UNIVERSITY OF HOHENHEIM

FACULTY OF BUSINESS, ECONOMICS AND SOCIAL SCIENCES

HOHENHEIM DISCUSSION PAPERS

IN BUSINESS, ECONOMICS AND SOCIAL SCIENCES

Research Area INEPA

DISCUSSION PAPER **11**-2017

DIVERGENCE, CONVERGENCE, AND THE HISTORY-AUGMENTED SOLOW MODEL

Vadim Kufenko

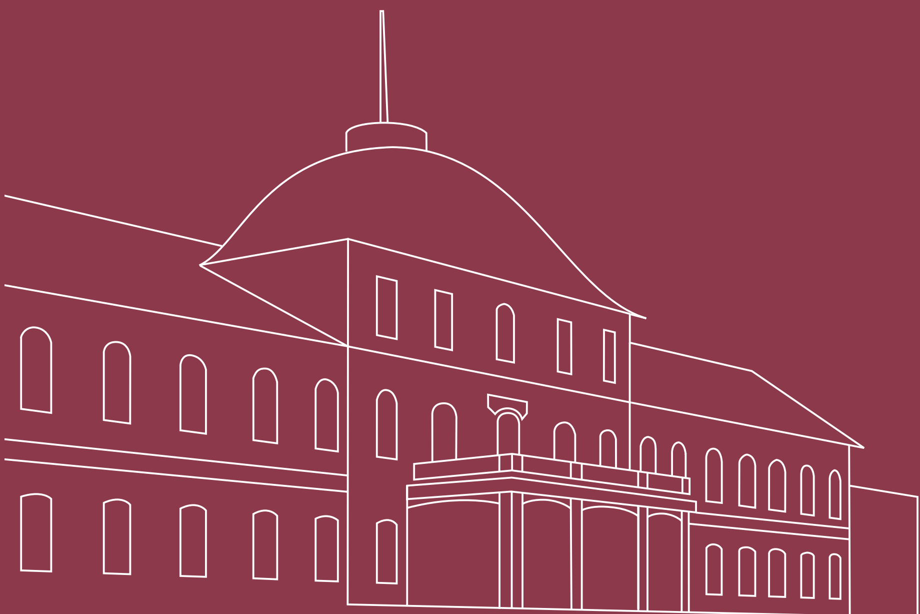
University of Hohenheim

Klaus Prettner

University of Hohenheim

Vincent Geloso

Texas Tech University



State: June 2017

www.wiso.uni-hohenheim.de

Discussion Paper 11-2017

Divergence, convergence, and the history-augmented Solow model

Vadim Kufenko, Klaus Prettner, and Vincent Geloso

Research Area "INEPA – Inequality and Economic Policy Analysis"

Download this Discussion Paper from our homepage:

https://wiso.uni-hohenheim.de/papers

ISSN 2364-2076 (Printausgabe)
ISSN 2364-2084 (Internetausgabe)

Divergence, convergence, and the history-augmented Solow model

Vadim Kufenko[a], Klaus Prettner[a], and Vincent Geloso[b*]

a) University of Hohenheim
Institute of Economics
Schloss, Osthof-West,
70593 Stuttgart, Germany

b) Free Market Institute
Texas Tech University
Box 45059, Lubbock, TX, 79409-5059, United States

Abstract

We test the history-augmented Solow model with respect to its predictions on the patterns of divergence and convergence between the nowadays industrialized countries of the OECD. We show that the dispersion of incomes increased after the Industrial Revolution, peaked during the Second World War, and decreased afterwards. This pattern is fully consistent with the transitional dynamics implied by the history-augmented Solow model.

JEL classification: J11, O11, O47.
Keywords: History-augmented Solow model, divergence, convergence, cross-country inequality.

*Vadim Kufenko and Klaus Prettner gratefully acknowledge the support provided by the Faculty of Business, Economics, and Social Sciences at the University of Hohenheim within the research area "Inequality and Economic Policy Analysis (INEPA)".

1 Introduction

From a historical perspective, today's industrialized countries have seen their incomes diverge during the Industrial Revolution. The main reason for this divergence is the differential timing in the takeoff to sustained economic growth as implied by the unified growth theory of Galor and Weil (2000) and Galor (2005, 2011), and as quantified for different countries in terms of the timing of the demographic transition by Reher (2004). In later phases of development, however, club convergence has been observed in the sense that income differences narrowed between countries with similar steady-state characteristics such as the members of the OECD (see, for example, Barro, 1997; Sala-i-Martin, 1997; Barro and Sala-i-Martin, 2004). Most recently, Dalgaard and Strulik (2013) proposed the history-augmented Solow (1956) model to reconcile these two dynamics by accounting for the differential takeoff to growth in an otherwise standard convergence growth regression. They show that their model-based estimates i) have a higher explanatory power than the standard approach with respect to the observed long-run income differences between different countries; ii) do not suffer from the otherwise common anomaly in growth regressions that the estimate of the capital share is exceedingly high.

While Dalgaard and Strulik (2013) focus on the long-run steady-state implications of their framework, we analyze the country-specific trajectories of per capita income as implied by the transition path of their model. Our test of the model is based on the notion of σ-convergence (Young et al., 2008), i.e., the change in the dispersion of income levels between different countries over time. If the history-augmented Solow model is an accurate description of the underlying data-generating process, then one should observe an increasing dispersion of incomes first, then a structural break, and finally a reduction in the dispersion of incomes. We show that this is indeed the case by relying on long-run data of per capita GDP. Our results give credence to the history-augmented Solow model and offer additional insights into the dynamics of cross-country inequality over a long time horizon.

2 The implications of the history-augmented Solow model for convergence

Following Dalgaard and Strulik (2013), we consider a production function along the lines of Solow (1956)

$$Y(t) = K(t)^{\alpha}[A(t)L(t)]^{1-\alpha}, \tag{1}$$

where $Y(t)$ is aggregate output at time t, $K(t)$ is the input of physical capital in the production process, $L(t)$ is employment in production, $A(t)$ is the stock of labor-augmenting technology, and α is the elasticity of output with respect to physical capital. For a constant savings rate $s \in (0,1)$, a constant rate of depreciation $\delta \in (0,1)$, and a constant population growth rate $n \geq 0$, it is well-known that income per efficiency unit of labor, $\hat{y}(t) =$

$Y(t)/[A(t)L(t)]$, is constant at the steady state and given by $\hat{y}^* = [s/(n+g+\delta)]^{\alpha/(1-\alpha)}$. Consequently, per capita income along the balanced growth path is driven by the evolution of technology according to the relationship

$$y(t) = A(t) \left(\frac{s}{n+g+\delta} \right)^{\frac{\alpha}{1-\alpha}}, \tag{2}$$

where $A(t)$ grows at the rate of technological progress as given by $g = \dot{A}/A$. Assuming, as in Dalgaard and Strulik (2013), that the takeoff to positive long-run growth occurred at time $\tau < t$, the economy experienced ongoing per capita income growth since $t - \tau$ years. Altogether, this implies that per capita income in the long run is given by

$$y(t) = A(\tau)e^{g(t-\tau)} \left(\frac{s}{n+g+\delta} \right)^{\frac{\alpha}{1-\alpha}}, \tag{3}$$

where $A(\tau)$ is the level of technology at the time of the takeoff to sustained growth. Countries that experienced an earlier takeoff (i.e., countries with a lower τ) have a higher per capita income as of time t. Dalgaard and Strulik (2013) use this equation to derive a cross-country growth regression equation by which they test their history-augmented Solow model. They find that adding a proxy for the differential timing of the takeoff – based upon the data of Reher (2004) – greatly enhances the explanatory power of cross-country growth regressions and solves the issue that most standard growth regressions exhibit an exceedingly high coefficient estimate for the elasticity of output with respect to physical capital, α.

There is, however, another highly interesting implication of the model that is due to its implied transitional dynamics. Since different countries are very similar before the onset of the industrial revolution in terms of their income levels, the differential takeoff leads countries to diverge in terms of their income levels after the first countries experience their takeoff. As more and more countries transition toward sustained long-run growth, however, the dispersion peaks at some point and afterwards it starts to decline. We display the simulated trajectories of the history-augmented Solow model in Figure 1 for five different groups of countries that can be interpreted as forerunners, followers, latecomers, and trailers according to the classification of Reher (2004). In case of the latecomers we assume for illustrative purposes that there are two types of countries. The first group has a gross savings rate of $s = 0.3$, while the second group has a higher gross savings rate of $s = 0.4$. The associated coefficient of variation between the income levels of the different country groups is displayed in Figure 2. We observe that the dispersion increases first and decreases afterwards. In the next section we test whether this pattern is consistent with the pattern of divergence and convergence that we observe in the data.

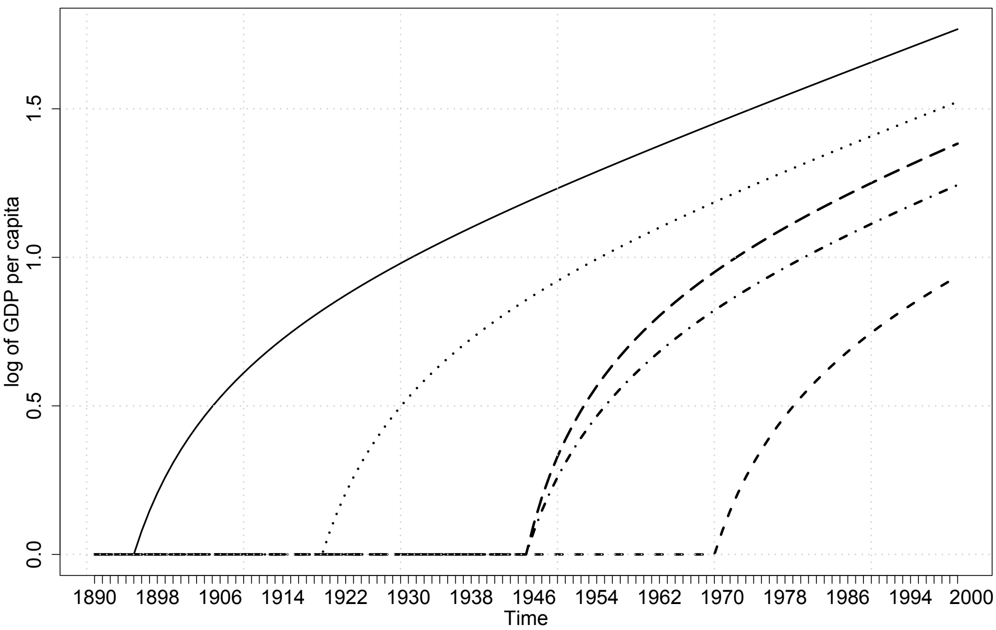


Figure 1: Simulated trajectories for the differential takeoff of five different groups of countries according to the history-augmented Solow model.

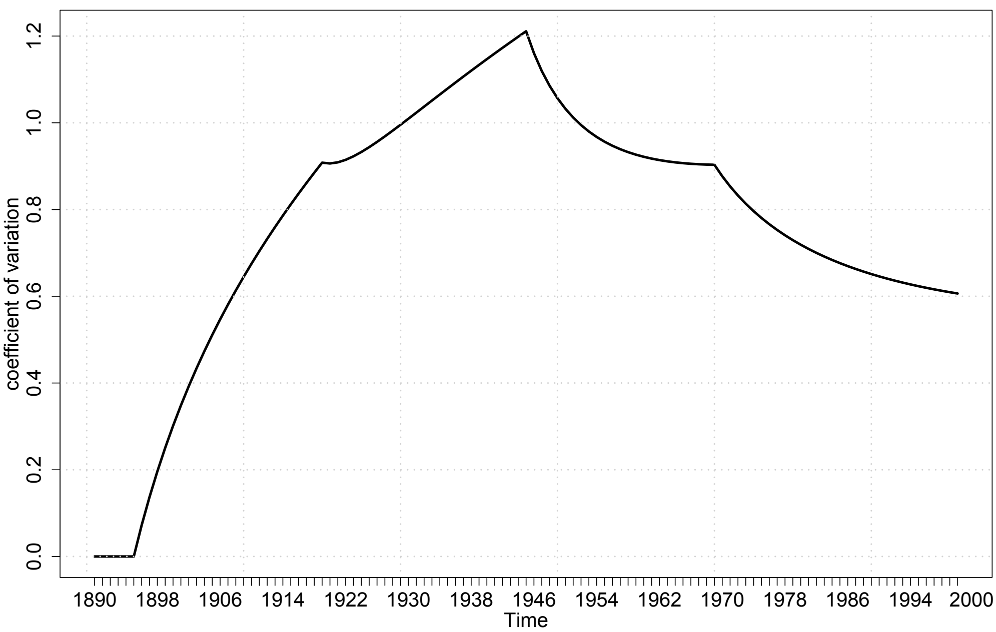


Figure 2: Coefficient of variation associated with the simulation of the history-augmented Solow model.

3 Main results

In order to test the implications of the history-augmented Solow model, we calculate the coefficient of variation for per capita output in the long run and analyze the data as a time series to identify the slopes and breakpoints, providing they exist. We use the data of Bolt and Zanden (2014) which covers the GDP and population series for the following OECD countries: Australia, Canada, England, Finland, France, Greece, Hungary, Ireland, Japan, the Netherlands, New Zealand, South Korea, Sweden, and the United States between 1890 and 2000. To tackle the changes in the composition of the sample over time and the associated size effects, we weight the GDP per capita series by the population size. Doing so yields a smoother series as compared to the unweighted one.

First, we apply the structural break test of Bai and Perron (2003), which was implemented in the software package "R" by Zeileis et al. (2002, 2003). The minimal size of segments is set to 30 and the number of structural breaks is set to one, which is a reasonalbe assumption, given the theoretical implications. The Bai–Perron test yields 1942 as the breakpoint: a brief visual examination shows that indeed, the coefficient of variation has been increasing before the breakpoint and decreasing afterwards (see Figure 3). In order to quantify the slope before and after the breakpoint, we apply a segmented regression as in Muggeo (2003, 2008). In so doing we use the result of the Bai–Perron test as the initial guess of the breakpoint $\psi^{(0)}$. The advantage of the used method is that it updates the breakpoint estimate through iterations, yielding a final value $\hat{\psi}$ of 1949. The results of this procedure are presented in Table 1 and yield a significantly positive slope before the breakpoint and a significantly negative slope afterwards. The annual increase of the population weighted coefficient of variation before the breakpoint is given by 1.39%, whereas the annual decrease after the breakpoint is 0.972%. These results show that there has been a significant divergence between the different countries until the end of the Second World War, whereas thereafter the results are consistent with the notion of gradual club convergence.

Table 1: Segmented regression estimates of the slopes of the trends

Dependent variable: Population-weighted coefficient of variation of per capita GDP	
$t<\hat{\psi}$	0.0139***
	(0.0006)
$t>\hat{\psi}$	-0.00972***
	(0.00072)
Initial breakpoint [$\psi^{(0)}$] from Bai and Perron (2003)	1942
Updated $\hat{\psi}$	1949
Adjusted R sq.	0.8829

Note: Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

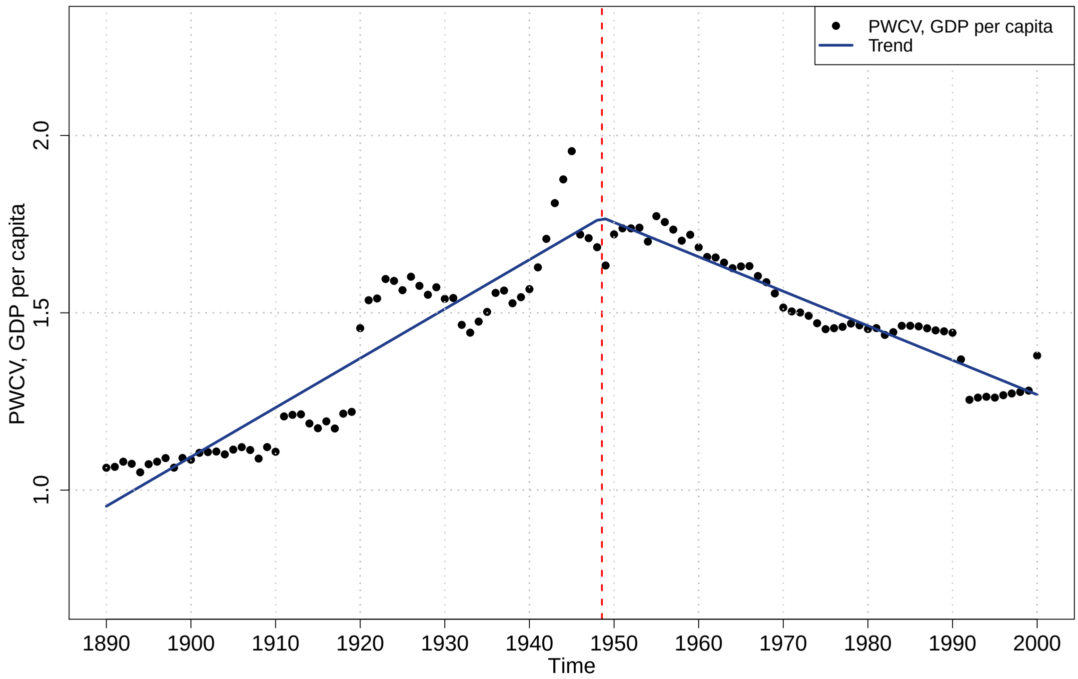


Figure 3: Population-weigthed coefficient of variation of per capita GDP; breakpoint and segmented trend estimation.

4 Conclusions

We put the history-augmented Solow model with respect to its predictions on cross-country divergence and convergence since the Industrial Revolution to the test. The transition phase toward the long-run steady state of the model implies increasing dispersion of incomes first and decreasing dispersion in later phases. This pattern is supported by the data for the nowadays industrialized OECD countries, which gives further credence to the history-augmented Solow model as suggested by Dalgaard and Strulik (2013).

References

Bai, J. and Perron, P. (2000). Computation and Analysis of Multiple Structural Change Models. *Journal of Applied Econometrics*, Vol. 18(No. 1):1–22.

Barro, R. J. (1997). *Determinants of Economic Growth: A Cross-Country Empirical Study*. MIT Press, Cambridge MA.

Barro, R. J. and Sala-i-Martin, X. S. (2004). *Economic Growth*. The MIT Press. Cambridge, Mass.

Bolt, J. and van Zanden, J. D. (2014). The Maddison Project: Collaborative Research on Historical National Accounts. *The Economic History Review*, Vol. 67(No. 3):627–651.

Dalgaard, C.-J. and Strulik, H. (2013). The history augmented solow model. *European Economic Review*, Vol. 63:134–149.

Galor, O. (2005). *Handbook of Economic Growth*, chapter 4. “From Stagnation to Growth: Unified Growth Theory”, pages 171–293.

Galor, O. (2011). *Unified Growth Theory.* Princeton University Press.

Galor, O. and Weil, D. (2000). Population, Technology, and Growth: From Malthusian Stagnation to the Demographic Transition and Beyond. *The American Economic Review*, Vol. 90(No. 4):806–828.

Geloso, V., Kufenko, V., and Prettner, K. (2016). Demographic change and regional convergence in Canada. *Economics Bulletin*, Vol. 36(No. 4):1904–1910.

Muggeo, Vito M. R. (2003). Estimating Regression Models with Unknown Break-points. *Statistics in Medicine*, Vol. 22(No. 19):3055–3071.

Muggeo, Vito M. R. (2008). Segmented: an R package to fit Regression Models with Broken-line Relationships (Ver. 0.5-2.1). *R News*, Vol. 8(No. 1):20–25.

Reher, D. S. (2004). The Demographic Transition Revisited as a Global Process. *Population, Space and Place*, Vol. 10:19–41.

Sala-i-Martin, X. (1997). I just ran two million regressions. *American Economic Review*, Vol. 87(No. 2).

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, Vol. 70(No. 1):65–94.

Young, A. T., Higgins, M. J., and Levy, D. (2008). Sigma Convergence versus Beta Convergence: Evidence from U.S. County-Level Data. *Journal of Money, Credit and Banking*, Vol. 40(No. 5):1083–1093.

Zeileis, A., Leisch, F., Hornik, K., and Kleiber, C. (2002). strucchange: An R Package for Testing for Structural Change in Linear Regression Models (Ver. 1.5-1). *Journal of Statistical Software*, Vol. 7(No. 2):1–38.

Zeileis, A., Kleiber, C., Kraemer, W., Hornik, K. (2003). Testing and Dating of Structural Changes in Practice. *Computational Statistics & Data Analysis*, Vol. 44:109–123.

Hohenheim Discussion Papers in Business, Economics and Social Sciences

The Faculty of Business, Economics and Social Sciences continues since 2015 the established “FZID Discussion Paper Series” of the “Centre for Research on Innovation and Services (FZID)” under the name “Hohenheim Discussion Papers in Business, Economics and Social Sciences”.

Institutes

510 Institute of Financial Management
520 Institute of Economics
530 Institute of Health Care & Public Management
540 Institute of Communication Science
550 Institute of Law and Social Sciences
560 Institute of Economic and Business Education
570 Institute of Marketing & Management
580 Institute of Interorganisational Management & Performance

Research Areas (since 2017)

INEPA “Inequality and Economic Policy Analysis”
TKID “Transformation der Kommunikation – Integration und Desintegration”
NegoTrans “Negotiation Research – Transformation, Technology, Media and Costs”
INEF “Innovation, Entrepreneurship and Finance”

Download Hohenheim Discussion Papers in Business, Economics and Social Sciences
from our homepage: https://wiso.uni-hohenheim.de/papers

No.	**Author**	**Title**	**Inst**
01-2015	Thomas Beissinger, Philipp Baudy	THE IMPACT OF TEMPORARY AGENCY WORK ON TRADE UNION WAGE SETTING: A Theoretical Analysis	520
02-2015	Fabian Wahl	PARTICIPATIVE POLITICAL INSTITUTIONS AND CITY DEVELOPMENT 800-1800	520
03-2015	Tommaso Proietti, Martyna Marczak, Gianluigi Mazzi	EUROMIND-D: A DENSITY ESTIMATE OF MONTHLY GROSS DOMESTIC PRODUCT FOR THE EURO AREA	520
04-2015	Thomas Beissinger, Nathalie Chusseau, Joël Hellier	OFFSHORING AND LABOUR MARKET REFORMS: MODELLING THE GERMAN EXPERIENCE	520
05-2015	Matthias Mueller, Kristina Bogner, Tobias Buchmann, Muhamed Kudic	SIMULATING KNOWLEDGE DIFFUSION IN FOUR STRUCTURALLY DISTINCT NETWORKS – AN AGENT-BASED SIMULATION MODEL	520
06-2015	Martyna Marczak, Thomas Beissinger	BIDIRECTIONAL RELATIONSHIP BETWEEN INVESTOR SENTIMENT AND EXCESS RETURNS: NEW EVIDENCE FROM THE WAVELET PERSPECTIVE	520
07-2015	Peng Nie, Galit Nimrod, Alfonso Sousa-Poza	INTERNET USE AND SUBJECTIVE WELL-BEING IN CHINA	530

No.	Author	Title	Inst
08-2015	Fabian Wahl	THE LONG SHADOW OF HISTORY ROMAN LEGACY AND ECONOMIC DEVELOPMENT – EVIDENCE FROM THE GERMAN LIMES	520
09-2015	Peng Nie, Alfonso Sousa-Poza	COMMUTE TIME AND SUBJECTIVE WELL-BEING IN URBAN CHINA	530
10-2015	Kristina Bogner	THE EFFECT OF PROJECT FUNDING ON INNOVATIVE PERFORMANCE AN AGENT-BASED SIMULATION MODEL	520
11-2015	Bogang Jun, Tai-Yoo Kim	A NEO-SCHUMPETERIAN PERSPECTIVE ON THE ANALYTICAL MACROECONOMIC FRAMEWORK: THE EXPANDED REPRODUCTION SYSTEM	520
12-2015	Volker Grossmann Aderonke Osikominu Marius Osterfeld	ARE SOCIOCULTURAL FACTORS IMPORTANT FOR STUDYING A SCIENCE UNIVERSITY MAJOR?	520
13-2015	Martyna Marczak Tommaso Proietti Stefano Grassi	A DATA–CLEANING AUGMENTED KALMAN FILTER FOR ROBUST ESTIMATION OF STATE SPACE MODELS	520
14-2015	Carolina Castagnetti Luisa Rosti Marina Töpfer	THE REVERSAL OF THE GENDER PAY GAP AMONG PUBLIC-CONTEST SELECTED YOUNG EMPLOYEES	520
15-2015	Alexander Opitz	DEMOCRATIC PROSPECTS IN IMPERIAL RUSSIA: THE REVOLUTION OF 1905 AND THE POLITICAL STOCK MARKET	520
01-2016	Michael Ahlheim, Jan Neidhardt	NON-TRADING BEHAVIOUR IN CHOICE EXPERIMENTS	520
02-2016	Bogang Jun, Alexander Gerybadze, Tai-Yoo Kim	THE LEGACY OF FRIEDRICH LIST: THE EXPANSIVE REPRODUCTION SYSTEM AND THE KOREAN HISTORY OF INDUSTRIALIZATION	520
03-2016	Peng Nie, Alfonso Sousa-Poza	FOOD INSECURITY AMONG OLDER EUROPEANS: EVIDENCE FROM THE SURVEY OF HEALTH, AGEING, AND RETIREMENT IN EUROPE	530
04-2016	Peter Spahn	POPULATION GROWTH, SAVING, INTEREST RATES AND STAGNATION. DISCUSSING THE EGGERTSSON-MEHROTRA-MODEL	520
05-2016	Vincent Dekker, Kristina Strohmaier, Nicole Bosch	A DATA-DRIVEN PROCEDURE TO DETERMINE THE BUNCHING WINDOW – AN APPLICATION TO THE NETHERLANDS	520
06-2016	Philipp Baudy, Dario Cords	DEREGULATION OF TEMPORARY AGENCY EMPLOYMENT IN A UNIONIZED ECONOMY: DOES THIS REALLY LEAD TO A SUBSTITUTION OF REGULAR EMPLOYMENT?	520

No.	Author	Title	Inst
07-2016	Robin Jessen, Davud Rostam-Afschar, Sebastian Schmitz	HOW IMPORTANT IS PRECAUTIONARY LABOR SUPPLY?	520
08-2016	Peng Nie, Alfonso Sousa-Poza, Jianhong Xue	FUEL FOR LIFE: DOMESTIC COOKING FUELS AND WOMEN'S HEALTH IN RURAL CHINA	530
09-2016	Bogang Jun, Seung Kyu-Yi, Tobias Buchmann, Matthias Müller	THE CO-EVOLUTION OF INNOVATION NETWORKS: COLLABORATION BETWEEN WEST AND EAST GERMANY FROM 1972 TO 2014	520
10-2016	Vladan Ivanovic, Vadim Kufenko, Boris Begovic Nenad Stanisic, Vincent Geloso	CONTINUITY UNDER A DIFFERENT NAME. THE OUTCOME OF PRIVATISATION IN SERBIA	520
11-2016	David E. Bloom Michael Kuhn Klaus Prettner	THE CONTRIBUTION OF FEMALE HEALTH TO ECONOMIC DEVELOPMENT	520
12-2016	Franz X. Hof Klaus Prettner	THE QUEST FOR STATUS AND R&D-BASED GROWTH	520
13-2016	Jung-In Yeon Andreas Pyka Tai-Yoo Kim	STRUCTURAL SHIFT AND INCREASING VARIETY IN KOREA, 1960–2010: EMPIRICAL EVIDENCE OF THE ECONOMIC DEVELOPMENT MODEL BY THE CREATION OF NEW SECTORS	520
14-2016	Benjamin Fuchs	THE EFFECT OF TEENAGE EMPLOYMENT ON CHARACTER SKILLS, EXPECTATIONS AND OCCUPATIONAL CHOICE STRATEGIES	520
15-2016	Seung-Kyu Yi Bogang Jun	HAS THE GERMAN REUNIFICATION STRENGTHENED GERMANY'S NATIONAL INNOVATION SYSTEM? TRIPLE HELIX DYNAMICS OF GERMANY'S INNOVATION SYSTEM	520
16-2016	Gregor Pfeifer Fabian Wahl Martyna Marczak	ILLUMINATING THE WORLD CUP EFFECT: NIGHT LIGHTS EVIDENCE FROM SOUTH AFRICA	520
17-2016	Malte Klein Andreas Sauer	CELEBRATING 30 YEARS OF INNOVATION SYSTEM RESEARCH: WHAT YOU NEED TO KNOW ABOUT INNOVATION SYSTEMS	570
18-2016	Klaus Prettner	THE IMPLICATIONS OF AUTOMATION FOR ECONOMIC GROWTH AND THE LABOR SHARE	520
19-2016	Klaus Prettner Andreas Schaefer	HIGHER EDUCATION AND THE FALL AND RISE OF INEQUALITY	520
20-2016	Vadim Kufenko Klaus Prettner	YOU CAN'T ALWAYS GET WHAT YOU WANT? ESTIMATOR CHOICE AND THE SPEED OF CONVERGENCE	520

No.	Author	Title	Inst
01-2017	Annarita Baldanzi Alberto Bucci Klaus Prettner	CHILDRENS HEALTH, HUMAN CAPITAL ACCUMULATION, AND R&D-BASED ECONOMIC GROWTH	INEPA
02-2017	Julius Tennert Marie Lambert Hans-Peter Burghof	MORAL HAZARD IN VC-FINANCE: MORE EXPENSIVE THAN YOU THOUGHT	INEF
03-2017	Michael Ahlheim Oliver Frör Nguyen Minh Duc Antonia Rehl Ute Siepmann Pham Van Dinh	LABOUR AS A UTILITY MEASURE RECONSIDERED	520
04-2017	Bohdan Kukharskyy Sebastian Seiffert	GUN VIOLENCE IN THE U.S.: CORRELATES AND CAUSES	520
05-2017	Ana Abeliansky Klaus Prettner	AUTOMATION AND DEMOGRAPHIC CHANGE	520
06-2017	Vincent Geloso Vadim Kufenko	INEQUALITY AND GUARD LABOR, OR PROHIBITION AND GUARD LABOR?	INEPA
07-2017	Emanuel Gasteiger Klaus Prettner	ON THE POSSIBILITY OF AUTOMATION-INDUCED STAGNATION	520
08-2017	Klaus Prettner Holger Strulik	THE LOST RACE AGAINST THE MACHINE: AUTOMATION, EDUCATION, AND INEQUALITY IN AN R&D-BASED GROWTH MODEL	INEPA
09-2017	David E. Bloom Simiao Chen Michael Kuhn Mark E. McGovern Les Oxley Klaus Prettner	THE ECONOMIC BURDEN OF CHRONIC DISEASES: ESTIMATES AND PROJECTIONS FOR CHINA, JAPAN, AND SOUTH KOREA	520
10-2017	Sebastian Till Braun Nadja Dwenger	THE LOCAL ENVIRONMENT SHAPES REFUGEE INTEGRATION: EVIDENCE FROM POST-WAR GERMANY	INEPA
11-2017	Vadim Kufenko Klaus Prettner Vincent Geloso	DIVERGENCE, CONVERGENCE, AND THE HISTORY-AUGMENTED SOLOW MODEL	INEPA

FZID Discussion Papers

(published 2009-2014)

Competence Centers

IK	Innovation and Knowledge
ICT	Information Systems and Communication Systems
CRFM	Corporate Finance and Risk Management
HCM	Health Care Management
CM	Communication Management
MM	Marketing Management
ECO	Economics

Download FZID Discussion Papers from our homepage: https://wiso.uni-hohenheim.de/archiv_fzid_papers

Nr.	Autor	Titel	CC
01-2009	Julian P. Christ	NEW ECONOMIC GEOGRAPHY RELOADED: Localized Knowledge Spillovers and the Geography of Innovation	IK
02-2009	André P. Slowak	MARKET FIELD STRUCTURE & DYNAMICS IN INDUSTRIAL AUTOMATION	IK
03-2009	Pier Paolo Saviotti, Andreas Pyka	GENERALIZED BARRIERS TO ENTRY AND ECONOMIC DEVELOPMENT	IK
04-2009	Uwe Focht, Andreas Richter and Jörg Schiller	INTERMEDIATION AND MATCHING IN INSURANCE MARKETS	HCM
05-2009	Julian P. Christ, André P. Slowak	WHY BLU-RAY VS. HD-DVD IS NOT VHS VS. BETAMAX: THE CO-EVOLUTION OF STANDARD-SETTING CONSORTIA	IK
06-2009	Gabriel Felbermayr, Mario Larch and Wolfgang Lechthaler	UNEMPLOYMENT IN AN INTERDEPENDENT WORLD	ECO
07-2009	Steffen Otterbach	MISMATCHES BETWEEN ACTUAL AND PREFERRED WORK TIME: Empirical Evidence of Hours Constraints in 21 Countries	HCM
08-2009	Sven Wydra	PRODUCTION AND EMPLOYMENT IMPACTS OF NEW TECHNOLOGIES – ANALYSIS FOR BIOTECHNOLOGY	IK
09-2009	Ralf Richter, Jochen Streb	CATCHING-UP AND FALLING BEHIND KNOWLEDGE SPILLOVER FROM AMERICAN TO GERMAN MACHINE TOOL MAKERS	IK

Nr.	Autor	Titel	CC
10-2010	Rahel Aichele, Gabriel Felbermayr	KYOTO AND THE CARBON CONTENT OF TRADE	ECO
11-2010	David E. Bloom, Alfonso Sousa-Poza	ECONOMIC CONSEQUENCES OF LOW FERTILITY IN EUROPE	HCM
12-2010	Michael Ahlheim, Oliver Frör	DRINKING AND PROTECTING – A MARKET APPROACH TO THE PRESERVATION OF CORK OAK LANDSCAPES	ECO
13-2010	Michael Ahlheim, Oliver Frör, Antonia Heinke, Nguyen Minh Duc, and Pham Van Dinh	LABOUR AS A UTILITY MEASURE IN CONTINGENT VALUATION STUDIES – HOW GOOD IS IT REALLY?	ECO
14-2010	Julian P. Christ	THE GEOGRAPHY AND CO-LOCATION OF EUROPEAN TECHNOLOGY-SPECIFIC CO-INVENTORSHIP NETWORKS	IK
15-2010	Harald Degner	WINDOWS OF TECHNOLOGICAL OPPORTUNITY DO TECHNOLOGICAL BOOMS INFLUENCE THE RELATIONSHIP BETWEEN FIRM SIZE AND INNOVATIVENESS?	IK
16-2010	Tobias A. Jopp	THE WELFARE STATE EVOLVES: GERMAN KNAPPSCHAFTEN, 1854-1923	HCM
17-2010	Stefan Kirn (Ed.)	PROCESS OF CHANGE IN ORGANISATIONS THROUGH eHEALTH	ICT
18-2010	Jörg Schiller	ÖKONOMISCHE ASPEKTE DER ENTLOHNUNG UND REGULIERUNG UNABHÄNGIGER VERSICHERUNGSVERMITTLER	HCM
19-2010	Frauke Lammers, Jörg Schiller	CONTRACT DESIGN AND INSURANCE FRAUD: AN EXPERIMENTAL INVESTIGATION	HCM
20-2010	Martyna Marczak, Thomas Beissinger	REAL WAGES AND THE BUSINESS CYCLE IN GERMANY	ECO
21-2010	Harald Degner, Jochen Streb	FOREIGN PATENTING IN GERMANY, 1877-1932	IK
22-2010	Heiko Stüber, Thomas Beissinger	DOES DOWNWARD NOMINAL WAGE RIGIDITY DAMPEN WAGE INCREASES?	ECO
23-2010	Mark Spoerer, Jochen Streb	GUNS AND BUTTER – BUT NO MARGARINE: THE IMPACT OF NAZI ECONOMIC POLICIES ON GERMAN FOOD CONSUMPTION, 1933-38	ECO

Nr.	Autor	Titel	CC
24-2011	Dhammika Dharmapala, Nadine Riedel	EARNINGS SHOCKS AND TAX-MOTIVATED INCOME-SHIFTING: EVIDENCE FROM EUROPEAN MULTINATIONALS	ECO
25-2011	Michael Schuele, Stefan Kirn	QUALITATIVES, RÄUMLICHES SCHLIEßEN ZUR KOLLISIONSERKENNUNG UND KOLLISIONSVERMEIDUNG AUTONOMER BDI-AGENTEN	ICT
26-2011	Marcus Müller, Guillaume Stern, Ansger Jacob and Stefan Kirn	VERHALTENSMODELLE FÜR SOFTWAREAGENTEN IM PUBLIC GOODS GAME	ICT
27-2011	Monnet Benoit, Patrick Gbakoua and Alfonso Sousa-Poza	ENGEL CURVES, SPATIAL VARIATION IN PRICES AND DEMAND FOR COMMODITIES IN CÔTE D'IVOIRE	ECO
28-2011	Nadine Riedel, Hannah Schildberg-Hörisch	ASYMMETRIC OBLIGATIONS	ECO
29-2011	Nicole Waidlein	CAUSES OF PERSISTENT PRODUCTIVITY DIFFERENCES IN THE WEST GERMAN STATES IN THE PERIOD FROM 1950 TO 1990	IK
30-2011	Dominik Hartmann, Atilio Arata	MEASURING SOCIAL CAPITAL AND INNOVATION IN POOR AGRICULTURAL COMMUNITIES. THE CASE OF CHÁPARRA - PERU	IK
31-2011	Peter Spahn	DIE WÄHRUNGSKRISENUNION DIE EURO-VERSCHULDUNG DER NATIONALSTAATEN ALS SCHWACHSTELLE DER EWU	ECO
32-2011	Fabian Wahl	DIE ENTWICKLUNG DES LEBENSSTANDARDS IM DRITTEN REICH – EINE GLÜCKSÖKONOMISCHE PERSPEKTIVE	ECO
33-2011	Giorgio Triulzi, Ramon Scholz and Andreas Pyka	R&D AND KNOWLEDGE DYNAMICS IN UNIVERSITY-INDUSTRY RELATIONSHIPS IN BIOTECH AND PHARMACEUTICALS: AN AGENT-BASED MODEL	IK
34-2011	Claus D. Müller-Hengstenberg, Stefan Kirn	ANWENDUNG DES ÖFFENTLICHEN VERGABERECHTS AUF MODERNE IT SOFTWAREENTWICKLUNGSVERFAHREN	ICT
35-2011	Andreas Pyka	AVOIDING EVOLUTIONARY INEFFICIENCIES IN INNOVATION NETWORKS	IK
36-2011	David Bell, Steffen Otterbach and Alfonso Sousa-Poza	WORK HOURS CONSTRAINTS AND HEALTH	HCM
37-2011	Lukas Scheffknecht, Felix Geiger	A BEHAVIORAL MACROECONOMIC MODEL WITH ENDOGENOUS BOOM-BUST CYCLES AND LEVERAGE DYNAMICS	ECO
38-2011	Yin Krogmann, Ulrich Schwalbe	INTER-FIRM R&D NETWORKS IN THE GLOBAL PHARMACEUTICAL BIOTECHNOLOGY INDUSTRY DURING 1985–1998: A CONCEPTUAL AND EMPIRICAL ANALYSIS	IK

Nr.	Autor	Titel	CC
39-2011	Michael Ahlheim, Tobias Börger and Oliver Frör	RESPONDENT INCENTIVES IN CONTINGENT VALUATION: THE ROLE OF RECIPROCITY	ECO
40-2011	Tobias Börger	A DIRECT TEST OF SOCIALLY DESIRABLE RESPONDING IN CONTINGENT VALUATION INTERVIEWS	ECO
41-2011	Ralf Rukwid, Julian P. Christ	QUANTITATIVE CLUSTERIDENTIFIKATION AUF EBENE DER DEUTSCHEN STADT- UND LANDKREISE (1999-2008)	IK

Nr.	Autor	Titel	CC
42-2012	Benjamin Schön, Andreas Pyka	A TAXONOMY OF INNOVATION NETWORKS	IK
43-2012	Dirk Foremny, Nadine Riedel	BUSINESS TAXES AND THE ELECTORAL CYCLE	ECO
44-2012	Gisela Di Meglio, Andreas Pyka and Luis Rubalcaba	VARIETIES OF SERVICE ECONOMIES IN EUROPE	IK
45-2012	Ralf Rukwid, Julian P. Christ	INNOVATIONSPOTENTIALE IN BADEN-WÜRTTEMBERG: PRODUKTIONSCLUSTER IM BEREICH „METALL, ELEKTRO, IKT“ UND REGIONALE VERFÜGBARKEIT AKADEMISCHER FACHKRÄFTE IN DEN MINT-FÄCHERN	IK
46-2012	Julian P. Christ, Ralf Rukwid	INNOVATIONSPOTENTIALE IN BADEN-WÜRTTEMBERG: BRANCHENSPEZIFISCHE FORSCHUNGS- UND ENTWICKLUNGSAKTIVITÄT, REGIONALES PATENTAUFKOMMEN UND BESCHÄFTIGUNGSSTRUKTUR	IK
47-2012	Oliver Sauter	ASSESSING UNCERTAINTY IN EUROPE AND THE US - IS THERE A COMMON FACTOR?	ECO
48-2012	Dominik Hartmann	SEN MEETS SCHUMPETER. INTRODUCING STRUCTURAL AND DYNAMIC ELEMENTS INTO THE HUMAN CAPABILITY APPROACH	IK
49-2012	Harold Paredes-Frigolett, Andreas Pyka	DISTAL EMBEDDING AS A TECHNOLOGY INNOVATION NETWORK FORMATION STRATEGY	IK
50-2012	Martyna Marczak, Víctor Gómez	CYCLICALITY OF REAL WAGES IN THE USA AND GERMANY: NEW INSIGHTS FROM WAVELET ANALYSIS	ECO
51-2012	André P. Slowak	DIE DURCHSETZUNG VON SCHNITTSTELLEN IN DER STANDARDSETZUNG: FALLBEISPIEL LADESYSTEM ELEKTROMOBILITÄT	IK
52-2012	Fabian Wahl	WHY IT MATTERS WHAT PEOPLE THINK - BELIEFS, LEGAL ORIGINS AND THE DEEP ROOTS OF TRUST	ECO
53-2012	Dominik Hartmann, Micha Kaiser	STATISTISCHER ÜBERBLICK DER TÜRKISCHEN MIGRATION IN BADEN-WÜRTTEMBERG UND DEUTSCHLAND	IK
54-2012	Dominik Hartmann, Andreas Pyka, Seda Aydin, Lena Klauß, Fabian Stahl, Ali Santircioglu, Silvia Oberegelsbacher, Sheida Rashidi, Gaye Onan and Suna Erginkoç	IDENTIFIZIERUNG UND ANALYSE DEUTSCH-TÜRKISCHER INNOVATIONSNETZWERKE. ERSTE ERGEBNISSE DES TGIN-PROJEKTES	IK
55-2012	Michael Ahlheim, Tobias Börger and Oliver Frör	THE ECOLOGICAL PRICE OF GETTING RICH IN A GREEN DESERT: A CONTINGENT VALUATION STUDY IN RURAL SOUTHWEST CHINA	ECO

Nr.	Autor	Titel	CC
56-2012	Matthias Strifler Thomas Beissinger	FAIRNESS CONSIDERATIONS IN LABOR UNION WAGE SETTING – A THEORETICAL ANALYSIS	ECO
57-2012	Peter Spahn	INTEGRATION DURCH WÄHRUNGSUNION? DER FALL DER EURO-ZONE	ECO
58-2012	Sibylle H. Lehmann	TAKING FIRMS TO THE STOCK MARKET: IPOS AND THE IMPORTANCE OF LARGE BANKS IN IMPERIAL GERMANY 1896-1913	ECO
59-2012	Sibylle H. Lehmann, Philipp Hauber and Alexander Opitz	POLITICAL RIGHTS, TAXATION, AND FIRM VALUATION – EVIDENCE FROM SAXONY AROUND 1900	ECO
60-2012	Martyna Marczak, Víctor Gómez	SPECTRAN, A SET OF MATLAB PROGRAMS FOR SPECTRAL ANALYSIS	ECO
61-2012	Theresa Lohse, Nadine Riedel	THE IMPACT OF TRANSFER PRICING REGULATIONS ON PROFIT SHIFTING WITHIN EUROPEAN MULTINATIONALS	ECO

Nr.	Autor	Titel	CC
62-2013	Heiko Stüber	REAL WAGE CYCLICALITY OF NEWLY HIRED WORKERS	ECO
63-2013	David E. Bloom, Alfonso Sousa-Poza	AGEING AND PRODUCTIVITY	HCM
64-2013	Martyna Marczak, Víctor Gómez	MONTHLY US BUSINESS CYCLE INDICATORS: A NEW MULTIVARIATE APPROACH BASED ON A BAND-PASS FILTER	ECO
65-2013	Dominik Hartmann, Andreas Pyka	INNOVATION, ECONOMIC DIVERSIFICATION AND HUMAN DEVELOPMENT	IK
66-2013	Christof Ernst, Katharina Richter and Nadine Riedel	CORPORATE TAXATION AND THE QUALITY OF RESEARCH AND DEVELOPMENT	ECO
67-2013	Michael Ahlheim, Oliver Frör, Jiang Tong, Luo Jing and Sonna Pelz	NONUSE VALUES OF CLIMATE POLICY - AN EMPIRICAL STUDY IN XINJIANG AND BEIJING	ECO
68-2013	Michael Ahlheim, Friedrich Schneider	CONSIDERING HOUSEHOLD SIZE IN CONTINGENT VALUATION STUDIES	ECO
69-2013	Fabio Bertoni, Tereza Tykvová	WHICH FORM OF VENTURE CAPITAL IS MOST SUPPORTIVE OF INNOVATION? EVIDENCE FROM EUROPEAN BIOTECHNOLOGY COMPANIES	CFRM
70-2013	Tobias Buchmann, Andreas Pyka	THE EVOLUTION OF INNOVATION NETWORKS: THE CASE OF A GERMAN AUTOMOTIVE NETWORK	IK
71-2013	B. Vermeulen, A. Pyka, J. A. La Poutré and A. G. de Kok	CAPABILITY-BASED GOVERNANCE PATTERNS OVER THE PRODUCT LIFE-CYCLE	IK
72-2013	Beatriz Fabiola López Ulloa, Valerie Møller and Alfonso Sousa-Poza	HOW DOES SUBJECTIVE WELL-BEING EVOLVE WITH AGE? A LITERATURE REVIEW	HCM
73-2013	Wencke Gwozdz, Alfonso Sousa-Poza, Lucia A. Reisch, Wolfgang Ahrens, Stefaan De Henauw, Gabriele Eiben, Juan M. Fernández-Alvira, Charalampos Hadjigeorgiou, Eva Kovács, Fabio Lauria, Toomas Veidebaum, Garrath Williams, Karin Bammann	MATERNAL EMPLOYMENT AND CHILDHOOD OBESITY – A EUROPEAN PERSPECTIVE	HCM

Nr.	Autor	Titel	CC
74-2013	Andreas Haas, Annette Hofmann	RISIKEN AUS CLOUD-COMPUTING-SERVICES: FRAGEN DES RISIKOMANAGEMENTS UND ASPEKTE DER VERSICHERBARKEIT	HCM
75-2013	Yin Krogmann, Nadine Riedel and Ulrich Schwalbe	INTER-FIRM R&D NETWORKS IN PHARMACEUTICAL BIOTECHNOLOGY: WHAT DETERMINES FIRM'S CENTRALITY-BASED PARTNERING CAPABILITY?	ECO, IK
76-2013	Peter Spahn	MACROECONOMIC STABILISATION AND BANK LENDING: A SIMPLE WORKHORSE MODEL	ECO
77-2013	Sheida Rashidi, Andreas Pyka	MIGRATION AND INNOVATION – A SURVEY	IK
78-2013	Benjamin Schön, Andreas Pyka	THE SUCCESS FACTORS OF TECHNOLOGY-SOURCING THROUGH MERGERS & ACQUISITIONS – AN INTUITIVE META-ANALYSIS	IK
79-2013	Irene Prostolupow, Andreas Pyka and Barbara Heller-Schuh	TURKISH-GERMAN INNOVATION NETWORKS IN THE EUROPEAN RESEARCH LANDSCAPE	IK
80-2013	Eva Schlenker, Kai D. Schmid	CAPITAL INCOME SHARES AND INCOME INEQUALITY IN THE EUROPEAN UNION	ECO
81-2013	Michael Ahlheim, Tobias Börger and Oliver Frör	THE INFLUENCE OF ETHNICITY AND CULTURE ON THE VALUATION OF ENVIRONMENTAL IMPROVEMENTS – RESULTS FROM A CVM STUDY IN SOUTHWEST CHINA –	ECO
82-2013	Fabian Wahl	DOES MEDIEVAL TRADE STILL MATTER? HISTORICAL TRADE CENTERS, AGGLOMERATION AND CONTEMPORARY ECONOMIC DEVELOPMENT	ECO
83-2013	Peter Spahn	SUBPRIME AND EURO CRISIS: SHOULD WE BLAME THE ECONOMISTS?	ECO
84-2013	Daniel Guffarth, Michael J. Barber	THE EUROPEAN AEROSPACE R&D COLLABORATION NETWORK	IK
85-2013	Athanasios Saitis	KARTELLBEKÄMPFUNG UND INTERNE KARTELLSTRUKTUREN: EIN NETZWERKTHEORETISCHER ANSATZ	IK

Nr.	Autor	Titel	CC
86-2014	Stefan Kirn, Claus D. Müller-Hengstenberg	INTELLIGENTE (SOFTWARE-)AGENTEN: EINE NEUE HERAUSFORDERUNG FÜR DIE GESELLSCHAFT UND UNSER RECHTSSYSTEM?	ICT
87-2014	Peng Nie, Alfonso Sousa-Poza	MATERNAL EMPLOYMENT AND CHILDHOOD OBESITY IN CHINA: EVIDENCE FROM THE CHINA HEALTH AND NUTRITION SURVEY	HCM
88-2014	Steffen Otterbach, Alfonso Sousa-Poza	JOB INSECURITY, EMPLOYABILITY, AND HEALTH: AN ANALYSIS FOR GERMANY ACROSS GENERATIONS	HCM
89-2014	Carsten Burhop, Sibylle H. Lehmann-Hasemeyer	THE GEOGRAPHY OF STOCK EXCHANGES IN IMPERIAL GERMANY	ECO
90-2014	Martyna Marczak, Tommaso Proietti	OUTLIER DETECTION IN STRUCTURAL TIME SERIES MODELS: THE INDICATOR SATURATION APPROACH	ECO
91-2014	Sophie Urmetzer, Andreas Pyka	VARIETIES OF KNOWLEDGE-BASED BIOECONOMIES	IK
92-2014	Bogang Jun, Joongho Lee	THE TRADEOFF BETWEEN FERTILITY AND EDUCATION: EVIDENCE FROM THE KOREAN DEVELOPMENT PATH	IK
93-2014	Bogang Jun, Tai-Yoo Kim	NON-FINANCIAL HURDLES FOR HUMAN CAPITAL ACCUMULATION: LANDOWNERSHIP IN KOREA UNDER JAPANESE RULE	IK
94-2014	Michael Ahlheim, Oliver Frör, Gerhard Langenberger and Sonna Pelz	CHINESE URBANITES AND THE PRESERVATION OF RARE SPECIES IN REMOTE PARTS OF THE COUNTRY – THE EXAMPLE OF EAGLEWOOD	ECO
95-2014	Harold Paredes-Frigolett, Andreas Pyka, Javier Pereira and Luiz Flávio Autran Monteiro Gomes	RANKING THE PERFORMANCE OF NATIONAL INNOVATION SYSTEMS IN THE IBERIAN PENINSULA AND LATIN AMERICA FROM A NEO-SCHUMPETERIAN ECONOMICS PERSPECTIVE	IK
96-2014	Daniel Guffarth, Michael J. Barber	NETWORK EVOLUTION, SUCCESS, AND REGIONAL DEVELOPMENT IN THE EUROPEAN AEROSPACE INDUSTRY	IK

IMPRINT

University of Hohenheim
Dean’s Office of the Faculty of Business, Economics and Social Sciences
Palace Hohenheim 1 B
70593 Stuttgart | Germany
Fon +49 (0)711 459 22488
Fax +49 (0)711 459 22785
E-mail wiso@uni-hohenheim.de
Web www.wiso.uni-hohenheim.de