IZA COMPACT

Shaping the Future of Labor

www.iza.org

October / November 2009

IZA Pioneers Econometric Analysis of Internet Data in Labor Market Research

Google Indicator Uses Search Engine Statistics to Predict Short-Term Trends in Unemployment

Throughout the current crisis, economic forecasts have proven controversial. Consequently, there has been an increased reliance on "soft" indicators, such as business and consumer confidence surveys, or trade indices. The strong demand for early warning systems that can prepare policymakers for changing situations, however, requires appropriate indicators – which are available on a timely and continuous basis over the internet through Google search statistics.

With the Google Indicator, IZA has broken new econometric ground by testing, proving and refining the usefulness of these internet data in a natural laboratory – the German labor market. This approach accounts for the fact that more and more people use the internet to search for jobs. The German press has interpreted the trend shown by IZA's Google Indicator, in addition to other more established indicators, as a strong sign of a turnaround for the German economy (see e.g. *Frankfurter Allgemeine Sonntagszeitung*, August 16, 2009, p. 29).

Although "soft" indicator systems such as confidence surveys or trade indices (like the German DAX) say little about the distant future, they do paint a sharp picture of the current state of the economy, at least in normal times. In the current crisis, however, these soft indicators have not always been available in time. After all, it is economic policy itself that makes forecasting more difficult, with policies aimed at stabilizing the economy and by changing the definitions of important variables. Another disadvantage of soft indicators is that they cannot easily be linked quantitatively to relevant variables. This is particularly true when dealing with new phenomena that cannot yet be seen against a longer time horizon. Since Google data, such as those employed by IZA, are relatively new to scientific analysis, more experience with their use is needed. Nonetheless, IZA's Google Indicator allows an immediate comparison with the target variable as it can be linked directly with the unemployment rate. This is an option not provided by other indicators, which force the observer to estimate trends by interpreting curves.

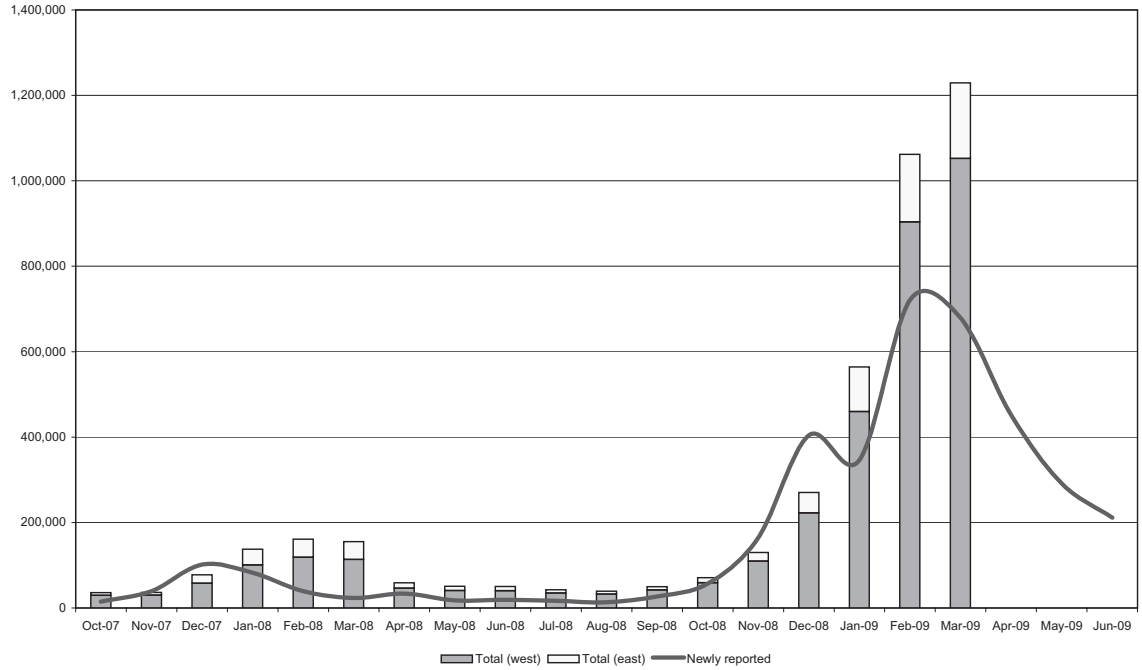
Googlemetrics and the labor market

The internet provides information on unemployment – at least indirectly. With an internet penetration rate of close to 70%, Germany exceeds the European average. Data on German internet users therefore offer an interesting, so far mostly unused basis for scientific research. Since the data are immediately available, extensive, and responsive to changes in the economic environment, they have a great potential for the analysis of labor market issues. An analysis of the IZA Evaluation Dataset has revealed that over 86% of unemployed use the internet for job search purposes. This is more than for any alternative search method, such as friends and family (84%), newspaper advertisements (83%) and employment agency (70%), which also allows its customers to use the internet. Almost every jobseeker therefore leaves traces online.

Googlemetrics may develop into a scientific subdiscipline, using internet data to pose and answer questions in ways not imaginable with traditional empirical data. Googlemetrics can thus provide a valuable contribution to making the growing world of internet search activity measurable for analysis and forecasting. So far, Google data have been used, for example, to predict the outcome of the U.S. presidential elections or the spread of influenza epidemics.

» IN THIS ISSUE

Figure 1: Number of short-time workers and newly reported short-time work (October 2007 – June 2009)



Source: Federal Employment Agency, own calculations. *Note:* Short-time work as reported by employers.

Behavioral model

In a recent article in Applied Economics Quarterly, *Nikos Askitas* (IZA) and IZA Director *Klaus F. Zimmermann* have presented an econometric concept which makes search activity on the internet usable for behavioral analysis and economic forecasts, with a specific focus on unemployment. Further studies by the same authors document and discuss their experience with concrete forecasts based on the Google Indicator.

The unemployment rate in a given month is usually reported at the end of the same month by the Federal Employment Agency (BA). As the authors were able to show, the rate is strongly correlated with internet search activity during the second half of the previous month. This may be attributable to administrative procedures of the BA, which cause an informational time lag between the actual incidence of unemployment and its measurement. The official unemployment rate is recorded on a reference date in the middle of the month. Aggregate weekly data for the second half of a month are therefore used to predict the unemployment rate for the following month. As far as the indicator potential is concerned, this means that at the time the official unemployment figures are announced, a forecast for the following month can already be made using this method. The informational advantage is thus one month.

Selecting keywords is obviously of central importance. After various alternatives have been tested extensively, three indicator models are used to predict the unemployment rate using different keyword groups:

1. Google 1 – "Arbeitsamt/-agentur" (employment office/agency), "jobsearch" (collection of most popular websites for job search)

2. Google 2 – "Arbeitsamt/-agentur", "jobsearch", "Kurzarbeit" (short-time work)

3. Google 3 – "jobsearch", "Kurzarbeit".

The history of unemployment trends can be captured in a statistically satisfactory way with these few variables. Internet activity using these keywords in the second half of a month is then linked to the official unemployment rate reported by the Federal Employment Agency at the end of the following month. In principle, Google data is available on a daily basis dating back to January 2004. IZA's Google Indicator, however, uses only the aggregate data for the second half of each month.

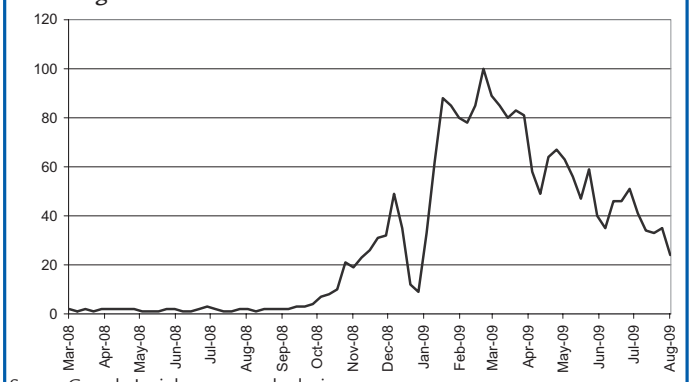
The complicated economic and labor market situation over the past months and years provides an ideal test environment for this innovative forecasting approach. As figures 1▲ and 2▶ show, weekly measurements of internet search for short-time work are strongly correlated with short-time work announcements by employers. However, the internet data have a clear advantage in their continuity and immediate availability at the end of the period under study. Public interest evidently declined during the month of December, then rose in the following year, remaining at a high level through February and March. Since then, the indicator has been falling as well.

Methodology

The innovative indicator method uses Google search statistics by keywords, validated by econometric methods regressing the data on a target variable, in this case the (non-seasonally adjusted) official unemployment rate. In the process of statistical analysis, the optimal econometric specification and useful forecasting variables are selected out of a list of possible forecast determinants (or keywords). As usual in modern time-series econometrics, so-called error correction models are then applied. An error correction model is a dynamic system with the characteristics that the deviation of the current state from its long-run relationship will be fed into its short-run dynamics. A condition for this approach is that the observed time series be cointegrated. In practice, they mostly exhibit roughly the same development over time.

In the standard approach, the authors regress the annual change of the unemployment rate and of all other regressors with a lag of 12 months.

Figure 2: Internet search trend for "short-time work"



Source: Google Insights, own calculations.
Note: Figure based on weekly internet search activity.

$$(1) \quad \Delta Y_t = \alpha + \beta Y_{t-12} + \sum_{i=1}^{k} (\gamma_i \Delta X_{i,t} + \delta_i X_{i,t-12})$$

with $\Delta Y_t = Y_t - Y_{t-12}$; $\Delta X_t - X_{t-12}$; Δ: difference operator of length 12 and t = 1,2,...,n

The non-seasonally adjusted unemployment rate is used; the 12-month lag operator automatically leads to a seasonal adjustment.

The choice of model is based on the well-known Bayesian Information Criterion (BIC). It weighs the accuracy with which a given model matches the available data against its complexity measured by the number of parameters. This measure allows for selection of the best model for each time period via direct comparison of the BIC measure, independent of whether or not the models are nested in each other. A high number of parameters is penalized and parsimonious models favored.

$$(2) \quad \mathrm{BIC} = m \ln\left(\frac{\mathrm{RSS}}{m}\right) + q \ln(m)$$

RSS: residual sum of squares
m = 1,2,3,...,n-12 sample size, used data

q: number of estimated parameters

Equation (2) refers to the whole estimation period of the data and is an ex-post analysis.

However, the quality of a model is also measured by the extent of errors of the model in a given forecasting period ex ante. For this purpose the model is estimated for a past period, and a forecast using the model is made out-of-sample for the following period, which is then compared with reality. The new period is then added, the model is estimated anew, another forecast is made for the following period, and so on. The quality of a model may then be assessed by its Mean Absolute Error (MAE):

$$(3) \quad \mathrm{MAE} = \frac{1}{T} \sum_{t=1}^{T} \mid Y_t - Y_t^* \mid$$

T: number of one-step forecasts, where Y_t^* is the forecast of Y_t

As is known from time-series econometrics, the choice of models via BIC does not necessarily coincide with a best model assessment via MAE.

Choice of model

Table 1▶ contains the evaluation of the estimated models. In the standard approach the authors regress the annual change of the unemployment rate and of all other regressors with a lag of 12 months. Three estimates using the Google data exclusively (Google 1 to Google 3) are compared to a model based on the DAX alone (DAX forecast) and a combination of Google data and the DAX (Google 1 + DAX to Google 3 + DAX).

Table 1 further includes the adjusted R^2 (R^2-a) and the Bayesian Information Criterion (BIC) for a selection of the best specifications found during the analyzed period. The models perform very well overall. However, the Google data outperforms the DAX model in each specification by a notable margin, as these measures clearly show (the larger its R^2 and the smaller its BIC, the better the model). Google 2 with its regressors "employment office/agency", "job search" and "short-time work" proves to be the best Google model in the timeframe under analysis. It also becomes evident that a regression of the Google data combined with the DAX leads to additional improvements. The model Google 2 + DAX, which features the DAX as an additional regressor, offers the largest improvements.

Figure 3 compares the ex post forecasts of the best models in each class (Google 2, DAX, Google 2 + DAX) to the actual development of unemployment. The models generally perform well. At the beginning of the crisis in late 2008, they overestimate the rise in unemployment while underestimating the level afterwards. They do not show notable differences in performance with regard to direction.

The performance of forecasting models may also be evaluated by the quality of their one-step forecasts. To quantify this quality, table 1 shows MAE, the mean absolute error. At first, the DAX forecast seems superior to all pure Google models (Google 1-3). However, this is only due to an unusual error in February 2009, which is mainly attributable to a considerable increase in online job search despite the rise in short-time work.

Using Google and DAX in a single regression (Google + DAX) reduces this error considerably, by 24% compared to the pure DAX model. Substantially lower MAEs are obtained when simply averaging the forecasts of the pure DAX and Google models (AVG lines in table 1), which is also a well-known method. Relying on the best option, Google 2 + DAX, simply averaging the forecasts derived from the DAX regression and the Google regression (using "employment office", "job search", and "short-time work"), reduces the error even by 37% compared to the pure DAX model.

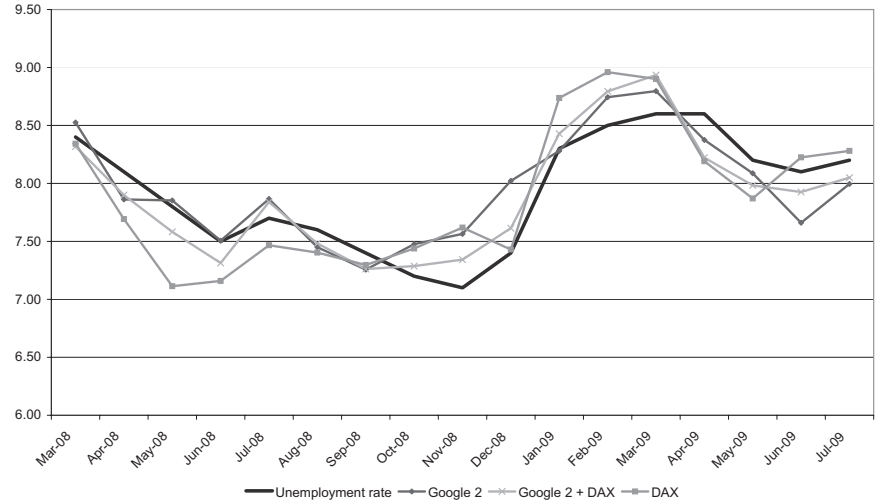
Table 1: Evaluation of regression models and one-step forecasts

Model	Employment office	Short-time work	Jobsearch	DAX	R^2-a	BIC	MAE
Google 1	L*** + K +		L*** - K* -		0.885	62.138	0.424
Google 2	L*** + K +	L** + K*** +	L*** - K** -		0.939	32.911	0.395
Google 3		L*** + K*** +	L*** - K -		0.925	38.823	0.446
Google 1 + DAX	L*** + K +		L*** - K*** -	L*** - K*** -	0.955	17.175	0.261
Google 2 + DAX	L** + K +	L + K*** +	L*** - K*** -	L*** - K -	0.968	4.292	0.309
Google 3 + DAX		L + K*** +	L*** - K*** -	L*** - K** -	0.957	16.177	0.396
DAX forecast				L*** - K*** -	0.906	47.275	0.314
AVG (Google 1, DAX)							0.280
AVG (Google 2, DAX)							0.217
AVG (Google 3, DAX)							0.278

Source: Arbeitsamt.de, Ifo-Institute and Google Insights. Official employment statistics are non-seasonally adjusted. Precise keywords are: "employment office" = (Arbeitsamt OR Arbeitsagentur); "jobsearch" = (Stepstone OR Jobworld OR Jobscout OR Meinestadt OR meine Stadt OR Monster Jobs OR Monster de OR Jobboerse); "short-time work" = (Kurzarbeit).

Note: The regression models using equation 1 were estimated from monthly data for a period from January 2005 to May 2009 using the least squares method. K represents the change, L the 12th lag of the respective variable. +,- is the sign of the estimated coefficient and * refers to its statistical significance (* P < 0,05, ** P < 0,01, **** P < 0,001). One-step forecasts were made for a period of January 2005 to May 2009. R^2-a is the corrected determination, BIC the Bayesian Information Criterion, MAE the mean absolute error and AVG the averages of the respective forecasts.

Figure 3: Official unemployment rates and model results



Source: Federal Employment Agency, own calculations.

Example: August and September forecasts

The above procedures are applied to the months of August and September as an example. Using only the alternative models DAX and Google 2, as well as their average, yields the following result: Although Google 2 + DAX, the combined econometric model using Google and DAX data, performed better at one-step forecasts than each model separately, it did not do as well as the average of the one-step forecasts from the separate models.

Forecasts for August were derived from the available Google data for the second half of July and the DAX value on August 3. At the time the September forecast was made, however, data for August was not yet available. The regressors for August were therefore estimated using time-series methods. This is obviously problematic for the DAX, since its value is determined largely by its error term (the so-called innovations). In this regard, the DAX forecast presented below is rather exploratory in nature. This should be taken into account when evaluating the September forecast.

Figure 4▶ contains the one-step forecasts of the models considered together with the realizations and results from the data at that time, respectively. Since November, forecasts with the pure Google model have systematically fallen short of actual developments, whereas the DAX model forecasts have tended to exceed actual values. Both errors mostly offset each other when the average is taken, with a slight tendency to underestimate.

Forecasting errors are inherent in all scientific methods. In contrast to pure indicators, which do not look for a direct quantitative link to a target variable, here these errors may be measured directly. This is a clear advantage over some competing approaches. The degree of ex post explanatory power (fig. 3▲) is already very good. What matters in particular, however, is the pattern of the forecasts: The Google data has captured the downward trend from March to November 2008 nicely, as well as the rise in unemployment until March 2009 (with the exception of the errors in February due to the expansion of short-time work) and the decline thereafter.

As the August forecast shows, both indicators predict falling unemployment, in line with the usual seasonal pattern. Had the forecasts gone in the other direction, this would have been a strong crisis indicator. Instead, the forecast pointed at a relatively calm development. The analysis for September paints a slightly different picture. Google and DAX data had to be estimated, creating more uncertainty. The Google indicators once again point to a further decrease in unemployment, as typical seasonal patterns would suggest. However, the DAX indicator points steeply upwards, while the average of both values stagnates. In reality, unemployment rose slightly in August (against the typical pattern) and fell again in September. During the federal elections the labor market situation remained unexpectedly stable. This supports the expectation that the labor market will remain relatively unaffected by the crisis until the end of the year.

Conclusion

IZA's Google Indicator based on internet search data is an innovative approach to forecasting unemployment. It makes use of readily available information with substantial explanatory power for the unemployment trend in the period under study, even when compared to other well-established alternatives and over the longer period of 2005-2009. The model is able to predict the official unemployment rate reasonably well. Until January these forecasts are accurate even one period ahead. With the introduction of short-time work and implementation of other labor market policies as of February 2009, the instrument becomes less certain.

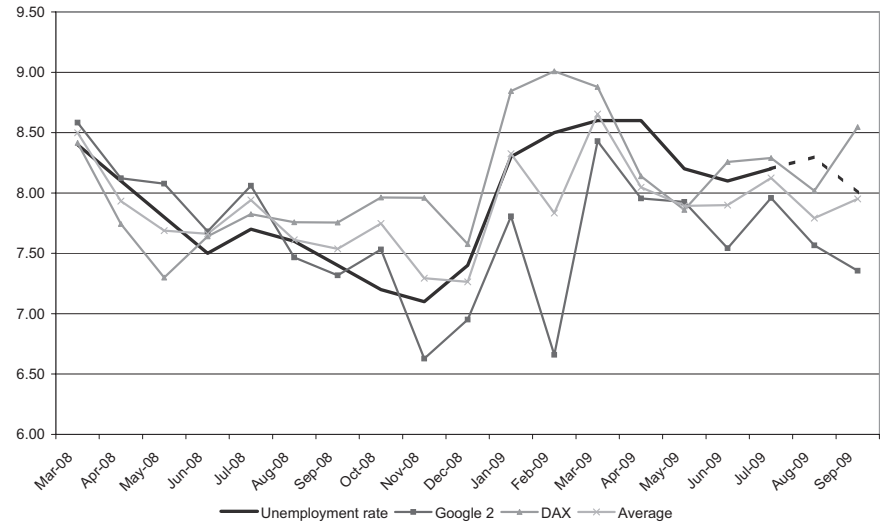
In sum, the development of IZA's Google Indicator has broken new econometric ground. The overall potential of this approach is much greater than its application to labor market trends: Googlemetrics could well develop into a scientific subdiscipline that offers entirely new avenues for behavioral analysis and forecasting.

Selected publications:

Askitas, N. and Zimmermann, K.F. (2009): Google Econometrics and Unemployment Forecasting, Applied Economics Quarterly, 55, 107-120.

Askitas, N. and Zimmermann, K.F. (2009): Googlemetrie und Arbeitsmarkt, Wirtschaftsdienst, 7, 489-496.

Figure 4: Official unemployment rates and forecast results



Source: Federal Employment Agency, own calculations.

IZA on Tour 2009

EU Labor Markets after Post-Enlargement Migration: Lessons, Challenges and the Economic Crisis

Post-enlargement migration in the European Union has not hurt the receiving labor markets. Although there are some risks, it also creates opportunities in the sending countries, and benefits the EU as a whole. Transitional arrangements work against the countries which impose them. In the current economic crisis, labor migration will play an important role in cushioning the effects of the crisis and creating a potential for recovery.

These are the main results of a new book, "EU Labor Markets after Post-Enlargement Migration" (see IZA Compact April/May 2009), which were presented by its editors, *Martin Kahanec* and *Klaus F. Zimmermann*, in a series of book launch events in European and global hotspots of academic and policy debate. The objective of this IZA topic-focused "tour" was to foster intellectual discourse on free mobility in an enlarged European Union, a topic whose significance goes far beyond the current economic crisis. IZA is to proceed with this initiative and be present in several other European and international capitals in the near future.

German Labor Minister kicks off IZA tour: Berlin, June 24

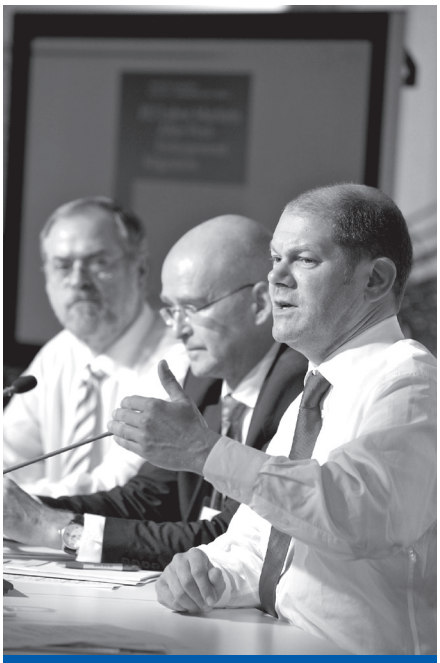
Germany has adopted a particularly reluctant approach to the access of workers from the new member states to its labor market. The book launch under the title "Interim assessment of the labor migration from the new EU member states and prospects for Germany" within the Berlin Lunchtime Meeting series at DIW Berlin marked the start of the IZA Tour 2009. Its significance was underscored by the presence of the Federal Minister of Labor and Social Affairs, *Olaf Scholz*. Welcoming the book, the minister stated that while early opening of the German labor market was not feasible for political reasons, Germany has amended its immigration rules to facilitate the inflow of high-skilled workers to Germany. In particular, the minister emphasized that the new Labor Migration Control Act *(Arbeitsmigrationssteuerungsgesetz)*, which came into force January 1, 2009, offers new flexibility for the immigration of skilled migrants from the new EU member states. Based on the results of the book, however, Klaus F. Zimmermann pointed out that these efforts had come rather late and Germany may have lost the opportunity to attract high-skilled immigrants from the new member states, who so far had preferred to migrate to more welcoming countries.

Reaching top levels of EU policy making: Brussels, June 25

As the seat of the European Commission, Brussels plays host to one of the most influential policy audiences in Europe and the world. The IZA book launch, organized within the framework of the Economic Seminar Series of the Directorate General for Economic and Financial Affairs, stirred keen interest among high-ranking European Commission bureaucrats and policy professionals. The Director of the Directorate A "Economic studies and research" of the European Commission, *István Pál Székely*, and the Coordinator of the Advisers Group at the same Directorate, *Karl Pichelmann*, facilitated the event and underscored the book's contribution to our understanding of the five-year experience after EU enlargement.

Transatlantic dialogue fostered: Washington, July 23

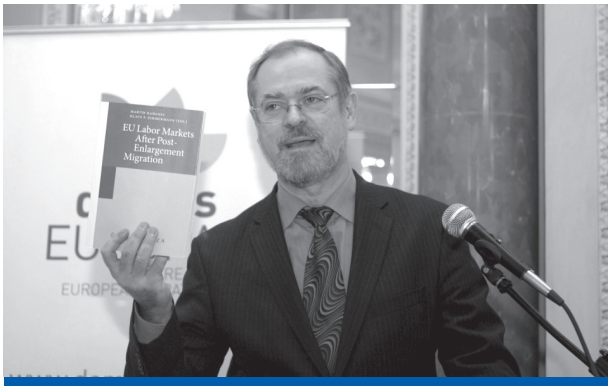
Presenting the book in Washington, D.C., the global hub for policy makers, analysts and academics, Klaus F. Zimmermann provided the U.S. audience with a profound review of the lessons and current policy challenges of post-enlargement migration in the EU. Co-hosted by the Center for Strategic and International Studies (CSIS) and DIW DC, whose Director, *Amelie F. Constant*, is also Deputy of IZA's migration program, the event provided a vibrant forum for transatlantic dialogue within a broader theme of labor mobility and its effects on the labor markets in the source as well as receiving countries. The meeting was moderated by *Sidney Weintraub*, holder of the William E. Simon Chair at the CSIS. It was well attended by influential policymakers and media experts including *Michael Hofmann* (Executive Director for Germany at the World Bank), *Matthias Sonn* (Head of Economic Affairs at the German Embassy), and *Stephan Richter* (Publisher and Editor-in-Chief of *The Globalist*).



Klaus F. Zimmermann, Thomas Hanke, Olaf Scholz

Strategic role of Swedish migration policy: Stockholm, September 2

Given that Sweden was the only country which completely opened up to immigrants from the new member states immediately after both the 2004 and 2007 enlargements, Stockholm was a natural choice for the IZA tour schedule. As the new IZA book shows, Sweden was well-advised in its choice of an open border migration policy: the Swedish labor market and welfare system, overall, have clearly benefited from the free movement of labor. The IZA book launch was co-organized by *Eskil Wadensjö* of Stockholm University, who is IZA Research Fellow and contributor to the book. The event was attended by a number of top government officials, including the State Secretary of the Prime Minister's Office, *Maria Åsenius*. In her speech, which focused on the policy aspects of EU enlargement, the State Secretary praised the book for providing additional momentum to research on labor migration in an enlarged EU.



Klaus F. Zimmermann presenting the book in Warsaw

Strong media attention in Ireland: Dublin, September 3

Ireland tops the statistics on inflows of immigrants from the new member states. The well-attended book launch in Dublin was a testimony to the importance of the issue of post-enlargement migration in Ireland. It was hosted by the Economic and Social Research Institute (ESRI) and co-organized by *Alan Barrett*, IZA Research Fellow, ESRI Research Professor and contributor to the book. Besides distinguished scholars including ESRI Director *Frances Ruane*, the head of its Social Research Division, *Philip J. O'Connell*, and faculty members from the Departments of Sociology and Economics at Trinity College Dublin, the audience included a number of senior policy makers and representatives from international embassies in Dublin. The IZA message – free labor migration is a solution to labor market problems, even in times of economic crisis – was prominently covered by the leading Irish newspapers.

Brain drain and gain in Latvia: Riga, September 11

Latvia experienced some of the largest outflows of its labor force following its EU accession in 2004, and it currently faces another wave of out-migration triggered by the economic crisis. According to the findings presented in the new book, Latvia would be well-advised to plan strategically an active labor migration policy and create incentives for post-crisis return migration to avoid severe labor shortages, which are currently concealed by the results of the economic crisis. Overall, the Baltic states have simultaneously experienced brain drain and the beginning of brain gain in terms of remittances and additional skills of return migrants. *Andris Bērziņš*, Chairperson of the Parliamentary Foreign Affairs Committee and former Prime Minister, as well as the Minister of Education and Science, *Tatjana Koķe*, on behalf of Prime Minister *Valdis Dombrovskis*, acclaimed the significant contribution and policy relevance of the IZA book for pending policy decisions in the Baltic states. Hosted by the University of Latvia and co-organized by *Mihails Hazans*, who also contributed to the book, this meeting provided a forum for intensive debate on brain drain and gain in the context of EU Eastern enlargement. This topic will be of special importance for a common EU approach towards labor migration.

Andris Bērziņš, Klaus F. Zimmermann, Martin Kahanec, Mihails Hazans

Poland as largest sending country: Warsaw, November 10

Polish nationals constitute by far the largest share of post-enlargement migrants from the new member states. Consequently, the IZA book tour stop at the Tyszkiewicz Palace of the University of Warsaw in the heart of the city attracted a large audience of leading academics, policy professionals and politicians, including several representatives of the Polish government and ambassadors, as well as journalists. *Paweł Świeboda* (President, demosEUROPA - Centre for European Strategy) and *Marek Okólski* (Director, Centre of Migration Research, University of Warsaw) hosted the event. Other prominent experts on migration included *Pawel Kaczmarczyk* (Vice-director, Centre of Migration Research and contributor of the book chapter on Poland), *Dariusz Stola* (Centre of Migration Research), *Marek Kupiszewski* (Director, Central European Forum for Migration Research), and *Marek Góra* (Warsaw School of Economics).

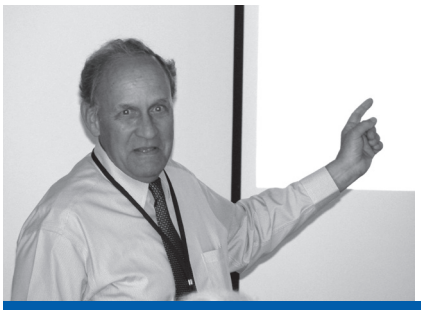
Table of Contents

Martin Kahanec
Klaus F. Zimmermann
(Eds.)
EU Labor Markets After Post-Enlargement Migration
Springer, Berlin et al. 2009
ISBN 978-3-642-02241-8

Fueling the World's Progress: 6th Annual Migration Meeting (AM²)

Migration expert *Julian Simon* once declared that "the main fuel to speed the world's progress is our stock of knowledge." With this philosophy in mind, the 6th Annual Migration Meeting (AM²) took place on May 21-23, 2009 at IZA in Bonn. Co-organized by DIW DC Executive Director and IZA Deputy Program Director in Migration *Amelie F. Constant* and *Barry R. Chiswick* (University of Chicago and IZA Program Director in Migration), AM² draws together leading international researchers to share their work and ideas on migration. This year's meeting was again successful in including eleven scholarly papers from different countries on a variety of migration topics. The highlight of the meetings is the Julian Simon Lecture, which is presented in honor of Simon's prolific contributions to population change research.

The 2009 Julian Simon Lecture was delivered by the renowned economic historian *Jeffrey G. Williamson* of Harvard University.



Jeffrey G. Williamson

Williamson's lecture, entitled "Vanishing Third World Emigrants?", examined the third world's emigration life cycle since the 1960s. Following a peak in the late 1980s and the early 1990s, third world emigration rates (except those from Africa) have been level or even declining, a trend that has only been accelerated by the current economic crisis. Williamson argues that income and educational gaps between the U.S. and the sending country, poverty traps and the size of the cohort at risk in the sending country, and the migrant stock in the U.S. are the economic and demographic fundamentals driving emigration life cycles to the United States. Projecting the emigration life cycle up to 2024, Williamson suggests that pressure on third world emigration over the next two decades will either remain steady or decline. Future U.S. immigrants, he says, will likely be more African and less Hispanic than in the past.

Nuria Rodriguez-Planas (Universitat Autònoma de Barcelona) presented her research on the effect of immigrants on the creation of a more flexible work force. She finds that Spanish immigrants are more occupationally mobile than natives and more sensitive to economic changes, enabling the Spanish economy to be more adaptable to new technology and demand shocks. *Magnus Lofstrom* (Public Policy Institute of California) examined the labor market effects of immigrant legalization on illegal border crossers and visa abusers, finding that while the earnings of illegal border crossers do not necessarily improve after receiving Legal Permanent Resident status, visa abusers catch up with the continuously legal immigrant group after receiving a green card.

Odelia Heizler-Cohen (Hebrew University) presented her work on the connection between social networks and reality show wins. She finds that social networks and membership in minority groups play key roles in a contestant's victory, but their effects are nonlinear: the social network effect is *U*-shaped, whereas minority group membership follows an inverted *U* shape. *Pieter Bevelander* (Malmö University) presented his research on voting and social inclusion in Sweden, revealing that although immigrants are less likely to vote than native-born Swedes, immigrants who naturalize are generally far more likely to vote than those who do not. *Thomas Lange* (University of Konstanz) presented his research on the return migration of foreign students and the choice of non-resident tuition fees, presenting a model of student migration that attempts to determine the optimal choice of non-resident higher education tuition fees in the host country.

Stephen Trejo (University of Texas at Austin) discussed selectivity and immigrant employment, showing that immigrants tend to be favorably selected in terms of employment rates. At low skill levels, foreign-born men are more likely to work than U.S.-born men, whereas at high skill levels, the employment rates of immigrants and natives are similar. *Monika Sander* (University of Bamberg) examined the relationship between immigrants' Body Mass Index and their duration of residence in Germany, revealing that additional years in Germany lead to an increase in BMI for both men and women. *Sherrie Kossoudji* (University of Michigan) explored how state policy shapes child and family characteristics in intercountry adoptions. Changes in immigration policy in the United States and adoption policy abroad both affect these characteristics, such as when the break-up of the Soviet Union was responsible for a tidal wave of adoptions from Russia.

Diego Aycinena (Francisco Marroquin University) presented his work on remittances and the problem of control. By conducting a field experiment among migrants from El Salvador, Aycinena discovered that when migrants have the option of greater control over home country savings accounts, they are more likely to open such accounts and accumulate more savings in them. *Kerry Papps* (University of Oxford) discussed gender, source country characteristics and labor market assimilation among immigrants, finding that women migrating from countries with high relative female labor force participation rates work substantially more than women coming from countries with lower relative female labor supply levels. Echoing this, Papps also found substantial and persistent negative effects of source country fertility on the labor supply of female immigrants.

The conference papers are downloadable from the IZA website. Next year's meeting will take place in conjuction with the Migration Topic Week at IZA (June 2-6, 2010). The call for papers is available online at:

▶ www.iza.org/AMsquared

Causes and Consequences of Formality and Informality

Fourth IZA/World Bank Conference in Bonn

Each year IZA and the World Bank co-organize a research conference on "Employment and Development" at alternating venues in the developed and developing world. Following up on three previous conferences in Berlin (2006), Bonn (2007) and Skhirat, Morocco (2008), the Fourth IZA/World Bank Conference was held in Bonn, May 4-5, 2009. The aim of the annual conferences is to provide an opportunity for development economists and policymakers to interact and discuss important development issues. The events provide a bridge for these two communities in the hope of improving both research output and policymaking for labor markets in developing countries.

The focus of this year's conference was on the "Causes and Consequences of Formality and Informality," one of the priority research areas identified by the IZA development program. This focus was reflected in two keynote addresses and several panels discussing current research in this field. In recent years, the scientific interest in the analysis of informal and formal labor markets has re-emerged. At the same time, policy discussions have focused on how to tackle informality and help workers in the informal sector.

All labor markets in developing countries and transition economies include diverse types of employment in terms of "formal" jobs, "informal" jobs, and variations in between. Informal employment has been growing faster than more formal types of employment. This has raised many questions for labor market analysis as well as for policy-making. It is obvious that the reality is more complex than the traditional view of an informal "sector" where the poor, unable to find formal jobs, eke out a subsistence living through very low productivity labor. While this characterization applies in some cases, empirical studies in Latin America have shown that some workers seem to be voluntarily moving to the informal sector to improve their lot. Moreover, workers in sectors traditionally considered as "formal" are increasingly employed in temporary precarious jobs, blurring the line between formal and informal employment. However, knowledge on the causes and consequences of informality and its links to the formal labor market is still very limited. Further research is needed in a number of specific areas: investigating the dynamics of the formal and informal labor markets, re-thinking social protection for informal workers, and identifying the effects of labor regulations and social protection programs on informality.

The opening addresses of the conference were given by *Ingrid-Gabriela Hoven* (Head of Directorate-General 2 at the German Ministry for Economic Cooperation and Development), *Robert Holzmann* (Director of the World Bank's Human Development Network) and IZA Director *Klaus F. Zimmermann*.

Stefano Scarpetta, Robert Holzmann, Jan Svejnar, Klaus F. Zimmermann, Santiago Levy Algazi

The first keynote speech was delivered by *Santiago Levy Algazi* (Vice President for Sectors and Knowledge, Inter-American Development Bank). He focused on the interplay of social security and social protection with the formal and informal labor markets. Based on his analysis of the Mexican experience with Oportunidades/Progresa (a large-scale cash transfer program) and the institutional distinction between salaried and non-salaried workers, he argued that the existence of social protection provided a subsidy for the informal labor market while social security constituted a tax on the formal labor market, thereby creating a distortion. He pointed out that two key policy challenges arise from this situation: to protect all workers at all times (social point of view), and to ensure that the distortions are by-passed (economic point of view).

His proposal, which tackled these policy challenges in the Mexican case, is based on the notion of universal social rights. He argued that the right to social security would need to be disassociated from the labor market status (salaried worker) and become a universal right. This in turn would increase equity and social cohesion. His case study of social security, social protection and the informal labor market in Mexico provided interesting research findings, based on policy work, that help to re-think the provision of social protection (one of the key areas for further research, determined under the IZA Employment and Development program).

Gary Fields (Cornell University), the second keynote speaker, gave an overview of research on formality and informality, drawing on his tremendous research experience in this area. Pointing out some of the discrepancies and shortcomings of current research, Fields also provided an avenue for future activities in this field. In his reading of the literature he found that empirical studies on informality have focused predominantly on micro-based (individual-level) studies while the marketplace, one level above the individual level, has been largely neglected.

Moreover, he pointed out that many different definitions of informality are employed in the literature, while the distinguishing features between formality and informality often remain unexplained. He proposed that instead of talking about "formality" vs. "informality," the dividing criterion should be used, such as "covered" vs. "uncovered." In the theoretical literature, he observed that the self-employed could be modeled as a more heterogeneous category. His reflections on informality gave a comprehensive account of research accomplishments in the area of informality, as well as obvious gaps in the literature.

Concluding the conference, a policy panel chaired by *Stefano Scarpetta* (OECD and IZA) on the "Effects of Financial and Economic Downturn in Labor Markets in Developing Countries" debated the ongoing global recession and labor markets in developing countries. *Jan Svejnar* (University of Michigan) joined Robert Holzmann and Santiago Levy Algazi on the panel. He discussed potential effects of the crisis on the labor market in the Europe and Central Asia (ECA) region, highlighting some of the labor market risks and potential policy responses to the crisis. Levy Algazi shared his outlook on the Latin American region,

while Holzmann covered several other regions and discussed additional impacts of the crisis.

Over the course of the conference, new research papers were presented in 27 different panel sessions covering a wide range of topics in developing countries in Africa, Asia, Latin America and transition economies. Key topics included: informality, trade and development, gender, entrepreneurship, training, education occupational choice, migration, health, conflict, institutions, child labor and poverty reduction.

The complete program and the presented papers are available on the IZA website. Next year's IZA/World Bank Conference will be held in Cape Town, South Africa, May 3-4, 2010. For more information see:

▶ www.iza.org/development

Examining the Effects of Policy Programs Against Child Labor

Second Workshop of IZA Expert Network

Organized by *Eric Edmonds* (Dartmouth College), *Randy Akee* (IZA) and *Markus Frölich* (University of Mannheim and IZA), IZA held its second workshop on Child Labor in May 2009. These events are a component of the IZA Child Labor Network established after the first workshop in 2007.

Among the participants were researchers from 11 nations. The sessions covered the impact of policies designed to discourage child labor, children in conflict, trade and child labor, as well as measurement issues in child labor research. The presented research used data from a diverse set of countries including Burkina Faso, India, Indonesia, Mexico, Palestine, and Rwanda.

A major policy priority in the area of child labor is to better understand what works for working children. Three papers were based on the evaluation of randomized policy experiments relevant to child labor. *Jim Berry* (MIT) presented a study about a program to encourage out-of-school children in India to attend bridge classes, aimed at helping these children transition into mainstream public schools. His presentation emphasized the importance of peer interactions in the decision to attend these bridge classes.

Damien de Walque (World Bank) presented an evaluation of two programs designed to incentivize school attendance in Burkina Faso. One program provided girls with food to take home conditional on meeting attendance targets. A second program provided meals in school. Both programs promote school enrollment and attendance, especially for girls. The take-home rations seem to also be associated with a reduction of girl participation in farm and non-farm work and a rise in collection activities and chores.

The third experiment-based paper was presented by *Kirk Doran* (University of Notre Dame). While other studies have documented declines in child wage employment associated with Mexico's conditional cash transfer experiment, Progresa, Doran found that these declines are associated with increases in wages and adult employment in local labor markets. This observation is consistent with the assumption that child and adult labor are perfect substitutes subject to a productivity shifter.

Two papers examined the effect of conflict on child schooling and child labor. *Richard Akresh* (University of Illinois) presented research on the impact of the schooling disruption attributable to the Rwandan genocide. The study documents that six years after the genocide, affected cohorts have lost about a half year of schooling relative to the pre-genocide time trend. *Michele Di Maio* (University of Naples) analyzed how child labor and schooling have been affected by border closings in Palestine. His study finds that restrictions in border crossings to Israel increase the incidence of child labor for Palestinian children while they also lower the market wage in Palestinian regions. He argued that children work more despite lower wages in order to compensate for the decline in total family income attributable to the border closings.

Krisztina Kis-Katos (University of Freiburg) presented research about how child labor in Indonesia has been affected by Indonesia's changes in trade policy. Regions in Indonesia vary in their exposure to national tariff changes based on their pre-reform industrial composition. Kis-Katos reported that regions which experience larger reductions in tariffs also experience large declines in child labor and increases in school enrollments through faster economic growth.

Establishing a uniform vocabulary for discussing child labor related issues has been a major hurdle in comparing research results. Two papers focused on the effects of survey design and implementation on the reporting of child labor. *Andrew Dillon* (International Food Policy Research Institute) presented a study where researchers found that the incidence of child labor in a country was extremely sensitive to the detail of the questions asked about time allocation. Short questions, as is standard in many World Bank Living Standards Measurement Surveys, were found to understate economic activity rates by more than 30 percent for girls relative to more detailed questions. *Lorenzo Guarcello* (Understanding Children's Work) compared estimates of child labor in a number of different data sets, arguing that many of the differences in child labor observed over time and across countries may be due to differences in the detail of the questions, the length of time used for recall, and who is asked to provide information on the child's time allocation.

The presented papers are available online:

▶ www.iza.org/link/childl2009

Additional outputs of the IZA Child Labor Network include the publication of a special issue of Research in Labor Economics, which will focus on child labor and is expected to appear in 2010.

IZA Conference on Hot Topic of Public Debate: The Minimum Wage

Organized by IZA Program Director *Pierre Cahuc* (Ecole Polytechnique, Paris) and *Konstantinos Tatsiramos* (IZA), an IZA conference on "The Economics of the Minimum Wage" was held in Berlin on June 21-23, 2009.

The minimum wage has been a core element of public policy for more than a century in a number of countries (such as the United States and Australia) as a way for individuals or families to achieve self-sufficiency. Although the goals of the minimum wage are generally accepted, there is much less agreement whether the minimum wage is effective at attaining these goals. Economic research, both theoretical and empirical, has played an important role in the ongoing debate about minimum wages, which has also had an influence on discussions about the adequacy of alternative theories of the labor market. In recent years, this debate has been intensified in light of the introduction of a minimum wage in the UK, increases of the federal minimum wage in the US, and the discussion about introducing a minimum wage in Germany and Italy.

The conference brought together leading researchers in the field to discuss their work on the consequences of minimum wages from a number of different countries on the basis of recent theoretical and empirical contributions. These contributions investigated the effect of the minimum wage on employment, wages, income distribution, skills, and firm profitability, as well as the interaction of the minimum wage with employment subsidies. From a more theoretical point of view, the optimal design of the minimum wage and its interaction with taxation were also covered. In addition, a panel discussion with academic economists and policy makers reflected the ongoing debate on the consequences of the minimum wage. The purpose of this discussion was to inform German policy makers about the international experience with the effects of the minimum wage, and to foster the dialogue between academic researchers, politicians and stakeholders.

From the academic side, the panel consisted of *Tito Boeri* (Bocconi University), who has a vast experience in policy advice, *Stephen Machin* (UCL), who is also a member of the Low Pay Commission in England, and *David Neumark* (University of California, Irvine), a leading expert on the effects of the minimum wage across different countries. From the policy side, the panel consisted of *Reinhard Dombre*, Head of Collective Bargaining Policy at the Confederation of German Trade Unions (DGB), *Günther Horzetzky*, State Secretary at the Federal Ministry of Labor and Social Affairs, and *Heinrich Kolb*, Member of Parliament and Social Policy Spokesman of the Free Democratic Party (FDP). The panel was moderated by Pierre Cahuc.

Tito Boeri, Günther Horzetzky, Stephen Machin, Pierre Cahuc, Reinhard Dombre

The Academic Conference

The first session of the conference focused on the employment effects of the minimum wage, which is one of the most widely investigated topics. *John Abowd* (Cornell University) presented his work on the effect of the minimum wage in France and the United States. His findings suggest that an increase in the minimum wage leads to significant decreases in employment in France but not in the U.S. On the other hand, decreases in the real minimum wage have no substantial effects on the entry into employment in both countries. These results can be explained by the level of the minimum wage, which is much higher in France.

David Neumark investigated the often overlooked interaction of employment subsidies and the minimum wage. In the U.S., the Earned Income Tax Credit (EITC), the country's main anti-poverty policy, subsidizes labor supply especially for families with children. The main question is to what extent a higher minimum wage makes the EITC effective. The findings suggest that a higher EITC for single women with kids leads to higher employment and earnings, while it adversely affects ineligible single childless women. Also, increases in EITC leads to higher employment effects when the minimum wage is higher.

While many studies have focused on the employment effects of the minimum wage in the overall economy, *John Addison* (University of South Carolina) analyzed the labor market outcomes in sectors of the economy that tend to pay workers at or close to the minimum such as the U.S. retail sector. He finds no general evidence that minimum wage increases tend to reduce employment. In particular, a 10% increase in the minimum wage leads to a 2% rise in employment. However, there may be a tendency for the minimum wage to increase in some counties due to an improvement in local-area employment conditions. Ignoring this tendency could lead to spurious findings of positive employment effects.

Understanding findings of positive employment effects of the minimum wage requires models with market imperfections, which suggest that employment effects may depend on the group of workers affected and on the specifics of particular labor markets. Using personnel data from a large U.S. retail firm, *Laura Giuliano* (UC Berkeley) exploited geographic variation in initial wage levels to estimate the employment effects of the 1996 federal minimum wage increase, focusing on the differential effects for teenagers and adults. Increases in average wages had negative effects on the full-time equivalent level of employment. However, in stores where the legislation led to larger increases in the relative wages of teenagers, there was a relative increase in the rate at which teenagers were employed. The explanation is that to the extent that the legislation increased the wages of all employees without compressing their distribution, there is a negative effect on the overall employment of both teenagers and adults. But to the extent that the legislation increased the relative wages of teenagers, it significantly increased the level of teenage employment, and thus the level of overall employment. The results show the importance of distinguishing between subgroups of low-wage workers.

Joseph Sabia (American University) investigated the employment effects of the 2004-2006 New York State minimum wage

increase and uses these estimates to simulate the employment and distributional consequences of a newly proposed state minimum wage hike. His estimates show that the last state minimum wage hike from $5.15 to $6.75 per hour reduced employment among 16 to 29-year-olds without a high school diploma by approximately 26 percent. Based on these estimates, he estimates that just 20 percent of the benefits due to a newly proposed state minimum wage hike from $7.15 to $8.25 will be received by workers in poor households.

While economists have vigorously debated the effect of the minimum wage on employment, its contribution to the evolution of earnings inequality is understudied. The second session of the conference considered the relationship between minimum wages, enforcement and inequality. *Mirco Tonin* (University of Southampton) studied the interaction between the minimum wage and underreporting of earnings by employed labor. The basic idea is that the minimum wage constrains the choice of the wage to be reported. An introduction of a minimum wage will induce those who underreport to choose either to report zero or to report the minimum wage. Tonin finds that the minimum wage hike increases reported income but reduces net income, because workers who used to underreport and pay less taxes have to pay more taxes after the introduction of the minimum wage while their earnings remain the same. Using food consumption data, the author finds that those who were affected by the introduction of the minimum wage in Hungary experienced a drop in food consumption even if their gross reported income increased due to the minimum wage. These findings suggest that the minimum wage has implications for fiscal enforcement. If underreporting is high, then fiscal revenues can increase with the minimum wage. The paper thus emphasizes that the employment effects of the minimum wage may differ depending on the degree of informality.

Christopher Smith (Federal Reserve Board) investigated the role of the minimum wage in the evolution of the wage inequality in the U.S. over 1979 to 2007. The main question raised in the paper is to what extent the real minimum wage decline can explain the increase in wage inequality that was observed since the 1980s. Previous evidence suggests that most of the increase in low wage inequality was due to the decrease in the real minimum wage. Taking into account possible sources of bias, the authors suggest that while the minimum wage explains a substantial fraction of growth of lower-tail inequality in the 1980s, previous analyses have overestimated this effect.

The growth of informal employment around the world has been a concern of many economists and policy makers. In the context of developing countries, there are arguments that the rise in informality is the result of the high labor costs and rigid labor legislation – for instance in the form of enforced high minimum wages that decrease formal sector demand. *Katherine Terrell* (University of Michigan) analyzed the joint effects of minimum wage legislation and its enforcement on the labor market in Brazil, estimating the effect of changes in the minimum wage at the federal and state level on wages and flow out of formal jobs to other labor market states. The findings suggest a positive effect of an increase in the minimum wage on wages, which is larger for the less educated. Changes in the state minimum wages have a smaller effect on wages than changes in the federal minimum wage. The authors also find that an increase of the minimum wage increases the probability of formal workers to become informal workers and self-employed. On the other hand, an increase in the minimum wage reduces the probability to become unemployed or exit the labor force and reduces hiring in the formal sector.

The third session of the conference focused on the design of optimal minimum wage policies in the presence of taxation. *Emmanuel Saez* (UC Berkeley) examined the conditions under which the government should use the minimum wage for redistributive purposes in a competitive labor market in the presence of taxes. With a minimum wage there is a transfer from high-skilled to low-skilled workers, but also an efficiency loss since some workers become unemployed. The theoretical analysis finds that a minimum wage is desirable if the government values redistribution towards low-wage workers and the associated unemployment is efficient. Another result is that there is a reform that can improve everyone's welfare: reducing the minimum wage while keeping consumption constant creates a welfare improvement. This can be achieved by cutting taxes on low-skilled work when decreasing the minimum wage. The reduced revenues can be recouped by taxing more high-skilled workers, keeping their consumption constant thanks to an increase in overall production due to the increase in unskilled employment.

A popular justification of the minimum wage is that it strengthens the hand of the low-skilled workers who are exploited by monopsonistic employers. In the standard case of monopsony with a single skill, wages and employment are lower than in the competitive equilibrium. Therefore, imposing a minimum wage can bring back the market to the competitive solution where wages are equal to productivity. *Guy Laroque* (CREST-INSEE) investigated whether the minimum wage is still a useful instrument in the presence of nonlinear income taxes and heterogenous skills. The main finding is that monopsony power in the labor markets is not a justification for the minimum wage. In particular, the authors demonstrate that it is preferable to tax profits and subsidize employment than to impose a minimum wage when labor markets are monopsonistic.

The focus of the fourth session was on the macroeconomic effects of the minimum wage. *Christopher Flinn* (NYU) looked at the impact of a binding minimum wage on labor market outcomes and welfare distributions. In a matching model with search frictions and on-the-job search, minimum wages may "bind" in different ways depending on the nature of the worker-firm bargaining problem. His findings suggest that in a model that allowed for "bidding wars" between firms, minimum wages may bind at relatively high match values. The reason is that high match values, particularly when the individual is coming from the unemployment state, may have high value in terms of the future bargaining advantages they convey over the course of the current employment spell. To "pay" for this advantage, workers obtain a lower wage rate. Hence, over a certain range, minimum wages may merely impact the degree to which firms can charge employees for the bargaining advantage associated with the match value.

Tito Boeri emphasized that there are various ways to determine the minimum wage. Minimum wages can be set unilaterally by the government, they could be the outcome of collective bargaining, or occur in a case in which government are fixing the minimum wage in consultation with unions and employers. He analyzed to what extent these regimes can contribute to explaining the cross-country heterogeneity in the minimum wage levels, and whether the different regimes are associated with different responsiveness of the minimum wage to exogenous changes in the product and labor market conditions. In particular, he showed that countries with bargaining processes set higher minimum wages than those in which the government sets the minimum wage.

In the last session of the conference, *Leif Danziger* (Ben Gurion University) considered the role of enforcement in the analysis of the introduction of the minimum wage. His analysis is an inquiry into what happens on the black market when there is a mini-

mum wage and transactions take place below the minimum wage due to imperfect enforcement. The main finding of the paper is that an introduction of a minimum wage in a competitive labor market will lead small firms to endogenously become monopsonist due to imperfect enforcement of the minimum wage. The minimum wage, therefore, has the perverse effect of reducing both the employment in small firms as well as reducing what these firms will offer to their workers.

Stephen Machin investigated the effect of the minimum wage on profitability. The aim is to shed some light on the puzzling findings of no employment effect of the introduction of the minimum wage in some countries like the UK. One concern and argument voiced by many opponents of the minimum wage, especially among business, is that the minimum wage might affect profits, thus introducing a transfer from owners of capital to low-wage workers. Indeed, using the introduction of the minimum wage to the UK labor market in 1999 as a quasi-experiment, the findings suggest an increase in wages and a decrease in profits after the introduction of the minimum wage.

Policy Discussion on the Consequences of the Minimum Wage: The Case of Germany and the International Perspective

Part I: The Minimum Wage in Germany

In the first part of the policy discussion, which was chaired by Klaus F. Zimmermann, two papers were presented with an ex-ante analysis of the introduction of the minimum wage in Germany. Both papers go beyond employment effects and consider the fiscal and distributional effects of introducing a minimum wage.

Thomas Bauer (RWI Essen) investigated the potential fiscal effects of the introduction of a minimum wage in Germany, and how German wages would actually be affected by the introduction of different minimum wage rates. His findings suggest that the introduction of a minimum wage at a rate of 7.50 euros per hour will affect especially low-skilled part-time and marginal workers. In total, about 12 percent of full time workers, or 5 million workers, may be affected. In addition, a minimum wage of 7.50 euros per hour will result in substantial wage compression, but is expected to reduce employment by 860,000 workers – particularly among the low skilled. The fiscal burden is estimated to be about 12 billion euros due to the employment changes and the increasing cost of unemployment insurance.

Victor Steiner (DIW Berlin) found that due to social security the introduction of the minimum wage in Germany would have very little effect on the income of poor people as the implicit minimum wage for most groups is already higher than the suggested 7.50 euros per hour. About 10% of people would be affected, which are concentrated among the 1st decile of the wage distribution. In addition, the wage bill would increase by roughly a half billion euros a month (less than 0.5 percent of the wage sum). Only about 20% of the increase in the wage bill would be translated into a higher household income. These effects are reduced if the labor demand and price effects are taken into account.

In sum, both studies show that an introduction of a minimum wage in Germany will lead to wage compression at the bottom affecting marginal jobs and small firms. Although there will be less expenditure for in-work benefits, much higher expenditures are expected for unemployment insurance and active labor market policies. According to these studies, an introduction of the minimum wage in Germany would not reduce poverty.

Part II: Panel Discussion

In the panel discussion, Pierre Cahuc asked the researchers from the U.S., the UK and Italy to briefly explain how the minimum wage works in their country; what needs to be improved, and whether they think a minimum wage is feasible in the German case.

David Neumark commented on the U.S., where the minimum wage is legislated mainly at the federal level, with some state supplementary minimum wages. The consensus regarding the employment effects is that the minimum wage lowers employment, but not to a large extent: A 10% increase in the minimum wage reduces employment of the low-skilled by about 1.5%. Interestingly, the U.S. minimum wage has not helped poor families – it might even have hurt them. This is due to the fact that low-wage work and being in a poor family are weakly related. While most benefits go to families that are further up in the wage distribution, poor families have been hurt more in terms of employment. In Germany, the strong employment protection legislation (EPL) may weaken the disemployment effect. However, the distributional effects are difficult to predict because, unlike in the U.S., the minimum wage would not mainly affect young workers in Germany.

Stephen Machin commented on the case of the UK, which introduced a national minimum wage in April 1999 at the rate of 3.6 British pounds per hour with some variation for young worker. The rate has increased to 5.73 pounds per hour since then. He emphasized that many predictions of the potential effects had overestimated the share of workers that would be affected. Based on a number of studies, the British minimum wage seems to have no employment effects, while it has narrowed the wage distribution at the bottom despite increasing wage inequality. Overall, the minimum wage is not well suited for overall income distribution but can be beneficial for those in work. He stressed that the challenge for the UK is to fine-tune the minimum wage in the wake of the financial crisis. Machin also pointed out that the German debate is very different because of the more generous welfare system and stronger unions in Germany.

Tito Boeri commented on Italy, which, similar to Germany, has no national minimum wage but collective bargaining at the industry level that applies de facto to all workers. In Italy low pay is an issue due to the high prevalence of temporary contracts that pay 5 euros per hour. About 15% of workers could be affected by a minimum wage. Boeri suggested that collective bargaining be decoupled from the minimum wage setting because of long delays. He argued that a national minimum wage would in fact help the collective bargaining system. Regarding Germany, Boeri suggested that the discussion should focus on the right level of a minimum wage and how to integrate it into the welfare system. He also stressed that due to regional differences in cost of living, it may make sense to allow for regional variation in the minimum wage level.

Günther Horzetzky, the first representative of the policy side on the panel, stated that it is important to debate the principle and not the level of the minimum wage. The major issue, in his view, is how to ensure decent pay while at the same time avoiding dependence on government benefits for low-paid workers. Installing a national minimum wage to reduce unfair pay is the government's responsibility since collective bargaining does not work in this respect, Horzetzky said.

Reinhard Dombre agreed that decent pay cannot be achieved without a minimum wage because collective bargaining has failed. He favors a national minimum wage of 7.50 euros per hour, which would not be very high compared to the other European countries.

Heinrich Kolb criticized the proponents of the minimum wage for dismissing the idea to reduce unemployment by offering low-paid jobs through flexible work arrangements. He sees the achievements of past activation efforts at risk. Over the long term, wages must correspond to productivity, he said. Minimum wage would then exclude low-productivity workers from the labor market. With rigid employment protection, an introduction of the minimum wage would threaten the survival of firms who are not allowed to fire workers they cannot afford to pay. In addition, a minimum wage would distort competition by impeding start-ups, who often have to pay lower wages at the beginning. The goal should be a minimum income rather than a minimum wage, argued Kolb.

The presented papers provide a good overview of the current state of minimum wage research. They are downloadable at:
▶ www.iza.org/link/minimumwage

Automatic Stabilizers and Economic Crisis: United States vs. Europe

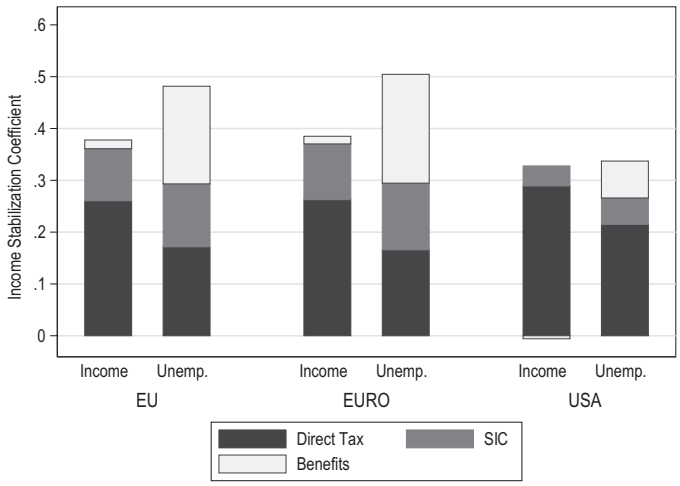
In the current economic crisis, fiscal policy is widely seen to play a key role in stabilizing demand and output. A large part of the debate on the fiscal policy response to the crisis has focused on discretionary fiscal policy action in the form of fiscal stimulus packages. But there is a second source of fiscal expansion in an economic crisis: the workings of automatic stabilizers. Automatic stabilizers are usually defined as those elements of fiscal policy which mitigate output fluctuations without discretionary government action. Some observers have argued that automatic stabilizers may provide a contribution to demand stabilization which is as important as active fiscal policy measures.

In a recent IZA Discussion Paper, *Mathias Dolls*, *Clemens Fuest* and *Andreas Peichl* assess the contribution of automatic stabilizers to overall fiscal expansion and demand stabilization and compare automatic fiscal stabilizers in Europe and the U.S. The extent to which automatic stabilizers mitigate the impact of income shocks on household demand essentially depends on two factors. Firstly, the tax and transfer system determines the way in which a given shock to gross income translates into a change in disposable income. For instance, in the presence of a proportional income tax with a tax rate of 40 percent, a shock on gross income of one hundred Euros leads to a decline in disposable income of 60 Euros. In this case, the tax absorbs 40 percent of the shock to gross income. A progressive tax, in turn, would have a stronger stabilizing effect. The second factor is the link between current disposable income and current demand for goods and services. If the income shock is perceived as transitory and current demand depends on some concept of permanent income, and if households can borrow, their demand will not change. In this case, the impact of automatic stabilizers on current demand would be equal to zero. Things are different, though, if households are liquidity constrained. In this case, their current expenditures do depend on disposable income so that automatic stabilizers play a role.

The authors of the study analyze the impact of automatic stabilizers using microsimulation models for 19 European countries (EUROMOD) and the U.S. (TAXSIM). In their baseline simulation, they only take into account personal income taxes (at all government levels), social insurance contributions as well as payroll taxes paid by employees, and transfers to private households, such as unemployment benefits. They consider the tax benefit rules which were in force before the start of the crisis (January 2008). As a measure of automatic stabilization, they use the normalized tax change. This indicator relates the shock absorption by the tax and transfer system to the overall size of the income shock. In the example given above, the normalized tax change would be equal to 0.4, which means that the automatic stabilizers of the tax and transfer system would absorb 40 percent of the shock to gross income.

The study draws on several controlled experiments of macro shocks to income and employment. The focus is on two types of shocks. The first is a proportional decline in household gross income by five percent (income shock). This is the usual way of modeling shocks in simulation studies analyzing automatic stabilizers. But economic downturns typically affect households asymmetrically, with some households losing their jobs and suffering a sharp decline in income and other households being much less affected, as wages are usually rigid in the short term. The analysis therefore considers a second macro shock where some households become unemployed, so that the unemployment rate increases by five percentage points (unemployment shock). After identifying the effects of these shocks on disposable income, the prevalence of credit constraints among households is estimated. On this basis, the authors calculate how the stabilization of disposable income translates into demand stabilization.

Decomposition of stabilization coefficient

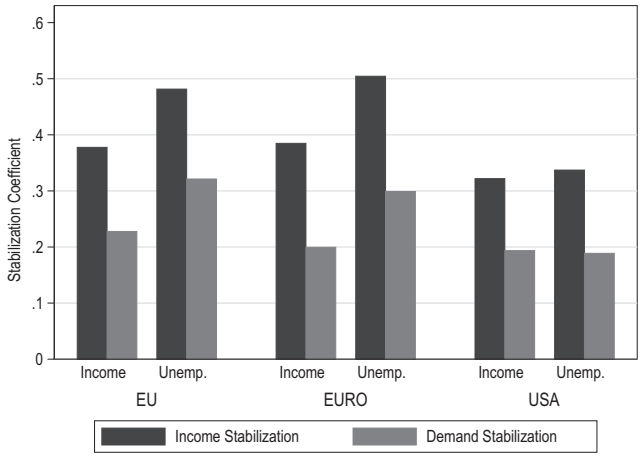


Source: Own calculations based on EUROMOD and TAXSIM

What does the paper contribute to the literature?

Firstly, previous studies have focused on proportional income shocks whereas the IZA Discussion Paper shows that automatic stabilizers work very differently in the case of unemployment shocks, which affect households asymmetrically.

Stabilization coefficient with and without liquidity constraints



Source: Own calculations based on EUROMOD and TAXSIM

Secondly, this study is probably the first to estimate the prevalence of liquidity constraints for EU household data. This is of key importance for assessing the role of automatic stabilizers for demand smoothing. Thirdly, the analysis includes a decomposition of the overall stabilization effects into the contributions of taxes, social insurance contributions and benefits. It can be shown that this decomposition is important for the comparison between the U.S. and Europe. Finally, unemployment benefits and state level income taxes are taken into account. This explains why the estimates of automatic stabilization effects in the U.S. are higher than in previous studies.

Among the main results is that approximately 38 percent of an income shock would be absorbed by automatic stabilizers in the EU. For the U.S., the value is about 32 percent. This is surprising because automatic stabilizers in Europe are usually perceived to be drastically higher than in the U.S. The authors qualify this view to some extent, at least as far as proportional shocks on household income are concerned. Within the EU, there is considerable heterogeneity, and results range from a value of 25 percent for Estonia to 59 percent for Denmark. In general, automatic stabilizers in Eastern and Southern European countries are considerably lower than in Continental and Northern European countries. In the case of the unemployment shock, the difference between the EU and the U.S. is larger. EU automatic stabilizers absorb 48 percent of the shock whereas the stabilization effect in the U.S. is only 34 percent. Again, there is considerable heterogeneity within the EU.

How does this cushioning of shocks translate into demand stabilization? Since demand stabilization can only be achieved for liquidity constrained households, the picture changes significantly. For the income shock, the cushioning effect of automatic stabilizers is now equal to 23 percent in the EU. For the U.S., the value is around 19 percent, which is again rather similar. For the unemployment shock, however, a large difference can be found. In the EU, the stabilization effect is equal to 32 percent whereas the value for the U.S. (19 percent) is similar to the value for the income shock. These results suggest that social transfers, in particular the rather generous systems of unemployment insurance in Europe, play a key role for demand stabilization and explain an important part of the difference in automatic stabilizers between Europe and the U.S.

Does this mean that the U.S. economy is particularly vulnerable to the current economic crisis?

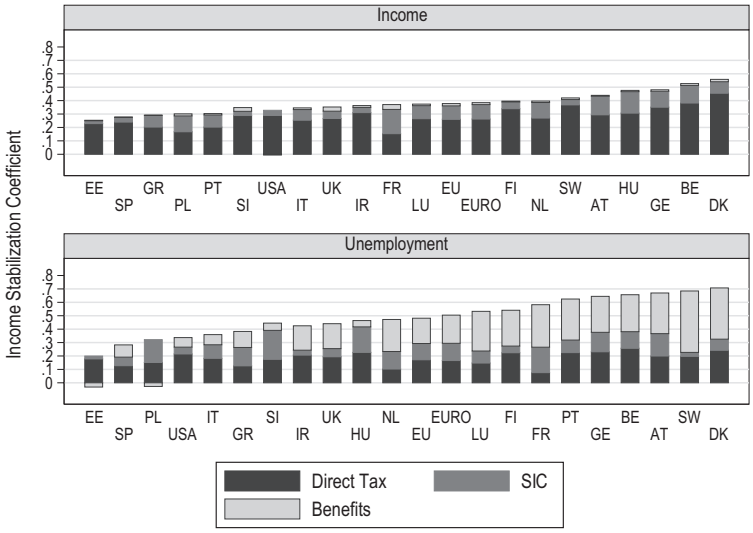
To the extent that U.S. wages are more flexible than in Europe, one could hope that fewer jobs will be lost in the crisis, so that the proportional income scenario is more relevant. But U.S. labor markets are also characterized by less employment protection, so that job losses occur more quickly. For instance, between April 2008 and April 2009, the U.S. unemployment rate increased by 3.9 percentage points while the unemployment rate in the Euro area only increased by less than two percentage points. There is much less automatic stabilization of disposable incomes as well as household consumption demand than in Europe.

A second major result from the analysis is that demand stabilization differs considerably from disposable income stabilization. This has important policy implications, also for discretionary fiscal policy. As low income households are more likely to be liquidity constrained and have a higher propensity of spending an income increase, policies aimed at those households should lead to higher stabilizing effects. If liquidity constraints are low, reducing tax rates in order to tackle the crisis will not be successful in increasing aggregate demand. In this case, increasing government expenditure might me a more successful way of tackling the crisis.

A third important result is that automatic stabilizers are very heterogenous within Europe. Interestingly, Eastern and Southern European countries are characterized by rather low automatic stabilizers. This is surprising, at least from an insurance point of view, because lower average income (and wealth) implies that households are more vulnerable to income shocks. One explanation for this finding could be that countries with lower per capita incomes tend to have smaller public sectors. From this perspective, weaker automatic stabilizers in Eastern and Southern European countries are a potentially unintended side effect of the lower demand for government activity including redistribution. Another potential explanation, the idea that more open economies have weaker automatic stabilizers because domestic demand spills over to other countries, seems to be inconsistent with the data, at least as far as the simple correlation between stabilization coefficients and trade to GDP ratios is concerned.

Finally, the paper discusses the claim that countries with smaller automatic stabilizers have engaged in more discretionary fiscal policy action. According to the results, there is no correlation between fiscal stimulus programs of individual countries and stabilization coefficients.

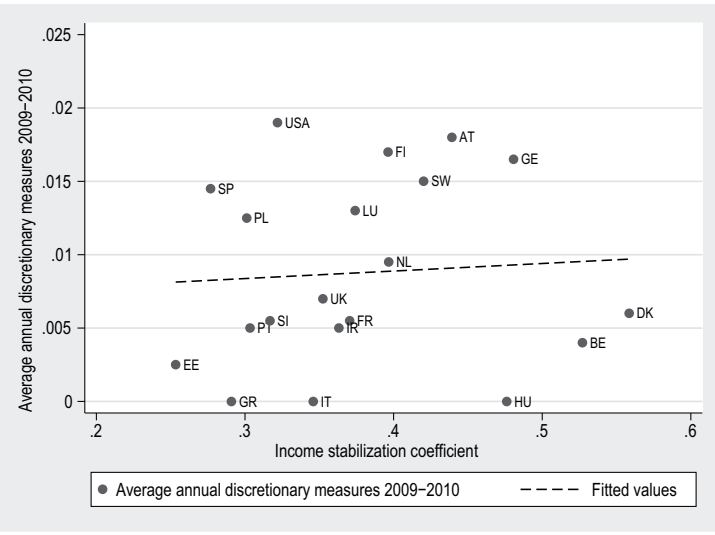
Decomposition of income stabilization coefficient for different countries



Source: Own calculations based on EUROMOD and TAXSIM

These results have to be interpreted in the light of various limitations of the analysis. Firstly, the role of tax and transfer systems for stabilizing household demand, not just disposable income, is based on strong assumptions on the link between disposable income and household expenditures. Although the authors have used what they believe to be the best available method for estimating liquidity constraints, considerable uncertainty remains as to whether this method leads to an appropriate description of household behavior. Secondly, their analysis abstracts from automatic stabilization through other taxes, in particular consumption taxes, employer social insurance contributions and payroll taxes and corporate income taxes. Thirdly, they have abstracted from the role of labor supply adjustments for the impact of automatic stabilizers. These issues will be pursued in future research.

Discretionary measures and income stabilization coefficient



Source: Own calculations based on EUROMOD and TAXSIM

Mathias Dolls
Clemens Fuest
Andreas Peichl
Automatic Stabilizers and Economic Crisis: US vs. Europe
IZA Discussion Paper No. 4310

Do Smaller Households Increase Income Inequality?

IZA Study Analyzes the Effect of Changing Household Structure on Income Distribution

Income inequality in Germany has increased dramatically over the past two decades. But to what extent can this growing income gap be explained by the fact that Germans tend to live in smaller households? IZA researchers *Andreas Peichl*, *Nico Pestel* and *Hilmar Schneider* have dealt with this question in two German-language research and policy papers on "demography and inequality" (IZA Discussion Paper No. 4197 and IZA Standpunkte No. 18, September 2009). They concluded that the demographic trend towards a smaller average household size has contributed substantially to the increase in income inequality.

Smaller households on the rise

For many years, the number of persons living together in German households has dropped sharply. Just behind Sweden, Germany has the second-lowest average household size among OECD member countries: In 2005 the average household size was recorded at 2.1 individuals, with less than two in eastern Germany. The main cause is a massive increase in single and two-person households. The prevalence of two-person households is due to the growing number of childless couples and a higher average life expectancy, which has led to an increase in the number of elderly couples living together. Single households have become increasingly common as a result of higher divorce and lower marriage rates.

Effects on income distribution

But what is the relationship between household size and income inequality? Economic welfare is usually seen as an individual experience. Therefore, it seems natural that an analysis of income distribution should compare individual disposable income. Most analyses, however, use equivalence incomes, which account for the size and age composition of households. This is because comparing individual income alone would ignore the fact that dependent persons with no income of their own, such as non-working spouses or children, also take part in consumption. In other words, some individuals would be classified as "poor" although they might live in an affluent household. In fact, people share their income with other household members.

Measuring household income per capita, on the other hand, would fail to take into account the economies of scale of living together, i.e. the falling average fixed costs for larger households. Consequently, the individual welfare of people with the same income level depends on whether they live alone or with someone else. Cohabitation lowers individual fixed costs and thus increases individual welfare. Equivalence-weighted income data therefore enables empirical researchers to compare individual income independent of household size. The equivalence-weighted income of an individual in a multi-person household informs about how much monetary income someone living in a single household would need to make in order to enjoy the same level of welfare. This is usually achieved by dividing total household income by the sum of the equivalence weights, which depends on the number of household members and other characteristics such as age. Thus, changes in the household structure naturally have an impact on the distribution of income. However, the sign of this demographic effect on income distribution is less than clear from the beginning.

The substantially decreasing birth rate, for instance, means that more and more couples choose to live together without having children. Consequently, their equivalence-weighted income is higher than it would be at a higher birth rate. According to the German microcensus, the number of live births dropped from 830,019 in 1991 to 685,795 in 2005 – a 17.4% decrease. Over the past five decades the birth rate went down almost 50% after it peaked at 1,357,304 in 1964.

The growing incidence of single households, on the other hand, leads to more individuals with smaller equivalence-weighted incomes because there are fewer persons who share the fixed costs of running a household. That is why a declining average household size has ambiguous effects on the distribution of income. The net effect depends on whether the affected population groups tend to have incomes above or below the national average.

Analysis of SOEP data

Against the background of a significant trend towards smaller households, the IZA study extends the literature on inequality decomposition by population subgroups. On the basis of data from the German Socio-economic Panel (SOEP), the authors analyze the impact of the demographic development in Germany on measured income inequality. The results of this decomposition analysis show to what extent this demographic trend has widened or narrowed the income gap.

The study finds that the increase in German income inequality in recent years was driven mainly by growing inequality within population subgroups. Between-group inequality has also played a role. In other words, income inequality would have increased even in the absence of the trend towards smaller households, but to a much smaller extent. The demographic development has thus reinforced the increase in income inequality. The reason is that population groups with high income inequality have grown due to the decrease in household size.

Differences before and after taxes

The IZA calculations also show that demographic factors play a larger role for income inequality before than after taxes and transfers. Apparently, a large share of the inequality caused by changes in household structure is offset by the tax and transfer system. However, it is also conceivable that the tax and transfer system may have provided incentives to lower the household size. Conclusions regarding the distribution of income therefore need to be differentiated. Appropriate measures to fight income inequality always depend on the causes. This is why it is important to analyze the development and the determinants of income inequality separately.

Way of living affects individual welfare

The authors of the IZA study were able to show that individual welfare is also affected by people's way of living, particularly the size of their households. Obviously, many Germans who live in single or two-person households could raise their welfare by sharing their cost of living with others. But since single households have become more common, a growing number of people must generate a higher income in order to enjoy the same standard of living that others can achieve by living in multi-person households.

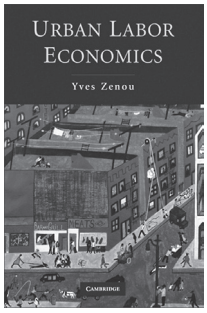
Andreas Peichl
Nico Pestel
Hilmar Schneider
Demografie und Ungleichheit: Der Einfluss von Veränderungen der Haushaltsstruktur auf die Einkommensverteilung in Deutschland
IZA Discussion Paper No. 4197

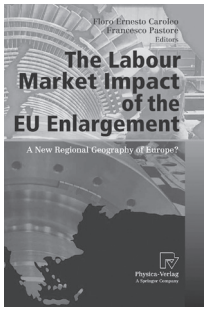
Andreas Peichl
Nico Pestel
Hilmar Schneider
Mehr Ungleichheit durch kleinere Haushalte? Der Einfluss von Veränderungen der Haushaltsstruktur auf die Einkommensverteilung in Deutschland
IZA Standpunkte No. 18

New Books: Urban Labor Economics / Labor Market Impact of EU Enlargement

A new book on "Urban Labor Economics" by IZA Research Fellow *Yves Zenou* (Stockholm University) studies the links between urban and labor economics. Different models of urban labor economic theory are examined in the initial two parts of this book: urban search-matching models and urban efficiency wages. In the third part, these models are applied to analyze urban ghettos and their consequences for ethnic minorities in the labor market. Zenou first provides different mechanisms for the so-called spatial mismatch hypothesis, which postulates that housing discrimination introduces a key frictional factor that prevents minorities from improving access to job opportunities by relocating their residences closer to jobs. He then explores social networks, which tend to be affected by spatial factors, as workers who are physically close to jobs can be socially far away from them. Based on these models, the author offers different policies aiming at fighting high unemployment rates experienced by ethnic minorities residing in segregated areas.

Yves Zenou
Urban Labor Economics
Cambridge 2009 (ISBN-13: 9780521698221)





IZA Fellows *Floro Ernesto Caroleo* (University of Naples 'Parthenope') and *Francesco Pastore* (University of Naples II) have edited a volume on "The Labour Market Impact of the EU Enlargement: A New Regional Geography of Europe?" Until recently, regional labor market imbalances were considered transitory phenomena caused by state failure in yielding distorted investment incentives and by labor market rigidities. Labor mobility and wage flexibility were at the core of the debate over the causes of and cures for regional imbalances. The book contributes to the debate by presenting important new findings on: a) the reasons why structural change in some sectors causes a slump in some regions; b) the extent to which poverty traps explain spatial imbalances; c) the degree of convergence across EU countries and regions; d) the role of labor mobility in Central and Eastern Europe; e) and the role of pro-active employment schemes and child care facilities in alleviating the hardship of the weakest segments of the population.

Floro Ernesto Caroleo/Francesco Pastore
The Labour Market Impact of the EU Enlargement
Berlin, New York 2009 (ISBN 978-3-7908-2163-5)

Selected **IZA Workshops** and **Conferences** in 2010:
(Complete calls for papers are available at www.iza.org)

May 14–15, 2010	IZA/Central Bank of Colombia Workshop: Employment and Development in Latin America	Deadline: Dec. 15, 2009
May 15–21, 2010	13th IZA European Summer School in Labor Economics	Deadline: Jan. 29, 2010
May 27–30, 2010	9th IZA/SOLE Transatlantic Meeting of Labor Economists	Deadline: Jan. 18, 2010
June 2–6, 2010	7th IZA Annual Migration Meeting (AM²) and 3rd IZA Migration Topic Week	Deadline: Jan. 03, 2010
July 30–31, 2010	IZA Workshop: Legal and Illicit Immigration: Theory, Empirics and Policy	Deadline: Jan. 15, 2010

President of German Taxpayers' Association: "Lower Taxes to Fight the Crisis"

At the 21th IZA Tower Talk, *Karl-Heinz Däke* (President of the German Taxpayers' Association) called for a modernization of German tax law, particularly in view of the current economic crisis. He dismissed the argument that a reform should be postponed because tax revenues already go down as a result of the crisis. These forgone revenues are not losses, he explained, but merely deviations from estimates made before the recession. In fact, Germany's total tax revenue in 2009 will still exceed the 2005 level by 70 billion euros. Däke therefore underscored his association's call for additional tax breaks for individuals and enterprises: "Tax reductions can be an important asset in fighting the financial crisis."

Karl-Heinz Däke

The federal government's economic stimulus package was met with skepticism by Däke. While he viewed government intervention as inevitable, he criticized the subsidization of selected industries and the allocation of funds in many cases in which too little emphasis was placed on sustainability. In particular, medium-sized businesses largely missed out on the stimulus plan although they are the "key players" in the German economy.

IZA Tower Talk with Edward Lazear: "Domino and Popcorn" in the Economic Crisis

On June 3, 2009, the 22nd IZA Tower talk was dedicated to the ongoing economic crisis. *Edward P. Lazear* (Stanford University), former Chairman of the U.S. Council of Economic Advisers under President Bush, delivered a first-hand account of the political debates and decision-making processes inside the U.S. government in the early days of the global crisis.

Lazear described the enormous pressure under which the former – as well as the current – U.S. administration had to contemplate different courses of action when it was clear that the domestic crisis would soon spread to economies around the world. He believed that the European economies have not yet reached the bottom of the recession. While a trend reversal is already on the horizon in the United States, Europe would eventually follow the same path, yet in a time-lagged fashion.

Edward Lazear and Hilmar Schneider

As to the primary cause of the crisis, Lazear explained that excessive subprime lending in the U.S. market promoted an irresponsible attitude towards money and the creation of highly speculative financial products. The bubble was aggravated by capital flows from less developed countries into the United States. This sent the wrong signal to market agents who, despite early warnings by the U.S. administration, pursued imprudent or too risky investments. In retrospect, the partial collapse of the U.S. real estate market and the banking sector was only a question of time, said Lazear. But the ferocity and velocity of this breakdown had been underestimated by most experts for lack of historical precedent.

In a rather self-critical manner, Lazear admitted that his own initial assumptions had also turned out wrong. The idea behind the U.S. government intervention to rescue the first collapsing banks was to prevent a domino effect. In reality, however, the crisis did not unfold like falling dominoes. Lazear compared it to "popcorn in an overheated pan – you can remove the popped corn, but the rest will still pop." Instead, the former economic adviser said the U.S. government should have taken the heat from the pan by pumping money into the market. This mistake was not corrected until half a year later, in September 2008, when Wall Street had already gone up in the air like exploding popcorn. On the "verge of a Great Depression," it was only the courageous recapitalization programs for the ailing banks that prevented matters from getting worse. Ultimately, in a historically unique situation, the government policy was marked by "responsibility and success," said Lazear. The Obama Administration, as well as the Europeans, can now build upon this foundation and benefit from the action taken by the previous administration.

The Stanford economist also warned against protectionist tendencies that seem to resurface in the global economies. He claimed that free trade is an important prerequisite for a quick resolution of the current crisis. Likewise, governments should not give in to the increasingly popular calls for a return to state regulation. The current programs must expire once the economies have recovered. According to Lazear, it was not at all a lack of regulation that led to the crisis since the banking sector is comparably well-regulated. Lazear agreed with *Hilmar Schneider*, IZA Director of Labor Market Policy, that the crisis is a result of collective failure, also on the part of the political entities that control the banking sector.

The U.S. recession would end in the second half of 2009, according to Lazear's prediction. Germany and Europe, however, should be prepared to wait another year. The crisis will not "end the American era," said the economic expert. On the contrary, foreign investment in the U.S. is on the rise again, which Lazear saw as evidence that "people are still convinced that the United States is the best place to invest."

» Opinion

Germany's New Labor Market Miracle

Klaus F. Zimmermann

The worst global recession in post-war history has understandably raised fears of surging unemployment rates around the world. And indeed, employment has dropped dramatically in many countries. In Germany, as well, many observers started to see dark clouds over the labor market by the end of last year. Most forecasts expected a substantial rise in unemployment in 2009. However, after an increase during the first months, the unemployment rate went down again in the spring.

With the arrival of summer came new forecasts that unemployment would rise substantially – to a rate of over 4 million this year and more than 5 million in 2010. These assessments were largely based on the observation that many firms have an excess workforce, are burdened by enormous business costs, and have introduced short-time work. With long-term stagnation of the German economy on the horizon, this situation cannot continue forever, the argument goes. And once the companies run out of breath, they will sooner or later have to dismiss their excess workers.

Against the background of these predictions, it really seemed like a miracle that the labor market situation has remained calm during the summer and into the fall – although this is precisely what I had predicted in early summer. Another miracle was the fact that the free fall of the economy could be stopped in the second quarter, when first signs of a slight upswing appeared. In the third quarter, Germany's economy has again picked up considerably. The impact of the crisis was therefore much less pronounced than was expected for 2009. The growth outlook for 2010 can be even more optimistic. That the unemployment rate will hit 4 million by the end of the year has become mathematically impossible. It is also most unlikely that unemployment will reach 5 million in 2010, as many had feared. Today's forecasts for 2010 are well below 4.5 million.

But a miracle is only a miracle until the causes are fully explained. Some claim that the stimulus packages have led to the fast recovery. But this ignores that most stimulus programs did not start before mid-2009 and that their real impact will not be felt until 2010, if at all. Short-time work aside, it was only the controversial "cash for clunkers" program that went into force earlier this year. But the limited scope of this program alone could not have caused the swift recovery. Now is the chance to discuss how to channel the public funds into sectors like education and infrastructure, where they would be invested most effectively and sustainably.

The past months have shown that the German labor market is in a strong position even in times of crisis. Political reform, union wage restraint and corporate restructuring have done their share in making this possible. Wage income has fallen behind capital income for a long time now. Moreover, the crisis has particularly hit skilled workers in the export-oriented investment good industries. But employers try to retain highly qualified staff as long as possible – and at almost any cost. Therefore, the short-time work policy is certainly the most effective component of Germany's economic stimulus package.

High employment rates and low energy prices strengthen the economy because they stimulate consumption. In fact, the crisis has not really hit private households in Germany. It has mainly affected corporate profits and investment income. Thus, the crisis essentially served to correct long-term trends in redistribution. Considering that the economies of Germany's most important trading partners have also started to recover, there is reason to hope that the "miracle" will continue.

Institute for the Study of Labor

Editor: Prof. Dr. Klaus F. Zimmermann
Managing Editors: Mark Fallak, Holger Hinte
Address: IZA, P.O. Box 7240, 53072 Bonn, Germany
Phone: +49 (0) 228 - 38 94 223
Fax: +49 (0) 228 - 38 94 180
E-Mail: compact@iza.org
Web: www.iza.org
Graphics/Photographs: IZA
Printing: Güll GmbH, Lindau
Layout: IZA