What have we learned?
Assessing labor market institutions and indicators

FIRST DRAFT, DO NOT CITE!

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Abstract

Over the last decade, both the availability of quantitative indicators on labor market institutions and of studies trying to explain differences in national labor market performance through institutional variables have burgeoned significantly. It is now time to review these indicators and the empirical findings. Therefore, this paper has a threefold objective: First, we provide an overview of the aggregate indicators of core labor market institutions such as employment protection, the generosity of the benefit system, active labor market policies, taxation and collective bargaining. We assess the reliability of selected indicators. Second, we review the most relevant macro-econometric studies that made use of these indicators in order to explain diverging patterns of national employment performance. Third, and finally, this paper draws some preliminary conclusions regarding the further development of aggregate indicators and possible directions for future empirical research.

1 Introduction

In recent years, attempts at explaining diverging patterns of labor market performance have received considerable attention, and not only in economics and the social sciences. From a policy perspective, evidence on causal factors that influence the levels and structures of employment and unemployment is relevant in order to inform policy-making in the labor market field. Most of the comparative research points at the crucial role played by complex, multi-dimensional institutional arrangements in different policy areas that have either direct or indirect influence on the labor market. Hence, institution-oriented research contributes to explaining variations in employment performance across countries and over time and helps identify more or less successful institutional arrangements and reform strategies.

Research into the causes and consequences of labor market institutions first concentrated on qualitative issues, including narrative descriptions and comparative analysis. However, due to the general advancement of quantitative research, the measurement of labor market institutions became more and more important. Quantitative research depends on reliable summary indicators. Constructing indices, however, is not an easy task, even if all the necessary data is available. In empirical work, however, the provision of data, in particular for the construction of long time series, is the greater challenge. The construction of indices has been a controversial issue, and the debate is still going on. While the production of indices can be seen as a research topic of its own, it is certainly more interesting to discuss the application of indices in econometric studies. And it appears that the debate on the correct measurement of labor market institutions has been fuelled by these applications.

If our understanding of labor market outcomes, unemployment being the most prominent one, can be seen as an interaction of "facts and ideas", as Blanchard (2006) put it, then quantitative research into the effects of labor market institutions can be seen as the interaction between the construction and the application of indicators.

Ten years after the publication of Nickell's (1997) very influential paper on the institutional differences between Europe and North America, we think that it is time to review indicators and empirical findings, and to assess the state of knowledge. This sort of stock-taking is similar to – and in some respect inspired by – that of Blanchard (2006). While Blanchard presents the big picture, we focus

on indicators and empirical research on the effects of labor market institutions on unemployment.

The paper first presents the basic evolution of theoretical arguments regarding the role of labor market institutions when it comes to explaining employment performance. With a strong emphasis on the adaptive capacities of labor markets in terms of flexibility, we discuss the role of interactions between institutions. Second, as empirical research crucially depends on the quality of the indicators available, the paper then assesses the main aggregate quantitative indicators representing core labor market institutions and existing labor market institution databases. As a third step the paper reviews what can be learned from quantitative empirical (macro-econometric) research using quantitative institutional indicators in order to explain cross-country differences in labor market performance. Finally, the papers suggest some perspectives for future improvement of indicators to map labor market flexibility and stimulate further empirical research.

2 Labor Markets and Institutions: The Theoretical Framework

Comparative research into labor market performance tries to explain the variation of employment and unemployment over time and across countries with a particular emphasis on institutional variables. Yet, over the last two decades there has been considerable progress toward more complex institutional explanations taking a larger number of institutions and interactions between institutions into account while at the same time emphasizing the dynamic aspect of labor market adaptation to a changing economic environment.

Earlier research focused on the role of macroeconomic shocks experienced by most industrialized countries in the 1970s and 1980s. Nominal and real wage rigidities determined by different wage-setting arrangements were the most important explanatory variable. Given the fact that persistent differences in unemployment levels could be observed even after the shocks, research on the role of other labor market institutions became more prominent (Blanchard 2006). This paved the way for a more complex institutional model aiming at an explanation of cross-country differences in labor market performance. Most relevant in this respect were the contributions of Layard, Nickell and Jackman (1991), Nickell and Layard (1999), the OECD Jobs Study (1994) and related articles. This institutional explanation of differences in unemployment soon became a widely shared

analytical tool both in empirical economics and more applied work used for policy advice.

Institutions affect labor market outcomes through the price and wage setting processes that, in turn, influence labor supply, labor demand and the matching between workers and available jobs via flows of labor. Effective wage and price setting allows for the wage adjustment required by business cycle variations or structural changes and enhance the mobility of labor from declining to growing sectors. Adverse labor market institutions inhibit these processes and can therefore explain higher unemployment.

According to this approach, labor market performance is to be explained by a core set of five labor market institutions:

1. One of the most classical explanatory factors is the wage setting arrangement, due to its direct influence on wage flexibility in terms of nominal and real rigidities and wage dispersion. In terms of institutions, the extent of unionization, coverage by collective agreements or binding minimum wages and the degree of centralization and coordination of wage bargaining through corporatist arrangements are the most relevant features. Wage adjustment is often seen as particularly efficient in decentralized bargaining structures with most wages being set at the individual or enterprise level due to the direct consideration of market forces or in a centralized and coordinated fashion which facilitates wage moderation. Hence, regarding wage moderation and wage flexibility there can be advantages for both centralized and decentralized regimes. Wage dispersion is assumed to be more pronounced in decentralized regimes with low bargaining coverage and low or non-existing binding minimum wages.
2. Unemployment benefits, i.e. passive labor market policies, provide income replacement in case of non-employment. In a wider sense, this not only comprises unemployment insurance, but also unemployment and social assistance and different forms of disability pensions and early retirement schemes. Through the provision of income replacement, unemployment benefits can provide some human capital insurance for qualified workers in the early phase of unemployment. However, unemployment benefits may reduce job search intensity and labor supply by presenting negative work incentives and raising the reservation wage as they provide an implicit wage floor.
3. Active labor market policies can facilitate a better matching on the labor market through placement support, raise productivity through publicly sponsored training and compensate for productivity deficits via hiring

subsidies. By improving the human capital of the unemployed and more intensifying job searches through tight monitoring, they can increase competition on the labor market, help avoid bottlenecks and facilitate wage moderation. The use of active schemes for activation helps counter potential work disincentives stemming from generous unemployment benefits. However, ineffective labor market policies can hamper employment performance given negative tax effects.

4. Taxes on labor, in particular non-wage labor costs resulting from social insurance contributions, can reduce labor demand and labor supply. The extent of this effect depends on the actual tax burden of employers and/or employees taking into account wage adjustments. Negative effects are more probable in the case of low-wage jobs where non-wage labor costs are not borne by the worker, but by the employer since the benefit system works as an effective wage floor.

5. Employment protection, i.e. provisions on dismissal protection and restrictions on temporary employment and temporary work agencies, can influence the adaptation processes by raising layoff and hiring costs. While on the one hand stabilizing jobs and setting incentives for training, this can hamper adjustment to changes by reducing mobility in the labor market. Given the protection of regular employees, employment protection can lead to stronger wage pressure from labor market insiders. Employment protection can reduce the reemployment opportunities of outsiders and entrants and deepen labor market segmentation.

In this model, however, the general assumptions are, first, that core labor market institutions in principle work in isolation from each other and do not form complex institutional arrangements in their interactions between each other or other, non-labor market institutions. The second assumption is that there is an optimal institutional setting that is close to the perfect functioning of market mechanisms so that differences in unemployment performance can basically be explained by the fact that countries' labor market institutions deviate more or less from this optimal arrangement. Hence, this method of analyzing labor markets assumes that there is a single peak of superior performance that is close to the market, i.e. where wage and price setting mechanisms work without much disturbance. Policy advice then calls for increasing flexibility over all institutional parameters.

More recent research emphasized, first, the interaction between institutions and shocks (Blanchard/Wolfers 2000) with institutional arrangements explaining the adaptive potential of national labor markets – determined by a core set of institutional variables – to external shocks. This body of literature stresses the role of

institutions when it comes to providing sufficient capacities to adapt. Otherwise unemployment persistence will result. The interaction of shocks and institutions can then help to explain why unemployment differs more strongly in more recent years despite the fact that institutions have been relatively stable.

Research, however, has not only put stronger emphasis on interactions between institutions and shocks, but also on interactions or complementarities between labor market institutions. This has several aspects:

First, theoretical, but also empirical research has addressed the potential explanatory power of interactions between different institutional variables, e.g. wage setting and employment protections or wage setting and taxation. Some researchers have pointed at policy areas outside the labor market that could influence labor market outcomes, e.g. the regulation of product markets. Others have argued in a political economy direction that labor market reforms are both more feasible in politico-economic terms and more effective in economic terms if they take policy complementarities into account (Coe/Snower 1997, Eichhorst/Konle-Seidl 2006).

While these options can be integrated into the well-established theoretical framework laid out above, other researchers, mainly from the social sciences, but also from an economic background, have questioned the idea that there is only one successful policy setting in terms of superior labor market performance. Starting from the observation that institutional factors do not work in isolation but form complex institutional arrangements, they construct typologies of employment systems with internal coherence and assume that diverging, but coherent models could have potentially equal capacities to generate favorable employment outcomes, albeit with a different internal economic logic. Most important in this respect were the typologies of welfare states by Esping-Andersen (1990), the varieties of capitalism approach by Hall and Soskice (2001) and Albert's (1993) and Amable's (2003) work on diversity in modern capitalism. This strand of literature basically argues that different institutional configurations can be equally successful in terms of economic activity and productivity while relying on diverging patterns of economic specialization that are stabilized by dense and coherent institutional networks, in particular labor market regulation, welfare state provisions, training and wage setting arrangements. The set of labor market institutions used in this type of research is mostly identical to that used in economics (Scharpf/Schmidt 2000), but it is more open to accept divergence of institutional patterns and reform paths. The labor market is structured by institutional settings in the productive system, and diverging institutional arrangements on the labor market are associated with specific national patterns of labor market adaptation.

Recent research into alternative regimes has in particular pointed at different models of insurance against labor market risks through strict employment protection or generous unemployment benefits which could also be complemented by effective reintegration-oriented labor market policies (Boeri/Conde-Ruiz/Galasso 2003, Eichhorst/Konle-Seidl 2006). This is related to the idea that different forms of flexibility and security can be facilitated by diverging institutional arrangements (see e.g. Wilthagen/Tros 2004), an idea which has become a prominent feature of some empirical work and European policy initiatives under the label of "flexicurity." Hence, institutional settings generate national patterns of labor market flexibility that combine different dimensions of flexibility (functional flexibility, external numerical flexibility, internal numerical flexibility and wage flexibility) as well as security (job security, employment security, income security). Most recently, the OECD also emphasized the institutional feasibility and actual existence of at least two different models of superior employment performance (OECD 2006) that allude to the often cited dualism between "liberal" or "Anglo-Saxon" models of flexibility and "corporatist" regimes. Hence, not all successful countries are necessarily "liberal" market economies. In a similar fashion Freeman and Schettkat (2000) argued that homogenous skill levels across the labor force limit the pressure for wage dispersion so that effective training schemes based in part on corporatist arrangements can be substitutes for high wage flexibility in decentralized bargaining systems.

Generalizing from these observations, there are different channels of flexibility on the labor market that can – at least partly – be substitutes for each other, i.e. be seen as functional equivalents so that not all parameters have to be close to the market optimum in order to achieve a functioning labor market. This allows for different models of good employment performance – even if some policy areas are characterized by some sort of "rigidity" – as long as they can be compensated for by other elements of flexibility. Different modes of adaptation can lead to a similar amount of overall adaptability so that there can be not only more than one peak of labor market performance (Schettkat 2003), but also different reform paths. However, the benefits of alternative institutional patterns are associated with specific costs in terms of taxation or inequality, for instance.

Summarizing the existing theoretical work on comparing national labor markets, there is a strong argument in favor of a dynamic and interactive framework that conceives labor markets as determined by a complex set of institutions that not only determine the adaptive potential of the labor market, but also form different patterns of labor market flexibility or adaptability. According to this framework, the capacity of labor markets to adapt to structural changes or business cycle variations is determined by institutional factors. If labor market institutions work

in the right direction, unemployment persistence will be low and employment high, whereas a less-favorable institutional arrangement will result in persistent unemployment and structural problems in the labor market. But labor market reforms to enhance labor market adaptability should help overcome theses structural problems. Hence, while sufficient capacities to cope with a changing economic environment are essential for positive employment performance, there can be different models of labor market adaptation given the diverging reliance on specific channels of flexibility. One core element is the relative role of flexibility/security provisions embedded in employment protection, wage setting and active and passive labor market policies, i.e. the diverging role of public intervention with respect to dismissal protection, wage floors, training and other labor market policies to counter potential disincentive effects arising from more generous benefits.

3 Labor Market Indicators

3.1 General issues

Generally speaking, indicators can be quantitative or qualitative measures that capture observable facts in a country over time and thereby show a country's standing in relation to others or to other periods of time. As such, they are used to assess and predict the performance of the economy. This section reviews indicators that describe labor market institutions. They are defined as "generally known rules that are designed to give structure to the recurring interactions in the labor market" (Ochel 2005). The interest in indicators of labor market institutions stems from the hypothesis that labor market institutions are the core explanatory factors of labor market decisions and outcomes. All institutions together shape the labor market and give rise to outcomes such as, for instance, unemployment. To verify the claim, empirical studies attempt to establish a statistical link between institutions and outcome variables. These studies serve to factor out the impact institutions have on outcomes in different countries and over time. As such, they are a basis of policy recommendations. Therefore, we need indicators that properly describe the institutions and outcomes in question.

In the following section, we review major institutions and attempts to measure the; that is, we focus on the right-hand side of the regression equation. We do not aim at providing a complete list of all existing indicators. Only those indicators

will be mentioned that are most frequently used in empirical studies and that serve to illustrate how they are constructed.

Labor market institutions have many dimensions. Relevant information can be qualitative or quantitative. Of course, the latter case is easier to deal with because we can tell numbers apart. It is more difficult to handle qualitative information. For empirical analysis, this information has to be quantified. As a first step, information must be grouped and common denominators need to be defined. Since we are interested in knowing something about relative positions, the next step involves rank-ordering the groups. For this, we must have some concept of intensity or significance in mind. As a result, we get an ordinal measure. If we stop here, we assume implicitly that relative intensities are the same for all ranks. To circumvent this shortcoming, a cardinal measure can be created. For this purpose, we need a scoring system to make judgments about institutional features' relative intensities. The needed number of scores is not clear in the beginning. By assessing the magnitude of a feature's intensity we get a cardinal measure.

Single-dimensioned institutions are the easiest to deal with. We group the qualitative information, rank-order it and assign scores. This gives a cardinal measure. If the data is already quantitative, we only have to make sure that units across countries and over time are the same and comparable. But most often, labor market institutions have many facets and are measured along many different dimensions. We then have detailed indicators with each capturing only one part of the whole picture. The problem is how to condense the information available in order to better grasp the overall picture. This relates to problems of constructing composite indicators. It basically involves the same steps as above. Additionally, we have to find a way to aggregate the detailed indicators into one indicator. To do this, after we have done the normalization, we assign weights to the detailed indicators. The detailed indicators then enter the composite indicator additively; other approaches are possible. As a general rule, the choice of weights should be guided by the relative importance of each detailed indicator. What we regard as relatively more or less important is a question of economic theory or statistical analysis. Weights are often simply based on subjective judgments.

Information on labor market institutions comes from many sources such as national legislation, expert reviews and national or international statistical offices and other bodies. The comparability of data is especially impaired in a cross-country context. Statistical offices, for instance, apply different definitions and standards that may also change over time. Whether information about the labor market is comparable or standardized across countries and over time is questionable. Thus, all forms of measurement errors can arise. Where information is

only insufficiently available, researchers sometimes need to fill in the gaps. A variety of methods are at the disposal of researchers, though none are free of further assumptions that change the data sets interpretation.

Indicators exist for almost all labor market institutions. They differ with respect to the number of countries and time periods covered. Data is mostly available for OECD countries from the 1950s onwards. In the following, we discuss some widely used indicators.

3.2 Employment protection

Lazear (1990) was the first to link employment protection legislation (EPL) to unemployment and other labor market outcomes. He used weeks of notice and severance pay as a proxy for EPL. Later, Addison and Grosso (1996) revised Lazear's data. Grubb and Wells (1993) built the first composite indicator. They identified several dimensions of EPL and assigned scores to them. Using a rank of averaged rank procedure they obtained a first ordinal measure. The OECD (1999, 2004) proceeded in the same fashion but adopted a different aggregation scheme for the 18 detailed indicators and came up with weights based on subjective reasoning. In order to obtain a time series, Blanchard and Wolfers (2000) had to interpolate between the OECD data points for the late 1980s and 1990s and used Lazear's proxy to finally offer data covering the time period 1960-1999. Using Blanchard and Wolfers' data, Nickell et al. (2003) annualized the data points to derive a time series.

While the OECD until recently only provided data points for the late 1980s, late 1990s and 2004, the update of the OECD Jobs Study was supported with the first "true" time series with annual data on employment protection legislation based upon information on reforms (Brandt/Burniaux/Duval 2005). Brandt et al. look at the period 1985-2003 and provide separate scores for EPL regarding temporary and permanent employment. Based on the OECD methodology and scoring system, Allard (2005a) reviews EPL changes and derives time-series for OECD countries. Allard bases his results on the ILO's International Encyclopedia for Labor Law and Industrial Relations and offers country scores for 1950-2003 at the aggregate level.

The latest approach is by Amable et al. (2007). They also use the OECD data as a starting point. In order to fill the gaps, they look the Social Reforms Database maintained by the Fondazione Rodolfo Debenedetti (FRDB) that collects information on labor market reforms and assesses their impact to see whether they

have increased or decreased the flexibility of the system. The authors run OLS regressions with the help of this data to predict the evolution of the EPL indicator between 1980 and 2004. As such, the information in the database is used as proxies to describe changes in the overall EPL indicator. They then compare the result to those of Nickell et al. (2003) and to the three OECD data points and manually change their data to improve the fit. What may bring this approach's validity into question is that the data set does not only include information on employment protection legislation but also on reforms of working time or wage setting institutions. Moreover, it is not always possible to exactly assign the 18 OECD EPL categories to the information provided. It is, therefore, hard to argue that changes in wage setting institutions, to mention one example, serve as good proxies to derive a time series of the EPL indicator.

This last issue refers to the quest for a time series of EPL. We have Blanchard and Wolfers, Nickell et al., Allard, Brandt et al. and the last approach that try to provide us with a complete panel. Neither Blanchard and Wolfers nor Nickell et al. offer arguments as to why their indicators are sufficiently reliable for use in empirical studies. Allard's and Brandt et al.'s approach are the most fruitful since they rely on raw data. Allard, however, fails to provide us with results of the detailed indicators. Therefore, we do not see another way except to regularly update the OECD data in order to extend the time series. Only pain-staking work by referring to labor laws and other sources can accomplish this task. Any attempts apart from that are "rough approximations" that are used for empirical studies as a basis for "rough" policy recommendations.

All existing indicators share the feature that they follow a de jure approach. Their respective constructors look at codified rules or surveys of them and from these they determine the strictness of the rules. So far no EPL indicators are available that take up a de facto approach or, put differently, that take into account the dimension of enforcement of these rules (see Bertola et al. (2000) for a discussion of this issue).

The indicators also do not include non-legislated forms of employment protection. EPL can be agreed upon in individual contracts or can be one outcome of a collective bargaining arrangement. These other forms of EPL may have different economic impacts across countries.

The indicators constructed so far all follow the OECD approach and provide (weighted or unweighted) averages of employment protection. The OECD indicator has three main categories (regular employment, temporary employment and collective dismissal) with the first two items having the same weight in the summary indicator. This implicitly means that these two domains have the same

economic impact, although different numbers of workers are affected. For the labor market, the differences between different regulation intensities applying for permanent and temporary staff may be of high relevance. It therefore seems questionable whether simply regressing EPL on overall employment or unemployment is a valid undertaking. Studies should, rather, identify sub-groups of workers (e.g. regularly or temporarily employed) and regress the corresponding domains of EPL on them.

Having found a relationship between EPL and an outcome variable still does not tell us what has been the driving force behind this result. From the usage of the indicator we cannot tell whether rules governing temporary or regular employment are responsible. We only know that EPL is bad/good and that we therefore should decrease/increase EPL strictness. But this result does not indicate which single item of EPL needs to be adjusted.

In summary, on the construction side of the indicators it seems most important to regularly update the indicator and take into account implementation issues. On the applied side, researchers should be clear about the appropriate dependent variable and the limited usage for policy advice.

3.3 Taxation

The literature identifies four different approaches to measure the tax burden and their impact on labor market outcomes: i) representative worker models, ii) aggregate/macroeconomic data, iii) micro-simulations and iv) tax/benefit models. The tax burden on labor is expressed as a ratio of two numbers. The numerator comprises some concept of taxes that might be relevant to the burden put on labor; the denominator captures some concept of tax base. Relevant taxes include payroll taxes, social security contributions and income taxes that dependent workers pay. The inclusion of consumption taxes and capital income is controversial and the same holds for the question of whether to allow for employers' voluntary contributions.

The OECD and its publication "Taxing Wages" uses models to assess the tax burden on labor on an annual basis. The strategy is fairly simple: It identifies an individual called average production worker who works full-time in the manufacturing sector and earns an average wage. This worker may claim different tax reliefs and benefits depending on the personal circumstances such as marriage and children. For each country, the OECD then applies the tax code and thus com-

putes the worker's net income. The OECD repeats the same analysis for different family types and income levels (as a percentage of the average production worker's income). From this data, it is easy to compute several relations, most importantly the tax wedge. In empirical studies, the tax wedge is then taken as a proxy for the tax burden on labor.

The second approach to measure the tax burden on labor is to use macroeconomic data. What the literature does is to derive effective (implicit) average tax rates. The only ingredient one needs is data on national accounts. From this, one extracts numbers on tax revenues and expresses these as a ratio of some defined aggregate tax base. The question left to the researcher is what to include in the numerator and denominator. Available indicators differ widely with respect to this, and, as a consequence, in magnitude. However, all indicators tend in the same direction and display high positive correlations (see De Haan et al. (2003) for further details). These authors give a comprehensive overview of recent indicators based on the aggregate data approach. OECD (2001), however, finds significant differences between indicators based on different methodologies. In addition to that, it discusses shortcomings in great detail and provides a revised computation of tax ratios.

The last approach uses micro data. It is easy to assess tax rates at various aggregation levels and to disentangle the tax wedge for different income levels, types and household structures. Therefore, this approach seems preferable in order to assess the labor market participation decisions of different taxpayers. The European Commission has set up a comprehensive tax/benefit model called EUROMOD that covers 15 member countries. Sutherland (2001) provides a detailed documentation on this model. Given household income as an input, EUROMOD reports new income levels resulting from a changing policy environment. A major drawback of this method is that tax rules may be applied too mechanically. In essence, this charge also applies to the model-based approach. Everything that is non-standard is not sufficiently captured by the two approaches.

The fourth and last procedure is similar to the OECD's Taxing Wages approach and is called Benefits and Wages. The salient feature is that it takes benefits into account as well. As such, it is especially suited to study the tax/benefit labor supply or work incentive effect of low-income earners and unemployed. "Benefits and Wages" thereby offers insights into how benefits might affect incentives to take up a job. Data is available from 1998 onwards. The caveats regarding Taxing Wages pertain to Benefits and Wages, too.

All the measures of the tax burden discussed so far are average tax rates. In order to study the incentive effects of taxes we also need to have knowledge about

marginal taxes – especially at the margin of whether to enter the labor market or not. Macro-based tax rates cannot give us this measure, particularly when we study taxes and benefits together, because at this point the institutional features that apply to the claimants are crucial. In this case, micro- and model-based approaches prove useful. To derive marginal tax rates, McKee et al. (1986) use a representative worker approach, Immervoll (2004) applies EUROMOD and Carone et al. (2004) use the OECD's Benefits and Wages approach.

What kinds of taxes are included makes the construction of the ratios more complicated. Some researchers argue to include consumption taxes since it is the purchasing power adjusted wage that counts for a worker. This view is certainly valid if we study the labor supply decisions. But if the interest lies more in the tax wedge, we can neglect consumption taxes because both wage earners and non-earners have to pay this form of tax and, therefore, the labor demand decision is unaffected.

We discussed the role of taxes in influencing individual decisions to enter the labor force or to extend working hours. The same approaches are used to study questions of voluntary early retirement. To be more precise, the literature distinguishes between pull and push factors referring to the financial system and employment conditions, respectively. In addition to the usual tax and social security schemes, the design of retirement and pension systems influences workers' behavior to leave the labor force before the standard age of entitlement. Studies use micro data at the country level (e.g. Gruber/Wise 1999, 2004, Schils 2005) or aggregate data (e.g. Blöndal/Scarpetta 1999, Burniaux et al. 2003, Duval 2003).

For studies of the household context, the model- and micro data-based approaches also allow for the inclusion of a second earner or other forms of dependencies. For instance, the OECD's Taxing Wages reports numbers from a working spouse that earns a certain fraction of the average production worker's income. The macro- and model-based approaches only look at one individual tax payer. That is why they provide us only with one number that is then taken to be the economy's overall tax rate. But depending on the tax code's progressivity and the wage distribution, this measure may be flawed. The last approach seems to be more successful by relying on micro data.

3.4 Benefit Generosity

The generosity of the unemployment insurance (UI) system has many facets that determine labor market participation or search effort decisions. It refers to the unemployment replacement rate, the duration of entitlement, other eligibility criteria that specify insurance coverage and recipients and to availability rules that define search effort requirements and the suitability of a job offer. Finally, the system has various sanction mechanisms available should a claimant not fulfill certain requirements and conditions. All of these different dimensions together make up the system's generosity and, thereby, an unemployed individual's welfare.

The measurement of the replacement rate is subject to the same problems as the Taxing Wages approach. There is not one single replacement rate that applies to all workers. In addition, workers are entitled to receive benefits for varying periods of time depending on other labor market characteristics such as age or the length of the previous employment period. Hence, all measures of the replacement rate have some average worker or household in mind. Whether it is a suitable average for the purpose of empirical studies is unclear.

The OECD calculates replacement rates for different representative workers, household compositions and earnings levels. Applying the specific country rules gives a gross replacement rate. These results, however, give a misleading picture because they do not account for variations in the replacement rates. Those may come from the different consideration of the tax system and other benefits. To tackle this problem, the OECD calculates net (after tax) replacement rates.

It has become evident that it is insufficient to only look at the replacement rate. Rather, we need to include more dimensions of UI's generosity. Allard (2005b) calculates an indicator that captures both the gross replacement rate, taxes on benefits, the duration of collecting benefits and eligibility criteria. The last point has been researched by the Danish Ministry of Finance (1998, Hasselpflug 2005). It conducts a survey and asks for the conditions that the unemployed must meet in order to collect benefits. Scores assigned to eight categories, subjectively weighted, give an overall indicator. Yet, this indicator is less than conclusive with respect to the country ranking.

Scruggs (2006) adopts a different approach. He calculates an expected welfare benefit that is the product of the income replacement and coverage rate of three social security regimes: unemployment, sickness and pensions. As such, the measure looks not only at the UI system. Yet, the approach by Scruggs is helpful

as it takes coverage into account. In a similar fashion, Vroman (2007) calculates benefit generosity as the ratio of annual unemployment compensation payments, i.e. unemployment insurance and assistance, to the average number of recipients normalized by average wages.

In contrast to spending ratios, the aforementioned indicators consider the incentive consequences better. Claimants seldom know how much money is spent on social security in total. What matters to them is the whole setup of the system that specifies waiting periods, eligibility conditions, duration, replacement rates and availability rules. Simple spending ratios do not include information of this kind. To put it differently, it does not matter how much but, rather, how money is spent on social security.

3.5 Active Labor Market Policies

In order to better assess active labor market programs, OECD Employment Outlooks and European Commission publications annually report numbers on participants and public spending. Since the range of programs is extremely wide, there are eight categories that capture the dimensions of active labor market policies. Only targeted programs are included, that is, only means to fight current or prospective unemployment are considered. The numbers are expressed as GDP ratios or as expenditure per unemployed person. The tables mostly report gross numbers – that is, taxes and other deductions are not taken into consideration.

The spending ratios and numbers on participants do not provide us with information on the programs' success. This is the aim of evaluation studies. Spending ratios are another ingredient of the cost-benefit analysis. Expenditure data on active labor market policies cannot shed light on the potential use of active schemes for activation purposes, i.e. making benefit receipt dependent upon participation in training measures and public employment offers. Expenditure data does not allow for the interpretation of active schemes either as “benevolent” supporting measures or “work test” programs. Hence, they cannot be taken as a proxy for activation.

3.6 Wage Setting

This section discusses measures of how employees and employers can decide on the terms of their labor relations. Those terms comprise questions of wage-setting, working time and procedures, health and safety regulations or even forms of employment protection. The literature usually concentrates on wage-setting issues, which are studied under four headings: i) trade union density, ii) collective bargaining coverage, iii) centralization and iv) coordination. To obtain numbers on i) and ii) is relatively easy compared to iii) and iv) the reason being that union density and coverage are already expressed in numerical terms. Measures of corporatism, i.e. centralization and coordination in the wage bargaining process, involve subjective judgments that may give rise to measurement problems.

The study of wage setting institutions usually starts by looking at the union density. It gives a measure of unions' presence in the labor market and of their strength to give voice to their demands. Union density is defined as the ratio of active and/or inactive union members and employed workers. The net union density adjusts for active members and is mostly used in empirical studies. Based on Visser's calculations using the model set up by Ebbinghaus and Visser (2000), the OECD Employment Outlooks (2004, 1997, 1994) provide numbers. Data exists for the 1970s, 1980s, 1990s and 2000 for almost all OECD countries.

A union-negotiated contract gets even more weight if it applies to non-union members and non-affiliated employers as well. This is summarized by collective bargaining coverage. Other factors are extension and enlargement mechanisms. Extension mechanisms rule that a collective agreement is binding within a sector or region regardless of whether employers participate in the wage-setting process. Enlargement goes beyond this and specifies that the collective agreement is binding in other sector or regions. Brandt et al. (2005) construct an indicator that accounts for extensions and enlargement. Coming from labor force surveys, EIRO (2000) and other official reports, the OECD provides numbers on collective bargaining coverage. Unfortunately, we are not able to precisely factor out the coverage rate due to extension or enlargement mechanisms. Furthermore, we do not have numbers on employers' affiliations. Clearly, these are missing parts of the overall picture of how labor market agents organize themselves.

Centralization and coordination are measures of corporatism. Basically, the centralization indicator should tell us the level of bargaining and the number of people affected by the outcome. The measures should account for the level itself,

the share of the workforce whose wages are determined at the corresponding level and the degree of horizontal centralization (Kenworthy 2001). Negotiations can occur at any level from the firm to the industry and up to the national level. Moreover – and this makes the whole quantification exercise complicated – multiple levels with varying authority may be involved in the process. Iversen (1999) tries to incorporate the connections between the different levels better by assigning weights to three bargaining authority levels – centralized, intermediate, decentralized – and thereby sheds light on the different structural characteristics within the bargaining process. Iversen then applies an aggregation scheme that also accounts for union density. Traxler et al. (2001) look at the actual level of the bargaining process. They include the influence of lower-levels on the outcome and the share of the workforce covered. Additionally, they take note of the degree of horizontal centralization. By judging each level's impact on wages on a case-by-case basis, they assign scores to the countries from a range of twelve points. Each score considers mixtures of bargaining levels and accounts for share of workers collectively bound by the corresponding bargaining agreement. Additionally, the OECD (2004) provides numbers on five-year averages from 1970-2000. It identifies five levels of centralization ranging from the company/plant level to central-level agreements.

Wage coordination captures the extent to which low-level bargaining parties are able and willing to internalize their actions. Or, as Kenworthy (2001) puts it, "it refers to the degree of intentional harmony in the wage-setting process." Soskice (1990) argues that it is a broader concept than centralization. Wage centralization as such is only one means to achieve coordination. Other modes include state-imposed centralization, guidance of lower-levels by peak-level organizations and pattern-setting by a powerful sector or group of firms (Kenworthy 2001). Soskice (1990) ranks countries according to five-point range for the late 1980s. Layard/Nickell/Jackman and the OECD, among others, adopt this approach as well. As a result, the OECD provides data points from 1970 to 2000. Following a different track, Traxler et al. look at the coordination activities by the major bargaining partners and put them into six categories. Each of the indicators mentioned so far have in common that they aim at measuring the actual degree of coordination achieved. Kenworthy (2001) adopts a different approach and tries to form expectations over the coordination activities by looking at the wage setting arrangement. He sets up a database for 18 OECD countries covering the time period 1960-2000. In his publication he provides extensive explanations how he comes up with his five point scoring scheme. Traxler et al. (2001) do not only look at centralization and coordination but also at the extent to which lower level bargaining partners (the rank and file) actually follow the agreements reached at

higher levels. In this sense bargaining governability refers to the degree of vertical coordination. Using Traxler et al.'s information, the OECD (2004) derives a cardinal indicator for 2000 based on scores on a scale form 1 to 4. A time series is not available, however, as the OECD argues, we may safely assume that practices have not changed in recent decades. Composite indicators of centralization and coordination usually exclude information on vertical coordination.

The 1994 OECD Jobs Study suggests a further decentralization of wage bargaining. One such means is to introduce opening or opt-out clauses that give the right to companies to re-negotiate collective bargaining agreements at a lower level. Data on this is scarce and what is available does not seem to warrant changes in the existing OECD rankings (OECD 2004).

Besides the indicators above, binding minimum wages influence labor supply and demand. For the purpose of international comparability, the Kaitz index (Kaitz 1970) gives a relative measure of the minimum wage that also takes the share of the population covered into account. Immervoll (2007) also puts many numbers on minimum wage, labor costs and taxes together. Additionally, the OECD and Eurostat maintain databases on minimum wages and report them on a regular basis, i.e. on the levels and the coverage of statutory (and generally binding) minimum wages. The European Foundation for the Improvement of Living and Working Conditions (Eurofound) and its European Industrial Relations Observatory (EIRO) regularly offers information on minimum wage systems in Europe. It distinguishes between statutory national minimum wages and minimum wages being part of a collective bargaining agreement. Additionally, it provides panel data from the late 1990s onwards.[1]

Many other labor market institutions can prove crucial in determining labor market outcomes. Although the OECD reports numbers on working time, we do not know much about its flexibility. In most countries, working time agreements are part of collective bargaining contracts that not only specify a fixed amount of time. Rather, they give discretion or guidelines to employers to adjust the working time if necessary. Indicators capturing the varying degrees of working time flexibility are still missing.

[1] Available online at: http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1073,46870091&_dad=portal&_schema=PORTAL&p_product_code=earn_minw_cur, http://stats.oecd.org/WBOS/Default.aspx and http://www.eurofound.europa.eu/eiro/2005/07/study/tn0507101s.html (June 2007).

3.7 Adjacent Policy Areas

So far we have looked at labor market institutions. Some researchers investigate other institutions and link them to the labor market. Oswald (1996) finds that the degree of home ownership has a negative effect on employment as it hinders employee's mobility. He puts together data, mainly collected by the United Nations, and runs regression with the ratio of homeowners being the right hand side variable. So far there is no systematic collection of data of this kind.

Nicoletti et al. (2000) or Conway et al. (2006) study product market regulations which refer to the rules of competition in the markets. The indicators include information on state control, barriers to entry, involvement in business operations and market structure. All researchers build composite indicators that allow for a comparison of OECD countries and describe the situation in the late 1990s and 1975-2003, respectively. An innovative feature of the first indicator is that the weighting scheme is not subjectively based since the authors use factor analysis to extracts weights from the data. For illustrative purposes they apply this technique to the OECD's EPL indicator without, however, finding major changes in the country orderings. Both indicators differ with respect to their data sources. Nicoletti et al. (2000) rely on questionnaires sent to national governments whereas Conway et al. (2006) look at the OECD International Regulation Database.[2]

Family-friendly employment policies aim to encourage more women to take up jobs. Bassanini and Duval (2006) study the usual tax incentives and family-related benefits. In addition, they consider parental leaves and childcare subsidies. Moreover, there is an OECD Family Database available that includes data on the usual labor market characteristics and also on public policies for families and children.

To study the impact of education and training on labor market performance, the UNESCO/OECD/EUROSTAT (UOE) database on education statistics, which is also the basis of the OECD series Education at a Glance, offers a wide set of indicators. In addition, the OECD provides earnings-related data and numbers on pupil and adult performance (PISA and IALS).

[2] www.oecd.org/eco/pmr (June 2007) offers more information and datasets.

3.8. Alternative Survey Data and Overall Indices

All indicators discussed mostly rely on statutory data. Researchers look at written rules and derive the indicators from them. The discussion of EPL indicators, only to mention one example, has meant that these indicators neglect the consideration of enforcement issues. As a consequence, there is a gap between what rules specify and what actual behavior is. Also for this reason, some researchers conduct surveys and ask employees, employers or other experts about their assessment of institutional provisions or their actual behavior and combine this with "hard" data. Prominent examples are the World Competitiveness Report, the Global Competitiveness Report, the Global Labor Survey or the Economic Freedom of the World indicator, published by the International Institute for Management Development, the World Economic Forum, Chor and Freeman (2005) and the Fraser Institute, respectively. Though the surveys are different in scope (competitiveness, economic freedom, labor practices), they also include intersections with labor market institutions (Ochel 2005). To take EPL as an example, the OECD indicator and the survey data set a bandwidth in which the true regulation pattern may be located. Whereas indicators on statutory data may understate, employers' survey may overstate the true extent and impact of the regulation in question. The enforcement component may partly explain the difference. But this is only a hypothesis and is not being discussed any further here.

Recently, the Ifo Institute has developed a new indicator called Institutions Climate Index (2007). Primarily focusing on the beneficial determinants of growth, this index could be easily used to assess the labor market's performance. It is a composite indicator that uses factor analysis to derive the weighting scheme for the detailed indicators.

The only attempt at an overall indicator of labor market adaptability so far was presented by Algoé/Alphametrics (2002) for the EU 15, Japan and the United States. This was conceived as a project to develop an indicator that integrated individual behavior, institutions and the external context in an interactive way, thus going beyond institutional factors and relying mainly labor market outcome variables. The study proposes a set of indices that stand for different dimensions of labor market adaptability such as labor availability, education and training, job mobility and working time flexibility – with some reference being made to institutional variables such as employment protection and unemployment insurance benefits. Hence, while this allows for interactions between different dimensions of adaptability as well as for specific national patterns and country clusters, the approach is not primarily institutional and, in a way, incomplete.

3.9 Comparative Datasets on Labor Market Reforms

Many researchers have set up data sets for comparative studies of labor market institutions. All these data sets have one thing in common: They draw heavily on OECD publications and data. These data sets aim at giving a comprehensive summary of the state and evolution of labor market institutions in OECD countries.

At the forefront, various issues of the OECD's Employment Outlooks provide a great many numbers on labor market outcomes, employment protection, social spending, active labor market policies and collective bargaining. Taxing Wages and Benefits and Wages are the OECD's publications that report on an average production worker's take-home income. Brandt et al. (2005) provide an extensive review of labor market reforms after the adoption of the OECD Jobs Strategy in 1994. They provide qualitative information on labor taxes, EPL unemployment benefits, active labor market policies, retirement, wage bargaining and working time.

Using information on 44 types of policies grouped into the above-mentioned seven categories, the authors construct two additional indicators regarding the reform effort. The first one, the so-called "reform intensity indicator," looks at all policy changes that took place in the OECD countries regardless of whether or not they were in accordance with the Jobs Strategy's recommendations or not. By using of an equal weights aggregation scheme for all 44 policy items, they calculate an overall indicator. The second one, the so-called "follow-through ratio," only accounts for those policies that comply with OECD recommendations. Although the indicators provide us with information on the intensity of reforms, they do not tell us much about their coherence. The OECD policy recommendations ask for comprehensive reform packages rather than for "piece-meal" reforms. The indicators cannot make such a distinction. Moreover, the results themselves are questionable since the authors conduct a sensitivity analysis by regarding the weighting scheme by means of the "random-weights" technique. Apparently, weights can have a huge impact on the ordering of the countries. To sum up this approach, the assessment of reforms is very general. The indicators do not show any interactions or complementarities between the different reforms.

Two quite similar sources of qualitative information on labor market reforms are the LABREF (Labor Market Reform) Database developed by the European

Commission and the Fondazione Rudolfo DeBenedetti Social Reforms Database. LABREF aims at providing information on the design of reforms in nine policy domains that comprise 36 areas of intervention and allows tracking of them by country and over time. Each policy reform is then assessed along 13 key features. Those include budgetary costs, who is affected, enforcement and monitoring procedures, whether the measure requires interaction with other areas, the context of the measures in terms of a policy package, the role of social partners, the main impact on labor demand, supply and wages – that is, the influence on the matching process. The constructors are very careful about making judgments or foreclosing the indicators' impact on some concept of the labor market's well-being. The only slight exception is that they make a prediction about the impact on labor supply and demand but without discussing long-term effects. Finally, the database not only delivers information on the de jure dimension of policies but also, and more importantly, on policy packages and about the ways in which labor market agents are involved. The database draws on the ILO Database of Conditions of Work and Employment Laws, EIRO, OECD country reports, IMF, National Action Plans and other national sources. So far, information is only available for the EU-25 in 2004 and 2005 (soon to be updated). A backdating is planned up to 1996 (see e.g. Arpaia et al. 2005 for a first attempt at assessing reported reforms in a qualitative and descriptive way with some political economy considerations regarding the scope and packages of reforms).

The FRDB Social Policy Reforms Database has at its core elements of the labor market and the welfare state in Europe. It focuses on four reform areas: EPL, public pension systems (PEN), non-employment benefits (NEB) and migration policy (IMM). It covers the EU-14 and the period 1987-2005. For each policy reform, the dataset contains a short, qualitative description along with an assessment of the reform's scope and whether it has increased or decreased EPL flexibility or the pension system's generosity. As such, this approach only keeps track of changes, but does not compare them. Moreover, it is not totally clear what the difference between a marginal and a structural reform is.

Other sources of qualitative information on labor market reforms include databases maintained by ILO that cover minimum wages, maternity protection and working time, MISSOC, or the Bertelsmann Foundation's International Reform Monitor.

Quantitative indicator databases include Baker et al. (2004), Nickell and Nunziata (2002) and the CEP-OECD Institutions Data Set maintained by William Nickell (2006). The CEP-OECD dataset (Nickell 2006) draws heavily on OECD data and is based on earlier work by Nunziata and Nickell. It covers 20 OECD countries

and contains time series for 1960-2004. For virtually all policy domains indicators are available. Sometimes the author linearly interpolates missing data points in order to construct a time series, a technique that we have already discussed above. The author then ends up providing 46 panels that are readily available for research.

The last set of indicators to be discussed here is by Chataignier (2005). Her aim is to provide data on indicators of social dialogue. It refers to "all types of negotiation, consultation or simply exchange of information between or among representatives of governments, employers and workers, on issues of common interest relating to economic and social policy" (ILO). Ranging from union density to coverage and strikes, she also points to indices of social dialogue. As such, this data set offers easy access to information about the employer-employee relationship.

3.10 Overall Assessment

Existing indicators try to capture levels of regulation or the reform intensity in the labor market. There has been considerable progress regarding the coverage of policy areas and the creation of time series information on both levels of regulation intensity and changes in terms of reforms.

Of course, the development of indicators is always a bit arbitrary. Most of them are based, at least partially, on subjective judgments and weights or implicitly have some economic model in mind. This holds for the inclusion of different elements into an aggregate indicator or the weights attached to particular elements. Exactly for this reason some others have moved toward tests of robustness or sensitivity and discuss the economic implication inherent in the underlying model. A handbook for constructing composite indicators (Nardo 2005) offers helpful guidelines to assess the statistical part of the construction exercise. When we look at a composite indicator, say EPL, the first step involves assigning scores to the items. After that, a weighting scheme is designed. An analysis of sensitivity has to find out whether changes in the scoring or weighting system yield changes in the overall country ranking. Even though only a small number of ranks are changed, it can have an impact on the outcome of an empirical analysis. Reviewing, replicating and revising existing indicators does not seem to be popular. However, it needs to be done in order to find out about an indicator's reliability. For the purpose of panel analyses, we need to have time series of the

indicators. Above we discussed some, albeit not promising, approaches to tackle this problem. We, however, do not see another way than pain-staking work to regularly update the indicators. Simply drawing a line between two data points cannot overcome the problem.

A more specific issue regarding the quality of available indicators is the fact that most of them rely on formal provisions or model calculations. Hence, with some exceptions, they do not take the scope of application and the de facto implementation into account, e.g. the actual enforcement of dismissal protection or availability criteria in unemployment protection. Since most of the indicators, apart from the survey-based ones, are based on a de jure approach, they do not give information on whether and how the different means are implemented or enforced. Whether the indicators carry some degree of economic significance also does not become clear. Researchers should report numbers and results of the real relevance, coverage and implementation along with their indicators. "If a regulation [...] is not implemented, then it is not relevant" (Ochel 2005).

The international comparison of institutions is further impaired by the fact that they evolve in different contexts. That means that if we use identical concepts to measure some phenomenon, this may give rise to false inferences. To overcome this problem, the notion of functional equivalence comes into play. It "refers to the requirement that concepts should be related to other concepts in other settings in more or less the same way" (van Deth 1998).

All indicators have been constructed pretty much in isolation to others. It seems that researchers have their favorite indicator that they use for empirical analysis. To look at an example, consider a young graduate who tries to enter the labor market. His reasons for not finding a job quickly are manifold. Some claim EPL and strict insider rules are responsible, others see a high tax wedge that makes an employer reluctant to offer a job, and still others claim that the social security system with its negative impact on the reservation wage or the search effort is responsible. Something like an overall indicator that describes the labor market's flexibility does not yet seem in sight. Not a single institution in isolation hinders a young graduate from entering the labor market quickly. There are a plethora of institutions that work with and against each other. To account for them seems to be the challenge.

Hence, some path for future work on indicators could lie in the development of indicators with a high "information content" that take into account the actual implementation and relevance for actors' behavior. Given that institutions are not isolated from each other, the development of indicators should provide a reliable picture of the complex and multi-dimensional institutional environment that in-

fluences actors' behavior in the labor market. However, one must then be aware of potential endogeneity problems.

4 Empirical Evidence on Labor Market Institutions and Outcomes: Single Peak or Twin Peaks?

Indicators of labor market institutions have been used intensively in macroeconometric studies on the causes of unemployment. This line of research benefited initially from the OECD's work on unemployment beginning in the 1990s, in particular the OECD Jobs Study (1994). Among the achievements of the OECD the provision of longer time series for a set of labor market institutions stands out. However, other researchers also provided data sets which have been used subsequently by others, namely Nickell (1997) and Blanchard and Wolfers (2000). The accessibility of such data certainly contributed to an increased interest in the causes of differing unemployment rates in OECD countries. This interest was further spurred by theoretical research on the relationship between institutions and labor market performance. Although the fundamentals were laid in the seminal work by Layard, Nickell and Jackman (1991), it took a couple of more years before the notion of "labor market institutions" eventually entered into the language of economists.

At the empirical research frontier, the contributions by Nickell (1997) and Elmeskov, Martin and Scarpetta (1998)[3] mark the beginning of a debate that has been going on since then. Nickell (1997) starts out from the "received wisdom" that European labor markets are rigid and inflexible and tries to find empirical evidence on the adverse effects of "labor market rigidities," as institutions were often named at this time. His analysis can be seen as a blueprint for other studies. He runs regressions of labor market institutions on unemployment and employment rates, using two cross sections. His data set is thus quite small (NT=40) and apart from the change in inflation his explaining variables only include labor market institutions. Nickell's results support the view that generous unemployment benefits, high unionization and union coverage without wage bargaining co-ordination, and high taxes on labor lead to higher unemployment rates. Employment protection has no significant effect on unemployment. Active labor market policies reduce unemployment.

[3] The paper by Elemeskov, Martin and Scarpetta (1998) draws heavily from an earlier contribution by Scarpetta (1996).

Elmeskov et al. (1998) go a little further by studying the interaction between institutions and (active) labor market policies in more detail. They also discuss the political economy of labor market reforms, a line of research that has regularly been dealt with in the context of labor market institutions and (un-)employment performance. While their sample is almost identical to the one used by Nickell, they use yearly data covering the time span from 1983 up to 1995 (NT=238). Different panel models are estimated, confirming mostly a priori expectations on the signs of coefficients. An important difference to Nickell (1997) is a positive and significant coefficient for employment protection. While Nickell only stresses interactions between unemployment benefits and active labor market policies on the one hand and union power and centralized bargaining on the other, Elmeskov et al. (1998) also analyze interactions between employment protection and unemployment benefits or centralization. They also include interaction terms for taxes and centralization. Regressions, however, including both institutions on their own and their interactions with each other, easily result in many insignificant estimates. Since Elmeskov et al. (1998) only report their experiences with interaction terms selectively, their results should be seen as tentative hints that institutions probably interact.

This line of research is further elaborated by Belot and van Ours (2001). Based on data from 18 OECD countries and seven five-year time spans, for which averages are constructed (NT=119), different panel models (fixed effects) are estimated. The basic set-up is very much in line with Nickell (1997); i.e. apart from the change in inflation only labor market institutions are used to explain standardized unemployment rates. An important result of this exercise is the importance of fixed effects. In a pooled regression all institutional variables are significant, in a fixed-effects model they are not. Adding interaction terms leads to more significant coefficients. Belot and van Ours (2001) interestingly find strong interactions between taxes and the replacement rate. Their results also indicate that high union density only raises unemployment in economies with decentralized wage bargaining. Finally they find evidence for a negatively signed interaction term of employment protection and decentralized bargaining.

At the turn of the century a new research question arose. While macroeconomic variables had certainly been in the equation for a long time, it was only Blanchard and Wolfers (2000) who put forth the hypothesis that in order to understand the evolution of unemployment across (European) countries and through time, the interaction of shocks and institutions has to be considered. Consequently their paper tries to show that only by interacting shocks and institutions satisfying estimates can be obtained. While the econometric results do not reject the "institutions only" version, Blanchard and Wolfers quite convincingly argue their

point. In a nonlinear specification combining three shock variables (TFP growth, real interest rate, a shift in labor demand) six out of eight labor market institutions show significant correlations and seven out of eight the results expected. Active labor market policies are found to be insignificant as well as union coverage. Thus, according to Blanchard and Wolfers, even employment protection legislation, which has hardly been found to be significant, must be seen as a cause of unemployment.

Bertola, Blau and Kahn (2002) perform a quasi-evaluation of Blanchard and Wolfers (2000), but they also extend and modify the previous study. While their results are not as "nice," they largely confirm the findings of Blanchard and Wolfers. Among their estimates, the finding that 50 percent of the difference between unemployment rates in the United States and those in other countries (1970-1996) can be explained by a model containing shocks and institutions. In comparison, excluding institutions diminishes the ratio to 11 percent. The authors conclude that "a large proportion of the reversal of unemployment fortunes between the United States and the other OECD countries appears to be due to the interaction between the laissez-faire institutions in the United States and the macroeconomic shocks of the 1980s and 1990s".

Around the same time as Blanchard and Wolfers, Fitoussi et al. (2000) came up with empirical work also relying on shocks and institutions. Their approach to institutions differs from most of the papers by adopting a two-step strategy. They first run regressions where unemployment rates are explained by macroeconomic variables and fixed effects. The adjustment to shocks is country specific. The estimates for both the fixed effects and the 'sensitivity-to-shocks' parameters are then explained in a second step by country-specific variables for unemployment benefits, trade union strength and active labor market policies. All variables show the expected signs. In a second step, Fitoussi et al. first estimate "pure" institution models. While institutions can explain the heterogeneity in unemployment rates across countries in the 1980s, they fail to explain changes in unemployment from the 1980s to the 1990s. Adding macroeconomic shocks to the institutions makes coefficient estimates for union density and union coordination significant, leading Fitoussi et al. to conclusions similar to those of Blanchard and Wolfers (2000).

In two papers, Nickell, Nunziata, Ochel and Quintini (2002) and Nickell, Nunziata and Ochel (2005) argue the case for the sole importance of institutions. Extending previous work by Layard, Nickell and Jackman (1994), Nickell (1997) and Nickell and Layard (1999), they regress institutional and shock variables on standardized unemployment and employment rates. Their estimated models for

unemployment use time series from 1960 to 1995 and include the lagged unemployment rate as an explanatory variable. The baseline and preferred specification contains institutional variables (some of them interacted) and measures of macroeconomic shocks such as labor demand, TFP and real import price shocks. The estimates for all institutions are significant and correctly signed, except for employment protection and total employment taxes, which are insignificant. By comparing the basic model with an enriched model containing interaction terms between time dummies (representing shocks) and institutions, they find that "the interacted time effects are, first, [jointly] insignificant and second make no contribution to the overall rise unemployment." Whether this research strategy actually allows the conclusion that interactions do not contribute to the explanation of the evolution of OECD unemployment appears questionable. Nickell et al. neither discuss their dynamic modeling strategy of including the lagged independent variable nor do they try to explain why in Blanchard and Wolfers' work the interactions of shocks and institutions have such importance.

In a series of papers (Baker et al. 2004, 2005, Howell et. al 2007), Baker et al. critically review all studies that have been discussed so far. Starting from the alternative hypothesis that labor market institutions are not responsible for high unemployment rates, they try to assess the robustness and reliability of the macroeconometric evidence. Their main conclusion of the exercise is that the effects of institutions on unemployment are distinctly shaky with widely divergent coefficients and levels of significance. They go on to argue that the latest work by the OECD (2006) basically confirms the lack of robustness in panel studies.

To highlight the work by Baker et al., we give two examples of their experiments. In the 2002 paper, Nickell's (1997) model is re-estimated using data from Nickell et al. (2001). While in Nickell's paper seven out of eight institutional variables were significant, in Baker et al. there are none. In another paper (2004), the IMF study (2003) is analyzed at length. One issue explored is the correct modeling approach to unemployment dynamics, a topic also implicitly dealt with by Nickell et al. (2003, 2005) by including the lagged dependent variable. By replacing country-specific time trends in the IMF specification and, probably much more important, replacing some of the series for the institutional variables by (slightly) revised versions, the coefficient estimates all become insignificant. Finally, Baker et al. (2004) chose a different set of interaction terms. Altogether these changes result in almost completely insignificant coefficient estimates. Unfortunately, Baker et al. do not justify the changes in the econometric model.

The contributions by Baker et al. are highly valuable for understanding and evaluating the prevailing studies. They are right in pointing out that practically

none of the major studies contains comprehensive specification tests or other measures to check their robustness. Most of the time, only the 'preferred' or best-fitting models are presented without discussing the problems that were encountered in the estimation process. While this problem is certainly not confined to macro-econometric work on labor market institutions, it appears highly debatable whether policy advice on reforming labor markets could be based on "fragile" econometric results. Thus the question is, as Blanchard (2006) puts, "Do we really know enough to give advice?" Baker et al. conclude that there is no convincing evidence for the "orthodox" case. While they certainly have a point in asking for robustness, it appears questionable whether their approaches to test for robustness are adequate.

Concentrating on econometric specification, Baccaro and Rei (2005) estimate models in the style of the IMF (2003). Using the data set of Baker et al., which in turn is built on the institutional data set by Nickell and Nunziata (2001), they particularly discuss the right approach to dynamic modeling. Leaving aside the details of an interesting set of alternative ways to deal with serial correlation, their main result is that none of their models lends support to the "orthodox" view. There are two issues of specification, which in our review deserve further notice. One is the inclusion of country-specific time trends, the other is co-integration. With respect to the former, Baccaro and Rei do not see any justification for country-specific time trends. Their replication of the IMF's (2003) study, however, suggests that it is just this element of the model that makes the difference. According to Baccaro and Rei the time series used are mostly non-stationary but the inclusion of first-order tests for co-integration suggest the existence of a co-integrating relationship. Baccaro and Rei therefore decide to estimate (dynamic) models in differences. They also discuss alternative approaches, among them some ad hoc tools like the insertion of country-specific time trends, which they do not recognize as appropriate, since "we do not want to control for trends. If anything we would like to explain them through our model." Summarizing tables 4-6, no clear picture in support of the "deregulatory view" emerges. With the exception of union density, which has a significant positive effect on unemployment in most of the models, the rest of the institutional variables show only sporadic signs of significance.

Also dealing heavily with alternative estimation techniques Amable, Demmou, Gatti (2006) contribute to the debate on robustness. Taking up the issue of slow, if at all changing institutional variables, they apply fixed effects vector decomposition (FEVD) estimators as well Beck and Katz's (1995) method to compute panel corrected standard errors (PCSE). While the latter does not make a big difference to the FGLS estimators used otherwise, the FEVD estimates produce sig-

nificant coefficients for almost all explanatory variables. Amable et al. follow Nickell et al. (2003, 2005) and estimate dynamic models, including the lagged dependent variable, on yearly data from 1980 to 2004. Their results basically confirm the importance of labor market institutions as important determinants of unemployment. In particular, they find significant positive effects of union density and taxes on labor. Product market regulation is always found to increase unemployment. Wage bargaining coordination as well as, surprisingly, employment protection decreases unemployment.

Bassanini and Duval (2006), in a paper which underlies Chapter 7 of the OECD Employment Outlook 2006, use new indicators, different lengths of time series and alternative specifications in order to "reassess the role of policies and institutions." Their work also takes up the reproach of the lack of robustness in estimations. The checks include different choices of the estimation samples, alternative model specifications and estimation techniques. None of these alterations leads to changes in the main findings. The first set of models, which consists of equations in levels, where apart from the institutional variables the output gap enters, confirms the expected effects of institutions on unemployment. Employment protection and union density are the only insignificant components of the different models.

Bassanini and Duval then go on to test specific and systemic interactions among institutions. In this context, it is important to note that the inclusion of all combinations of institutions is not feasible, since the degrees of freedom are simply too few. Thus the choice of interaction terms is always arbitrary in a sense. Overall the models presented lead to the conclusion that there is evidence for systemic interactions, but not for specific interactions, with the exception of unemployment benefits and spending on active labor market policies. This combination of institutions decreases unemployment, probably because higher spending on active labor market policies means stronger activation efforts.

Bassanini and Duval also take up the topic of "shocks and institutions." In the spirit of Blanchard and Wolfers (2000), they use their data sets to estimate equations including unobserved shocks. These shocks are modeled as common time dummies for all countries. In order to capture at least part of the important macroeconomic shocks of the 1970s, the previously-used timed series are prolonged backward, covering a time span from 1970 (1975) to 2003. With four institutions entered, the coefficients of the average replacement rate, the tax wedge and high corporatism are found to be significant and correctly signed. Bassanini and Duval take them as "evidence that direct and indirect effects of policies and institutions complement each other in explaining unemployment trends." The same

holds for a second set of regressions, where the unobserved shocks are replaced by the observed shock variables: TFP, terms of trade, interest rates and labor demand. Despite the significance estimates of the shocks and institution models Bassanini and Duval (2006) see their contribution more in line with Nickell (1997) and Nickell et al. (2003, 2005), stressing that "changes in policies and institutions appear to explain almost two-thirds of non-cyclical unemployment." However, the effects of adverse shocks are amplified by high unemployment benefits and a low degree of corporatism.

In summary, it appears fair to say that there has been enormous progress over the last ten years, if we take Nickell's (1997) influential paper as the starting point. Data sets have grown as has the number of studies. A lot of effort has been put into better, at least more detailed, time series for labor market institutions. New explanatory variables besides labor market institutions have been tested. Important econometric issues, such as dealing with the peculiarities of the institutional variables and co-integration, have been discussed. Robustness has been an issue, at least since Baker et al. (2002) started their critical work. Thus a lot of scientific effort has been put into the quest for empirical evidence on the effects of labor market institutions. Notwithstanding this effort, the case has to be recognized as largely unsolved. There certainly is a lot of evidence in support of the "deregulatory view." It is, however, not very difficult to come up with empirical estimates that reject this view. Yet, the role of interactions between institutions and between institutions and shocks is not clear either. The explanation for this "lack of robustness" refers to the general problem in macro-econometrics where it is rather common that minor changes to "nice" empirical models can produce quite disastrous results.[4]

But there is another, much more profound explanation: the potential existence of different peaks of superior labor market performance. In general, one can argue that this type of research is less suitable for regression analysis since it most often relies on complex institutional analyses with strong qualitative evidence, which can be seen as less rigorous in empirical terms (Howell et al. 2007, Scharpf/Schmidt 2000, Schettkat 2003).

There have, though, been some advances in the direction of quantitative analysis. Amable (2003) and Hall/Gingerich (2004) probably represent the most prominent

[4] The notion of robustness, at least in the very broad sense as it is used in our discussion, is not well defined, indeed. A significant part of the critique is raising very general points, even touching the philosophy of science. It is hard to see, how any econometric model can either be irrefutably verified or falsified. Thus there is always the question of what actually constitutes evidence and what does not.

examples. Both Hall/Gingerich and Amable show a positive correlation between institutional coherence embodied in either liberal, market coordinated systems or strategically coordinated economies and economic growth or other outcome variables such as productivity and inventions. Institutional coherence is measured in terms of an aggregate coordination index based on specific institutional variables developed by Hall and Gingerich (2004). They take the two extremes as "pure" models of liberal or coordinated market economies. Relying on OECD indicators, Amable identifies the coordinated model as a second peak besides the liberal system in terms of low unemployment. Although EPL drives unemployment in his model, coordination in industrial relations, public education and welfare state size reduce it. These factors also eliminate the potential negative effects of EPL and product market regulation. Hence, he suggests a dual peak model with liberal systems on the one hand and coordinated economies with strong welfare states on the other.

In nearly the same fashion, the OECD most recently argued – based on principal component analysis – that two models of superior labor market performance exist in OECD countries, with one group of countries having low unemployment benefits, taxes and EPL, and the second group achieving broadly similar outcomes, i.e. high employment and low unemployment, with a fully fledged system of benefits, active labor market policies and corporatist cooperation as long as this is interacting with a flexible labor market. The stronger role of the welfare states in corporatist, mostly Northern European systems, however, means that taxes are higher, yet the distribution of incomes is less unequal than in liberal economies. In contrast to the varieties of capitalism literature, however, the OECD sees coordinated economies in Continental Europe not as successful but, rather, as problematic in terms of labor market performance as they are associated with a passive welfare state and heavily regulated employment protection (OECD 2006).

The review of these studies shows that robust correlations between individual institutional variables and labor markets are hard to identify. The same is true for patterns of institutional interactions or interaction between shocks and institutions. Hence, while the theoretical argument is convincing, empirical evidence is less clear. This also holds for attempts at identifying the beneficial effects of institutional configurations that represent different types of labor markets or economic systems. Hence, while there is evidence in favor of the "single peak" model, the "twin peak" alternative cannot unambiguously be ruled out.

5 What Do We Know? What Should We Know?

The last decade can be characterized by considerable progress regarding both the construction of aggregate institutional indicators and empirical macro-econometric research into the determinants of employment performance (see also Arpaia/Mourre 2005). Given this co-evolution of empirical research and institutional indicators (as well as facts and ideas), we can now see a broad analytical consensus on the role of institutions, interactions between institutions and, last but not least, between institutions and shocks so that a dynamic and interactive framework can be seen as widely accepted. Most empirical studies converge to the point that the majority of the regressions – despite major differences in the models – show significant results for core labor market institutions, interactions and shocks, and mostly in the expected way. However, most studies only report "preferred" results. Hence, whereas many researchers agree that institutions and institutional reforms explain a significant part of cross-country differences in labor market performance, it is hard to single out the most relevant variables in terms of particular institutions or interactions in an unambiguous way. To a certain extent, empirical findings vary depending on the model specifications, the countries and period covered and the variables used. Hence we do not really know which institutions and which interactions have a substantial influence on labor market outcomes. Findings from one study can be neutralized by findings from other studies. Hence, the robustness of empirical findings is still under debate. The series of studies that is now available does not lead to unambiguous empirical findings regarding significant correlations between individual institutional variables and labor market outcomes. This inhibits strong statements in terms of policy advice. Hence, if policy advice would only be based on this type of macro-econometric studies, we certainly do not know enough.

Some questions remain. First, the role of interactions between institutions is still not clarified enough in econometric terms. Available studies and theoretical contributions point at a potential value added from deeper analysis of institutional interactions – in particular when it comes to diverging patterns of labor market adaptability. Empirical research in this direction is not yet conclusive. More specifically, the potential expected from interaction models has not materialized in a robust and theoretically convincing way thus far. However, available evidence seems to suggest that different models of superior employment performance are possible and that it is not the presence of protective mechanisms as such that cause persistent economic problems, but rather an inappropriate institutional setting that allows only for an insufficient amount of adaptation on the labor mar-

ket. In particular there seems to be a dualism between liberal, market oriented arrangements and corporatist ones. Yet, the debate between "single peak" and "twin peak" advocates is still open. By the same token, one might argue that a simple linear model of causal relations between single institutions and labor market outcomes is not suitable given the complex relationship between institutions and the labor market. Given this uncertainty, it does not seem appropriate to make strong statements on the role of individual institutional variables and potential policy recommendations based solely upon macro-econometric studies. What we have learned is that the empirical evidence is uncertain and that real processes within the labor market are more complex than originally assumed.

Second, despite the fact that considerable resources have been devoted to the development of quantitative institutional indicators over the last two decades, the set of available indicators is still far from being completely reliable and satisfying as they basically represent formal regulations or model calculations. The improvements on the indicator side have not necessarily contributed to more robust empirical findings yet. This may have to do with the fact that we do not know enough about the actual meaning of institutions in practice and the way they influence actors' behavior. Hence, there is some room for better indicators with a higher "information content" regarding the scope and actual application of formal provisions and with respect to potential functional equivalents. This in particular could help formulate policy advice as indicators available so far are often rather broad and "stylized" so that specific need for institutional reform cannot be derived.

Still, explaining cross-country differences in labor market outcomes is a major objective of theoretical and empirical work in economics. And policy making will be informed by more or less reliable statements on reasons why there are differences in labor market functioning across countries. Hence, future work should improve the empirical knowledge on explanations for diverging employment profiles in national labor markets not only for academic, but also for practical reasons. Given the fact that it is never possible to confirm or reject specific hypotheses definitively, it would not be realistic to expect totally unambiguous results form empirical work. Yet, we could try to make some steps forward. Against this background, three major points emerge:

1. Further work should be devoted to the theoretical refinement of interactions between the different institutions that influence the labor market and between institutions and the economic environment in order to inform empirical work with substantial hypotheses. Up to now, most work on interactions was basically inductive, but not based on strong theoretical ar-

guments. In that sense, we need a systematic theory of channels of adaptation and the relevant institutional environment.

2. Additional work seems necessary regarding the substance of quantitative indicators on labor market institutions in order to improve our understanding of the actual role or the "real meaning" and relevance of institutions. In particular, this calls for supplementing existing indicators with information on the implementation or enforcement of formal provisions (e.g. availability criteria, dismissal protection), the scope of application, i.e. coverage, and potential functional equivalents.
3. We could benefit from having a comprehensive set of quantitative indicators on institutional provisions that influence different dimensions of labor market adaptability or flexibility. This could help map national patterns of labor market flexibility. In practical terms, this means selecting individual elements and combining them in a theoretically and empirically sound way. This is possible by building upon existing indicators and databases on reforms although some empty space will have to be filled. Time series information would allow for the tracking of changes over time that stem from institutional reforms. It might be possible to achieve, with reasonable simplification, an overall indicator of labor market adaptability combining different dimensions of flexibility.

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Table 1: Survey of studies

Dependent variable: standardized unemployment rate
Countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States, unless otherwise indicated.

Study	**Independent Variables**	**Indicators**	**Countries (N)**	**Time Span (T)**	**Econometric Model(s)**	**Results**[i]	**Remarks**
Elmeskov, Martin, Scarpetta, 1998 (Table 2)	UB (combination of BRR and BD) EPL UD COOR, CENTR CORP (combination of COOR and CENTR) TW, ALMP GAP (output gap) MINWAGE	OECD	N = 19 without Switzerland	T = 13 Yearly data, 1983–1995	Random effects Feasible GLS (FGLS),	Significant: UB, EPL, TW ALMP, COOR, CORP, GAP	
Nickell, Nunziata, Ochel, 2005 (Table 5)[ii]	lagged unemployment rate EPL EPL x unemployment rate BRR BD (benefit duration) BD x BRR Δ UD COOR, COOR x UD Tax, COOR x Tax Home ownership rate Shocks: LD, TFP, RIP, MS, RIR	BRR, BD: OECD UD: Ebbinghaus and Visser (2000), COOR: OECD, EPL: Blanchard and Wolfers (2000), TT: CEP and OECD	N = 20	T = 36 Yearly data, 1960–1995 NT = 600, due to missing data	FGLS, heteroscedastic errors and country specific first order serial correlation Time and country dummies Country-specific time trends	All significant, except MS and RIR shocks	Additional model to test for interaction terms for shocks and institutions.
Belot, van Ours 2001 (Table III)	Tax BRR Home ownership rate Interaction terms: EPL x CENTR UD x CENTR	BRR: OECD EPL: own calculations CENTR: OECD and Bratt (1996)	N = 18 without Portugal and Spain	T = 7 Five-year time spans 1960–1994 NT = 108	OLS (mostly) fixed effects	TAX x BRR significant EPL x CENTR and UD x CENTR only	Fixed Effects result in insignificant estimates

	Change in inflation	Tax: CEP and OECD UD: CEP				significant for lowest level of centralisation	
Blanchard, Wolfers 2000 (Table 5)	TFP shock, RIR, LD shock BRR, BD, ALMP, EPL TAX, COVER, UD, COOR	BRR, BD: OECD EPL: Lazear (1990) and OECD (1999) Others: Nickell (1997)	N = 20	T = 8 Mostly five-year spans, 1960–1995 NT = 131	NLS	all significant except for ALMP and COVER	
Bertola, Blau, Kahn 2002 (Table 4.9)	LD shock RIR TFP shock Change in inflation Youth Pop. Share Interaction term for shocks and: BRR, BD, COVER, EPL, ALMP, UD, TAX, COOR	Blanchard and Wolfers (2000)	N = 20	T = 8, mostly five-year time spans, 1960–1996 NT = 103	NLS, country dummies some models with time dummies	Significant: RIR Change in Inflation BD, TAX	Blanchard/-Wolfers, 2000 – Data "model explains 50 % of divergence between US and rest"
Fitoussi,-Jestaz,-Phelps,-Zoega, 2000 (Tables 4, 6 and 8)	**Table 4 and 6:** BRR, BD, UD, COOR, COVER EMPCOOR (only Table 6), ALMP **Table 8:** Trend productivity growth, Nonwage support, average unemployment rate	Nickell and Layard (1999)	N = 19 without Switzerland	**Table 4:** T = 29 1960–1998 **Table 6 and 8:** averages for 1983–1988	OLS	**Table 4:** all significant **Table 6:** all significant except for union density + union coverage	Fixed effects and "sensitivity to shocks" first estimated on macroeconomic variables.
Baker, Glyn, Howell, Schmitt, 2004	lagged unemployment rate EPL, UD, COOR, COOR², BRR, BD, TW Interaction terms: UD x COOR, BRR x BD, TW x COOR Productivity growth, RIR, TOT(-1)	IMF (2003) which in turn is based on Nickell and Nunziata's	N = 20	T= 29 1960–1998 NT = 672	FGLS, heteroscedastic errors, fixed effects, time dummies	significant: UD x COOR, TWEDGE x COOR	Re-estimation of the IMF's (2003) model, without country-

(Table 4, column 4)		(2001) "Labour Market Institutions Database"					specific time trends
Bassanini, Duval, 2006	**Table 1.2, column 1:** BRR, TW, UD, EPL, PMR, High Corporatism, Output gap **Table 1.5, column 2 (systemic interactions):** BRR, TW, EPL, UD, PMR, High Corporatism Interactions between single institutions and the overall institutional framework: BRR, TW, UD, PMR, Output gap	OECD data:	N = 20	T = 24 1982–2003 NT = 434	**Table 1.2:** FGLS, fixed effects, time dummies **Table 1.5:** NLS, country and time dummies	**Table 1.2:** all significant except for UD and EPL **Table 1.5:** all significant	
Amable, Demmou, Gatti, 2006 (Table 4, col. 3)	PMR, EPL x BRR, BRR, COOR, UD, TW, CBI, FA, RER, Productivity (-1), Credit, TTB	OECD except for COOR (Nickell et al. 2005) and BRR (Scruggs, 2004)	N = 18, without New Zealand and Switzerland	T = 25 1980–2004 NT = 212	FEVD, country and time dummies, AR(1)	all significant except for TTB	

Independent variables include:

Institutional variables: UB = Unemployment Benefits, BRR = benefit replacement rate, BD = benefit duration, CENTR = centralization of collective bargaining, COOR = co-ordination of wage bargaining, COVER = union coverage, UD = union density, EPL = employment protection, ALMP = public spending on active labor market policies, TAX = taxes on labor, TW = tax wedge, EMPCOOR = employer co-ordination, PMR = product market regulation, CBI = central bank independence

Macroeconomic variables: LD = labor demand shock, TFP = total factor productivity shock, RIP = real import price shock, MS = money supply shock, RER = real exchange rate, RIR = real interest rate, FA = financial assets, Credit = rate of domestic credit to GDP, TTB = trend of trade balance

[i] All signs as expected by standard economic theory, unless explicitly mentioned.
[ii] Table 5 in Nickell et al. (205) is identical to Table 13 in Nickell et al. (2003).