency, asymptotic normality.