

**Status of the  
International Wage Flexibility Project  
After the Authors' Conference**

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**2 May, 2003\***

**\*This status report supercedes and updates the previous status report issued in November 2001.**

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## **Status of the International Wage Flexibility Project After the Authors' Conference**

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The International Wage Flexibility Project held a successful authors' meeting at the IZA, in Bonn on 18-19 October 2002. At this second meeting for the project, the authors presented results and made substantial progress toward the development of the final core analysis protocol for the project.

The motivation for the project can be summarized as follows: Most previous analyses of wage rigidity in Europe have relied on macro data. Such studies have been unable to differentiate the effects of real, downward nominal and symmetrical rigidity from each other or from other concepts of rigidity. Different types of wage rigidity pose different problems for policy makers. For example, while higher inflation may overcome downward nominal rigidity, real rigidity cannot be relaxed by inflation, and the costs from symmetrical rigidities (such as menu costs and inertia) and uncertainty may be exacerbated by inflation. It is also likely that these three different types of rigidity have different sources. With micro data we may be able to determine the relative importance of different types of rigidity in countries at different points in time. This may make it possible to identify their causes and consequences.

Before the first meeting, the project organizers identified and recruited team leaders for 13 countries and established protocols for the preliminary assembly and analysis of data on wage changes and description of wage setting institutions. At the organizational meeting, country teams presented descriptions of data and wage setting institutions, and several countries presented preliminary analyses. The discussion led to a rich project plan that augmented replication of the Groshen-Schweitzer "sand and grease" analyses of the effects of inflation with estimation of real wage rigidity and effects of labor market institutions on wage change patterns. The enhanced project includes the following: (1) pictures of individual wage change distributions/rigidities across countries and time; (2) parametric estimates of nominal, and hopefully some forms of real, rigidities; (3) identification of institutional/historical reasons for types of rigidities; (4) analysis of the role of institutions in mediating between rigidities and economic outcomes; and (5) estimates of sand effects in alternative ways perhaps more appropriate to European institutions and data.

The second meeting focussed on the challenges of developing common appropriate protocols for the analysis of wage change distributions. Bill Dickens and Lorenz Goette took the lead in the development of strategies for estimating the extent of nominal and real rigidity, using method of moments and maximum likelihood techniques. The authors applied these estimators to country data. Results of those applications led to further refinement of the approaches. In addition, the meeting discussed the data collected and strategies for conduct of the comparative analysis of the results.

The project will proceed in three phases. Within the next two months, a final econometric protocol with well-defined products will be developed and agreed upon. Authors will submit these core results and preliminary drafts of their papers by October 1, 2003. Project leaders will draw up plans for the cross-country analysis and finalize plans and funding for the project. Between October and the Final Conference (February 2004), project leaders will draft the cross-country analysis while the country teams produce final drafts of country studies. The Final Conference will be a high-profile event bringing in noted economists from around the world to comment on the study. The work will be finalized and published by Brookings Press in late 2004.

**Status of the International Wage Flexibility Project**  
**After the Authors' Conference**  
**18-19 October 2002 at the Institute for the Study of Labor [IZA]**

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### ***Introduction***

This memorandum summarizes the current status of the International Wage Flexibility Project, updating the previous status report, issued in November 2001. We describe what has been done to date, our observations as a result of the recent Authors' Conference, and our plans for the rest of the project.

### ***A. What has been done to date***

#### **1. Leaders and country teams identified and recruited**

The process of identifying and recruiting leaders and authors for the project began two years ago. Erica Groshen was the first leader. Mark Schweitzer, who hoped to co-direct the project, found that this would not be possible. Fortunately, William Dickens joined the effort in spring 2001. For authors, we sought to identify economists with access to longitudinal individual firm data on workers for a variety of countries. Typically, these data are confidential, so access to them is limited. Furthermore, substantial expertise is needed to effectively manipulate these data sets, because of their size (often millions of observations) and complex structure. We used contacts from the Committee for the Analysis of Establishment Data (an informal international network of economists that meets biannually to present papers and discuss issues related to the use of establishment level micro data) and elsewhere to identify and recruit seasoned, well-respected authors for the project. As we learned about possible participants, we sent them a set of data requirements and a project description and asked about their interest in and availability for the project. We focused on European countries and found very keen interest. Few people turned down the opportunity to participate.

Thirteen country teams have been assembled. The current list of countries, participants and affiliations appears in Appendix A. With one exception (the US), all countries are European. Most of the authors have academic affiliations; others work for statistical agencies, research institutes or central banks. Each initial author has gathered a country team by adding one to three (often junior) co-authors to the project. One team (the Netherlands) dropped out of the study after its inception, and one (Sweden) joined in the spring of 2002. We expect that the formation of country teams is now finished, although some shuffling of team membership in a project such as this is normal and likely to continue up to the final conference. The organizational meeting on 22-23 October 2001 included all country teams except Sweden, which had not yet joined, and the Dutch team, which later left the project. All current country teams were represented at the authors' meeting of 18-19 October 2002.

#### **2. Data gathered and described and wage setting processes described**

Once recruited, authors ensured their access to data for the project and began to process and analyze the data for the replication analysis. Organizational meeting attendees were asked to prepare, circulate and discuss data summaries using a common template that the organizers provided.

Review and discussion of the data descriptions illuminated the key ways in which the data varied. Appendix B summarizes key features of the data sets that will be used for each country's core analysis. It has become clear that most of the countries will use more than one data set in order to maximize coverage, to exploit different advantages and be able to address key questions. We have also learned that most of the data have individual observations for workers, which permitted a new dimension to be added to the core analysis.

The authors have prepared brief descriptions (2-5 pages in length) of the actors and their roles in their country's wage-setting process, including the use and importance of any system of negotiated, reference (or mandated minimum) wage changes. The descriptions list the order of steps in the wage-

setting process, and if there is more than one way that wages are set, they describe each major method and tell who is covered by each. Finally, they discuss how and where inflation affects the process, and any evolution in the process over the period under observation.

Presentation of these descriptions played a key role in helping reach consensus on the design of the core analyses and the eventual cross-country analysis. We expect to use these descriptions as the basis for our analysis of the role of institutions in wage rigidity, as described below. In addition, authors are encouraged to incorporate these descriptions into their final papers.

### 3. Communication means established

A restricted, confidential web site for project participants was established by the Federal Reserve Bank of New York to facilitate communication among the participants during all phases of the project. The web site contains project-related documents such as contact lists, relevant reference papers, items for review and comment, reviews and comments on those items, preliminary results of country studies and meta-analysis, other schedules and instructions.

Later, to facilitate e-mail communication, a Yahoo Group for IWFPP participants was formed. This was used for a “virtual” meeting that was held July 3, 2002 to discuss results from an estimation protocol. (Usage of these sites was discussed at the Authors’ Conference. The leaders suggested, and the project participants agreed, that these two vehicles be combined into a unified YahooGroup site in November 2002.)

### 4. Preliminary core analysis performed

- a) **Analysis of variance:** An analysis of variance (ANOVA) of wage changes shows the importance of occupation-wide and employer-wide changes in wages. Comparisons across countries show the effects of different institutions as well as the implications of different data sources. The authors from five countries (France, Denmark, Belgium, US, and Norway) presented ANOVA results. Norway and Denmark’s results looked similar to those in Groshen and Schweitzer. Both occupation and employer wage changes are important components of adjustments in those countries. The data for these two countries include many workers per firm and fine occupational detail. For the other countries, the sampling framework provides many fewer workers per firm. In all three of those cases, variation apparently associated with the firm dominates the ANOVA.
- b) **Pictures:** Histograms of the distribution of individuals’ wage changes for each year were prepared for each country. The impacts of the rigidities imposed by different wage-setting institutions as described by the authors were clearly visible in the presence or absence of particular spikes in the histograms. Appendix D presents some of these figures for the three countries.
- c) **Grease and sand replications:** Following the Groshen and Schweitzer approach, the country teams estimated the effects of inflation on the standard deviations of occupation and employer wage changes. The variety of results obtained suggests that both institutions and data limitations will be important in explaining the differences.
- d) **Other approaches:** Several countries also suggested other ways in which to address the core questions of the project, taking advantage of individual observations. In particular, the Swiss team, drawing on work by Altonji and Devereux (1999), proposed alternative measures of grease and sand that do not rely on the identifying assumption in Groshen and Schweitzer or on detailed occupational data.

### 5. Organizational meeting (22-23 October 2001)

The purpose of this meeting was for the country teams to meet, present wage-setting and data descriptions and agree on the direction for the core analysis. Three things became clear during the meeting:

- a) Occupation categories are very dissimilar across countries, but every country has panel data on individuals. The preliminary ANOVAs presented at the conference demonstrated the sensitivity of the results to the variation in how occupations were defined, and how many workers were observed per employer.

- b) Concerns arose that the strategy used by Groshen and Schweitzer to identify sand and grease effects might not apply to some countries. The problems may be particularly acute in countries with centralized bargaining systems.
- c) Some of the country wage change distributions presented at the meeting showed signs of substantial spikes at the level of inflation—suggesting the presence of *real* downward wage rigidity. This form of rigidity might not be captured in the Groshen-Schweitzer framework, yet wages in those countries are arguably more rigid than those facing downward nominal rigidity. Thus, a strategy that could identify real rigidities as well as nominal rigidities is desirable.

These observations suggested that the original plan of developing international comparisons based on the Groshen-Schweitzer replication could be usefully augmented by an additional methodology that would take advantage of individual data, use a different strategy to identify sand and grease effects, and separately analyze the effects of real and nominal wage rigidity.

## 6. Development and testing of distributional measures of rigidity

Following the Organizational Meeting, Bill Dickens and Lorenz Goette took the lead in the development of estimators that could identify multiple sources of wage rigidity. Initially Dickens and Goette attempted to develop a very elaborate method of simulated moments estimator of a model of wage rigidity. However, it proved impossible to maximize the objective function because McFadden's kernel smoothing method did not make the derivatives smooth enough for them to be useful for estimation and non-derivative methods proved impractical. Dickens, Goette and Schweitzer then began work on a second approach using a multiple-regime-switching-model. After considerable experimentation in several countries it became clear that this method could not produce robust estimates of the extent of rigidity. Schweitzer and Goette are continuing to experiment with alternative estimators.

When it seemed likely that the multiple regime model would not produce robust results, Dickens attempted to develop several simple method-of-moments (MOM) estimators for the extent of real and nominal rigidity. Unlike the full MOM and ML estimators that would have taken measurement error into account, these estimators did not. However, it was hoped that direct use of the distinctive features of wage distributions that indicate the presence of rigidity—particularly, spikes and asymmetry—would yield robust and believable estimates. Authors were asked to bring results of the application of these estimators on their data to the Authors' Conference.

## 7. Session at American Economics Association (January 2003)

We held a very successful session at the January 2003 meetings of the American Economics Association. The session was well attended so a large audience was made aware of the goals and progress of the project. Olivier Blanchard discussed the project and gave it a favorable review. We received some useful feedback on how others view the project and suggestions for additional work.

## ***B. Observations and decisions at the Authors' Conference (18-19 October 2002)***

### 1. Purpose of the Authors' Conference

The overall goal of the conference was to develop the best strategy for the core analysis, while increasing our shared understanding and the overall coherence of the project. During the 2-day informal meeting the authors presented the first results of their country analyses. In addition, the meta-analysis team described their progress and their general approach. Thus, the objectives of the meeting can be listed as follows:

- learn about each other's results
- work toward approach for rigidity/distribution measures for core analysis

- discuss which extensions of the core analysis would be most valuable for particular countries to pursue
- plan meta-analysis of core analyses

With one exception (Portugal, which has recently restructured its team) all teams produced at least one major element of the core analysis. Six grease and sand estimates were complete and all countries presented at least one distributional estimate.

## 2. Methodological issues addressed

### a) Basic question and the central challenge

- Our basic question is as follows: “How do labor market institutions mediate the impact of inflation on the economy?” In particular, we seek to understand the consequences of nominal and real rigidities in the presence of inflation, and the impact that inflation has on efficiency of price signals. From a policy perspective, we would like to understand the effect of a low-inflation environment on the distribution of wage changes, and its implications for unemployment.
- Our central challenge is to design a core analysis protocol to identify wage-setting rigidities that is appropriate to the variety of microdata available and institutional frameworks operating in these thirteen countries in recent decades.

### b) Data definitions to be applied universally by country teams

Recognizing that the data vary from country to country, it is important to try for the most consistency possible among the studies. Thus, we agreed on the following general strategy:

- On wages, produce estimate with the narrowest and most inclusive measures:
  - Narrow: Desired = hourly wage (if not available, get the closest approximation in the data).
  - Inclusive: wage + bonus + fringes + etc. (total compensation).
- On people, produce estimates with prime-age people (men and women) under the narrowest definition of job-stayers, and for everyone.
  - Narrow: stayers--with same employer and same occupation (or the closest you can get).
  - Broadest: everyone possible (to the degree possible with your measure of hourly wage).
- If countries have distinct data sets for different industrial sectors, regions or occupations, and/or with different variables, they should produce estimates for each sample and report results individually.
  - Possibilities include: Different people, collection methods, wage measures, methodology.
  - The meta-analysis will be able to handle these differences.

### c) Wage change distribution core analysis issues

- In the core analysis based on wage change distributions, we sought agreement on the signals that we were taking as evidence of wage rigidity. The main problem is achieving an appropriate diagnostic for real rigidity in its various forms.
  - Downward nominal wage rigidity has two clear signs in a distribution of wage changes: a “spike” at 0% wage changes accompanied by missing mass below 0%. Because it is well-defined, this component of the analysis in which we are most confident, apriori. We expect that, at a minimum, the project will yield comparable parametric estimates of the degree of nominal wage rigidity in European countries.
  - “Real” rigidity (caused by wage norms or bargaining), on the other hand, has more manifestations. In the models estimated for the meeting it was assumed that real rigidity took the same form as nominal rigidity with a floor for wage changes at the rate of inflation or some nationally bargained rate. The multiple-regime-switching-model allowed the estimation of this rate while the simple MOM estimates required the researcher to specify a range in which the real spike fell. Application of these estimators raised the following issues with regard to real wage rigidity:
    - (1) In some countries with strong centralized wage bargains, the “inflation rate” so estimated tracked the bargained wage increases, which sometimes diverge from

inflation, particularly when the parties agreed to use wage restraint as a method to lower inflation.

- (2) Clear spikes at the inflation rate are not present in many countries.
  - (3) In many cases, particularly at low rates of inflation, wage change distributions look very different from a normal distribution. They are strongly peaked, but with thick tails—looking rather like two hyperbolic curves joined at the top. This poses serious problems for the ML estimator which relies on the assumption that the notional wage change distribution is normal.
  - (4) The ML method interprets non-normality, which appears to be present to some degree in all countries, as lots of real rigidity even when it is very likely that no real rigidity is present.
- A plan for how to address these issues
    - Step 1: Experiment with two alternative approaches on the distributional estimators for two more months—until end of June 2003. Send around the programs and results and try to build a consensus.
      - (1) Approach #1: A two stage process can be used to create a number of estimates of rigidity. First, a just identified method of moments estimator of the true underlying wage distribution can be constructed to remove measurement error from the data. Then a number of estimates of rigidity can be constructed from the estimated distribution.
      - (2) Approach #2: Work with ML estimator to solve the robustness problems
        - Using external sources and/or putting more structure in (i.e., more info on individuals for notional wage distribution)
        - Contrast the right and left sides of distribution to identify rigidity
    - Step 2: In mid June, those who have been involved in developing the various methodologies can consult by e-mail (and at a Norwegian central bank conference that several project team members will be attending) to decide on a core method.

#### d) Grease and sand core analysis issues

- The central question here remains the correct interpretation of employer and occupation wage changes in the context of particular countries' the wage-setting institutions. In particular, is the interpretation of firm-wide wage movements as unintentional noise or "sand" appropriate? When would this confusion happen?
  - If companies are constrained from adjusting the wages for individual workers or occupations relative to others (or if workers are not mobile) they may need to adjust the wages of all of their workers in tandem in order to adjust to a shock that would otherwise affect only one occupation or skill group.
  - However, for this effect to be confused with "sand," pressure for firms to adjust their relative wages must be positively correlated with inflation. This could occur if central bank routinely accommodated supply shocks with higher inflation. Otherwise, this confusion should not arise.
- Resolution: Grease and sand extensions to investigate how much the increase in employer wage change dispersion is sand—rather than more grease. If the result of these probes support the identification strategy, the meta-analysis can more confidently replicate the grease and sand approach used by Groshen and Schweitzer. If not, the focus will turn to describing and understanding the nature and impact of these rigidities without labeling them definitely as grease or sand.
  - Probe the employer wage change distributions for evidence of sand vs. grease: Is the increase in dispersion asymmetrical? The sand effect is expected to be more symmetrical than the grease effect because menu costs and uncertainty should be symmetric.
  - Compare the employer results for expected versus unexpected inflation, using central bank forecasts of inflation for expected inflation. Sand effects should be stronger for unexpected inflation.
  - Examine behavior of shrinking firms (those in distress) as compared with growing firms. Do shrinking firms show more variance—then relative wage changes may be intentional.

### e) Meta-analysis issues

- The goals of the meta-analysis are as follows:
  - Summarize core analysis findings across countries, time spans and data types
  - Associate rigidity outcomes with labor market institutions
  - Associate macroeconomic outcomes with rigidity measures
- A description of the data for the meta-analysis was presented by Julian Messina, Jarkko Turunen and Melanie Ward. These data fall into three basic classes:
  - Institutional data (wage-setting and labor market characteristics—particularly those that vary among countries and over time—see Appendix C for a description)
  - Macroeconomic conditions (inflation, growth, unemployment, productivity, etc.)
  - Data and sample characteristics
- The issues raised were as follows:
  - Will we have enough degrees of freedom to handle the different institutional, macroeconomic and data source variables?
  - We need to formulate specific econometric hypotheses.
  - We may need to use instrumental variables to deal with endogeneity.
  - We will need a weighting scheme for the observations.
- Resolutions:
  - Take advantage of the variety of data sets (where they exist) and multiple years to give more degree of freedom.
  - Follow recommendations in the meta-analysis literature for weighting schemes.
  - Begin with the analysis of grease and sand and ANOVA results. Prepare a preliminary analysis for presentation at the AEA meetings in January to get the process started.

### 3. Project timeline

- a) Core analysis final instructions due: June 30, 2003
- b) Core analysis due: **October 1, 2003**
- c) Final conference date: February 2004
- d) Output to be a Brookings book: with country studies, meta-analysis, and methodology paper
  - If there is a better opportunity, let us know
  - Brookings editors are good and fast
  - Brookings books have high visibility
- e) Honoraria: desirable for authors, but depends on funding

## C. Plans

### 1. Project goals

#### a) Overall goals

This project addresses the question “How do labor market institutions mediate the impact of inflation on the economy?” More specifically, we are interested in learning about the consequences of nominal and real rigidities in the presence of inflation, and the impact that inflation has on efficiency of price signals. With the exception of the relatively recent literature on downward nominal rigidity and sand and grease, past analysis of rigidity has been done with macro data. We believe that we can learn much more about these questions by using micro data. Our project will have two parts: First, a number of country teams will conduct analyses of micro labor market data. These analyses will follow a common program to the extent possible, while also leaving teams free to do unique analysis when country data or circumstances suggest that an important contribution can be made. Second, cross-national and cross-time

comparisons will allow us to draw lessons about the role, causes and consequences of inflation in the presence of labor market rigidities.

b) Each country study has the following goals:

1. Obtain qualitative and quantitative assessments of the extent and nature of wage rigidity.
2. Obtain qualitative and quantitative assessments of how inflation in the presence of wage rigidity affects firm labor costs and through that the economy.
3. Obtain measures of the extent to which inflation degrades the value of wage signals.
4. Produce a description of wage setting institutions in the country, and how they have changed over time. The achievement of goals 1-3 will allow us to link the institutions and history to the different types of rigidity and their consequences.
5. Use unique aspects of individual data to shed light on outstanding questions (e.g., importance of reporting error, lack of hours information, etc., in previous studies and other studies in this project).

c) The goals of the cross-country summary include the following:

1. Produce a qualitative and quantitative summary of the cross-country evidence on the relationship between history and institutions, and nature and extent of wage rigidity.
2. Produce a cross-country summary of how inflation in the presence of wage rigidity affects the economies and how institutions mediate these effects.
3. Obtain cross-country measures of the extent to which inflation degrades the value of wage signals and the efficiency effects of that loss.
4. Integrate unique aspects of individual country results to shed light on outstanding questions.

## 2. Project elements

To these ends each country team will provide the following:

1. A description of the wage setting institutions in the country and how they have changed over the time for which data used in the study are available.
2. As close a replication of the original Groshen and Schweitzer analysis as possible.
3. For each year, a histogram of wage changes (and wage distribution when minimum wages are an issue) to allow a qualitative assessment of the importance of different sources of wage rigidity.
4. Any information available on the reliability of the wage data used in the analysis.
5. A parametric analysis of the wage change distribution, which we hope to relate to the extent of nominal and real wage rigidity.
6. Unique analysis which take advantage of special aspects of the country's data, history or institutions.

In turn, the project leaders will use the results of the country studies to draw qualitative conclusions about the role of institutions in shaping the nature, extent and effects of wage rigidity and the effects of inflation. They will also attempt to verify the qualitative conclusions by doing a quantitative meta-analysis of the cross-country-time-series data generated by the country studies.

## 3. Project phases

a) Now until the Final Conference (October 2002-February 2004)

- Plan (October 2002-June 2003): The project leaders (Dickens and Groshen) will develop the details of the project. This will involve three main interactive efforts:
  - *Refine Grease and Sand replication instructions*: The leaders will draft and distribute instructions for these exercises. This includes how the data should be prepared, how the analyses should be conducted and how results should be presented. Authors will be asked to respond with questions and suggestions, in order to obtain the most comparable and appropriate results. Leaders will finalize these core analysis instructions by April 2003.

- *Develop and distribute an explicit plan for qualitative and quantitative evaluation of wage distribution pictures and parametric analysis.* This includes how the data should be prepared, how the analyses should be conducted (including a software routine for authors to use in obtaining comparable estimates) and how results should be presented. Authors will be asked to respond with questions and suggestions, in order to obtain the most comparable and appropriate results. Leaders will finalize these core analysis instructions by June 2003.
- *Finish gathering data for meta-analysis and plan the specifications:* The leaders will draft and distribute instructions for this aspect of the country reports. This may include gathering information of some aspects of wage-setting directly from the country authors. In that case, we will develop a framework for consolidating this information in a way that will enable coding for quantitative analysis. The meta-analysis authors will follow the literature on the best practice for the conduct of meta-analysis exercises.
- Execution (July 2003-October 2003)
  - *Conduct country analyses:* Country authors will proceed with analyses, calling on leaders as needed. They will prepare first drafts of papers for comment and post these for comment on the website. Authors will finalize and submit results of country studies to the organizers by October 2003.
  - *Draft strategy for cross-country studies:* The leaders will review literature and prepare proposals for the cross-country analysis. The leaders will conduct initial cross-country analysis and draft an initial paper.
  - *Monitor progress on country studies:* The authors will check in periodically with country authors to ensure that progress is on track.
  - *Finalize funding:* The leaders will finalize funding arrangements for the project and publication of results. See final section for discussion of types of expenses anticipated. We expect this to include discussions with the European Central Bank, IZA (the German Institute to the Study of Labor), the Federal Reserve Bank of New York, the Brookings Institution, funders of Brookings Institution projects, and so on.
  - *Plan the Final Conference:* The leaders will plan select a format, discussants, venue, etc.
- b) **Final Conference (February? 2004):** We plan a public conference with high-visibility, well-respected discussants. The authors will present revised country analyses. The leaders will present the initial version of the cross-country analysis. Discussants will be asked to evaluate the implications of the work.
- c) **Final Conference until publication (February 2004-October 2004)**
  - The leaders will edit the volume. They will prepare comments for the authors on conference drafts (April 2004).
  - The leaders will finalize cross-country analysis (June 2004).
  - Authors will submit final draft of country studies (June 2004).
  - Copy editors will edit the volume (June-October 2004).
- d) **Publication (December 2004):** We plan a Brookings Press volume.

#### 4. Project funding

- a) **Aspects already funded:** Three components of the project have already been funded.
  - The leaders' time (along with their support staff) has been funded by their respective institutions (Dickens by Brookings and Groshen by the Federal Reserve Bank of New York). Participants' time has also been funded by their home institutions.
  - The Organizational meeting in October 2001 was generously supported by the European Central Bank.

- The Authors' meeting in October 2002 was generously funded by a grant from the Volkswagon Foundation and by IZA.
- b) **Final Conference:** Assuming that each country team sends two representatives, participant attendance at the meeting will total about 30. Discussants and perhaps a keynote speaker will add another 10-15 participants. The expenses needing coverage include travel, lodging, meeting place and a conference dinner. Finally, in order to thank the authors and give them an incentive to stay in the project and meet publication deadlines, we will ask for funds for honoraria for the final conference. Typically such honoraria are \$10,000 per paper when several authors are involved.
- c) **Publication (December 2004):** These expenses include Brookings Press copy-editing and printing costs. We will ask some foundations that fund Brookings projects for funding to cover publication expenses.
- d) **Administrative expenses:** Brookings will fund Bill Dickens' time on the project, and that of his research assistant and support staff. The Federal Reserve Bank of New York will fund Erica Groshen's time and administrative expenses.

**Appendix A**  
**International Wage Flexibility Project Participants**  
**(October 18, 2002)**

<b>Country</b>	<b>Authors</b>	<b>Affiliation</b>
1. Austria	1. Alfred Stiglbauer 2. Rudolf Winter-Ebmer 3. Josef Zuckerstattet	Austrian National Bank Johannes Kepler Universitat Linz Kammer fur Arbeiter und Angestellte Wein
2. Belgium	4. Jimmy Royer 5. Marc van Audenrude	Universite Laval Universite Laval
3. Denmark	6. Tor Eriksson 7. Niels Westergaard-Nielson	Aarhus School of Business Aarhus School of Business
4. Finland	8. Petri Bockerman 9. Seppo Laaksonen 10. Jari Vainiomaki	Finnish Research Institute of Labor Economics University of Tampere, Statistics Finland University of Tampere
5. France	11. Cedric Audenis 12. Pierre Biscourp 13. Orrietta Dessy 14. Nathalie Fourcade	ENSAE ENSAE ENSAE ENSAE
6. Germany	15. Thomas Bauer 16. Holger Bonin 17. Uwe Sunde	Institute for the Study of Labor (IZA) Institute for the Study of Labor (IZA) Institute for the Study of Labor (IZA)
7. Italy	18. Bruno Contini 19. Francesco Devicienti 20. Lia Pacelli 21. Paolo Sestito	LABORatorio Riccardo Revelli LABORatorio Riccardo Revelli LABORatorio Riccardo Revelli Ministero del Lavoro e delle Politiche Sociali
8. Norway	22. Jan Morten Drystad 23. Steinar Holden 24. Kjell Salvanes	Norwegian Institute of Science and Technology University of Oslo Norwegian School of Economics and Business
9. Portugal	25. Ana Rute Cardoso 26. Pedro Portugal	Institute for the Study of Labor (IZA) Bank of Portugal
10. Sweden	27. Jonas Agell 28. John Ekberg 29. Eva Udden Sonnegard	Stockholm University Stockholm School of Economics National Mediation Office
11. Switzerland	30. Ernst Fehr 31. Lorenz Goette	University of Zurich University of California, Berkeley
12. U.K.	32. Richard Barwell 33. Mark Schweitzer	Bank of England Federal Reserve Bank of Cleveland
13. U.S.	34. Bruce Fallick 35. Michael Lettau 36. William Wascher	Board of Governors of the Federal Reserve System US Bureau of Labor Statistics Board of Governors of the Federal Reserve System
Meta-Analysis	37. William Dickens 38. Erica Groshen 39. Julian Messina 40. Jarkko Turunen 41. Melanie Ward	Brookings Institution Federal Reserve Bank of New York European Central Bank European Central Bank European Central Bank
ECB contacts	Francesco Mongelli Philippe Moutot	

**Appendix B**  
**International Wage Flexibility Project Data Comparison**

**Table B-1: Sample Coverage**

<b>Country</b>	<b>Data Set Name(s)</b>	<b>Type of Data</b>	<b>Years</b>	<b>Coverage</b>
1. Austria	Social Security	Employment register	1975-1998	FT males, private sector
	Metal workers and white-collar union	Salary survey	1990-1999, maybe longer	Only workers in these sectors
2. Belgium	Social Security	Employment register	1978-1985	Census of workers outside of federal government
3. Denmark	Statistics Denmark	Employment register	1980-1998	Census
	Confederation of Finnish Service Sector Employers	Salary survey	1980-2000	Members of service employer assoc. (few small employers), all employees
4. Finland	Confederation of Finnish Industry and Employers	Salary survey	1980-2000	Members of manufacturing employer assoc. (few small employers), all employees
	Ideal data set	Salary surveys of all sectors (sample or census)	1995-2000	All workers of employers with more than 3-5 workers may be estimated
5. France	Social Security	Employment register	1976-1998 (except 1981, 1983, 1990)	1/25 and 1/250 samples of individuals
	Survey on Activity and Working Conditions of the Labour Force	Salary survey	1986-1999 quarterly	Workers in 16 categories, sample of small employers, census of plants with over 50 employees
6. Germany	IAB (Social Security)	Employment register	1975-1995 (original) 1975-1990 (regional file)	1/100 sample of covered workers
	German Socio-Economic Panel	Household panel survey	1984-2000	Representative sample
7. Italy	INPS	Employment register	1985-1996	1/90 sample in private sector

**Table B-1: Sample Coverage (continued)**

<b>Country</b>	<b>Data Set Name(s)</b>	<b>Type of Data</b>	<b>Years</b>	<b>Coverage</b>
8. Norway	Norwegian Confederation of Business and Industry	Salary survey	1971-1996 (blue collar) 1979-1996 (white collar)	All establishments in NHO: private sector, primarily larger firms
	Statistics Norway	Employment register	1986-1998	Census
9. Portugal	Quadros de Pessoal	Employer survey	1982-1998	Census, fulltime, non-agri., age 16-64
10. Sweden	Confederation of Swedish Enterprises (SAF)	Employer personnel records	1970-1990	All employers in SAF, excludes public sector, banks and insurance, and cooperatives (50% of private sector)
			1995-1999	Sample from SAF, weighted toward larger employers
11. Switzerland	Social Insurance Files	Employment register	1985-1999	2/100 sample of employees
	Labor Force Survey	Household panel survey	1991-1997	Representative sample, 5-year rotating
12. U.K.	New Earnings Survey	Employer survey	1975-2000	1/100 sample of employees, low-wage workers and small firms undersampled
13. U.S.	Employment Cost Index	Salary survey	1990-2001 (1980-1989 possible)	Surveyed occupations in random sample of employers (agric., fed. govt. excluded)

**Table B-2: Occupation, Demographic and Employer Data**

Country	Data Set Name(s)	Occupation Data	Demographic Data	Employer Data
1. Austria	Social Security	Blue vs. white collar	Age, education, experience, gender, tenure	ID, industry, size, age of firm
	Metal workers and white-collar union	6 blue collar, 12*5 white collar occupation	None	ID, industry, size
2. Belgium	Social Security	Blue vs. white collar	Age, gender, tenure	ID, financial data available for subsample
3. Denmark	Statistics Denmark	4-digit (1980-1995); D-ISCO (1996+)	Age, children, education, experience, gender, marital status, tenure	ID, industry, ownership, size, union status, annual hours for workers, financial data
4. Finland	Confederation of Finnish Service Sector Employers	Detailed negotiation categories	Age, education, gender, seniority, full-time vs. part time	ID, size
	Confederation of Finnish Industry and Employers	Hundreds detailed categories, now down to about 30	Age, education code for non-manual workers (for manual workers from 1995-2000), gender, union code	ID, size of establishment, share of women in establishment
5. France	Ideal data set	ISCO occupations	Age, education, gender	ID, size (many others may be linked)
	Social Security	31 2-digit sociological occupation	Age, gender, full- or part-time, nationality	ID, 4-digit industry, size brackets
	Survey on Activity and Working Conditions of the Labour Force	16 categories (7 manual, 3 clerical, 4 technical, 2 managers)		ID
6. Germany	IAB (original)	234 3-digit occupations	Age, children, education, gender, marital status, nationality	ID, 2-digit industry, size brackets, union/employer association
	German Socio-Economic Panel			
7. Italy	INPS	Blue-, white collar, apprentices	Age, birthplace, full- or part-time, gender, typical or atypical contract, social contribution rebates	ID, industry, location, size, mean wages by occupation

**Table B-2: Occupation, Demographic and Employer Data (continued)**

Country	Data Set Name(s)	Occupation Data	Demographic Data	Employer Data
8. Norway	Norwegian Confederation of Business and Industry	97 blue collar, 36 white collar occupations	None for blue collar age, gender, experience for white c.	ID, Can get inflation expectations by firm
	Statistics Norway	In 1990 only	Very rich, including family data	ID, rich, including financial data
9. Portugal	Quadros de Pessoal	5-digit (800 categories)	Date of last promotion, demographics, education, tenure, skill level, type of wage agreement	ID, establishment size, % public capital, % foreign capital
10. Sweden	Confederation of Swedish Enterprises (SAF)	4-digit codes	Age, gender	ID, industry, size
11. Switzerland	Social Insurance Files	none	Age, rough experience, gender, nationality	Employer association
	Labor Force Survey		Tenure, experience, education, gender, nationality	
12. U.K.	New Earnings Survey	3-digit coding, changes twice, 127 consistent codes	Job tenure, age, gender	ID, collective bargaining agreement, level of bargaining, industry, occasional information
13. U.S.	Employment Cost Index	Major occupation group (1980+), 3-digit occupation (1990+)	None	ID, industry, ownership, size, annual hours for job

**Table B-3: Wage, Hours and Region Data**

Country	Data Set Name(s)	Wage Data	Hours or Days?	Region Data	Reference Wage
1. Austria	Social Security	Monthly salary, top-coded	No	City, region	No
	Metal workers and white-collar union	Blue-collar hourly rate, white collar FTE	No	none	Minimum rate for job
2. Belgium	Social Security	Total pay over year	Days	Zip code	No
3. Denmark	Statistics Denmark	Earnings including overtime and taxable fringes; hourly rate for wages and salaries	Hours	Municipalities	No
	Confederation of Finnish Service Sector Employers	Regular-time wage, overtime hours and compensation	Hours paid	No	Available on paper
4. Finland	Confederation of Finnish Industry and Employers	Regular-time wage, overtime hours and compensation, piece-work wages	Hours paid	Municipalities	Available on paper
	Ideal data set	Regular-time wage, overtime hours and compensation	Hours paid	Municipalities	
	Social Security	Net yearly compensation	Days, hours after 1994	City and larger districts	No
5. France	Survey on Activity and Working Conditions of the Labour Force	Monthly gross wages (excluding bonuses)	Weekly hours		Yes
	IAB	Annual gross pay subject to social insurance	Days	East vs. West	Minimum (tariff) wage for job
6. Germany	German Socio-Economic Panel		Hours		No
	INPS	Total wages received in each job spell	Days	100 provinces	No

**Table B-3: Wage, Hours and Region Data (continued)**

<b>Country</b>	<b>Data Set Name(s)</b>	<b>Wage Data</b>	<b>Hours or Days?</b>	<b>Region Data</b>	<b>Reference Wage</b>
8. Norway	Norwegian Confederation of Business and Industry	Annual earnings for blue collar Monthly earnings for white collar	Days for white collar	440 municipalities	On paper
	Statistics Norway	Annual taxable earnings	Hours brackets, can match with other data to get actual hours	Neighborhood	No
9. Portugal	Quadros de Pessoal	Basic, overtime, subsidies, non-regular payments, wage agreement identifier	Hours		
10. Sweden	Confederation of Swedish Enterprises (SAF)	Baseline wages, overtime pay, bonus, benefits	Hours	Municipality, county	
11. Switzerland	Social Insurance Files				
	Labor Force Survey	Total compensation (net of SS contributions) divided by hours in labor contract	Hours in relevant labor contract		
12. U.K.	New Earnings Survey	Gross, overtime and basic wages, absence reduction	Hours	Country/urban areas or regions	File available
13. U.S.	Employment Cost Index	Hourly rate for wages and salaries, cost per hour for fringes		States (1980+), Counties (1990+)	Not applicable

## Appendix C

### Sources of Institutional Data for Meta-Analysis

#### Abbreviations

*OECD97*. OECD (1997) *Employment Outlook*: “Economic performance and the structure of collective bargaining” Trade union density, coverage and characteristics of collective bargaining systems and their effect on inflation. OECD countries 1980-1994.

*GLW*. Golden, Miriam; Lange, Peter; and Michael Wallerstein. (2002.) "Union Centralization among Advanced Industrial Societies: An Empirical Study." Dataset available at <http://www.shelley.polisci.ucla.edu/data>.

*TBK*. Traxler, Blaschke and Kittel (2001) “National Labour Relations in Internationalised Markets”. New York: Oxford University Press.

*NN*. Nickell, S and Nunziata, L (2000) “Employment Patterns in OECD Countries”, *London School of Economics, Centre for Economic Performance Discussion Paper: 448*.

*EMS*. Elmeskov, Martin, Scarpetta (1998). “Key Lessons for Labour Market Reform: Evidence from OECD Countries’ Experiences”. *Swedish Economic Policy Review 5(2)*

*ELSA*. *OECD Employment, Labour and Social Affairs Committee*.

*OE-NS*. Two sources:

- OECD (1999). *Employment Outlook*. OECD, Paris
- Nicoletti, Scarpetta and Boylaud (1999). “Summary Indicators of Product Market Regulation with an Extension to the Employment Protection Legislation”. *OECD Economic Department Working Papers*, 226.

*OECD98*. OECD (1998) *Employment Outlook*

*OECD99*. OECD (1999) *Employment Outlook*. “Employment protection and labour market performance”. OECD, Paris

*Eurostat*. New Cronos Database

**Table C-1: Collective Bargaining System Data**

		Centralization				Coordination			
		GLW		TBK		NN			
Observations	Period	Obs.	Period	Obs.	Period	Obs.	Period	Obs.	Period
Austria	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Belgium	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Denmark	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
France	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Finland	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Germany	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Italy	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Sweden	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Norway	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
Portugal	80;90;94	Missing	1950-00	3-5 years	1970-1990	Missing	1960-1995	5-years	1960-1995
Switzerland	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
UK	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995
US	80;90;94	Annual	1950-00	3-5 years	1970-1990	Annual	1960-1995	5-years	1960-1995

**Table C-2: Collective Bargaining Coverage and Density Data**

		Coverage				Density				Concentration	
		OECD-97. (Rate)		EMS. (Categorical)		NN-V (Rate)		EMS (Rate)		GWL-Herfindahl	
Observations	Period	Obs.	Period	Obs.	Period	Obs.	Period	Obs.	Period	Obs.	Period
Austria	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Belgium	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Denmark	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
France	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Finland	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Germany	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Italy	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Sweden	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Norway	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Portugal	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
Switzerland	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
UK	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992
US	80;90;94	Annual	1970-96	Annual	1960-1995	Annual	1970-1995	Annual	1970-1995	10 years	1960-1992

**Table C-3: Minimum Wage Data**

Country	Name, type of determination, year of introduction	Employees excluded.				Indexation or uprating procedures		Ratio of statutory minimum wage to median wage		Statutory minimum wage level	
		Source	Period	Source	Period	Source	Period	Source	Period	Source	Period
Austria	-	-	-	-	-	-	-	-	-	-	-
Belgium	OECD98	Up to 1997	OECD98	Up to 1997	OECD98	Up to 1997	ELSA	1975-1997	Eurostat	1980-now Y	
Denmark	-	-	-	-	-	-	-	-	-	-	
France	OECD98	Up to 1997	OECD98	Up to 1997	OECD98	Up to 1997	ELSA	1960-1997	Eurostat	1980-now Y	
Finland	-	-	-	-	-	-	-	-	-	-	
Germany	-	-	-	-	-	-	-	-	-	-	
Italy	-	-	-	-	-	-	-	-	-	-	
Sweden	-	-	-	-	-	-	-	-	-	-	
Norway	-	-	-	-	-	-	-	-	-	-	
Portugal	OECD98	Up to 1997	OECD98	Up to 1997	OECD98	Up to 1997	ELSA	1975-1997	Eurostat	1980-now Y	
Switzerland	-	-	-	-	-	-	-	-	-	-	
UK	-	-	-	-	-	-	-	-	Eurostat	1980-now Y	
US	OECD98	Up to 1997	OECD98	Up to 1997	OECD98	Up to 1997	ELSA	1960-1998	OECD98	1997	

**Table C-4: Employment Protection Legislation Data**

	EPL Provisions											
	Regular Contracts		Temporary Contract		Lazear type Measure		Collective Dismissal		Temporary Work Agency			
	Source	Period <sup>1</sup>	Source	Period <sup>1</sup>	Source	Period <sup>2</sup>	Source	Period <sup>1</sup>	Source	Period <sup>1</sup>		
Austria	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Belgium	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Denmark	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
France	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Finland	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Germany	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Italy	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Norway	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Portugal	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Sweden	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
Switzerland	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
UK	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		
US	OE-NS	89,98	OE-NS	89,98	NN	1960-1995	OECD2	89,98	OECD2	89,98		

<sup>1</sup> 89,98 refers to two observations: late eighties and late nineties.

<sup>2</sup> Five year averages.