Pflüger, Michael

Working Paper

A Simple, Analytically Solvable Chamberlinian Agglomeration Model

IZA Discussion Papers, No. 359

Provided in Cooperation with:
IZA – Institute of Labor Economics

Suggested Citation: Pflüger, Michael (2001) : A Simple, Analytically Solvable Chamberlinian Agglomeration Model, IZA Discussion Papers, No. 359, Institute for the Study of Labor (IZA), Bonn

This Version is available at:
https://hdl.handle.net/10419/21219

DISCUSSION PAPER SERIES

IZA DP No. 359

A Simple, Analytically Solvable Chamberlinian Agglomeration Model

Michael Pflüger

September 2001

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

A Simple, Analytically Solvable Chamberlinian Agglomeration Model

Michael Pflüger

University of Freiburg and IZA, Bonn

Discussion Paper No. 359
September 2001

IZA

P.O. Box 7240
D-53072 Bonn
Germany

Tel.: +49-228-3894-0
Fax: +49-228-3894-210
Email: iza@iza.org

IZA Discussion Paper No. 359
September 2001

ABSTRACT

A Simple, Analytically Solvable Chamberlinian Agglomeration Model *

This paper presents a simple, analytically solvable Chamberlinian agglomeration model. As in the canonical core-periphery (CP) model, two agglomerative forces are at work. However, the present model exhibits a 'pitchfork bifurcation' rather than the 'tomahawk bifurcation' of the CP model.

JEL Classification: F12, F15, F22, R12

Keywords: Economic geography, agglomeration, human capital mobility

Michael Pflüger
Institut für Allgemeine Wirtschaftsforschung
Abteilung für Wirtschaftstheorie
Universität Freiburg
Platz der Alten Synagoge
79085 Freiburg
Germany
Tel.: + 49 761/203-2329
Fax: + 49 761/203-2405
Email pflueger@vwl.uni-freiburg.de

* I would like to thank Andreas Haufler, Jörg Lingens and Jochen Michaelis for useful suggestions.

1. Introduction

The spatial aspects of the economy are at the heart of the 'new economic geography' which was launched with the seminal works by Krugman (1991), Krugman and Venables (1995) and Venables (1996). The analytical essence of the new economic geography is contained in the 'core-periphery (CP) model'.[1] This shows how the interactions among transport costs, increasing returns at the firm level, and supply and demand linkages shape and change the location of economic activity. In order to bring these interactions out clearly, this model is built around a set of simplifying assumptions which have become canonical (e.g. Chamberlinian monopolistic competition with Dixit-Stiglitz preferences, Cobb-Douglas upper-tier utility and iceberg transport costs). It has been perceived as a weakness that, these simplifications notwithstanding, only certain aspects of the CP model are analytically tractable. The model generally has to be solved by numerical simulation. This may be part of the reason why the analysis of the policy implications of the new economic geography, which would necessitate further complications of the model, is yet not fully developped. An analytically solvable case of the CP model has been worked out by Forslid (1999), however.[2] Due to its solvability, this model has proven useful for analyses in the field of capital and income tax competition (Andersson and Forslid, 1999; Baldwin and Krugman, 2000).

This paper presents an alternative model that can be solved analytically and is even simpler than the model of Forslid (1999). The gain in simplicity derives from the substitution of the Cobb-Douglas upper-tier utility with a quasi-linear function. With this modification, the two agglomerative forces contained in his model are still at work but the quasi-linear utility removes all income effects from the manufacturing sector, in which agglomerative forces appear. Moreover, the modified model has the surprising implication that, when transport costs are lowered, a different type of bifurcation arises. The CP model exhibits a 'tomahawk bifurcation'.[3] When transport costs are at a certain level (the sustain point), two stable fully agglomerative equilibria appear in addition to the initial symmetric equilibrium. At a still lower level of transport costs (the break point), the symmetric equilibrium becomes unstable. The model presented here exhibits a smooth 'pitchfork bifurcation'. At a certain level of transport costs, the initial symmetric equilibrium becomes unstable and two stable asymmetric

---

[1] The core-periphery model is conveniently laid out in Fujita et. al (1999, Ch. 4 and Ch. 5) and elaborated on and critically assessed in Neary (2000) and Baldwin et.al. (2001).

[2] Solvable models departing from the CP model have also been provided by Baldwin (1999), who stresses factor accumulation and by Ottaviano and Thisse (1998), who work out a non-Chamberlinian setting.

[3] A simple introduction to bifurcations is provided in Fujita et. al. (1999, appx. to Ch. 3).

equilibria emerge which are increasingly asymmetric as transport costs are reduced further.[4] This feature may be a better description for some of the agglomerative processes that are initiated by economic integration (decreasing transport costs) than the 'catastrophic' emergence of complete agglomeration predicted by the CP model.

2. The Model

The model builds on Forslids adaptation of the CP model which achieves its solvability by assuming that the fixed cost in the manufacturing sector consists of a separate internationally mobile factor as in Flam and Helpman (1987). Here we combine this model with the assumption that the upper-tier utility is quasi-linear rather than Cobb-Douglas drawing on a widely used specification (e.g. Dixit, 1990, Ch.3).

The world is composed of two countries, home and foreign (denoted by an asterisk (*)), two factors of production, labor (L) and human capital (K), and two sectors, manufacturing (X) and agriculture (A). Labor is intersectorally mobile. Countries are assumed to have identical preferences, technology and trade costs. In the long-run, human capital is assumed to be mobile internationally, while labor is not. The agricultural good is homogeneous, traded without costs and produced perfectly competitively under constant returns with labor as the only input. This good is the numéraire and assumed to be produced in both countries after trade. The monopolistically competitive X sector employs both factors to produce differentiated goods with a linear cost function. Labor is the only variable input. Human capital enters only the fixed cost. One unit of it is needed (for R&D or headquarter services) to produce at all. Trade in X is inhibited by iceberg costs.

There are $L+K$ households, L laborers and K human capital owners each of whom supplies one unit of labor and human capital, respectively. Their wages are denoted by W and R, respectively. Each household's preferences are characterised by:[5]

$$U = a \ln C_X + C_A , \qquad C_X = \left(\int_0^N x_i^{\frac{s-1}{s}} + \int_N^{N^*} x_j^{\frac{s-1}{s}} \right)^{\frac{s}{s-1}} , \; a > 0 , \; s > 1 \tag{1}$$

[4] When production in the perfectly competitive outside sector takes place under decreasing rather than constant returns, a smooth pitchfork bifurcations is observed in the CP model, too (Fujita et. al., 1999, Ch. 14).

[5] Martin and Rogers (1995) and Pflüger (2001) use this preference specification in non-agglomeration contexts. A similar specification is used in Helpman and Krugman (1989, Ch. 7).

where C_X is the manufacturing aggregate, C_A is the consumption of the agricultural good, x_i (x_j) is the quantity consumed of a domestic variety i (foreign variety j), N and $N*$ are the number of varieties produced in home and foreign and s is the elasticity of substitution between manufacturing varieties. The budget constraint is given by

$$PC_X + C_A = Y, \qquad P = \left(NP_i^{1-s} + N*\left(tP_j\right)^{1-s}\right)^{\frac{1}{1-s}}, \qquad t > 1 \tag{2}$$

where Y denotes the household's income, P is the perfect CES-price index, P_i (P_j) is the price set by a domestic (foreign) firm. Iceberg transport costs are formalised by the constant t. These imply that only $1/t$ of a unit of a foreign variety arrives for consumption and that the consumer price of an imported variety is tP_j. Utility maximisation yields the demand functions and indirect utility, V:

$$C_X = aP^{-1}, \quad C_A = Y - a, \quad x_i = aP_i^{-s}P^{s-1}, \qquad x_j = a\left(tP_j\right)^{-s}P^{s-1} \tag{3}$$

$$V = -a\ lnP + Y + \left[a\left(ln\,a - 1\right)\right]. \tag{4}$$

Choosing units and letting L_A denote labour input, the production function of the agricultural good is $X_A = L_A$. Perfect competition ensures that this good is priced at marginal (which is also average) cost. Since this good is the numéraire, the wage rate is unity, $W = 1$.

Market clearing for domestic variety i is expressed by $X_i = (L+K)x_i + (L*+K*)tx_i^*$, where X_i is production and x_i^* is the demand of the foreign representative household. Part of demand is indirect, caused by transport losses. Each product type is supplied by a single firm. With $W = 1$ and the technology $L_i = cX_i$ ($c > 0$, a constant), the marginal cost is given by c. The fixed cost due to the requirement of one unit of human capital is given by R. Let the producer prices charged to domestic (foreign) households be denoted P_i (P_i^*). Profits of the representative firm in the home region, P_i, are then given by:

$$P_i = (P_i - c)(L+K)x_i + (P_i* - c)(L*+K*)tx_i^* - R \tag{5}$$

With the Chamberlinian large group assumption, profit maximising prices are constant markups on marginal costs:

$$P_i = P_i^* = cs/(s-1) \tag{6}$$

The compensation of human capital adjusts so as to ensure zero profit equilibrium. Using the market clearing condition, a relationship between firm scale X_i and fixed costs R obtains:

$$X_i = R(s-1)/c\,. \tag{7}$$

3. Short-Run Equilibrium

In the short-run, human capital is immobile between countries so that $N = K$ and $N^* = K^*$. With free trade in goods, and using (2), (3), (5), (6) and their foreign counterparts, the zero profit conditions in home and foreign are given by:

$$sR = \frac{a(L+K)}{K+fK^*} + \frac{fa(L^*+K^*)}{fK+K^*}; \qquad sR^* = \frac{fa(L+K)}{K+fK^*} + \frac{a(L^*+K^*)}{fK+K^*} \tag{8}$$

where $0 < f \equiv t^{1-s} < 1$. Human capital's compensation in home and foreign in the short-run equilibrium, R and R^*, can directly be read of (8). This is the simplification obtained by the quasi-linear upper tier utility which eliminates all income effects from the manufacturing sector. With a Cobb-Douglas, domestic and foreign incomes enter in the numerators of (8) which then have to be solved simultaneously. Once R is derived, the firm scale X_i follows directly from (7) and all other endogenous variables can be derived straightforwardly. The X sector employs $NcX_i = KR(s-1)$ units of labor (from (7) and $N = K$) which is assumed to be less than L in order to fulfill the assumption that both sectors are active after trade.

4. Long-Run Equilibrium

In the long run, human capital owners are internationally mobile and will move to the region where their indirect utility is higher. The utility differential, $V - V^* = a(\ln P/P^*) + (R - R^*)$, can easily be derived analytically for general trade costs in this model:

$$V - V^* = \frac{a}{1-s}\left\{\ln f + \ln\left[\frac{l + (1-l)/f}{l + (1-l)f}\right]\right\} + \frac{a(1-f)}{s}\left[\frac{\frac{L}{K+K^*} + l}{l + (1-l)f} - \frac{\frac{L^*}{K+K^*} + (1-l)}{lf + (1-l)}\right] \tag{9}$$

where $l \equiv K / K + K^*$. A long-run equilibrium in which both regions produce manufactures is given when $V - V^* = 0$. It is easily verified that $l = 1/2$ is always such an equilibrium with identical countries. However, this equilibrium is not necessarily stable because the model contains two agglomerative forces. There is a supply linkage in (9) as the region with the higher share of human capital has a larger manufacturing sector and therefore a lower price index. This is captured in the first term in (9) which is rising in l for all transport costs. There is also a demand linkage in (9) since increasing the share of human capital in one region implies a larger market. This raises the profitability of firms as expressed by the differential $(R - R^*)$ and thus attracts more human capital. The demand linkage is captured in the second term in (9). Around $l = 1/2$ this term is rising in l when transport costs are low. However, when they are high enough, this term is falling in l (the cut-off being at $t = (1/2)^{1/(1-s)}$ for $L = L^* = 2; K = K^* = 1$). This demonstrates that transport costs stabilise the symmetric equilibrium, i.e. tend to disperse production. With quasi-linear preferences, the utility differential (9) is the additive result of these two terms.

Fig. 1 about here

Fig. 1 depicts (9) for different levels of trade costs ($L = L^* = 2; K = K^* = 1; s = 6; a = 0.3$). For high trade costs, (9) is monotonically falling and the symmetric equilibrium is stable. It becomes unstable for lower trade costs and two stable asymmetric equilibria emerge which become increasingly asymmetric when trade costs are continuously reduced. For still lower trade costs, the utility differential slopes up monotonically implying that these asymmetric equilibria involve full specialisation in one of the countries. When trade costs are nil, difference doesn't matter in the model and human capital owners are indifferent where to locate. The model exhibits a 'pitchfork bifurcation'. Taking the derivative of (9) with respect to l at $l = 1/2$ yields the parameter criterion at which the symmetric equilibrium becomes unstable and the two arms of the fork appear: $f \equiv t^{1-s} = (s - 2)/(5s - 4)$ for $L = L^* = 2; K = K^* = 1$.

The bifurcation type encountered in geography models is determined by the curvature of the utility differential of the mobile factor (Fujita et.al., 1999, Ch.3). As exemplified by the dashed and thick lines in Fig. 1, this curve goes from convex to concave with quasi-linear preferences, leading to the smooth pitchfork bifurcation. Plotting the two terms separately clarifies that the demand linkage captured in $R - R^*$ is responsible for the convexity-concavity behaviour of (9). With the Cobb-

Douglas, two qualitatively identical linkages are at work. However, the utility differential goes from concave to convex, implying a tomahawk bifurcation. Arguably, the smooth pitchfork is a more convincing description of some of the concentration processes triggered by falling transport costs than the 'catastrophe' implied by the tomahawk bifurcation.

5. Conclusions

This paper presents a simple, analytically solvable Chamberlinian agglomeration model. The simplicity of the model derives from two assumptions which depart from the canonical CP model. First, the fixed cost in the manufacturing sector is assumed to consist of a separate internationally mobile factor (human capital). Second, and novel, preferences of households are characterised by a quasi-linear upper tier utility rather than a Cobb-Douglas. Like the CP model, the present model contains two agglomerative forces, a supply and a demand linkage. However, due to the alternative specification of preferences, the model exhibits a smooth 'pitchfork bifurcation' rather than the 'tomahawk bifurcation' of the CP model.

References

Andersson, Fr. and R. Forslid, 1999. Tax Competition and Economic Geography, CEPR Discussion Paper 2220.

Baldwin, R. E., 1999. Agglomeration and Endogenous Capital, European Economic Review 43, 253-280.

Baldwin, R. E. and P. Krugman, 2000. Agglomeration, Integration, and Tax Harmonization, CEPR Discussion Paper 2630.

Baldwin, R.E., Forslid, R., G. Ottaviano and Fr. Robert-Nicoud, 2001. The Core-Periphery Model: Key Features and Effects, manuscript, University of Geneva.

Dixit, A., 1990. Optimization in Economic Theory. Second Edition, Oxford University Press.

Flam, H. and E. Helpman, 1987. Industrial Policy Under Monopolistic Competition, Journal of International Economics 22, 79-102.

Forslid, R., 1999. Agglomeration with Human and Physical Capital: An Analytically Solvable Case, CEPR Discussion Paper 2102.

Fujita, M., P. Krugman and A.J. Venables, 1999. The Spatial Economy. Cities, Regions, and International Trade, MIT-Press, Cambridge, Mass.

Helpman, E. and P. R. Krugman, 1989. Trade Policy and Market Structure, The MIT-Press, Cambridge, Mass.

Krugman. P., 1991. Increasing Returns and Economic Geography, Journal of Political Economy 99, 483-499.

Krugman, P., and A. J. Venables, 1995. Globalization and the Inequality of Nations, Quarterly Journal of Economics 60, 857-880.

Martin, Ph. J. and C. A. Rogers, 1995. Trade Effects of Regional Aid, in: R. Baldwin, P. Haaparanta and J. Kiander (eds.), Expanding Membership of the European Union, Cambridge University Press, 166-188.

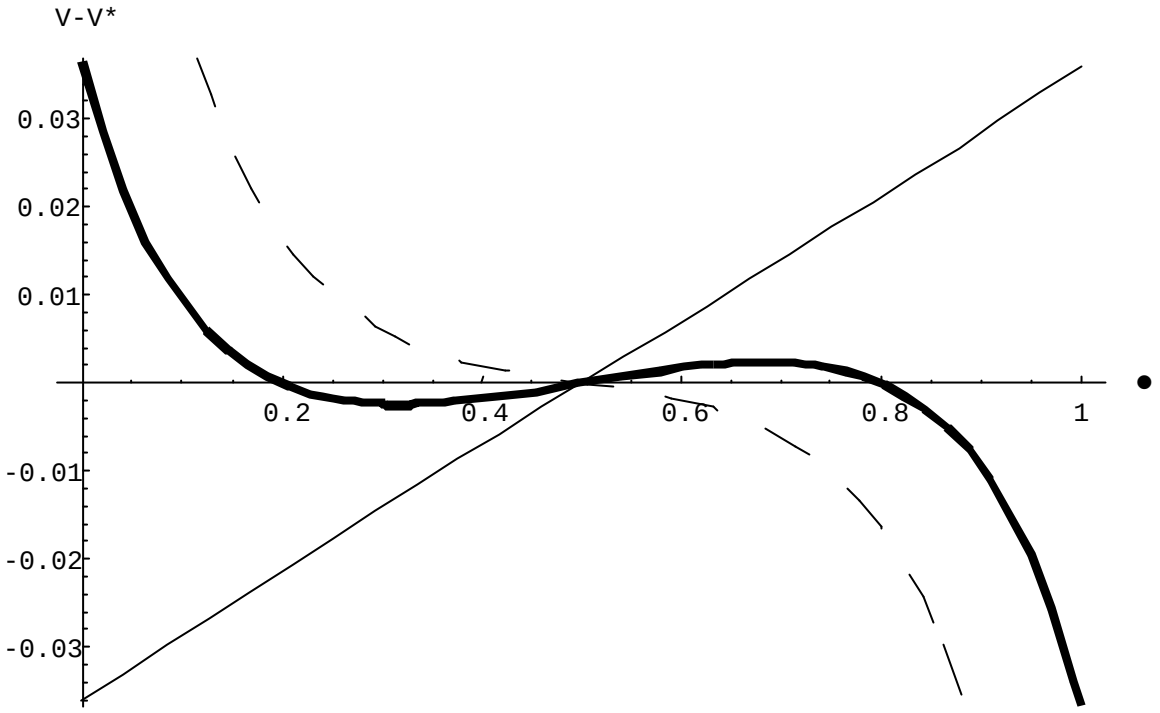
Neary, P. J., 2000. Of Hype and Hyperbolas: Introducing the New Economic Geography, manuscript, University College Dublin, August.

Ottaviano, G. and J.-F. Thisse, 1998. Agglomeration and Trade Revisited, CEPR Discussion Paper 1903.

Pflüger, M., 2001. Ecological Dumping Under Monopolistic Competition, Scandinavian Journal of Economics, forthcoming.

Venables, A.J., 1996. Equilibrium Location of Vertically Linked Industries, International Economic Review 37, 341-359.

Figure 1: International utility differential, human capital



Trade costs:

High:	Dashed Line:	$t = 1.5$
Intermediate:	Thick Line:	$t = 1.4$
Low:	Regular Line:	$t = 1.1$

IZA Discussion Papers

No.	Author(s)	Title	Area	Date
280	P. Apps R. Rees	Household Saving and Full Consumption over the Life Cycle	7	04/01
281	G. Saint-Paul	Information Technology and the Knowledge Elites	5	04/01
282	J. Albrecht A. Björklund S. Vroman	Is There a Glass Ceiling in Sweden?	5	04/01
283	M. Hagedorn A. Kaul V. Reinthaler	Welfare Analysis in a Schumpeterian Growth Model with Capital	7	04/01
284	H. Rapoport A. Weiss	The Optimal Size for a Minority	1	04/01
285	J. Jerger C. Pohnke A. Spermann	Gut betreut in den Arbeitsmarkt? Eine mikroökonometrische Evaluation der Mannheimer Arbeitsvermittlungsagentur	5	04/01
286	M. Fertig C. M. Schmidt	First- and Second-Generation Migrants in Germany – What Do We Know and What Do People Think	1	04/01
287	P. Guggenberger A. Kaul M. Kolmar	Efficiency Properties of Labor Taxation in a Spatial Model of Restricted Labor Mobility	3	04/01
288	D. A. Cobb-Clark	Getting Ahead: The Determinants of and Payoffs to Internal Promotion for Young U.S. Men and Women	5	04/01
289	L. Cameron D. A. Cobb-Clark	Old-Age Support in Developing Countries: Labor Supply, Intergenerational Transfers and Living Arrangements	3	04/01
290	D. A. Cobb-Clark M. D. Connolly C. Worswick	The Job Search and Education Investments of Immigrant Families	1	04/01
291	R. T. Riphahn	Cohort Effects in the Educational Attainment of Second Generation Immigrants in Germany: An Analysis of Census Data	1	05/01

292	E. Wasmer	Between-group Competition in the Labor Market and the Rising Returns to Skill: US and France 1964-2000	5	05/01
293	D. Cobb-Clark T. F. Crossley	Gender, Comparative Advantage and Labor Market Activity in Immigrant Families	1	05/01
294	Š. Jurajda	Estimating the Effect of Unemployment Insurance Compensation on the Labor Market Histories of Displaced Workers	3	05/01
295	F. Duffy P. P. Walsh	Individual Pay and Outside Options: Evidence from the Polish Labour Force Survey	4	05/01
296	H. S. Nielsen M. Rosholm N. Smith L. Husted	Intergenerational Transmissions and the School-to-Work Transition of 2nd Generation Immigrants	1	05/01
297	J. C. van Ours J. Veenman	The Educational Attainment of Second Generation Immigrants in The Netherlands	1	05/01
298	P. Telhado Pereira P. Silva Martins	Returns to Education and Wage Equations	5	06/01
299	G. Brunello C. Lucifora R. Winter-Ebmer	The Wage Expectations of European College Students	5	06/01
300	A. Stutzer R. Lalive	The Role of Social Work Norms in Job Searching and Subjective Well-Being	5	06/01
301	J. R. Frick G. G. Wagner	Economic and Social Perspectives of Immigrant Children in Germany	1	06/01
302	G. S. Epstein A. Weiss	A Theory of Immigration Amnesties	1	06/01
303	G. A. Pfann B. F. Blumberg	Social Capital and the Uncertainty Reduction of Self-Employment	5	06/01
304	P. Cahuc E. Wasmer	Labour Market Efficiency, Wages and Employ-ment when Search Frictions Interact with Intra-firm Bargaining	2	06/01
305	H. Bonin	Fiskalische Effekte der Zuwanderung nach Deutschland: Eine Generationenbilanz	1	06/01

306	H. Bonin G. Abío E. Berenguer J. Gil C. Patxot	Is the Deficit under Control? A Generational Accounting Perspective on Fiscal Policy and Labour Market Trends in Spain	2	06/01
307	G. A. Pfann	Downsizing	1/5	06/01
308	G. A. Pfann D. S. Hamermesh	Two-Sided Learning, Labor Turnover and Worker Displacement	1	06/01
309	G. Brunello	On the Complementarity between Education and Training in Europe	5	06/01
310	U. Sunde	Human Capital Accumulation, Education and Earnings Inequality	5	06/01
311	G. Brunello	Unemployment, Education and Earnings Growth	3	06/01
312	C. Furnée M. Kemler G. A. Pfann	The Value of Pain Relief	5	06/01
313	A. Ferrer-i-Carbonell B. M.S. van Praag	The Subjective Costs of Health Losses due to Chronic Diseases: An Alternative Model for Monetary Appraisal	7	06/01
314	B. M.S. van Praag A. Ferrer-i-Carbonell	Age-Differentiated QALY Losses	7	06/01
315	W. H. J. Hassink R. Schettkat	On Price-Setting for Identical Products in Markets without Formal Trade Barriers	7	06/01
316	M. Frondel C. M. Schmidt	Rejecting Capital-Skill Complementarity at all Costs	5	06/01
317	R. Winkelmann	Health Care Reform and the Number of Doctor Visits – An Econometric Analysis	7	06/01
318	M. Pannenberg G. G. Wagner	Overtime Work, Overtime Compensation and the Distribution of Economic Well-Being: Evidence for West Germany and Great Britain	1	06/01
319	R. Euwals R. Winkelmann	Why do Firms Train? Empirical Evidence on the First Labour Market Outcomes of Graduated Apprentices	1	06/01

320	R. Fahr U. Sunde	Strategic Hiring Behavior in Empirical Matching Functions	1	06/01
321	P. Telhado Pereira P. Silva Martins	Is there a Return – Risk Link in Education?	5	07/01
322	O. Hübler U. Jirjahn	Works Councils and Collective Bargaining in Germany: The Impact on Productivity and Wages	1	07/01
323	A. Frederiksen E. K. Graversen N. Smith	Overtime Work, Dual Job Holding and Taxation	1	07/01
324	M. Pflüger	Trade, Technology and Labour Markets: Empirical Controversies in the Light of the Jones Model	2	07/01
325	R. A. Hart J. R. Malley U. Woitek	Real Wages and the Cycle: The View from the Frequency Domain	1	07/01
326	J. S. Earle Á. Telegdy	Privatization and Productivity in Romanian Industry: Evidence from a Comprehensive Enterprise Panel	4	07/01
327	H. Gersbach A. Schmutzler	A Product Market Theory of Training and Turnover in Firms	5	07/01
328	F. Breyer	Why Funding is not a Solution to the “Social Security Crisis”	3	07/01
329	X. Gong A. van Soest	Wage Differentials and Mobility in the Urban Labor Market: A Panel Data Analysis for Mexico	1	07/01
330	D. N. Margolis K. G. Salvanes	Do Firms Really Share Rents with Their Workers?	5	07/01
331	R. Winkelmann	Why Do Firms Recruit Internationally? Results from the IZA International Employer Survey 2000	5	07/01
332	M. Rosholm	An Analysis of the Processes of Labour Market Exclusion and (Re-) Inclusion	3	07/01
333	W. Arulampalam R. A. Naylor J. P. Smith	A Hazard Model of the Probability of Medical School Dropout in the United Kingdom	5	07/01

334	P. A. Puhani	Wage Rigidities in Western Germany? Microeconometric Evidence from the 1990s	1	07/01
335	R. Fahr U. Sunde	Disaggregate Matching Functions	1	07/01
336	F. Lima P. Telhado Pereira	Careers and Wage Growth within Large Firms	5	07/01
337	F. Büchel M. Pollmann-Schult	Overeducation and Skill Endowments: The Role of School Achievement and Vocational Training Quality	5	08/01
338	C. Bell H. Gersbach	Child Labor and the Education of a Society	5	08/01
339	A. Ibourk B. Maillard S. Perelman H. R. Sneessens	The Matching Efficiency of Regional Labour Markets: A Stochastic Production Frontier Estimation, France 1990-1995	1	08/01
340	X. Wauthy Y. Zenou	How Does Imperfect Competition in the Labor Market Affect Unemployment Policies?	3	08/01
341	S. Kohns	Testing for Asymmetry in British, German and US Unemployment Data	1	08/01
342	W. Schnedler	The Virtue of Being Underestimated: A Note on Discriminatory Contracts in Hidden Information Models	5	08/01
343	H. Bonin	Will it Last? An Assessment of the 2001 German Pension Reform	3	08/01
344	E. Plug P. Berkhout	Effects of Sexual Preferences on Earnings in the Netherlands	5	08/01
345	J. Hampe M. Steininger	Survival, Growth, and Interfirm Collaboration of Start-Up Companies in High-Technology Industries: A Case Study of Upper Bavaria	5	08/01
346	L. Locher	The Determination of a Migration Wave Using Ethnicity and Community Ties	1	08/01
347	M. Lofstrom F. D. Bean	Labor Market Conditions and Post-Reform Declines in Welfare Receipt Among Immigrants	3	08/01
348	S. Neuman A. Ziderman	Can Vocational Education Improve the Wages of Minorities and Disadvantaged Groups? The Case of Israel	5	08/01

349	J. T. Addison P. Portugal	Job Search Methods and Outcomes	1	08/01
350	J. T. Addison P. Portugal	Unemployment Duration: Competing and Defective Risks	1	08/01
351	J. D. Brown J. S. Earle	Gross Job Flows in Russian Industry Before and After Reforms: Has Destruction Become More Creative?	4	08/01
352	J. T. Addison J. S. Heywood X. Wei	Unions and Plant Closings in Britain: New Evidence from the 1990/98 WERS	1	08/01
353	T. Bauer S. Bender	Flexible Work Systems and the Structure of Wages: Evidence from Matched Employer-Employee Data	5	08/01
354	J. Kluve	On the Role of Counterfactuals in Inferring Causal Effects of Treatments	6	09/01
355	J. Kluve H. Lehmann C. M. Schmidt	Disentangling Treatment Effects of Polish Active Labor Market Policies: Evidence from Matched Samples	4/6	09/01
356	C. Heady T. Mitrakos P. Tsakloglou	The Distributional Impact of Social Transfers in the European Union: Evidence from the ECHP	3	09/01
357	C. Knoppik T. Beissinger	How Rigid are Nominal Wages? Evidence and Implications for Germany	1	09/01
358	T. Beissinger O. Buesse	Bismarck versus Beveridge: Which Unemployment Compensation System is More Prone to Labor Market Shocks?	3	09/01
359	M. Pflüger	A Simple, Analytically Solvable Chamberlinian Agglomeration Model	2	09/01