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Department of Economics  
524 Condon Hall, Box 353330  
Seattle, WA 98195-353330, USA  
Cell: (510) 220-7961  
hgwolff@u.washington.edu

**Hendrik Wolff**  
**University of Washington**

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## **CURRENT EMPLOYMENT**

Assistant Professor of Economics, University of Washington, Department of Economics, since September 2007

## **EDUCATION**

Ph.D. University of California, Berkeley, Agricultural and Resource Economics, May 2007.  
M.Sc. University of California, Berkeley, Agricultural and Resource Economics, December 2004.  
M.Sc. (*Diplom Ing. Agr.*) University of Bonn, Germany, Agricultural Engineering, December 2000.  
B.A. (*Vordiplom*) University of Göttingen, Germany, Agricultural Engineering, September 1997.

## **DISSERTATION**

*Testing Simulation and Structural Models with Applications to Energy Demand.*

Principal advisors: Maximilian Auffhammer (co-chair) and Michael Hanemann (co-chair).

Other references: Guido Imbens, Enrico Moretti and David Zilberman.

## **HONORS**

*IZA Research Affiliate*, since 2007.

*Fleishhacker Foundation* and UC Berkeley Financial Award, 2004-2005.

Scholarships: *German Academic Exchange Service (DAAD)*, 2002-2003.

*Most original masters thesis of the year 1999*, Göttingen University, Faculty of Agricultural Sciences, 1999.

## **PEER REVIEWED ARTICLES**

“Symmetric Positive Equilibrium Problem: A framework for rationalizing economic behavior with limited information: Comment.” *American Journal of Agricultural Economics*, 85(4), with W. Britz, T. Heckeley, 2003.

Symmetric Positive Equilibrium Problem (SPEP) is a mathematical programming multi-output-multi-input model designed to analyze the behavior of heterogeneous firms that operate under complex policy mandates, self selection and multiple limiting inputs. In this paper we discuss the conceptual framework of SPEP, the estimation procedure to obtain the model parameters, and an application of SPEP to a dataset of Italian firms. We find that the standard SPEP three stage estimation method leads to inconsistent parameter estimates and show that the SPEP model is in conflict with economic theory.

“Estimation of constrained optimisation models for agricultural supply analysis based on generalised maximum entropy.” *European Review of Agricultural Economics*. 30 (1), with T. Heckeley, 2003.

The paper introduces a general methodological approach for the estimation of constrained optimisation models in agricultural supply analysis. It is based on optimality conditions of the desired programming model and shows a conceptual advantage compared to Positive Mathematical Programming in the context of well posed estimation problems. Moreover, it closes the empirical and methodological gap between programming models and duality based functional models with explicit allocation of fixed factors. Monte Carlo simulations are performed with a maximum entropy estimator to evaluate the functionality of the approach as well as the impact of empirically relevant prior information in small sample situations.

“Willingness to Pay for Clean Air in Chile.” *Revista interdisciplinaria de Gestión Ambiental*, 61(6), with P. Villalobos, 2004 (in Spanish. English version presented at *Econometric Society Meeting, Sao Paulo*, 2002).

In Chile, due to the Environmental Baseline Law 1994, a new era for the application of the Contingent Valuation (CV) methods has begun to evaluate the environmental impacts of economical activities and governmental policies. This investigation is the first empirical study developed in Chile using the CV method. We review the Contingent Valuation (CV) procedure at the background of Chile's situation and we apply the concept empirically by a Willingness to Pay (WTP) study for an emerging environmental problem in rural areas. Finally, we discuss the possibility to apply such studies at a more general level by benefit transfer.

“Determinants to Switch from Conventional to Biological Farming and the Concept of Path Dependence.” *Agrarwirtschaft*, 50(7), with U. Latacz-Lohmann and G. Recke, 2001 (published in German).

This paper invokes the concept of path dependence to gain new conceptual insights into the competition between conventional and organic agriculture. We develop a simple model of path dependent agricultural technologies to demonstrate how random events at the beginning of the development path of a technology, combined with increasing returns to adoption, can give rise to an early lock-in of an inferior production system. We conclude that there is a place for policy intervention to break the dominance of locked-in agricultural technologies.

“Path Dependence and Implementation Strategies for Integrated Pest Management.” *Quarterly Journal of International Agriculture*, 39(2), with G. Recke, 2000.

This article examines the concept of ‘path dependence’ for Integrated Pest Management (IPM). On the basis of this theoretical framework implementation strategies are designed for IPM in Ghana. The analysis reveals the significance of path dependence as an instrument for ex-ante agricultural policies.

## POPULAR MEDIA

The paper “Daylight Time and Energy: Evidence from an Australian Experiment” has been discussed

- on TV e.g.: ABC News (U.S. national), Bloomberg TV (U.S. national), KTVU/Fox (California local)
- on Radio e.g.: CBC (Canada national), KQED (California), KGO (California), KCBS (California)
- in press (U.S. national) e.g.: Chicago Tribune, Bloomberg News, U.S. News, Federal Reserve Bank Videos, podcasts, magazines and newspaper articles available upon request.

## WORKING PAPERS

“Daylight Time and Energy: Evidence from an Australian Experiment”, with Ryan Kellogg

Rising energy prices and environmental concerns are driving countries to consider extending Daylight Saving Time (DST) in order to conserve energy. Beginning in 2007, the U.S. will lengthen DST by one month with the specific goal of reducing electricity consumption by 1%. In this paper we question the findings of prior DST studies, which often rely on simulation models and extrapolation rather than empirical evidence. By contrast, our research exploits a quasi-experiment, in which parts of Australia extended DST by two months to facilitate the Sydney Olympic Games in 2000. We test the electricity-saving hypothesis using detailed panel data on half-hourly electricity consumption, prices, and weather conditions. We show that the extension failed to reduce electricity demand. We further examine prior DST studies and apply the most sophisticated simulation model available in the literature to the Australian data. We find that prior models significantly overstate electricity savings. These results suggest that current plans and proposals to extend DST will fail to conserve energy.

“Imposing Curvature and Monotonicity on Flexible Functional Forms”, with T. Heckelei and R. Mittelhammer

In many areas of economic analysis, economic theory restricts the shape as well as other characteristics of functions used to represent economic constructs. Obvious examples are the monotonicity and curvature conditions that apply to utility, profit, and cost functions. Commonly, these regularity conditions are imposed either locally or globally. Here we extend and improve upon currently available estimation methods for imposing regularity conditions by imposing regularity on a connected subset of the regressor space. This method offers important advantages over the local approach by imposing theoretical consistency not only locally, at a given evaluation point but also within the whole empirically relevant region of the domain associated with the function being estimated. The method also provides benefits relative to the global approach, through higher flexibility, which generally leads to a better model fit to the sample data compared to the global imposition of regularity. Specific contributions of this paper are (a) to increase the computational speed and tractability of imposing

regularity conditions in estimation, (b) to provide regularity preserving point estimates, (c) to avoid biases existent in previous applications, and (d) to illustrate the benefits of the regional approach via numerical simulation results.

“Can we Close the Gap between the Empirical Model and Economic Theory?”

Behavioral assumptions are often the central building blocks of many economic theories, such as the assumption of profit or utility maximization. This paper proposes a procedure to test for behavioral assumptions. The test relies on the following principle: Behavior manifests itself in the form of “shape conditions.” For example, if a firm minimizes costs, then, by standard microeconomic theory, the dual cost function is concave and increasing in input prices. The intuition of the proposed test is simple: if for a given dataset we statistically reject the shape properties, then we reject the underlying economic theory. To make the test work, we first estimate a flexible functional form without imposing the shape conditions. Secondly, we re-estimate the function subject to the shape conditions. Finally, the comparison of the restricted estimate to the unrestricted estimate provides the test statistic. The challenging part of this test is the estimation of the restricted model. Literature has suggested several shape imposing estimators, but it is not clear which of these to use in practice. In this paper, we apply a series of such estimators, and their comparison within this context provides several insights into the advantages and disadvantages.

“Are Developing Countries Misclassified? Evidence from the Human Development Index”, with Howard Chong and Maximilian Auffhammer

Many indicators are used to rank countries and often these statistics take on important policy significance. This paper proposes a simple statistical framework to investigate how data error may bias such rank assignments. We analyze the Human Development Index which ranks countries into the three categories: ‘low’, ‘medium’ and ‘high’ human development. We identify three major sources of data error according to which up to 45% of developing countries are misclassified. Moreover, by replicating prior development/macroeconomic studies, we find that key estimated parameters of this literature vary by up to 100% due to the three sources of data error.

## BOOK CONTRIBUTIONS

“Ansätze zur (Auf-)Lösung eines alten Methodenstreits: Ökonometrische Spezifikation von Programmierungsmodellen zur Agrarangebotsanalyse,“ with T. Heckelee. In: Brockmeier, M., F. Isermeyer and S. v. Cramon Taubadel: Liberalisierung des Weltagrarhandels. Münster-Hiltrup, 37, pp. 377-388, 2002.

“Pfadabhängigkeit und Umstellung auf ökologischen Landbau - eine empirische Studie,“ with G. Recke and U. Latacz-Lohmann. In: Brockmeier, M., F. Isermeyer and S. v. Cramon Taubadel: Liberalisierung des Weltagrarhandels. Münster-Hiltrup, 37, pp. 503-508, 2002.

“Die Veränderung der regionalen Wettbewerbsfähigkeit der Ölsaaten- und Getreideproduktion unter dem Einfluß der GAP 1992 - Analyse auf Grundlage einer EU-weiten, regionalisierten Datenbasis,“ with R. Sander, W. Britz and T. Heckelee. In: V. Alvensleben, R., Koester, U. and C. Langbehn: Wettbewerbsfähigkeit und Unternehmertum in der Land- und Ernährungswirtschaft, 36, pp. 21-28, Münster-Hiltrup, 2000.

“Economics of Tomato Production with special Reference to Aspects of Plant Protection: A Case Study of Two Tomato Production Systems in Brong-Ahafo Region, Ghana.” CD included with two Scenario Programmes, Ghanaian-German Project for Integrated Crop Protection, GTZ, Eschborn. 131 pages, 1999.

## TEACHING EXPERIENCE

Instructor in “Environmental Economics”, ECON436, undergraduate level course, University of Washington, Autumn 2007.

Graduate student instructor in “Applied Econometrics”, PhD level course, with Guido Imbens, 2006.

Research assistant and grader in “Probability and Statistics” and “Mathematical Methods”, both PhD level courses at UC Berkeley, with Jeffrey LaFrance and Leo Simon, 2004.

Lecturer at University of Bonn in “Econometric Methods” and “Welfare Analysis”, 1999-2002.

Student instructor at University of Bonn in “Macroeconomics”, 1999.

## RESEARCH EXPERIENCE

Since 2006: I am working on research grants that I obtained from NSF and IGCC.

Guest researcher, Institute for the Study of Labor (IZA), Bonn, Summer 2005.

Research assistant, with G. Imbens, UC Berkeley: (a) *Analysis of statistical methods for “data masking” in order to release sensitive individual datasets.* (b) *Estimating treatment effects using Markov Chain Monte Carlo techniques to obtain the distributions of the parameters of interest,* 2003-2004.

Research assistant, with R. Mittelhammer, Washington State University: *Developing Bayesian techniques to estimate multivariate polynomials subject to nonlinear inequality constraints*, 2002-2003.

Research assistant, with W. Henrichsmeyer, University of Bonn, Germany: *Developing Multi-Input-Multi-Output Agricultural Models. Forecasting Long Run Demand and Supply for Agricultural Commodities subject to different WTO and European Agricultural Policy Instruments*, 1999-2002.

Consultant, German Technical Co-operation (GTZ), "*Integrated Crop Protection/Ghana*," 1998.

## **CONFERENCE AND SEMINAR PRESENTATIONS**

Occasional Workshop on Environmental and Resource Economics, Santa Barbara, 2006.

Environmental and Resource Economics Seminar, University of California, Berkeley, 2006.

Seminar on Bayesian Inference in Econometrics and Statistics, University of Iowa, 2006.

Seminar, Department of Agricultural Politics, University of Kiel, Germany, 2006.

Econometric Society: North American Summer Meeting, Brown University, 2004.

Econometric Society: European Meeting, Madrid, 2004.

American Agricultural Economics Association (AAEA) Meeting, 2004.

Summer Econometrics Workshop, University of California, Berkeley, 2004.

Environmental and Resource Economics Seminar, University of California, Berkeley, 2003.

Econometric Society: Latin American Meeting, Sao Paulo, Brazil, 2002.

Tagung der Gesellschaft für Wirtschafts- und Sozialwissenschaften des Landbaus, 2001.

## **INTERNATIONAL EXPERIENCE IN DEVELOPING COUNTRIES**

*Ghana*: Fieldwork conducting surveys in a development project to optimize pesticide use and reduce externalities in intensive agricultural vegetable production, German Technical Co-operation (GTZ), Integrated Crop Protection/Ghana, 05 - 09/1998.

*Chile*: Internship at the Agricultural Academy, Linares; Deputyship for the International Association of Agricultural Students (IAAS), 11/1996 - 04/1997.

*Mexico*: Volunteer in rural development projects of the Friedrich-Ebert-Stiftung (CODAC & SEDAC, Ixmiquilpan, Hgo), 06/1993 - 05/1994.

*Guatemala*: Management of Restaurant in San Pedro, Lake Atitlan, 11/1993 - 03/1994.

## **FUNDED RESEARCH GRANTS**

*Earthquake Disaster Preparation Behavior in California*, National Science Foundation (NSF) three-year research grant, with M. Hanemann, 2006-2009.

*Fighting over Aid: The Endogenous Choice of Development Indicators*, Institute on Global Conflict and Cooperation (IGGC) one-year research grant in development economics: with M. Auffhammer, 2006-2007.

## **PROFESSIONAL ACTIVITIES**

Journal Referee: *European Review of Agricultural Economics*, *Economic Modeling*

## **PROFESSIONAL MEMBERSHIP**

Affiliation: American Economic Association, Econometric Society, American Agricultural Economics Association, Verein für Socialpolitik, Association of Environmental and Resource Economists.

## **LANGUAGES**

German (native), English (fluent), Spanish (good), French (basic).

## **STATISTICAL SOFTWARE**

EViews, GAMS, GAUSS, Maple, Matlab, SPSS, Stata, Visual Basic.