

Institutions, Shocks and Unemployment in the OECD: an Empirical Analysis of the Interactions of Institutions and Shocks within OECD Labour Markets

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Frederik Knirsch

Institutions, Shocks and Unemployment in the OECD

**An Empirical Analysis of the
Interactions of Institutions
and Shocks within
OECD Labour Markets**

.....
ZÖSS
ZENTRUM FÜR ÖKONOMISCHE
UND SOZIOLOGISCHE STUDIEN

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Institutions, Shocks and Unemployment in the OECD

An Empirical Analysis of the Interactions
of Institutions and Shocks within OECD
Labour Markets

Frederik Knirsch

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Vorwort der Herausgeber

In dieser Publikationsreihe werden Bachelor- und Masterarbeiten von Studierenden des Fachbereichs Sozialökonomie der Universität Hamburg veröffentlicht, die als exemplarisch gelten können und es deshalb einerseits verdient haben, einer größeren Öffentlichkeit vorgestellt zu werden, die andererseits damit aber auch einen Vorbildcharakter erhalten sollen. Die Arbeiten, die in unserer Reihe veröffentlicht werden, werden entweder von Mitgliedern des Zentrums für Ökonomische und Soziologische Studien (ZÖSS) vorgeschlagen oder das ZÖSS wird von anderen Mitgliedern des Lehrkörpers des Fachbereichs Sozialökonomie auf zumeist von ihnen betreute Abschlussarbeiten aufmerksam gemacht und eine entsprechende Veröffentlichung angeregt.

Die vorliegende Arbeit von Frederik Knirsch wurde dem ZÖSS von dessen Betreuern Prof. Miriam Beblo und Prof. Ulrich Fritsche vorgeschlagen. Frederik Knirsch behandelt darin ein gleichermaßen relevantes wie anspruchsvolles Thema: Er untersucht die Interaktion von Institutionen und exogenen Schocks auf die Entwicklung der Arbeitslosigkeit in der Europäischen Union. Begreift man die jüngste, von den US-amerikanischen Immobilienmärkten ausgegangene Weltfinanzkrise als einen exogenen Schock für die Volkswirtschaften der Europäischen Union und konstatiert, dass die Arbeitsmärkte in der EU sehr unterschiedlich darauf reagiert haben und die Entwicklung der Arbeitslosigkeit innerhalb der EU sehr unterschiedlich verlief, dann wird die Relevanz des Themas schnell ersichtlich. Anspruchsvoll ist das Thema deshalb, weil es eine ganze Reihe von Arbeiten und Ansätzen gibt, die zur Bearbeitung dieser Fragestellung herangezogen und verarbeitet werden müssen. Miriam Beblo und Ulrich Fritsche als Gutachter der Abschlussarbeit bescheinigen dem Autor, dies in hervorragender Weise getan zu haben. Nach ihrer Einschätzung hat es die Arbeit deshalb verdient, einer breiteren Öffentlichkeit vorgestellt zu werden – ich denke, dieses Urteil werden die geneigten Leser vollkommen teilen. Die Arbeit argumentiert sehr sauber, abgewogen und ist auch sprachlich ansprechend – insgesamt also eine überdurchschnittliche Arbeit, die wir gerne in dieser Hinsicht als ‚exemplarisch‘ vorstellen.

Allerdings hat die Einreichung und folglich Begutachtung der Arbeit auch aufgezeigt, dass wir im ZÖSS bislang keine klare Definition davon hatten, wann eine Masterarbeit als ‚exemplarisch‘ gelten darf. Wir haben uns nun darauf verständigt, dass aus Sicht des ZÖSS neben der grundsätzlichen, überdurchschnittlichen Qualität der Arbeit auch die Kriterien der Interdisziplinarität und/oder der pluralen Herangehensweise (also Betrachtung einer Fragestellung aus mehreren paradigmatischen Perspektiven) erfüllt sein sollten. Das Qualitätskriterium erfüllt die Masterarbeit allemal, aber sie ist weder explizit interdisziplinär angelegt, noch wirklich pluralistisch. Es wird vielmehr auf jene Literatur abgestellt, die die traditionellen theoretischen Grundlagen verwendet, alternative postkeynesianische (Marktkonstellations- oder Regimeansatz; vgl. Fritsche et al. 2004; Heine et al. 2006; Heise 2008; Heise 2011; Herr/Kazandziska 2011) oder regulationstheoretische Ansätze (vgl. z.B. Amable 2003; Atzmüller et al. 2013; Deumelandt 2010; Becker 2009) werden hingegen nicht erwähnt. Gerade bei der Erklärung der Arbeitslosigkeit erscheint uns dies aber (zumindest für eine

exemplarische Masterarbeit des ZÖSS) sinnvoll – zumal diese Ansätze von Mitgliedern des Fachbereichs vertreten werden und selbst einer der Gutachter (Ulrich Fritsche) auf diesem Gebiet gearbeitet hat (aber nicht in der Literaturliste erwähnt wird). Diese Leerstelle kann man angesichts der Marginalisierung alternativer Ansätze in der heutigen Wirtschaftswissenschaft sicher nicht dem Autoren anlasten, allenfalls hätten die Betreuer entsprechende Literaturhinweise geben können – was wir uns sehr wünschen würden, denn das Studium an einem sozialökonomischen Fachbereich sollte doch wohl so verstanden werden, dass hier auch Ansätze, Theorien und Paradigmen vorgestellt werden, die ansonsten an traditionellen wirtschaftswissenschaftlichen oder volkswirtschaftlichen Fachbereichen heute kaum noch zur Kenntnis genommen werden.

Aufgrund der Qualität der Arbeit haben wir uns entschlossen, dass sie eine Veröffentlichung verdient hat, auch wenn sie im Umgang mit alternativen theoretischen Zugängen und dem Anspruch der Pluralität nicht uneingeschränkt als ‚exemplarisch‘ gelten kann.

Arne Heise
(Co-Direktor des ZÖSS)

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Abbreviations and symbols

Abbreviations

AIAS	Amsterdam Institute for Advanced Labour Studies
APW	Average production worker
CEP	Centre of Economic Performance from the London School of Economics and Political Science
EC	European Commission
EMU	European Economic and Monetary Union (Eurozone)
ETH	Swiss Federal Institute of Technology Zurich (Eidgenössische Technische Hochschule Zürich)
EU	European Union
FDI	foreign direct investment
fRDB	Fondazione Rodolfo Debenedetti (Research Institute in Milan)
GDP	gross domestic product
HP	Hodrick-Prescott filter
ICTWSS	Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts Database
IMF	International Monetary Fund
IZA	Institute for the Study of Labour (Forschungsinstitut zur Zukunft der Arbeit)
KOF	KOF Swiss Economic Institute (KOF is the acronym for the German word "Konjunkturforschungsstelle")
NAWRU	Non-accelerating wage rate of unemployment
OECD	Organization for Economic Co-Operation and Development
OLS	ordinary least squares
OPEC	Organization of the Petroleum Exporting Countries
PIIGS	Portugal, Italy, Ireland, Greece and Spain
PS	price-setting relation
SD	standard deviation
SGP	Stability and Growth Pact
UV	unemployment-vacancies relation
VoC	Varieties of Capitalism-approach
WS	wage-setting relation

Symbols

L^d	labour demand
L^e	expected employment
L_l^d	long-run labour demand
L^s	labour supply
L_s^d	short-run labour demand
$\frac{k}{a}$	“capital in efficiency units”
$\frac{w}{a}$	“wage in efficiency units”
a	labour productivity
a^e	expected labour productivity
aL	“labour in efficiency units”
c	user cost of labour
g^a	rate of Harrod neutral technological progress
h	hires
K	aggregated capital
L	aggregated employment
L^*	equilibrium employment
M	nominal imports
m	union membership
N	aggregated labour force ($N=L+U$)
p	price level
p^e	expected price level
p_m	import price deflator
p_y	GDP deflator
r	user cost of capital
t	tax rate
U	unemployed population
u	unemployment rate
u^*	equilibrium unemployment rate
v	vacancies
w^*	equilibrium wage
w^b	bargained wage
w^e	expected wage

w^n	nominal wage
w^r	real wage ($w^n - p$)
y	aggregated output/GDP
z	factor at stable employment
z_b	factors affecting wage bargaining
z_m	factors affecting the efficiency of job matching
z_x	factors affecting job creation
z_y	factors affecting job destruction
α	output elasticity of labour
β	Parameter for adjustment of unemployment to adverse shocks (real rigidities)
ε	decrease of productivity
Θ	parameter for unions care about unemployment
λ	Parameter for adjustment of expected productivity to actual productivity (real rigidities)
π	profit rate

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1 Introduction

The Financial Crisis 2007 and the following Great Recession of 2008/2009 still challenge the dominating economic theories and political recommendations. Even if the financial markets have been identified as the root of the crisis, the labour markets - particular within the member states of the Organization of Economic Co-operation and Development (OECD) - have been hit by the global recession to a large extent. With regard to the recent developments of labour markets, the consequences of the crisis were obvious. Since 2007, the average unemployment rate in the OECD rose from around 5% up to around 8% in 2013.¹ Consequently, the Great Recession of 2008/2009 and the ongoing crisis affected not only the financial markets but particularly the labour markets and challenged the existing political recommendations and economic policies. In that context, a central issue is whether the increase of unemployment is cyclical or structural. In order to answer this question and to apply the “right” design or institutional framework on OECD labour markets, the economic research is characterized by permanent and mutual interactions between theoretical arguments and models, empirical developments and findings as well as political recommendations and interventions. Thereby, the economic research has always been influenced by a comparison between the developments in the United States and the Anglo-Saxon liberal labour markets on the one hand and the European countries on the other hand. But even in that comparison, the argumentation and preferences for the *right* way have changed with in the historical developments (cp. Blanchard 2006; Boeri & Van Ours 2013).

Nevertheless, there has been a broad consensus about the political recommendations concerning the design of labour market policies postulated by influential researchers around the OECD, the European Commission (EC) or the International Monetary Fund (IMF). This consensus consists of a couple of theoretical assumptions about the effects and interactions of labour market institutions which are based on the empirical findings of the 1970s and 1980s. The results were a couple of policy reports such as the wide-spread *OECD Jobs Study* from 1994 (cp. OECD 1994a. OECD 1994b). The dominant argumentation within the OECD report followed the postulation that OECD unemployment has been “natural” or stemmed from structural inefficiencies. Consequently, OECD labour markets have to be enhanced by liberal employment- and market-friendly institutions and structural reforms (cp. OECD 1994a: chap. 3). Despite the economic research of the last decades these political strategies and recommendations are still wide spread. But in the light of recent economic research on OECD labour markets, the argumentation is not that simple. In order to explain the evolution of unemployment in the OECD, economic research has run into theoretical and empirical problems (cp. Blanchard & Wolfers 2000: p. 2).

¹ Please note that all numbers, graphs and tables in the following text refer to a sample of 20 OECD member states, namely Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and the United States. For a detailed description cp. Annex I.

“Explanations (of high unemployment) based solely on institutions also run however into a major empirical problem: many of these institutions were already present when unemployment was low [...]. Thus, while labour market institutions can potentially explain cross country differences today, they do not appear able to explain the general evolution of unemployment over time.”(Blanchard & Wolfers 2000: p. 2)

The question behind that theoretical and empirical problem is related to the old debate about cyclical and structural unemployment supplemented by a huge increase of new theoretical achievements, empirical data and methodological approaches. In order to analyse the different factors which determine (equilibrium) unemployment, extensive research focused on the effects and the interactions of institutions and macroeconomic shocks (cp. inter alia Scarpetta 1996; Nickell 1997; Blanchard & Wolfers 2000; Belot & Van Ours 2001; Nickell et al. 2005; Bassanini & Duval 2006). On the one hand, such studies focused on the macroeconomic effects on unemployment explaining unemployment over time and on the other hand, aimed on the effects of labour market institutions explaining the differences of unemployment over the countries. The result of these studies has been a sophisticated understanding of institutional interactions which seems to allow for broad political recommendations. With regard to those empirical findings, economic devices have focused more and more on comprehensive policies and institutional complementarities which challenge the former simple demand of liberal and flexible structural reforms (cp. Bassanini & Duval 2009: p. 40f; Glyn et al. 2006; Baccaro & Rei 2007; Howell et al. 2007).

The present work reassesses the existing theoretic explanations of unemployment as well as the latest empirical studies. Therefore, the research design follows the methodological approach of existing studies which apply the econometric methods of a comparative panel data analysis of institutions and institutional interactions namely the works of Blanchard and Wolfers (2000), Nickel et al. (2005) and Bassanini and Duval (2006, 2009). The present work contributing to the existing literature on several grounds, by i) the use of *up-to-date* data, which capture developments from 1970 to 2012² ii) by checking the robustness of existing empirical findings with the current data and iii) by switching the focus of analysis to the interaction of coordination or corporatism and increasing global competition. The research question can be summarized as follows: *To which extend can OECD unemployment be explained by institutions, institutional interactions and interactions between institutions and macroeconomic shocks?*

Therefore, the empirical analysis is divided into three parts in order to answer the research question and to test the following working hypotheses. In the first part, actual unemployment is explained by labour market institutions and institutional change.

² For a comparison of the data with the data used by Nickel and Nunziata (2001) and Bassanini and Duval (2006) see as well Chapter 4.2 and Annex III.

Therefore, the first working hypothesis H1 states that labour market institutions³ have significant direct effects on actual unemployment. In the second part, the differences and developments of actual unemployment are explained by labour market institutions and institutional interactions. Therefore, the second working hypothesis H2 states that labour market institutions have significant interaction effects on actual unemployment. In a final third part, the differences and developments of actual unemployment are explained by labour market institutions which interact with macroeconomic shocks. Thus, the third hypothesis H3 is that labour market institutions have significant effects on actual unemployment if they interact with macroeconomic shocks.

Consequently, the present work is structured as follows. The historical developments and the evolution of unemployment in the OECD are presented in Chapter 2. Starting with a particular focus on the interaction between theoretical achievements, empirical findings and political developments of the last decades (Chapter 2.1), followed by a discussion of other relevant characteristics such as unemployment duration or specific groups of the labour force in more detail (Chapter 2.2) and concluding with the impact of the recent Financial Crisis 2007 and the ongoing Great Recession of 2008/2009 (Chapter 2.3).

The theoretical background is presented in Chapter 3 which can be described as a loose analytic framework that reflects the explanations of the last decades. In the beginning of the 1970s, labour market research focused on the relation between inflation and employment and the concept of the so-called *natural rate of unemployment* (Chapter 03.1). Thus, explanations of unemployment were influenced by adverse macroeconomic shocks which interact with rigid wage-setting systems (Chapter 3.2) and, since unemployment remains high in the 1980s, the focus shifts to mechanisms of persistence (Chapter 3.3). Later in the 1990s, labour market theories were dominated by explanations focusing on labour market institutions and the search and matching process of job (re-)allocation (Chapter 3.4). The pre-crisis theories combine the entire experience from over 30 years of research into a loose but straightforward framework including interactions between institutions and adverse shocks into the explanation of unemployment (Chapter 3.5). In the end, the Financial Crisis 2007 revealed the limits of the existing framework and left behind open questions for labour market theories (Chapter 3.6).

The empirical analysis in Chapter 4 starts with a description of the methodology and the research design and an explanation of the working hypotheses that are tested (Chapter 4.1). Then, the used data is analysed and discussed (Chapter 4.2). Due to the claim to use new data, the discussion of the data focuses on changes and time trends of relevant indicators, similarities and differences related to the data of former empirical studies and general problems concerning panel data on labour market institutions. Then, the three explanation

³ In the following work, labour market institutions are primarily referred to the following common set of institutions: the union density rate, the coverage of collective agreements, the coordination and the level of collective bargaining, government interventions, the degree of corporatism, unemployment benefits, employment protection legislation, product market regulation, labour taxes, active labour market policies and the degree of globalization (unless otherwise stated). For a detailed description of the single indicators cp. Annex I.

approaches follow each including a description of the model specification and the main results of estimation (Chapter 4.3; Chapter 4.4; Chapter 4.5). Finally, the central empirical findings will be discussed in the light of former empirical studies and existing assumptions about the effects of institutions and interactions (Chapter 4.6).

Finally, Chapter 5 provides a resume of the work including the main implications for the theoretical framework as well as for the empirical analysis of OECD labour markets. Therefore, the particular relevance and challenges in the context of the Financial Crisis 2007 and the following crisis of the *Eurozone* (European Economic and Monetary Union (EMU)) are in the focus of the discussion.

2 Unemployment in the OECD

“[L]abour market rigidities cannot explain why European unemployment is so much higher than US unemployment because the institutions generating these rigidities were much the same in the 1960s as they are today and in the 1960s, unemployment was much higher in the US than in Europe.”(Nickell et al. 2005: p. 1)

2.1 A short history of unemployment

In the early 1960s, the global economy has recovered from World War II. The so-called *Golden Age of capitalism* was accompanied by high and steady growth rates and most OECD countries achieved a broad growth of employment, productivity and wages. The explanations for the steady and sustain growth rates ranged from high productivity growth rates, fiscal stimulus of the Keynesian economic policies and government spending or have been seen as the result of the deregulation and liberalization of the global trade system in the course of the implementation of the Bretton Wood system (cp. Skidelsky 2010: chap. 5). Particular the Continental European countries such as France, Germany, the BeNeLux-states, Italy and Spain have been characterized by high growth rates combined with unemployment rates around 2 %. In the same time, the Anglo-Saxon and liberal market economies such as the United States, United Kingdom, Canada and Australia, suffered from higher unemployment rates around 5 %. Figure 1 shows the developments of unemployment in the OECD from 1960 to 2012:

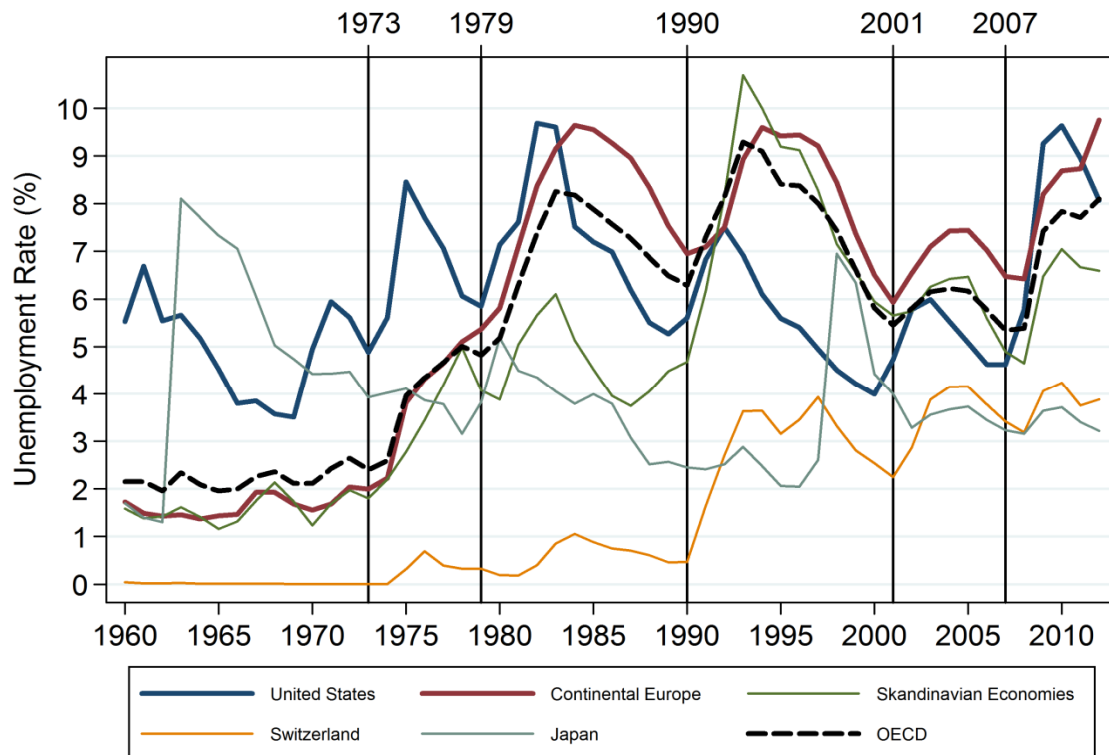


Figure 1: Regional comparison of unemployment in the OECD, 1960-2012

Source: OECD Statistical Database

Thus, in the 1960s, researchers and politicians from the United States have focused on the characteristics of European labour markets due to the stable unemployment rates much lower than in the United States. European labour markets have been seen as a kind of reference which should be achieved by political reforms (cp. Boeri & Van Ours 2013: p. 1ff). This view has changed in the course of the history of OECD unemployment.

Since the Oil Crisis 1973 (first vertical reference line), unemployment has risen in the most countries of the OECD. The extensive increase of the oil prices in the course of the oil embargo proclaimed by the Organization of the Petroleum Exporting Countries (OPEC) can be seen as the initial impulse of the rising unemployment. The rise of stagflation⁴ in some OECD economies such as the United Kingdom and the United States challenged the dominated post-war Keynesian macroeconomic explanations and led to a change in economic thinking as well as political decisions. The assumptions originated from John M. Keynes *General Theory*, about a stable and negative relationship between inflation and unemployment, the so-called *Phillips curve*, has been challenged by those developments. Thus, the shifts of the Phillips curve changed economic thinking towards a Monetarist view where rational expectations determine the relation between unemployment and inflation in the long-run. In the late-1970s, the labour market in the United States recovered in the from around 8% to 5 % whereas the European labour markets suffered from a steady growth of unemployment from around 2 % in 1970 to 6 % in 1979. The developments repeated as oil prices exploded again in the course of the second Oil Crisis

⁴ Stagflation describes the presence of stagnation and inflation at the same time, which means, that economic growth slows down while the inflation rate is high and the unemployment rate remains steady at a high level.

in 1979 (second vertical reference line). And again, some countries were hit by the initial shock more than other countries. The effect of the second oil price shock lasted much longer in the European labour markets where unemployment rose up to 10 % in 1985. In the United States the initial claim of unemployment up to 10 % recovered and fell down to around 5 % in the late-1980s. Thus, European unemployment rose above the level of the United States. After a short period of decline, unemployment rose again in the beginning of the 1990s – the interest rate hike (third vertical reference line) – and the gap between the United States and Europe increased.

The so-called *Great Moderation* from 1985 to 2007 describes the stable pre-crisis economic growth without strong turbulences which led to the belief in the right assessment of economic policies. Since that time, there has been a *great consensus* about the effects and the functions of the economic policies in particular about the role of monetary policies.

Figure 2: shows the macroeconomic developments in the OECD from 1960 to 2012:

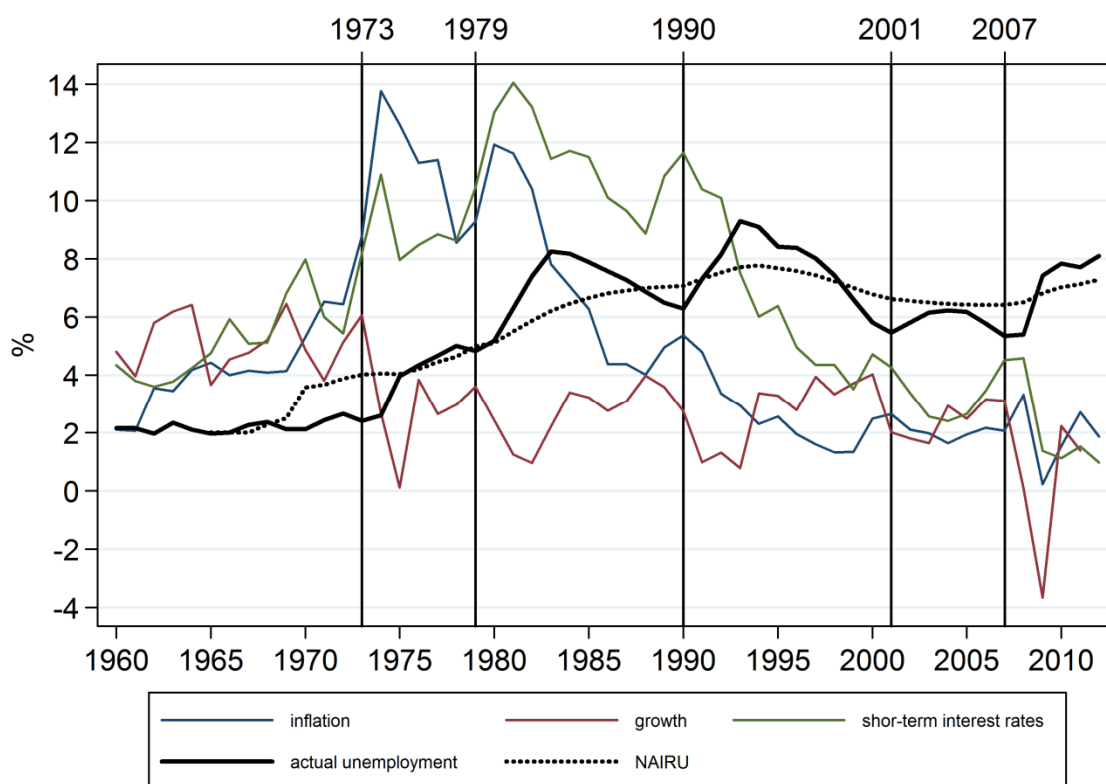


Figure 2: Macroeconomic developments in the OECD, 1960-2012

Source: OECD Statistical Database

Thereby, the macroeconomic models have seen monetary policy as the best (and unique) instrument for the long-run stabilization of the economic developments (cp. inter alia Clarida et al. 1998: p. 1048ff; Abel & Bernanke 2001: p. 544ff; Carlin & Soskice 2010: pp. 13–35). According to the empirical findings of Taylor (1993) or Woodford (2001), economic (or monetary) policies have to be orientated by inflation targeting (cp. Taylor 1993: p. 195ff; Woodford 2001: p. 232). Therefore, the control of the short-term interest rates should ensure stable prices by focusing on economic trend-indicators such as the potential

output and the output gap, the potential employment and the NAIRU and the inflation gap. The central conclusions were i) the focus on inflation targeting and price stability ii) the short-term interest rates as the prime instrument iii) the limitations of fiscal policies and iv) the strict separation of monetary policy and the regulation of the financial markets (cp. Blanchard et al. 2010: p. 3ff).

In the 1990s, the unemployment rates remained high in most of Continental European countries such as France, Spain, Italy and Germany.⁵ Other countries such as the United States, the United Kingdom, Ireland and the Netherlands showed a decrease of unemployment. In countries such as Austria, Norway or Portugal, the unemployment rate was still relative low. Those developments described a steady and, to some extent, an increasing dispersion of unemployment in the OECD. At the same time, the developments of unemployment in the last decades, that declined from around 9 % in the early 1990s to 5 % in 2005, are often believed to reflect structural unemployment because of the low and stable wage and price inflation (cp. inter alia Arpaia & Mourre 2005: p. 4; with reference to Garibaldi & Mauro 2002; Blanchard 2006: p. 9). Accordingly, the focus of economic research on labour markets and unemployment shifted towards labour market institutions as an useful explanation of cross-country differences (cp. Blanchard 2006: p. 25). Dominant economic researchers demanded for political reforms under the credo of flexibility and decentralization which resulted in a couple of reports such as the influential *OECD Jobs Study 1994*.

Consequently, the *Monetary Revolution* was accompanied by a liberal course and the so-called *third way* has been spread over many OECD member states. According to Giddens (1998), this transition has been characterized by specific simultaneous developments. This includes, inter alia, an autonomous and responsible civil society, market fundamentalism (especially with regard to the labour market), growing social and economic inequalities (in combination with an increasing concentration of property and assets), the contrast between increasing demands for economic liberties and (authoritarian) security policies, the perception of a linear development through liberalization and free markets (modernization theory), the privatization of public goods and the unlimited belief in economic growth (cp. Giddens 1998: p. 18f). Since the 1990s, in regard of the so-called *globalization*, this transformation has become a self-enhancing dynamic process which has been declared to be unavoidable. Therefore, the decline of the unions (cp. Chapter 4.2) has to be considered primarily as the result of conscious political decisions based on the dominating economic paradigm (cp. the argumentation of Polanyi 2001: p. 41ff). The necessary adjustments to extern conditions such as the increasing global product market competitions have supported the acceptance of the *third way* and served as an explanation of the current situation (cp. Driffill 2006: p. 12). But this consensus of economic thinking has failed to prevent the global economy to fall in a great recession again in 2008.

⁵ Whereas the unemployment rate in Germany depended to a large extend on the high rates in Eastern Germany after the reunification in 1990.

But nevertheless, in the beginning of the 21th century, the OECD economies were hit again by the so-called *dot-com crisis* in 2001 (fourth vertical reference line). And again, unemployment rose at both sides of the Atlantic, whereas the United States were hit stronger than the European economies and the divergence slightly decreased.

The Financial Crisis 2007 (fifth vertical reference line) and the following Great Recession 2008/2009 affected OECD labour markets to a large extend. Almost all countries were hit by the collapse of the financial sector and the decline of real GDP growth. The average of real GDP growth suddenly fell from around 4 % in 2007 down to a recession of around 4% in 2009. The result was a reduction of aggregated consumption in most countries and a decreasing global aggregated demand. The consequences for the growth-driven OECD economies were heavy regardless of whether the economy was sustained on a credit-based consumption growth model such as the liberal economies (e.g. the United States or the United Kingdom) or an export-orientated growth model such as more coordinated economies (e.g. Germany or Japan) (cp. inter alia Krueger & Perri 2006: p. 187; Horn et al. 2009: p. 1). With regard to the comparison of Europe and the United States, the Financial Crisis 2007 brought the economic thinking back to the ideas of 1960s. Just like US-American researchers and politicians in the 1960s, European labour market institutions are considered as the job miracle which prevents the economy to suffer from adverse shocks and high unemployment growth rates. Thus, Paul Krugman emphasizes, like his colleagues 50 years ago, the specific combination of rigid labour market institutions such as strict employment protection with flexible instruments such as the “short-time work scheme” which allowed “Germany got through the recession with remarkably few job losses.” (Krugman 2009)⁶

2.2 Characteristics of unemployment

In order to get a better understanding of the unemployment patterns in the OECD, it seems necessary to take a closer look to the characteristics of unemployment and labour market performance. The general unemployment rate is solely one indicator beside a couple of additional indicators which describe labour market performance. Thus, different measurements indicate different aspects of labour market performance including efficiency aspects (e.g. labour productivity or unit labour costs), justice and distributional aspects (e.g. the so-called *GINI-coefficient*) or extended concepts of labour market well-being (cp. Layard 2009: p. 145ff). Even if alternative measurements and concepts such as the employment rate or the participation rate provide useful additional information, the following analysis focused on the actual unemployment rate in order to understand and explain the unemployment developments in the OECD (cp. Blanchard 2006: p. 13). Nevertheless, it has to be mentioned here that particular alternative indicators such as the participation rate or the GINI-coefficient are affected by the Financial Crisis 2007 and the following Great Recession of 2008/2009.

⁶ Surely, he has in mind the worse situation of the United States where the economy suffered from a long trend of decreasing productivity in manufacturing, industrial decline and rising long-term unemployment.

The initial rise of unemployment in the early 1970s was accompanied by an increasing dispersion across the industrialized market economies. As Blanchard (2006) pointed out “[w]hile this heterogeneity has always been present, it is more marked today, to the point where talking about ‘European unemployment’ is indeed misleading.” (Blanchard 2006: p. 10) This heterogeneity seems to have originated in different responses to macroeconomic conditions and adverse shocks. Even if these differences are visible and measurable to some extent only a few aspects of the heterogeneity can be captured by the existing empirical indicators (cp. Blanchard & Wolfers 2000: p. 25; Blanchard 2006: pp. 9–11). In order to understand the heterogeneity, the hidden characteristics beside the overall unemployment rate play a major role. Thus, the particular differences can be expressed by the differences referring to the distribution of unemployment among different groups of workers or the duration of unemployment. In order to illustrate such differences, Figure 3 shows the unemployment rate including the 25 and 75 percentile (reflecting the interquartile range) (left scale) and the variance⁷ (right scale) from 1960 to 2012:

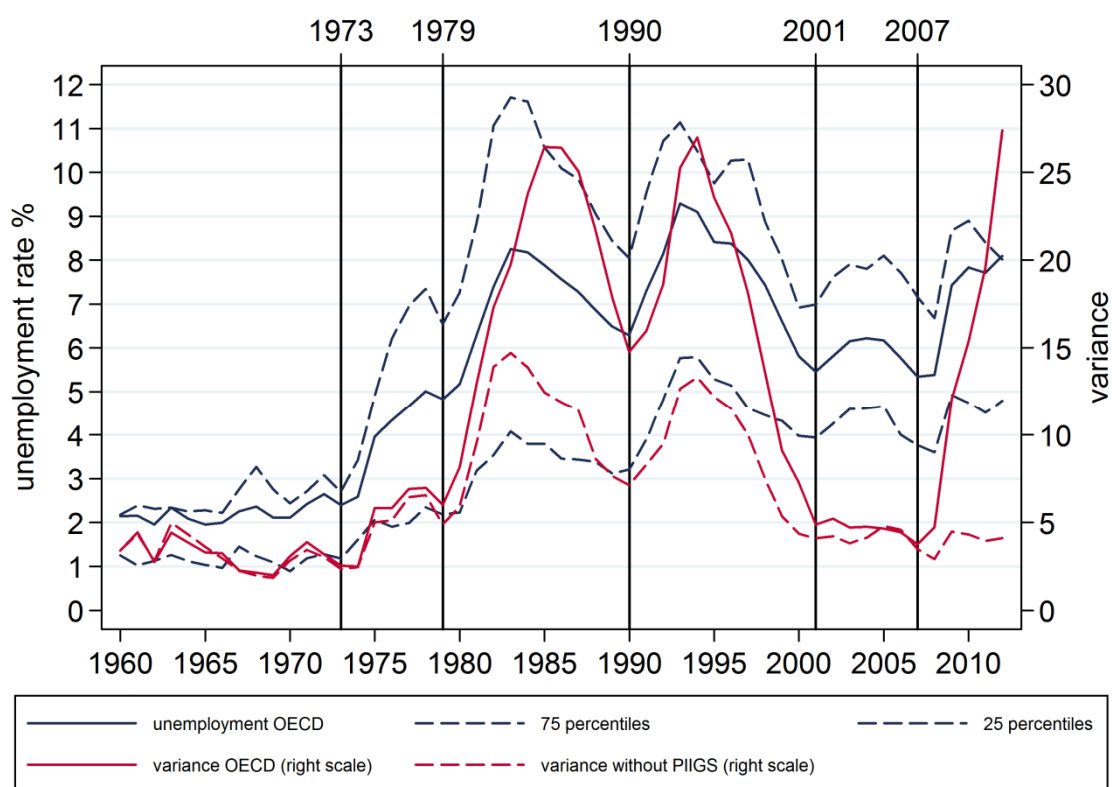


Figure 3: Dispersion of unemployment in the OECD, 1960-2012

Source: OECD Statistical Database and own calculations

These measurements can give a first but straightforward picture of unemployment dispersion in the OECD since 1960. The increase in dispersion in the 1980s as well as in the 1990s and 2007 is based to a large extent on the high fluctuations of unemployment in the so-called “PIIGS” (Portugal, Italy, Ireland, Greece and particular Spain). Thus, the increase of dispersion (in terms of the variance) is much lower without the five countries.

⁷ The variance measures the deviation of the single values from the mean and therefore indicates the distribution of unemployment rates over the time.

But, as mentioned before, this picture cannot capture further aspects of labour market performance such as the duration of unemployment or the distribution of unemployment over specific groups of the labour force.

The relevance of the duration of unemployment on the theoretical explanations is high. Thus, long-term unemployment (which is defined as an unemployment duration longer than one year) seems to reflect the dynamics of the labour market and the efficiency of the search and matching process (referring to the works of Diamond 1982; Pissarides 1985; Mortensen & Pissarides 1994; Pissarides 2000). This aspect indicates, whether the origin of high unemployment has come from high flows in and out of unemployment or from long durations of unemployment. Figure 4 shows a regional comparison of the developments of the long-term unemployment rate from 1980 to 2012:

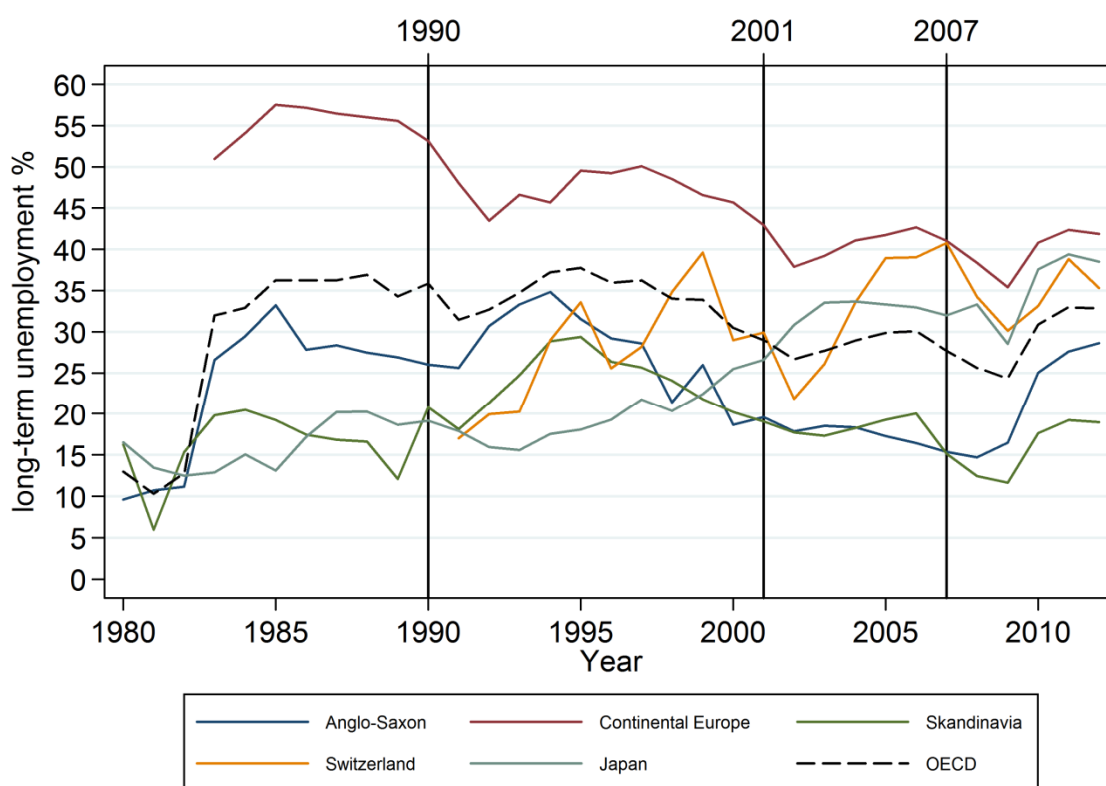


Figure 4: Regional comparison of long-term unemployment in the OECD, 1980-2012

Source: OECD Statistical Database, description see Annex I.

When comparing long-term unemployment across the OECD, great differences emerge between the liberal and flexible Anglo-Saxon labour markets (e.g. Australia, Canada, New Zealand or the United States) where the average long-term unemployment rate is under 10% and the European labour markets (e.g. Belgium, France, Germany, Italy, Spain or Portugal) where the average long-term unemployment rate is above 20% with peaks above 60% (cp. Table 9). Obviously, the regional differences are significant but the differences seem to converge slightly in the last decades (for a detailed comparison please see as well Table 9). Blanchard and Portugal (2001) has given a fruitful analysis of such hidden characteristics with regard to the duration of unemployment in the United States and Portugal. Accordingly, even if the general unemployment rate has been very similar, the

underlying structure (in terms of unemployment duration) differs due to different institutional conditions (cp. Blanchard & Portugal 2001: p. 187). Furthermore, long-term unemployment seems to affect labour market performances itself through several mechanisms such as the negative effects on human capital. Following the argumentation of Phelps (1972), Nickell and Layard (1987) postulated a negative effect of long-term unemployment on human capital and the skill levels of workers. A separation of the labour market into skilled short-term unemployed workers on the one hand and unskilled long-term unemployed on the other hand has been the consequence (cp. Blanchard 2006: p. 24 referring to; Layard & Nickell 1987). This aspect is directly related to the distribution of unemployment among groups of unemployed persons. Thus, there are great differences between men and women, young and old-age persons and skilled or unskilled workers. Especially the differences between skilled and unskilled unemployment as well as between youth and old-age unemployment are interesting. Such dispersions can be explained, inter alia, by different reactions on adverse shocks due to labour market institutions and conditions (cp. for deeper analysis Bertola et al. 2007). A regional comparison of youth unemployment in the OECD shows that relative high levels were found in the European labour markets compared to other non-European countries such as the United States or Canada (cp. Blanchard 2006: p. 12). But the relevant aspect here is the comparison between youth, old-age unemployment and average unemployment (cp. Figure 5). Blanchflower and Freeman (2000) pointed out that unemployment becomes more and more a problem of the youth which can be seen in the high correlation between youth unemployment and overall unemployment (cp. Blanchflower & Freeman 2000: p. 19f). According to the argumentation of Bertola et al. (2007), cross-country differences in youth or old-age unemployment originate in the different labour market institutions which affect the elasticity of specific groups of the labour supply (cp. Bertola et al. 2007: p. 835f).

Figure 5 illustrates the significant difference between youth, old-age and average unemployment rates:

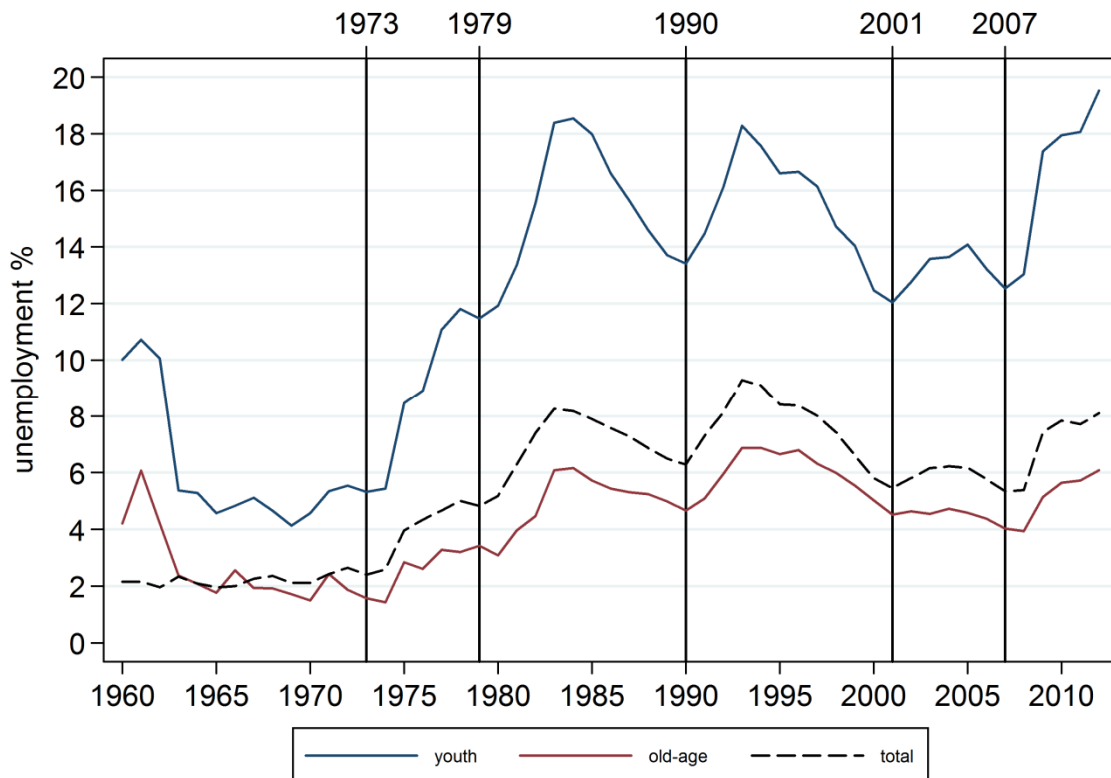


Figure 5: Youth and old-age unemployment, 1960-2012

Source: OECD Statistical Database

Different levels of skilled and unskilled unemployment can be explained by a similar argumentation targeting on the demand and supply of skilled and unskilled workers which differ in various aspects. One aspect is the different elasticity of labour demand referring to structural changes. Hence technology progress influences particular groups of the labour market, the labour demand of unskilled workers can decline in the same time when the labour demand for skilled workers increases (cp. Blanchard & Katz 1997: p. 58). This aspect supports the formation of a dual labour market where young and old-age unskilled workers tend to become unemployed and persist in that status for a long time. The structural reforms of the 1990s intensify this process due to an unbalanced flexibility of the labour market. These reforms are widely discussed under the postulation of a so-called *honeymoon-effect* of two-tier labour market reforms (cp. inter alia Boeri & Garibaldi 2007; Ochel 2008). In short, the debate follows the argumentation that the two-tier flexibility of the OECD labour markets (e.g. in Belgium, Denmark, Germany, Greece, Italy, the Netherlands or Sweden) which targets mainly on the reduction of employment protection of temporary contracts, has led to a transitional job creating effect. But such two-tier employment protection reforms have no long-run effects on labour demand and therefore, the positive employment effect seems to reflect only a short honeymoon. Finally, the two-tier flexibility ends up in higher volatility in the course of cyclical developments and a fall of average productivity can be predicted (cp. Boeri & Garibaldi 2007: p. 1f). Thus, especially unskilled and young employees were affected by the deregulation whereas regularly employed skilled workers were often still protected against wage pressure and

dismissals. Nevertheless, a recent comprehensive study on the employment situation of young and old-age workers suggested that i) both groups are not in a competition, ii) labour market institutions can play a crucial role in enhancing the situation for such groups (particular vocational training schemes and active labour market policies are named) and iii) political reforms have to be implemented at the national level (instead of the EU level) (cp. Eichhorst et al. 2013: p. 91f).

2.3 Recent developments

In the run up to the Financial Crisis 2007, most OECD countries recorded low but stable GDP growth between 1% and 4% (around 5% in Ireland) and a steady decline of unemployment down to an average around 5,3% in 2007 (cp. Table 7 and Table 12). Figure 6 shows the change of the unemployment rate and the real GDP growth rate from 2007 to 2009:

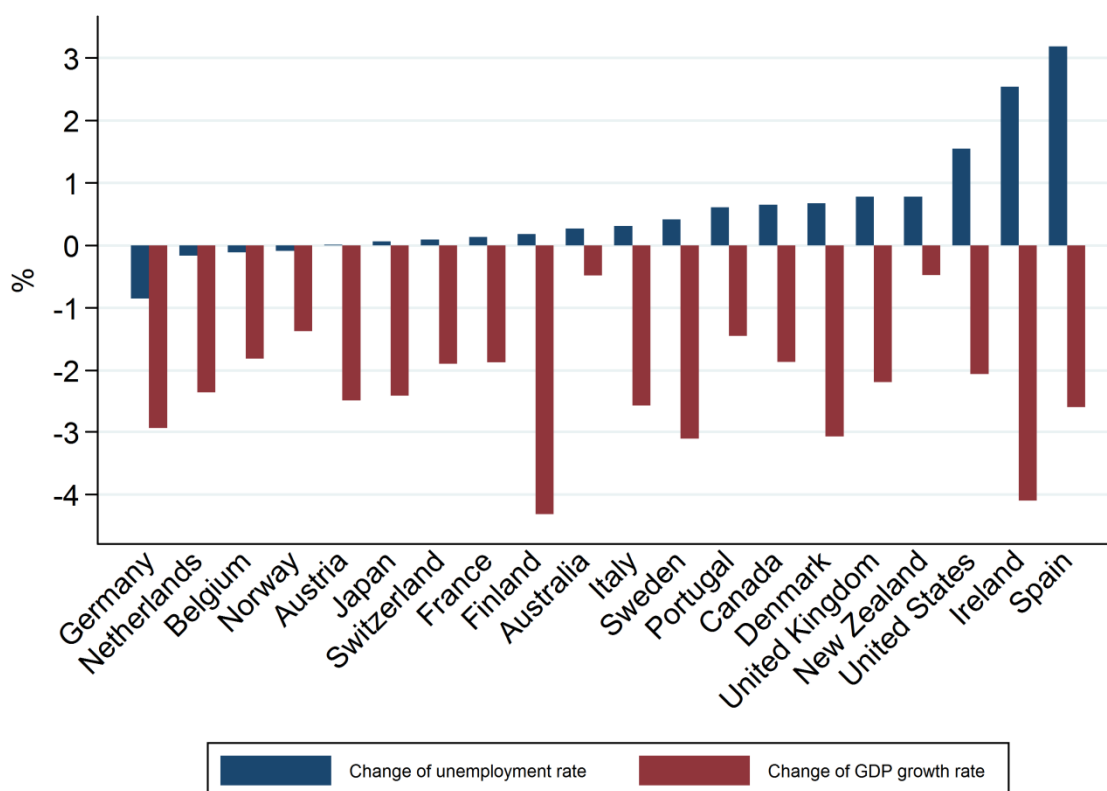


Figure 6: Average change of unemployment and GDP growth in the OECD, 2007-2009

Source: OECD Statistical Database and own calculations

The Financial Crisis 2007 hit the OECD economies immediately by a continuous decline of real growth rates. Thus, OECD fell into a Great Recession in 2008/2009 but the developments of unemployment were very heterogonous. The effects on unemployment were particular strong in the United Kingdom, New Zealand, the United States, Ireland and Spain. The consequence was that the social costs increased due to the combination of high rates of long-term unemployment and the absence of adequate unemployment benefits and

social security systems (e.g. in the United States). On the other hand, the high degree of coordination and the presence of social pacts preventing further job losses (e.g. in Germany or Austria) (cp. OECD 2013: p. 20). As mentioned above, especially young and unskilled workers were hit by the crisis and, at the same time, the risk of youth and old-age unemployment and poverty increased due to growing inequality before and after the initial recession. Therefore, the crisis intensified the trend of growing inequalities in the OECD (cp. inter alia OECD 2008. OECD 2011) particular due to public debt pressure and austerity policies which are decreasing political redistribution. Even if the aspect of inequality and distribution of income and assets plays an import role in macroeconomic thinking and growth theory, this issue is neglected with regard to the focus of the present work.⁸ The central banks reacted with a expansionary monetary policy (which has been limited at the zero bond level) and further so-called *quantitative easing* to prevent of deflation (cp. Bernanke 2009). Subsequently, the crisis affected the labour markets in 2008 and 2009 and unemployment rose in nearly all OECD countries with particular effects on different groups of the labour market. The following three aspects seem to be most relevant, i) the rise of long-term unemployment in the United States, ii) the particular effects on young and unskilled groups and iii) the increasing inequality of wages and property and the separation of the labour markets. With regard to the following analysis, the question is how such developments can be explained by specific institutional arrangements. In the course of the Financial Crisis 2007 and the following Great Recession 2008/2009, the rise of unemployment (and particular long-term unemployment) challenged the existing explanation of unemployment and rose up again the debate about structural and cyclical components of unemployment, particular in the United States.

3 Analytic framework

“Forget the conventional analysis of the labor market in terms of neo-classical labor demand and supply: Unemployment does not make sense in that framework, and imperfections must be at the centre of any theory of unemployment. Think instead in terms of a price-setting and of a wage-setting relation.” (Blanchard 2007: p. 411)

3.1 Wage-setting, price-setting and equilibrium unemployment

In the 1960s, the economic theory was influenced by the experiences of the last decades, in particular the Great Depression in the 1930s. The economic thinking changed dramatically and, driven by John M. Keynes *General Theory*, economists developed a macroeconomic framework which took into account the relation between employment, interest rates and

⁸ Recent OECD Studies proved the increasing inequality in the OECD (particular in Germany) (OECD 2008. OECD 2011). The effects of inequality and distributions on macroeconomic performance have been analyzed to a large extend. Therefore, the theoretical and empirical findings suggest that inequality affects growth via several mechanisms such as consumption and saving patterns as well as social inclusions, trust and political and social stability. At this point, the work of Fukuyama (2011) and Sturm and van Treeck (2010) should be taken into account as examples for the effects of inequality on macroeconomic performance and social cohesion.

money (cp. Skidelsky 2010: chap. 4). In the course of the so-called *Keynesian Revolution*, economics started to explain cyclical fluctuations of the economy focusing on the function of the state or fiscal and monetary policies. The most relevant aspect for the present work was the development of a macroeconomic framework which explained the interdependence between monetary policy, inflation and employment, expressed by the so-called *Phillips curve* relation. The Phillips curve describes the simple relationship between the rate of (un-)employment and inflation whereas a higher inflation is correlated with a lower rate of unemployment (cp. Samuelson & Solow 1960: p. 192f). The implication of such a trade-off between unemployment and inflation implies the possibility to control fluctuations of the economy by government policy. Figure 7 shows this relation for the United States from 1960 to 1969:

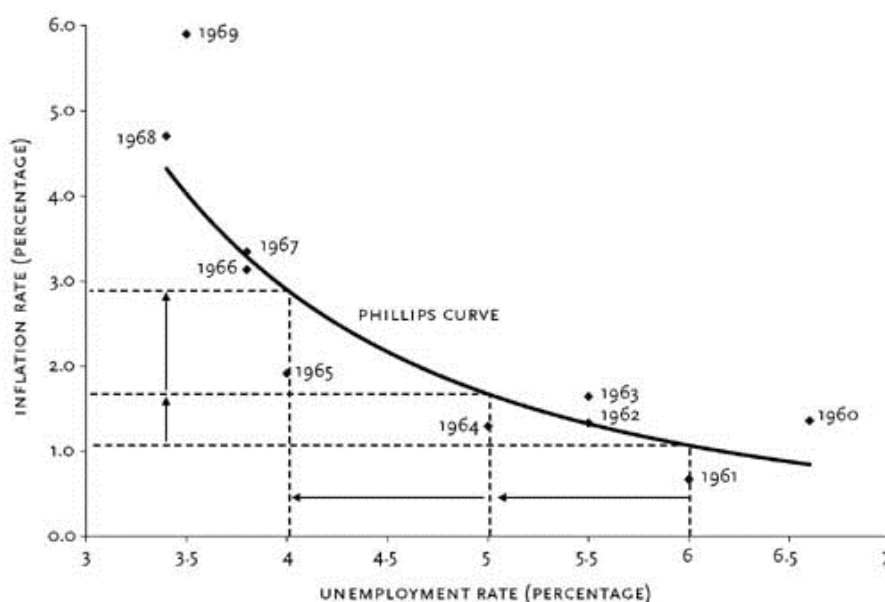


Figure 7: The Phillips Curve in the United States, 1961-1969

Source: Hoover (2014)

But the incidence of stagflation in the 1970s led to a contrary understanding of the Phillips curve relation. This argumentation is mainly influenced by Milton Friedman and Edmund Phelps who postulated a so-called *natural rate of unemployment* (cp. Friedman 1968: p. 1ff; Phelps 1968: p. 678ff).

“The ‘‘natural rate of unemployment,’’ [...] is the level that would be ground out by the Walrasian system of general equilibrium equations, provided there is imbedded in them the actual structural characteristics of the labor and commodity markets, including market imperfections, stochastic variability in demands and supplies, the cost of gathering information about job vacancies and labor availabilities, the costs of mobility, and so on.” (Friedman 1968: p. 8)

Accordingly, the Phillips curve relation, the trade-off between inflation and unemployment, holds as long as the market does not expect future inflation which seems to be true in the short-run. Thus the short-run Phillips curve is a sloping curve describing a negative relation between inflation and unemployment. Thus, increasing inflation through monetary

or fiscal policies leads to lower unemployment along the short-term Phillips curve. But the relation between inflation and unemployment changes since individuals generate either adaptive or rational expectations about future inflation. Figure 8 shows this so-called *expectations-augmented* Phillips curve:

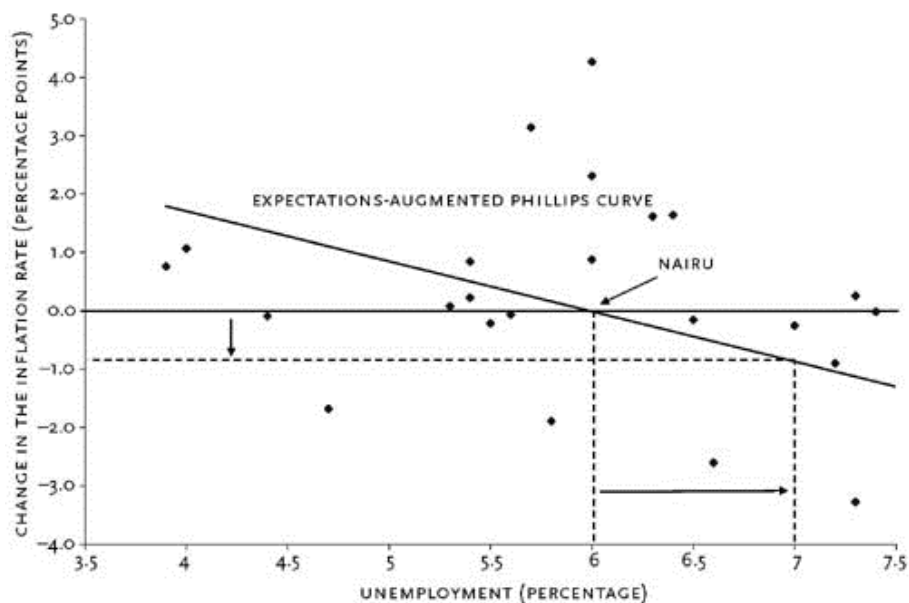


Figure 8: The expectations-augmented Phillips Curve in the United States, 1976-2002

Source: Hoover (2014)

This seems to be true for the long-run (or medium-run), when wage-setters of nominal wages take into account the potential price developments and adopted monetary policies in the course of wage bargaining. Thus, expectations determine future price- and wage-setting and increasing inflation ends in a so-called *wage-price spiral* (cp. Layard et al. 2005: pp. 12–16). The natural rate of unemployment or the so-called *non-accelerating inflation rate of unemployment* (NAIRU) describes a level of unemployment which corresponds with a stable and low inflation rate. This long-term Philips curve relation derived from expectations about inflations as well as the expected impact of unemployment on prices. Thus, the NAIRU can be seen as the natural, structural or equilibrium unemployment which results from the bargaining process about nominal wages.⁹ Since that time there is a broad and emotional discussion in economic research whether unemployment originates from fluctuations and cycles of the economy or from structural inefficiency.¹⁰ But how is unemployment related to inflation? A major challenge is the combination between the macroeconomic framework (explaining the relation of aggregated indicators of the economy such has the Phillips curve) and microeconomic explanations (based on individual choices in an institutional framework). Thereby, thinking in terms of neo-classical labour demand and

⁹ The concept of the *natural rate of unemployment* describes a long-run equilibrium level of unemployment which is determined by structural policies. The term *natural* is not convincing since the concept targets on an *equilibrium* or *structural* rate of unemployment. Hence, a *natural* unemployment rate suggests a misleading idea of an unavoidable unemployment level. In the following, the term equilibrium unemployment or NAIRU refers to this concept.

¹⁰ At this point, Layard et al. (2005) comment that present theory is neither *Keynesian* nor *classical* and consists of elements from both strands. Labeling with such terms does not help to achieve objectives.

supply does not make sense in order to understand this relation or explain unemployment (cp. Blanchard 2007: p. 411).

The relation between inflation and unemployment as well as the effects of adverse shocks and institutions on unemployment can be described in a simple standard model which “combines a model of monopolistic price setting among firms with collective bargaining over the nominal wage level” (Nymoen & Sparrman 2013: p. 2). Such a simple wage-setting and price-setting model (WS-PS model) is useful to show macroeconomic effects of institutions on unemployment and to understand the underlying microeconomic foundations (cp. inter alia Layard et al. 2005: p. 12ff). In that framework, equilibrium unemployment and stable inflation depend on the relation of real wages and employment or the consistency between wage claims and price setting “[a]nd the variable which brings about this consistency is the level of unemployment” (Layard et al. 2005: p. 12f). Thus, price-setters establish prices in relation to nominal wages which can be seen “as a mark-up on expected wages” (Layard et al. 2005: p. 13) represented in the following equation:

$$p - w^e = \beta_0 - \beta_1 u \quad (\beta_1 \geq 0) \quad (1)$$

where p reflects log prices, w^e log expected wages and u the actual unemployment rate. This price-setting relation PS reflects the former aggregated labour demand curve L^d . PS depends on the warrant wage which describes the price of the factor labour in relation to the price of other factors of production. Thus, the warrant wage depends on the productivity of the factor labour and decreases when the prices of other factors increase.

On the other hand, wage-setters set wages by bargaining about nominal wages w^n in relation to a given price level p which can be seen “as a mark-up on expected prices” (Layard et al. 2005: p. 13), given in the equation:

$$w - p^e = \gamma_0 - \gamma_1 u \quad (\gamma_1 \geq 0) \quad (2)$$

where w^n reflects log nominal wages, p^e log expected prices and u the actual unemployment rate. This wage-setting relation WS reflects the old labour supply curve L^s . WS depends on the bargained wage w^b which describes the wage set by the wage-setters in the bargaining system and depends inter alia on the preferences of the labour force (reservation wages) or the collective bargaining system (e.g. the bargaining power of firms and trade unions or the degree of organization) and, to some extent, on the given unemployment level as well. In the context of the simple WS-PS model, equilibrium unemployment or the NAIRU can be described in an equation where actual prices equals expected prices ($p=p^e$) and actual wages equals expected wages ($w=w^e$):

$$u^* = \frac{\beta_0 + \gamma_0}{\beta_1 + \gamma_1} \quad (3)$$

where equilibrium unemployment u^* is determined by exogenous factors that increases u^* through rising wage push γ_0 or rising price push β_0 or reduce u^* through rising wage flexibility γ_1 or rising price flexibility β_1 (cp. Layard et al. 2005: p. 14). According to Layard et al. (2005), the NAIRU is determined solely by supply factors in the long-run

whereas in the short-run unemployment is influenced by aggregated demand and short-run aggregated supply.

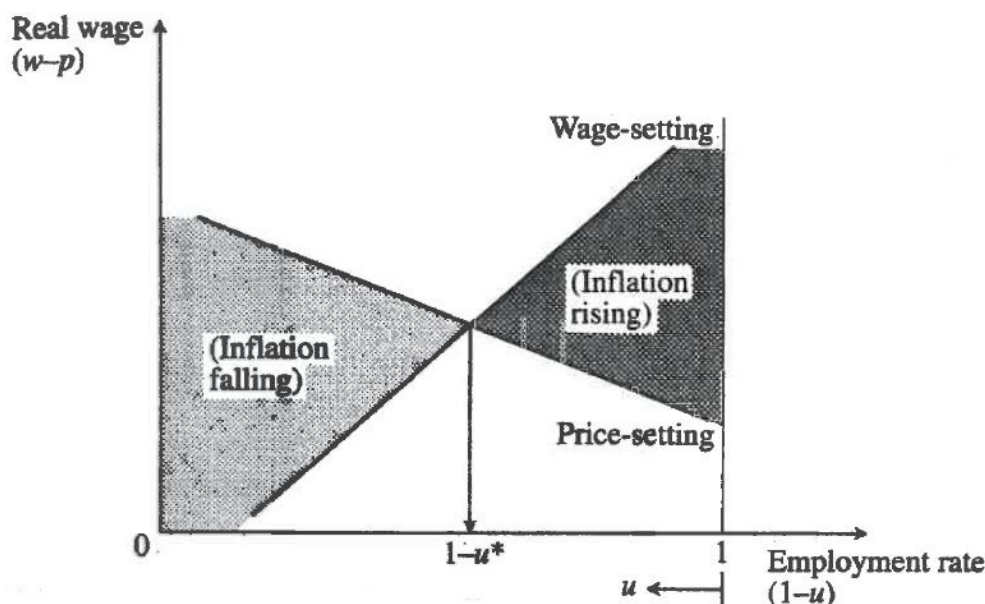


Figure 9: Unemployment and inflation in a WS-PS model

Source: Layard et al. (2005): 14

The following formal description can be seen as a simplification in order to explain the micro-foundation of the underlying principles (cp. Blanchard 2000: p. 2ff. Blanchard 2006: p. 17f). Following Blanchard (2000, 2006), the underlying mechanism is related to the relation between wages and employment based on the assumption that “[a]long a balanced growth path, the wage consistent with stable employment must grow at the rate of Harrod-neutral technological progress” (cp. Blanchard & Katz 1997: p. 53ff; Blanchard 2006: p. 13). Thus, the output of firms with constant returns to labour is a function from employment and productivity (whereas capital is excluded for simplification and labour productivity complies total factor productivity in that case and). Such an economy can be described by the production function:

$$y = aL^\alpha = \alpha(a + L) \quad (4)$$

where log output y depends on log employment L and log productivity a and the output elasticity of labour is expressed by α .

In a competitive product market, firms pay the *warrant wage* given by the equation:

$$w^r = w^n - p = a \quad (5)$$

where the warrant wage is expressed by the log real wage w^r (log nominal wage w^n minus the price level p) which equals the technological or productivity level a (either total factor productivity or labour productivity). Moreover, a grows at the constant rate of g_a .

The *short-run labour demand*, assuming that capital is fixed, is given by:

$$L_s^d = \frac{aL}{K} = f\left(\frac{w^n}{a}\right) \quad f'(\cdot) < 0 \quad (6)$$

where aggregated short-run labour demand L_S^d can be described as the ratio of “labour in efficiency units” aL to capital K or as a decreasing function of “wage in efficiency units” $\frac{w^n}{a}$ (cp. Blanchard 2000: p. 3). The elasticity of the decreasing labour demand curve derived from the substitution between capital and labour and thus, the lower the elasticity the steeper the short-run demand curve. In terms of price-setting PS , L_S^d is influenced by the adjustments of expected prices to real prices and expected wages to real wages and, in the presence of inflation, the relation between both delays determines the distribution between labour and capital (cp. Layard et al. 2005: p. 20).

The long-run labour demand, can be described in the following equation:

$$L_l^d = c = \pi = g\left(\frac{w^n}{a}\right) \quad g'(\cdot) < 0 \quad (7)$$

where capital is not fix, the cost of labour c equals the profit rate π and g describes the factor price frontier relation derived by the production function. The equation implies a horizontal long-term labour demand curve which is determined by the profit rate π . In terms of price-setting PS , L_l^d can be seen as a case of normal pricing with a constant price mark-up which implies that increasing wage claims affected solely unemployment whereas real wages stay constant (cp. Layard et al. 2005: p. 19f).

On the other hand, short-run labour supply is described by the equation:

$$L_S^s = G(w^r) \quad G'(\cdot) > 0 \quad (8)$$

where the short-run labour supply L_S^s is an increasing function G of the real wage w^r which depends on the aggregated individual reservation wages. Thus, aggregated labour supply consists of workers (in working age, willing to work) with a reservation wage equal or lower than w^r .

The wage-setting WS in a balanced economy (where “wage in efficiency units” and unemployment is constant) can be simplified expressed as (cp. Blanchard 2000: p. 4ff. Blanchard 2006: p. 13ff):

$$w^b = \frac{w}{a} = zh(u) \quad h'(\cdot) \leq 0 \quad (9)$$

where the bargained wage w^b or “wage in efficiency units” $\frac{w}{a}$ is described by a decreasing function of unemployment u . The factor z as well as the form of the function h captures all determinants which affect the wage-setting process. These factors include the structure of collective wage bargaining, the power of trade unions as well as the unemployment benefits, employment protection legislation and additional institutional features which are reflected in the following section in more detail.

Two questions arise from the idea of equilibrium unemployment: i) why does actual unemployment differ from equilibrium in the short-run and ii) what determines the

equilibrium unemployment level in the long-run? The following framework was developed to find answers on these questions.

3.2 Adverse shocks and rigidities

In the 1970s, research was influenced by the rise of unemployment in the course of the oil price shocks and the following slowdown of the productivity growth and explanations targeting on the role of adverse shocks and collective bargaining. The main argumentation was that the bargained wages increase over the warrant wages in the course of unexpected macroeconomic shocks (cp. Blanchard 2006: p. 14). This understanding based to a large extent on the work of Bruno and Sachs (1985), who wrote about the *Economics of world-wide stagflation* and formulated a theory of movements of the natural rate of unemployment (cp. Bruno & Sachs 1985). They explained the rise of unemployment in the 1970s with adverse shocks such as the oil price shock in 1973 and 1979 and a significant factor productivity slowdown which interacts with real and nominal rigidities.

Therefore, turning back to the relation between wages and productivity where the warrant wage w^f paid by the firms depends on productivity a , assuming that an unexpected decrease of productivity can be captured by $a - a^e$. On the other hand, the bargained wage is influenced by the expected productivity and simultaneous negative related to unemployment expressed in the equation:

$$w^b = a^e - \beta u \quad (10)$$

where the bargained wage w^b depends on the expected productivity a^e and the actual unemployment u . The adjustments of expected to actual productivity can be described by:

$$a^e = \lambda a^e(-1) + (1 - \lambda)a \quad (11)$$

where the speed of adjustment $(1-\lambda)$ depends on the parameter λ .¹¹

Hence, unemployment as a function of the warranted and the bargained wage can be expressed by the following equation:

$$u = -\frac{1}{\beta}(a - a^e) \quad (12)$$

That implies that an unexpected decline of productivity $(a - a^e)$ leads to an increase of unemployment. Integrating the equation of expected productivity, the result describes the assumptions of the equilibrium rate of unemployment:

$$u = \lambda u(-1) - \frac{\lambda}{\beta}\varepsilon \quad (13)$$

which implies that a permanent decline of productivity (captured by a negative value of $(a - a^e)$) increases the equilibrium unemployment over the time depending on the two

¹¹ This parameter can be formalized in further adoption models, where the agents learn in a Bayesian setting (cp. Blanchard 2006: p. 17; referring to Taylor 1980; Calvo 1983))

dimensions of real rigidities λ and β . The higher λ the slower the adjustments of expectations after a shock and the longer lasting the (negative) effects of the shock. Whereas β influences the strength of the effect, i.e. the lower β the stronger the effect of a productivity slowdown on unemployment. On the other hand, nominal rigidities can be captured by the equation for the bargained wage:

$$w^b = p^e + a^e - \beta u \quad (14)$$

where the bargained wage w^b is based on the expected price level p^e and the expected productivity a^e . And again, unemployment, as a function of the warranted and the bargained wage, can be expressed by the equation:

$$u = -\frac{1}{\beta}[(a - a^e) + (p - p^e)] \quad (15)$$

which describes the common Philips curve relation ($p = p^e - \beta u$) expanded by the expected productivity a^e .

Consequently, cross-country differences after an initial adverse shock can be explained by the differences in real and nominal rigidities. On the one hand, real wage rigidities describe the adaptability of the real wage in response to a change in productivity or the warrant wage. That means, the slower the adjustments of the bargained real wages, the longer lasting the effects of a factor productivity shock. The differences of real rigidities are rooted in the collective bargaining systems and refer to centralization and coordination of wage bargaining as well as strong unions and high levels of coverage of collective agreements. According to extensive research on the relation between collective bargaining systems and macroeconomic performance there is no clear and linear relation expected.

But at this point, the model described before solely reflects real terms “with no nominal rigidities, and so no role for monetary policy in affecting real interest rates. [...] And if monetary policy affects not only actual but also equilibrium unemployment, we may need to revisit its role.”(Blanchard 2000: p. 14f) Blanchard’s statement on the role of monetary policy implicitly pointed out the demand for further efforts and a deeper understanding of unemployment. In order to answer the question how wage-setting was adjusted to changes in prices and productivity, a closer look to the inner structure of the bargain process is necessary. Accordingly, nominal wage rigidities describe the adaptability of the nominal wages in response to changes in prices. That means, the slower the anticipation of inflation the more the real wages decrease. The major implication is that the effectiveness of monetary policy in order to reduce actual unemployment depends on the extent of nominal wage rigidities. According to the existence of nominal rigidities, monetary policies can increase $p-p^e$ and hence, reduce the negative effects of an adverse productivity shock (cp. Blanchard 2006: p. 15ff; for more details cp. Blanchard & Gali 2005). Nominal rigidities are originated in the collective bargaining systems. Institutional features of the collective bargaining systems such as the degree of indexation are referred to the possibility and the speed of nominal adjustments and therefore, for the effectiveness of monetary instruments. Turner et al. (1993) analyzed the role of real and nominal rigidities in a comparison between USA, Germany and Japan and studied the different reactions of macroeconomic

adjustments. According to their empirical analysis, they found some empirical evidence referring to differences in national wage-setting institutions. Accordingly, the United States (as well as Germany to a smaller extent) suffer from much more disturbance after demand and supply shocks due to higher real and nominal rigidities in wage and price setting whereas in Japan, wage-setting is much more sensitive to unemployment (cp. Turner et al. 1993: p. 113f).

To conclude, two key implications can be drawn from the developed framework, i) demand shocks can be seen as a shift of the aggregated labour demand L^d outwards which raise inflation as well as employment and ii) supply-shocks can be seen as a rise of equilibrium unemployment which increases inflation and reduce employment. In the same way, it can be distinguished between demand-pull inflation (shift of the aggregated demand curve) and cost-push inflation (shift of the aggregated supply curve). Regarding that, a supply shock or cost-push inflation e.g. an increase in the oil price could led to stagflation (cp. Abel & Bernanke 2001: p. 419f).

3.3 Persistence of unemployment

Since there has been an economic model which explains the initial rise of unemployment across OECD countries, there was no explanation for the persistence of unemployment in or the rise of equilibrium unemployment. According to the assumption that wage-setters develop expectations about wages and prices (or productivity and inflation), it has to be expected that adjustments towards equilibrium unemployment occur over time. The explanation that the loose monetary policies in the 1970s have moved unemployment into the 1980s did not consist when inflation started to decrease in the mid-1980s in the course of tight monetary policies. The shortcomings and limits of the existing model are obvious (cp. Blanchard 2000: p. 14. Blanchard 2006: p. 25). The adverse shocks in the 1970s and monetary policy response pushed the average inflation in the OECD from 5% in 1970 up to 12% in 1980. Since the 1980s, the economic thinking around Margret Thatcher and Ronald Reagan changed in the mid-1980s and the inflation rate started to decline due to their monetary policies targeting on inflation. The consequence was a huge rise of unemployment which seemed to represent an increase of the actual rate over the equilibrium rate where inflation has been stable at a low level (cp. Blanchard 2006: p. 19). But even in the 1980s when the initial adverse shock had been past, actual unemployment remained high especially in the Continental European countries (and still increases in some countries such as Finland or Norway). Such persistence of unemployment was difficult to explain by the framework developed above where oil prices recovered and the productivity slowdown should be adjusted by the expectations of the wage setters. There have to be mechanisms of persistence which prevent economies from a recovery of adverse shocks. Such factors of persistence referring to hysteresis or the possibility that unemployment directly affects equilibrium unemployment (cp. Blanchard & Summers 1986: p. 1). Hence, economic research started to focus on *capital accumulation* and the *role of insiders* in collective bargaining (the description follows Box 2 in Blanchard 2006: p. 19ff).

Therefore, considering a Cobb-Douglas production function including labour and capital with constant returns to scale (instead of constant return to labour):

$$y = aL^\alpha K^{1-\alpha} = \alpha(a + L) + (1 - \alpha)K \quad (16)$$

where log output y is a function of log employment L and log capital K and the Harrod-neutral technology level a . The warrant real wage is expressed by the equation:

$$w^r = (\alpha - 1)(L - K + a) + a \quad (17)$$

where the real wage w^r decreases at a fixed capital stock K if employment L increase and the marginal product of labour decrease. According to a given real wage, the profit rate π of the firms can be expressed by the factor price frontier relation:

$$\pi = -\frac{\alpha}{1 - \alpha}(w^r - a) \quad (18)$$

where the profit rate π depends on the user cost of labour w^r and on the user cost of capital r . In the long-run the profit rate π equals the user cost r and therefore determines the warrant wage w^r :

$$w^r = a + \frac{1 - \alpha}{\alpha}r \quad (19)$$

According to that, the capital stock K grows if $\pi > r$ and declines if $\pi < r$. On the other hand, the bargained wage is given by:

$$w^b = a^e - \beta u \quad (20)$$

The combination of the short-run warrant wage and the bargained wage:

$$p + (\alpha - 1)(N - K + a) - (\alpha - 1)u = p^e + a^e - \beta u \quad (21)$$

where N is the aggregated labour force. It follows that:

$$u = -\frac{1}{1 - \alpha + \beta} [(a - a^e) + (p - p^e) + (\alpha - 1)(N - K + a)] \quad (22)$$

where, in the short-run, the unemployment rate u depends on the difference between actual and expected productivity ($a - a^e$), the actual and expected price level ($p - p^e$) and additionally on the capital stock K . The implication is that unemployment is negatively related to capital, if capital declines, labour demand decreases and unemployment increases.

According to the assumptions above, a long-lasting decrease in productivity leads to higher expectations than actual productivity ($a < a^e$) and, ceteris paribus without nominal rigidities, to higher unemployment. This negative effect is recovered by the adjustments of a^e to a . But additionally, capital accumulation is negatively affected by lower employment and lower profits which can be seen as one conclusion for the long persistence of unemployment due to a productivity shock.

The second argumentation, the so-called *insider-effect*, stems from the assumption that the structure of the wage bargaining system is the source for unemployment persistence. Remember, firms paid the real wage given by:

$$w^r = (\alpha - 1)(L - K + a) + a = (\alpha - 1)(L - K) + \alpha a \quad (23)$$

And, focusing on collective bargaining, capital is held constant yet.

Then, assume that a monopoly union sets the nominal wage so that a member is employed whereas firms chose employment:

$$w^b | L^e = m \quad (24)$$

where the membership m influences both, the bargained wage w^b and expected employment L^e . Thereby, the membership is given by:

$$m = L(-1) + \theta(N - L(-1)) \quad (25)$$

where the parameter θ describes unions care about unemployment. If the employment in the last period equals membership ($\theta=0$) unions focus only on their employed members. But if the union considers unemployment as well, the parameter is higher ($1>\theta>0$). According to the considerations above, the bargained wage is given by:

$$w^b = p^e + (\alpha - 1)(L(-1) + \theta(N - L(-1) - K)) + \alpha a^e \quad (26)$$

Finally, unemployment u is determined by the combination of the equations for the warrant and the bargained wage:

$$u = (1 - \theta)u(-1) - \frac{1}{1 - \alpha} [(p - p^e) + \alpha(a - a^e)] \quad (27)$$

The unemployment rate which is originated from unexpected price and productivity developments will be adjusted over time. But the persistence of unemployment is influenced by the wage claims of trade unions or the parameter θ .

If trade unions only care about their members, the so-called insiders, the weight of unemployment in the wage bargaining is low (low value of θ) and the persistence is high. The consequence of such insider-driven wage setting (assume that $\theta=0$) is known as hysteresis. But the assumption of a perfect insider-driven wage-setting behaviour ($\theta=0$), inter alia formulated by Blanchard and Summers (1986), does not correspond with theoretical and empirical experiences. Though unions always care about the risk for their members to be unemployed and thus, it could be assumed that θ increases with higher unemployment rates. That means, it can be considered that strong trade unions are a source of persistence rather than hysteresis ($\theta>0$). Even though the argumentation about the insider-effect and the assumptions about hysteresis are still controversial within the scientific debate, the underlying principles are clear and relevant in order to understand the difference between OECD unemployment persistence. To conclude, adverse macroeconomic shocks affected deviations of actual unemployment over equilibrium unemployment as well as shifts of equilibrium unemployment through hysteresis-effects (cp. Blanchard & Summers 1986: p. 73; Blanchard & Wolfers 2000: p. 17). But these effects depend on the specific structure of the wage-setting regime.

Calmfors and Driffill (1988) postulated a so-called *hump-shaped* relation between unemployment and the degree of coordination in collective bargaining. They have verified this postulation theoretically and empirically for the most OECD member states (cp. for a revision of the hump-shape thesis Driffill 2006). Calmfors' and Driffill's arguments have been based on Mancur Olsons (1982) assumptions about the private interests and objectives of organizations (and trade unions) within a market economy. Therefore, organizations cause lower social costs or produce greater economic benefits if the organization is both i) very small and decentralized and therefore not able to enforce particular interests or ii) centralized and powerful enough to anticipate the social costs and benefits within the private calculations (cp. Calmfors et al. 1988: p. 15f; Driffill 2006: p. 3; referring to Olson 1982). Calmfors and Driffill have pointed out simple theoretical assumptions and they have constructed a straightforward theoretical model consisting of a closed static economy where, inter alia, all workers are union members, the capital stock is fixed, goods are produced for the final use and the structure of collective bargaining appears as an exogenous variable. In the simplest monopoly-union model, the outcome or wages are modelled as Nash equilibrium among the wage-setting units. Within these restrictions, the relationship between centralization and real wages and employment appears as a non-monotonic or hump-shaped curve affected by the interaction of rising wages and rising prices (cp. Driffill 2006: p. 3ff).

3.4 Search frictions and the matching-process

In the 1990s, the focus of economic labour market research moved from the mechanism of persistence described above to a deeper analysis of labour market institutions and their effects on unemployment. In that period, the average unemployment rate of the OECD sample was still very high from around 6-9% in the early 1990s and around 5% at the end of the century. But this picture hides the real situation, the increasing heterogeneity of labour market performance across the OECD member states.

Thus, there was a large group of countries particularly the Continental European economies such as France, Spain, Italy and Germany, where unemployment remained at a high level. Within another couple of countries such as the United Kingdom, Ireland or the Netherlands, unemployment declined to rates under 5%. Finally, some countries stayed at low levels of unemployment such as the United States, Austria, Norway and even Portugal. Whereas the temporary increase of unemployment in Sweden, Denmark and Finland could be explained by an increase of the actual unemployment over the equilibrium rate due to cyclical dynamics of the economy (cp. Chapter 4.2). The existing theories about the effects of adverse shocks on unemployment did not explain these developments and economic research focused stronger on the dynamics and differences of unemployment durations across OECD economies. The matching-theory in labour markets with so-called *search frictions* was originally developed by Peter A. Diamond, Dale T. Mortensen and Christopher A. Pissarides (cp. Diamond 1982; Mortensen & Pissarides 1994; Pissarides

2000).¹² Based on the far-reaching book *Equilibrium Unemployment Theory* by Pissarides 2000, the formal description of the flow approach can be briefly described as a complex process of job construction and job destruction (for the following description cp. Blanchard 2006: p. 27ff). The underlying argumentation can be described by a growing market economy which is characterized by a permanent allocation of resources. Within such an economy, an increase of living standards stems from the growth of productivity which is, in turn, connected with a reallocation of productive resources and therefore, with a steady and dynamic exchange of jobs. Therefore, job construction x is given by:

$$x = -\theta_x(w^r) + z_x \quad (28)$$

where job construction x decreases with the real wage w^r . Whereas job destruction y

$$y = -\theta_y(w^r) + z_y \quad (29)$$

increases with the real wage w^r . Given the real wage w^r , z_x and z_y are the factors that affected job creation and destruction such as increasing (oil) prices or capital user costs. Hence, the matching process is characterized by a permanent exchange between unemployed workers and vacancies and, in a steady state, employment is constant and x equals y . The stable level of inflows x and outflows y is determined by the warrant wage:

$$w^r = z = \frac{1}{\theta_x + \theta_y} (z_x + z_y) \quad (30)$$

According to that, the matching function is given by:

$$h = \alpha u + (1 - \alpha)v + z_m \quad (31)$$

describing the rate of successful hires h depending on unemployment u and vacancies v . Hence, the higher either unemployment and/or vacancies, the more matches whereas z_m express the efficiency of the matching process. That means z_m is a parameter for institutions and policies which affect the matching process (e.g. training schemes, information and incentives for job search or unemployment benefits).

The so-called Beveridge curve or unemployment-vacancies curve (UV) describes the relation between unemployment and vacancies for a given level of hires h , which implies, that shifts of the curve are solely based on changes in z_m :

$$(h - u) = (1 - \alpha)(v - u) + z_m \quad (32)$$

where the log of the ratio of hires to unemployment ($h-u$) describes the log of the probability to find a job and in the other direction, suggesting that unemployment duration is a decreasing function of the ratio of job vacancies to unemployment (cp. Blanchard 2006: p. 28). Figure 10 illustrates the underlying principles:

¹² In 2010, they won the Nobel Memorial Prize in Economic Sciences "for their analysis of markets with search frictions" (cp. nobelprize.org 2010)

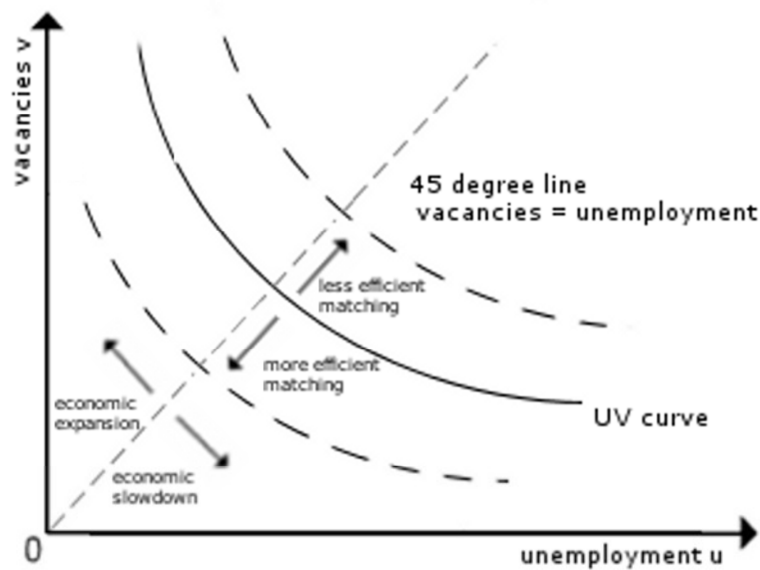


Figure 10: The Beveridge Curve relation

Source: own illustration

The implications of the UV relationship are strongly connected with the discussion about whether unemployment stems from structural or cyclical reasons. Accordingly, frictional unemployment originates from structural problems due to an inefficient matching process. If unemployment equals vacancies (45 degree line $v=u$), the economy suffers from matching inefficiencies which demands for structural reforms shifting the UV curve either to the left, a more efficient matching, or to the right, a less efficient matching. On the other hand, there is a cyclical component of unemployment, which cannot be explained solely by frictional or structural aspects. In the context of the UV curve, cyclical unemployment means that unemployment unequal vacancies (either $v>u$ or $v<u$) and, therefore, cannot be addressed by institutional or political reforms targeting on the improvements of the matching process.

The second target of the research on labour market institutions was referred again to the wage bargaining process. But, in the context of the flow model, researchers considered unemployment themselves as a relevant determinant of the bargaining process. In the context of wage bargaining between firms and individual workers, the bargain power of both sides depends on the exiting employment situation. Therefore, the bargain power of the workers increases with $(h-u)$ and decreases with $(h-v)$ (the other way around for the firms). According to this, the wage-setting function can be expanded by:

$$w^n - p^e = \beta[(h - u) - (h - v)] + z_b \quad (33)$$

where the bargained wage depends on the expected price level p^e and the relation of the bargaining power (the difference between the possibility to find a job $(h-u)$ and the possibility to find a worker $(h-v)$). Finally, z_b describes all institutional and political factors affecting the bargaining process. These factors include the entire social system such as unemployment benefits as well as employment protection legislations and firing cost.

Hence, the bargained wage can be expressed as:

$$w^n - p^e = \beta(u - v) + z_b \quad (34)$$

or, according to the relation of the matching function described above, as:

$$w^n - p^e = \frac{\beta}{1 - \alpha} [(h - u) - z_m] + z_b \quad (35)$$

These assumptions implicate, that wage bargaining depends on the ratio between unemployment and vacancies or the Beveridge curve and not, as applied in former theories, on unemployment alone. At this point, the combination of the bargained wage and the warranted wage results in the equation:

$$p - p^e = -\beta(u - v) - z + z_b \quad (36)$$

which describes a Phillips curve relation where z is a factor at stable employment and z_b is a proxy for those factors which affect bargaining.

In the context of a long-run equilibrium where expected prices equals actual prices ($p = p^e$) and the warrant wage is set by the firms, equilibrium unemployment duration is given by:

$$h - u = \frac{1}{\beta} [(1 - \alpha)z + \beta z_m - (1 - \alpha)z_b] \quad (37)$$

where the equilibrium duration of unemployment (remember $h - u$ is the log of duration) depends on all factors that shift the warrant wage (z), that shift the matching function (z_m) and the bargain function (z_b). Even if the underlying institutional factors of the different “ z -parameters” can be the same, they influence the outcome in various ways.

The most important consequence which derives from that argumentation is that, in the long-run, equilibrium flow h has to be the same as job creation ($h = x$). Hence, job construction x depends on the warrant wage w^r , the equilibrium rate of unemployment is the product of equilibrium unemployment duration and the equilibrium flow h . Finally, it can be considered that shifts of the equilibrium rate of unemployment are explained by the Beveridge curve or the unemployment-vacancies relation (that means shifts of z_m) and by the Philips curve (that means shifts of z or z_b) (cp. Blanchard 2006: p. 29; Layard et al. 2005: p. 34ff).

The formalized concept of the matching-process was the most important achievement of the explanation of equilibrium unemployment in the last decades, particular for a better understanding of long-term unemployment in the OECD (cp. Blanchard 2007: p. 6).¹³ With regard to the search and matching theory, a permanent existing level of equilibrium unemployment is intuitively comprehensible. The flow model and the implications for equilibrium unemployment resulted in a couple of new insights about the evolution of unemployment. The analytic framework allowed a systematic analysis of the hidden characteristics of unemployment particularly with regard to the underlying effects of institutions on the

¹³ Nevertheless, the recent rise of unemployment duration in the United States reveals an unsolved puzzle in the searching model.

dynamic of the labour market, the unemployment duration or the distribution of employment among different types of workers or sectors.

The focus on employment protection provides a fruitful example of the application of the flow model. The correlation between employment protection and unemployment is ambiguous and depends on the broader assumptions on the single impacts of employment protection on either labour demand or supply. But even if the underlying mechanisms of employment protection are still unclear, there seems to be a good evidence for their impact on the unemployment duration. Hence, employment protection produces higher firing costs for the firms leading to lower job construction and job destruction and at the same time strengthening the bargain position of workers. With regard to the analytic framework of the flow model, cross-country differences in the employment protection can explain differences in unemployment duration to a large extent (cp. Blanchard & Portugal 2001: p. 187ff). Another dimension of the matching process is the suitable skill level of the unemployed referring to vacancies or, in other words, the coordination of the educational system. Particularly according to technological progress or structural change, the adjustments of job allocations can affect the labour demand of particular groups of the labour market. Hence, the elasticity of skilled and unskilled workers often differ to a large extent, technological progress can increase the demand for skilled workers while the labour demand for unskilled workers declines (cp. Blanchard & Katz 1997: p. 58). The consequence was a dramatic shift of the focus of economic research towards labour market institutions which resulted in a great consensus about the reasons of unemployment among policy makers particularly in the OECD and the IMF (cp. Baccaro & Rei 2007: p. 527f).

3.5 Institutions, institutional complementarities and globalization

In the 1990s, the impact of institutions was indisputable among economic researchers and played a major role within the analysis of the effects of institutions on unemployment and other macroeconomic indicators (cp. exemplary North 1990). In that time, the economic recommendations demanded for employment-friendly structural labour market reforms targeting mainly on more flexibility and decentralization. That means “to reduce “labor market rigidities” such as generous unemployment insurance schemes; high employment protection, such as high firing costs; high minimum wages; non-competitive wage-setting mechanisms; and severe tax distortions.” (International Monetary Fund 2003: p. 129). The idea emerge that all industrialized economies follows such a liberal development path and a *convergence of the markets* was postulated (cp. Sachs & Warner 1995: p. 1ff). At the same time, leading economic researchers have supported such liberal structural reforms (e.g. Elmeskov et al. 1998; Nickell 1997) even if the robustness of their results based on their specific variables and approaches their evidence was ambiguous (cp. Baker et al. 2004: p. 72ff). The argumentation based on the idea of a perfect labour market which can be seen as a background reference. Thus, the equilibrium derived from the aggregated labour demand L^d and aggregated labour supply L^s (The following description follows Boeri & Van Ours 2013: chap. 1; Blanchard 2006 Box 1 to 5; Bassanini & Duval 2006: p. 19f). In that model, the equilibrium consists of the equilibrium wage w^* where individual

firms and workers are maximizing their surplus and equilibrium employment L^* which implies that all individuals who are willing to work are employed.¹⁴ But as mentioned before, the real world is not reflected by such a simple model and the theoretical equilibrium does not exist. There are several arguments for a deviation from the perfect labour market equilibrium. Such arguments base on considerations about efficiency, equity and policy failure and are directly linked to the effects of institutions on performance (cp. Boeri & Van Ours 2013: p. 20f). Therefore, labour market institutions produce a wedge between the existing outcome of the labour market and the theoretical first-best equilibrium. Accordingly, institutions can act on prices such as minimum wages or labour taxes or on quantities such as regulations on working hours or retirement plans. Furthermore institutions influence the elasticity of the labour demand and supply functions defined as a percentage change of labour supply or demand caused by a 1 percentage change of wage.

In the analytic framework of the WS-PS model described above, the effects of labour market institutions and the mechanism of institutional interaction and their impact on unemployment can be shown. Figure 11 and Figure 12 illustrate that policies and institutions can affect the elasticity of the WS and/or the PS curve as well as the level of the WS and/or PS curve:

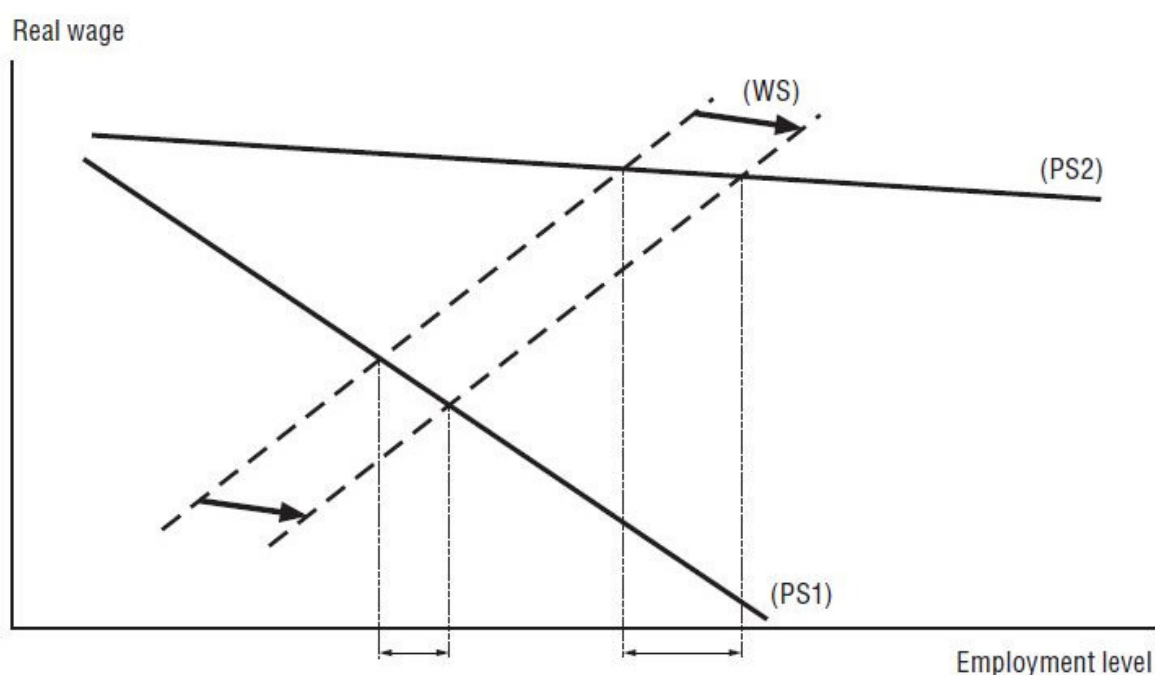


Figure 11: Institutional interaction in the WS-PS model

Source: Bassanini and Duval (2006): Box 1, pp. 19-20.

According to Belot and van Ours (2004), two groups of mechanism are relevant: i) the effects on the elasticity of the wage-setting curve and ii) the effects on the marginal impact on labour demand (depending on the initial level of unemployment) (cp. for the following

¹⁴ According to Boeri and van Ours (2013), in a perfect labour market, all unemployed individuals are either indifferent to work ($w^i=w^*$), *voluntary* unemployed ($w^i>w^*$) or *inactive*.

description Bassanini & Duval 2006: pp. 19–20 Box 1). Consequently, every structural reform or institutional change which affects either the elasticity or the level interacts with each other. Thus, the WS-PS model provides a useful framework for a more detailed analysis. For example, the effect of a cut of unemployment benefit (which shifts the WS-curve downwards) is greater if the degree of product market regulation is low (which means that the PS-curve is flat) or if the bargain power of trade unions is weak (which means that the PS-curve is flat). In both cases, the desired positive effects are reduced through the “smaller feedback effects in terms of higher wage claims” (Bassanini & Duval 2006: p. 19).

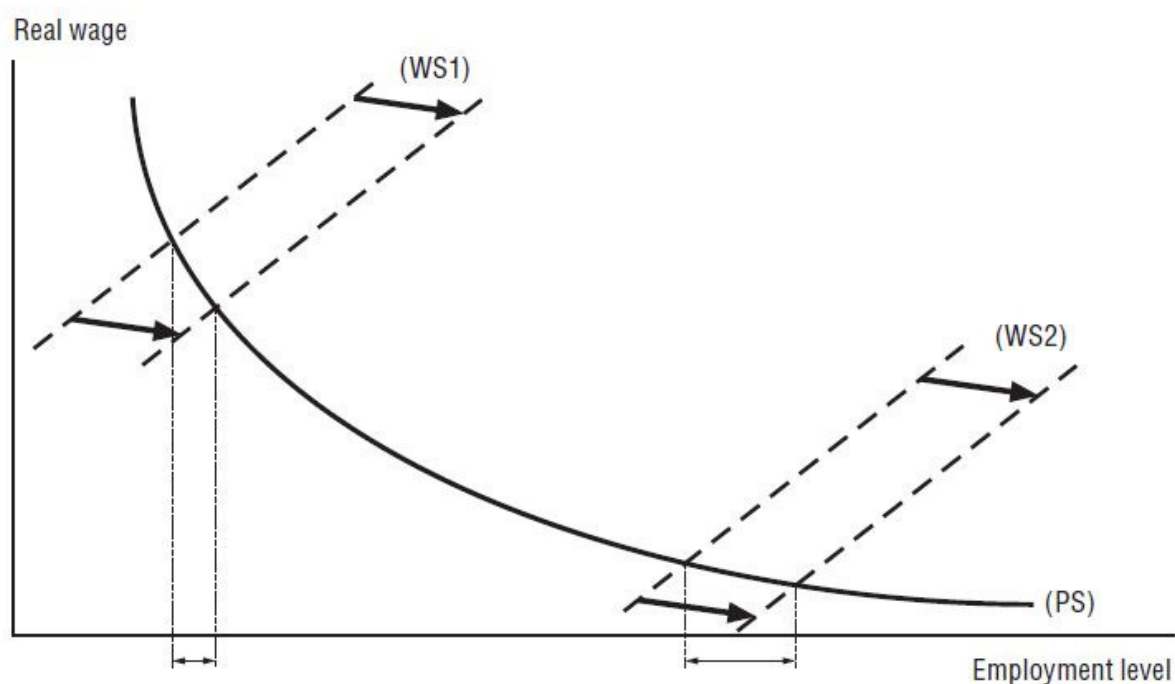


Figure 12: Initial employment level in the WS-PS model

Source: Bassanini and Duval (2006): Box 1, pp. 19-20.

A main implication refers to the marginal effect of a change in real wages on labour demand which seems to depend on the initial level of unemployment. Therefore, it can be assumed that the marginal effect is higher if unemployment is at a low level and vice versa which means that e.g. a cut in unemployment benefits has stronger effects on employment if the initial institutional setting is already employment-friendly.

Since the 1990s, OECD labour markets are influenced by a strong pressure for liberal employment-friendly structural reforms. Based on the scientific and political supported credo of competitiveness, the pressure from the global competition has been transferred to the national markets in particular with regard to the labour cost. Thus, particularly in the context of an increasing product market competition due to liberal and open global markets, the costs of the so-called *wedge* (the deviation from the perfect market produced by labour market institutions) rise. If the elasticity of the labour demand rises due to an increase in product market competition (represented by a decrease of product market

regulation and an increase of trade and open markets), higher bargained wages lead to lower labour demand (than in the context of lower competition). But the effects of labour market institutions on unemployment seem to depend on the particular interaction between the institutions as well as between the institutions and adverse shocks. This perspective has become more and more important in the analytic framework (cp. inter alia Scarpetta 1996; Nickell 1997; Elmeskov et al. 1998; Blanchard & Wolfers 2000; Nickell et al. 2005; Bassanini & Duval 2006). In the course of the debate about institutional interactions the former view of structural reforms targeting on the simple reduction of the *wedge* was challenged by contrary empirical evidence (inter alia Baker et al. 2004; Glyn et al. 2006; Baccaro & Rei 2007; Howell et al. 2007). An alternative understanding of LMIs was enforced. Researchers argued that institutional changes or labour market reforms are more effective if they include “comprehensive policy packages” (Bassanini & Duval 2006: p. 17) which take into account the characteristics of national institutional frameworks. Thus, the wage-setting process is embedded in the specific national institutional framework including the historical and cultural tradition as well as the behaviour of the wage setting units (cp. Granovetter 1985: p. 481f; Hall & Soskice 2001: p. 12ff). The consequence of the development of such an analytic framework was the possibility to analyze the complex interactions between the different labour market institutions allowing for statements about the institutional complementarities (cp. Aoki 1994; Coe & Snower 1997; Belot & Van Ours 2004; Blanchard 2006: p. 29; Hall & Gingerich 2009). Especially in the context of increasing global competition, institutional competitive advantages can be derived from that perspective (cp. Hall & Soskice 2001: p. 56f).

A prominent example for such institutional complementarities are the *flexicurity* reforms within some OECD countries, such as Denmark or Austria. In the context of the increasing global competition, the idea of flexicurity has been seen as a kind of best practice for the trade-off between flexibility and security within globalized labour markets. According to the EC, the “idea of flexicurity is based on three points: [...] the protection of people, [...] greater flexibility [...] [and] the cohesion of the social system as a whole.” (European Commission 2006) Particular Austria and Denmark are seen as good examples for the positive impact of the strategy which “protects workers not jobs” (cp. Blanchard et al. 2013: p. 5). But since today, there has been no theoretical or empirical evidence on the “right” or “best” labour market reform program. Even if recent researchers found good examples of successful and comprehensive labour market reforms such as in Denmark or the Netherland, there is no robust evidence on institutional interaction and institutional complementarities (cp. Bassanini & Duval 2006: p. 17). The Financial Crisis 2007 revealed the short-comings and gaps of the existing framework. Today, the theoretical understanding and empirical evidence is still ambiguous and there are still open questions and research gaps in economic research. The extensive experience on unemployment has to be enhanced by new insights of the impact of financial markets.

3.6 Actual questions

In the run up of the Financial Crisis 2007, the theoretical and empirical efforts on the explanation of OECD unemployment have achieved a good matching between macroeconomic models and microeconomic foundations as well as empirical validation of various indicators (cp. Blanchard 2006: p. 35f). Thereby, a potential direction of further research seems to be relevant, the focus on additional shocks, institutions and interactions and particular on all factors which describe the openness and competitiveness of an economy.¹⁵ The main conclusion is that “higher competition in the goods market, lower trade barriers and higher integration of goods markets across countries, higher globalization and outsourcing, are all leading to a more turbulent environment, an environment with more job destruction and job creation.” (Blanchard 2006: p. 36) And indeed, the considerations about economic turbulences which mainly derive from the deregulated financial markets seem to be true. Such turbulences affect in turn the effectiveness of existing institutions, such as high employment protection (e.g. in Portugal, France or Spain) and increase the cost of firms due to unknown dynamics (that means higher rates of job destruction and construction) (cp. Boeri & Van Ours 2013: p. 2).

The question whether post-crisis unemployment has a cyclical or structural nature has been discussed in particular in the United States where the debate is still relevant whereas European unemployment is not in the focus of that discussion yet (cp. European Commission 2013a: p. 62). Thereby, researchers have not been able to give a clear answer where some argued for structural reasons (e.g. Katz 2010) and others supported cyclical arguments (e.g. Bernanke 2010). According to Katz (2010), the rise of unemployment in the United States originated from normal cyclical developments due to job destructions in the course of the recession but the persistence of unemployment in terms of long-term unemployment cannot be explained by a assumed relation between GDP growth and job construction (or destruction) (cp. Katz 2010: p. 4). Consequently, the persistence of unemployment has had to stem from a mismatch in the labour market and therefore structural inefficiency. But these argumentation is not that easy and Lazear and Spletzer (2012) pointed out that the rise of long-term unemployment in the United States is rooted in the “depth of the current recession” as well as in a trend “which began many decades ago” (Lazear & Spletzer 2012: p. 33). Furthermore, there is a trend of a decreasing matching process after the labour demand shocks in 2009 and 2011, whereas an adjustments process through increasing vacancies is suggested (cp. European Commission 2013a: p. 1ff). Within the *OECD Employment Outlook 2013*, the effects on such subgroups are analyzed and highlighted. Thus, young and unskilled workers are affected much more than older employees who are, generally spoken, often more skilled and protected by better working conditions and contracts preventing them from short-term job losses (cp. OECD 2013: p. 19ff). Besides varying employment protection legislation schemes, another aspect can explain the different effects on skilled and unskilled workers. The argumentation targets on the efficiency

¹⁵ The exploration and the measurement of institutions are discussed in Chapter 4 in more detail and for further research on the joint behaviour of unemployment, employment, capital, wages and user cost see inter alia Bassanini (2012) who analyzes the effects of institutions on aggregated earnings and employment.

of the matching effect of the national labour markets. According to the EC, changes and shifts of the Beveridge curve have been the main causes for the post-crisis cross-country differences in Europe (cp. European Commission 2013a: p. 64ff). An analysis through the lens of the Beveridge curve suggests that the nature of unemployment differs across OECD countries. According to Pissarides (2013), some countries suffer from the recession from cyclical but not structural problems (e.g. the United Kingdom) whereas other countries reveal great structural problems (such as the United States) (cp. Pissarides 2013: p. 1).

It seems to be necessary to take a closer look at the structure of the national economies as well as the political response in terms of fiscal efforts and institutional adjustments (cp. Eichhorst et al. 2010: p. 1). One aspect is that there is a relation between different spheres of the economy especially between industrial relations on labour markets and corporate finance (cp. Hall & Gingerich 2009: p. 453ff). The main conclusion which derives from recent theoretical and empirical developments is that the existing framework has to be expanding in order to capture the new interactions between institutions of the labour and financial markets.

4 Empirical analysis

„The view that unemployment is caused by labor market rigidities and should be addressed through systematic institutional deregulation has gained broad currency and has been embraced by national and international policymaking agencies alike. It is unclear, however, whether there really is robust empirical support for such conclusions. This article engages in an econometric analysis comparing several estimators and specifications. It does not find much robust evidence either of labor market institutions' direct effects on unemployment rate, or of a more indirect impact through the magnitude of adverse shocks“ (Baccaro & Rei 2007: p. 527)

4.1 Methodology and hypotheses

The empirical analysis focuses on the question to which extend labour market institutions and structural changes and policies can explain unemployment in the OECD. In order to explain differences across countries *and* developments over time, the central argumentation is that labour market institutions have direct effects on unemployment and simultaneously interact with other institutions and macroeconomic shocks. The analysis follows the methodological approach of recent existing studies which focus on the same question, namely the works of Blanchard and Wolfers (2000), Nickel et al. (2005) and Bassanini and Duval (2006, 2009). Thus, the empirical analysis consists of several panel data estimations within a sample of 20 OECD countries over the period from 1980 to 2012.¹⁶

The present work is contributing to the existing literature on several grounds, by i) the use of *up-to-date* data, which capture recent developments up to 2012¹⁷ ii) by checking the

¹⁶ For a detailed description of the sample and the coverage see Annex I.

¹⁷ For a comparison of the data with the data used by Nickel and Nunziata (2001) and Bassanini and Duval (2006) see as well Chapter 4.2 and Annex III.

robustness of existing empirical findings with the new data and iii) by switching the focus of analysis to the interaction of coordination or corporatism and increasing global competition. The later can be seen as a link to the argumentation that globalization affects national labour markets not only through increasing productivity and growth rates but as well through increasing turbulences and risks in the course of the liberalization of global financial markets.

Therefore, the empirical analysis is divided into three parts in order to answer the research question which has been introduced in the beginning.

In the first part, actual unemployment is explained by labour market institutions and institutional change. Therefore, the first hypothesis H1 is that labour market institutions (namely the union density rate, the coverage of collective agreements, the coordination and the level of collective bargaining, government interventions, the degree of corporatism, unemployment benefits, employment protection legislation, product market regulation, labour taxes, active labour market policies and the degree of globalization)¹⁸ have significant direct effects on actual unemployment. Furthermore, this hypothesis can be refined by further specifications that the direct effects of labour market institutions are robust to the control for i) unobserved and common macroeconomic shocks (in terms of common time-effects), ii) unobserved country-specific macroeconomic shocks (in terms of the output gap) and iii) observed country-specific macroeconomic shocks (in terms of productivity shocks, interest rate shocks, terms of trade shocks and labour demand shocks).

In the second part, the differences and developments of actual unemployment are explained by labour market institutions and institutional interactions (or complementarities). Therefore, the second hypothesis H2 is that labour market institutions (which are mentioned above) have significant interaction effects on actual unemployment. Such interaction effects have to be controlled for the direct effects of the institutions as well as for common and country-specific macroeconomic shocks. Obviously, the number of potential institutions and interaction terms exceed every reasonable estimation equation and therefore the empirical analysis has to be limited to particular interaction terms. Thus, the second hypothesis has been specified for two argumentation strands which focus on the interaction between i) labour market institutions and coordination in wage bargaining and ii) labour market institutions and globalization.

In a third and final part, the differences and developments of actual unemployment are explained by labour market institutions which interact with macroeconomic shocks. Thus, the third hypothesis H3 is that labour market institutions (which are mentioned above) have significant effects on actual unemployment if they interact with macroeconomic shocks. And again, such interaction effects have to be controlled for the direct effects of the institutions as well as for common and country-specific macroeconomic shocks. The hypothesis can be tested for the interaction of labour market institution with i) unobserved and common macroeconomic shocks (in terms of common time-effects), ii) unobserved

¹⁸ For a detailed description of the single indicators see Annex I.

country-specific macroeconomic shocks (in terms of the output gap) and iii) observed country-specific macroeconomic shocks (in terms of productivity shocks, interest rate shocks, terms of trade shocks and labour demand shocks).

Note that all estimations are based on a static instead of a dynamic model which has been used in recent literature as well (e.g. Nickell et al. 2005). Even if dynamic estimation equations content some worthwhile advantages, problems can derive from the case where the construction of the first difference is based on a variable – here unemployment - which is “close to a random walk” (Nymoen & Sparrman 2013: p. 14). Furthermore, Bassanini and Duval (2009) stated that the large number of institutional variables and infrequent changes, which effects are long-lasting and difficult to verify, do not allow “to specify the correct error structure of a model” (Bassanini & Duval 2009: p. 41). Moreover, serial correlated residuals which will be barely the case are a problem of efficiency rather than consistency of the estimations.

4.2 Data analysis

Within the last decades, the economic literature as well as empirical studies discussed and analysed a broad spectrum of empirical indicators and, in the same time, the foundation of micro- and macro-data has grown. Thereby, the existing empirical literature refers to a increasing selection of potential variables which have been assumed to determine (equilibrium) unemployment. Unfortunately, there is no possibility to capture all relevant variables in one model due to the limits of statistical options. Consequently, the choice of independent variables has to be an ad-hoc decision based on the large extend of theoretical and empirical literature (cp. Blanchard 2006: p. 36; Bassanini & Duval 2006: p. 10). In order to take into account recent developments, the empirical analysis consists of several model specifications which can be seen as a step by step approach to capture different institutional interactions. According to this, the following section gives a short overview about the most relevant aspects and problems referring to the used data.¹⁹ Thus, the source, the sample and some empirical developments are represented and potential problems and their consequences are discussed in more detail.

The main source of the used data is the OECD Statistical Database (<http://stats.oecd.org/>) as well as additional sources such as the database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) from the Amsterdam Institute for Advanced Labour Studies (AIAS) (<http://www.uva-aias.net/208>) and the CEP-OECD Institutions Data Set (1960-2004) from the Centre of Economic Performance (CEP) in London (<http://cep.lse.ac.uk/pubs/download/data0759.zip>) which provided indicators from previous studies. Particular acknowledgments count for the work from Blanchard and Wolfers (2000), Nickell and Nunziata (2001), Nickell et al (2005) and Bassanini and Duval (2006, 2009) which serve as reference for the data selection. The data which has been used

¹⁹ Please note that the extent of potential data is not captured by the following section and therefore some alternative references are presented as well.

in the following analysis correlates with the data from Nickell and Nunziata (2001) (<http://cep.lse.ac.uk/pubs/download/data0502.zip>) and Bassanini and Duval (2006) (www.oecd.org/dataoecd/25/25/37431112.zip) to some extent (cp. Annex IV). Moreover, some indicators which are used in the present analysis reflect expansions of these data e.g. the employment protection legislation index first used by Lazear (1990) or the product market regulation indicator used by Nickell et al. (2001) and Bassanini and Duval (2006) (cp. Annex I). The macroeconomic indicators of observed adverse shocks, namely the productivity shock, the interest rate shock and the terms of trade shock are following the definition of Bassanini and Duval (2006) and have been reconstructed on the basis of the data from the OECD Statistics. An exception is the indicator of the labour demand shock which is directly taken from the data provided by Bassanini and Duval (2006) due to the great deviations from own calculations.²⁰

According to the *fRDB-IZA Social Reforms Database* from the Institution for the Study of Labour (IZA) and the Fondazione Rodolfo DeBenedetti institute (fRDB) (cp. Fondazione Rodolfo DeBenedetti 2009), the political reforms of the last decades increasingly focused on a decrease of the wedge (cp. Boeri & Van Ours 2013: p. 22ff). Such institutions which are associated to produce a wedge have been discussed above (e.g. strong employment protection, high and generous unemployment benefits or strong trade unions). In order to connect the empirical developments to the theoretical framework, the institutional indicators are subsumed under the following dimensions: i) the wage-setting system and coordination of bargaining, ii) the social security system, flexibility and regulation of labour markets and iii) additional indicators referring to globalization and competitiveness. The empirical variables of the wage-setting system consist namely of the union density rate and the coverage of collective agreements as indicators for the degree of organization or the bargaining power of employers. Furthermore, the wage-setting system includes those indicators which are describing the degree of coordination or corporatism – namely the degree of coordination, the level of bargaining and the degree of government interventions. Additionally, institutional features such as indexation mechanisms and legal extension mechanisms are part of the wage-setting system.²¹ Although the structure of the collective wage bargaining systems is very complex, two dimensions can be distinguished, the bargaining power or the degree of organization of the wage-setters – namely the trade unions and the employer's associations – and the structure of the bargaining process (cp. Leertouwer & Haan 2002 for a detailed factor analysis of existing corporatism indicators). Both dimensions and their different effects on the macroeconomic performance have been analysed to a large extend (e.g. Flanagan et al. 1983; Calmfors et al. 1988; Hall & Franzese 1997; Cukierman & Lippi 1999; Iversen et al. 2000; Driffill 2006).

²⁰ Note that the indicator of the labour demand shock which is provided by the data from Nickel and Nunziata (2001) differs from that provided by Bassanini and Duval (2006) as well with a negative correlation coefficient of -0.0862 (significant at the 10% level).

²¹ One aspect which is particularly relevant in the context of collective wage bargaining is that trade unions and social partners often bargain not only about wages but as well about working conditions such as employment protection, retirement plans, family allowance, working hours and even unemployment benefits (in the case of the Belgium Ghent system (cp. Boeri & Van Ours 2013: p. 63ff).

But how do wage-setting systems in the OECD have changed since 1960? The general trend can be described as a decline of unions in the OECD since the 1980s. Particular in the United Kingdom as well as later in Germany with the *Agenda 2010*, labour markets changed towards more flexible and decentralized wage-setting structures. Thus, the trend describes the decline in union density - from around 49% in 1980 to 31% in 2010 – and a decline of bargaining coverage – from 67% in 1960 to 56% in 2010. Even if the decline of unions has to be appointed as the general trend, the developments within the national wage-setting regimes differ considerably. Usually, the union density rate serves as a common empirical indicator reflecting the bargaining power. But a closer look on the features of the collective bargaining system shows that the bargaining power depends on more than solely the union density rate. Thereby, it can be observed that the employee bargaining powers differ between the countries and the coverage of wage bargaining becomes more and more significant for bargaining power (instead of the union density). The bargaining power increasingly depends on the coverage of wage bargaining and on the specific institutional characteristics. One important aspect is the legal extension mechanism which expand the collective agreements over broad parts of the economy (even without membership) such as the entire public sector. Thus, some countries have legal extensions of collective agreements binding wage-setting to a broader part of the economy i) through political decisions such as in Germany, France and the Netherlands, ii) quasi automatic such as in Italy, Spain or Finland, or iii) an obligated membership of all workers in employers' associations such as in Austria (cp. inter alia Nickell et al. 2005: p. 6; Driffill 2006: p. 12; European Commission 2013b: p. 3). This so-called *excess coverage* has compensated the decline of members in the Continental European economies to some extent or on the other hand, has induced this development due to decrease of the incentives for a membership. Consequentially, the coverage of the collective agreements reflects the bargaining power of the unions as well and has to be taken into account (cp. inter alia Bassanini & Duval 2006: p. 35; Nickell et al. 2005: p. 12; Boeri & Van Ours 2013: p. 63ff). However, the argumentation of the effects of legal extension mechanisms on labour market performance is the same as for collective agreements in general. The extension of collective agreements prevent wage adjustments to *local* productivity levels and moreover, reduce “the need to avoid pricing their members out of work” (Bassanini & Duval 2006: p. 72f). The consequence is that legal extension mechanism raises wage claims of unions which are likely to be higher than without such mechanism and on the other hand, the union density rates are expected to be lower due to the “free-ride” on collective agreements. But it has to be noted here, that the bargaining power of the employees is captured by the empirical data only in some extent. In addition to these empirical insights, there are further institutional characteristics, which affect the wage-setting such as the presence of minimum wages, the duration of collective agreements, the so-called *escape clauses*, wage indexation mechanism, or the (German) co-decision model (“Mitbestimmung”) (cp. inter alia Driffill 2006: p. 13ff; with regard to Spielmann 2006; European Commission 2013b: pp. 1–4). Du Caju et al. (2008) have identified three groups within the OECD member states, whose wage-setting regimes can be characterized by five institutional dimensions (cp. Du Caju et al. 2008: p. 28ff). The first group is distinguished by strong regulated wage setting systems, legal extension procedures and a domination of the sectoral bargaining

level.²² The second group is similar to the first one but is complemented by indexation of wage setting, inter-sectoral coordination and government interventions.²³ Within the third group, wage-settings are to a large extent deregulated and decentralized, thus, the union density and the bargaining coverage is low and the dominant level of bargaining is, if at all, at the firm level.²⁴ A common approach to test and estimate the effects of the different degrees of corporatism is the application of dummy variables capturing the different groups such as high, intermediated or low corporatism (cp. Bassanini & Duval 2009: p. 41; Scarpetta 1996; Elmeskov et al. 1998).²⁵

The entire social security system as well as all institutions and political regulations which affect the flexibility of labour markets have been seen as relevant factors determining actual and particular equilibrium unemployment. In the context of the current analysis the unemployment benefits, the employment protection legislation and the regulation of product markets are relevant due to the theoretical and empirical findings.

The unemployment benefit systems consist namely of four relevant dimensions which seem to influence (equilibrium) unemployment: i) the level of unemployment benefits, ii) the duration of unemployment benefits, iii) the coverage of unemployment benefits and the strictness and incentives of the benefit system (cp. Layard et al. 2005: p. xxvii). In the context of the current work, particular two dimensions are relevant and available in terms of cross-country time-series data, the generous replacement rate and the duration of unemployment benefits. Thus, the OECD has collected comparable data on benefit levels for different family types and unemployment durations. The duration of unemployment benefits has been neglected here due to weak data availability and insignificant results. Even if the strictness and generosity of unemployment benefits have been captured by more empirical aspects than solely the level of benefits, the gross replacement rate is a common and useful indicator for the underlying theoretical argumentation particularly in regard that the level correlates with other dimensions such as the duration. Therefore, the following analysis refers to the unemployment benefit level in terms of the average gross replacement rate (cp. Annex I).²⁶ There is an alternative measure for the replacement rates of the OECD for the period from 1971 to 2002 reported by Scruggs (2005).²⁷ This alternative measurement is used by Bassanini and Duval (2009) and other researchers due to the higher volatility (cp. Bassanini & Duval 2009: p. 45) but not considered here (in order to compare with other studies). With regard to the level of unemployment benefits in the OECD countries, there was a general trend towards a more generous system and higher levels from an average of 15.5% around 1960 up to 31,3% around 2000. Particular in

²² Including Austria, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal and Sweden.

²³ Including Belgium, Cyprus, Finland, Luxembourg, Slovenia and Spain.

²⁴ Including Czech Republic, Estonia, Hungary, Japan, Lithuania, Poland, Great Britain and the United States.

²⁵ Within the current analysis, the approach of dummy variables for high or intermediated corporatism is adopted, for a detailed description of the indicators see Annex I.

²⁶ Note that a high correlation between the gross replacement rate and net replacement rate can be considered (cp. Bassanini & Duval 2009: p. 44f; Howell & Rehm 2009).

²⁷ The data is available under <http://sp.uconn.edu/~scruggs/#links>.

countries such as Denmark, Finland, the Netherlands, Norway, Ireland, Spain, Portugal, Sweden and Switzerland, the unemployment benefit systems have been expanded. Other countries such as Germany, New Zealand and the United Kingdom can be characterized by a decline of generous unemployment benefits. Whereas the variance between the single benefit systems has been relative high until 2000, the national systems have significantly adjusted their generous unemployment benefit levels in the last decade.

In the context of increasing global competition another set of institutions becomes more and more relevant such as labour taxes as well as employment protection and product market regulation or active labour market policies. Thereby, globalization is associated with several empirical developments which has been measured usually by empirical indicators such as increasing product market competition due to the reduction of all kind of trade barriers, foreign direct investments (FDI), the share of foreign trade flows (import and exports) to GDP, indicating the so-called *openness*, or further aggregated indices such as the *KOF Index of globalization* developed by the KOF Swiss Economic Institute from the Swiss Federal Institute of Technology Zurich (ETH Zürich) (cp. Dreher 2006; updated in Dreher et al. 2008 as well as Annex I). But there is no clear theoretical and empirical evidence on an overall effect of globalization on unemployment in the economic literature yet (cp. Gozgor 2013: p. 1f).

Thereby, the use of quantitative aggregated data on labour market institutions is quite problematic and researchers have to be aware of the underlying survey methods and definitions which can influence the empirical results in various ways. Several researchers stated the weak robustness of panel data analysis due to different problems and shortcomings (e.g. inter alia Baker et al. 2004; Baccaro & Rei 2007). In order to face the problems of panel data analysis and to ensure the robustness of empirical results, a couple of sensitive checks have been developed. At this point, it can be referred to Bassanini and Duval (2006, 2009), who provide a comprehensive treatment of the data and panel data analysis in that context (cp. Bassanini & Duval 2006: p. 15f. Bassanini & Duval 2009: pp. 42–45). The empirical studies which have analysed the effects of institutions on aggregated unemployment must surely be treated with caution. Freeman (2005) has summed up the weaknesses of the debate about the role of institution and structural policies by pointing out three main aspects of current research: i) the analysis of existing data does not provide stringent results, ii) research is always influenced by their own views and prior assumptions, iii) further efforts should focus on better understanding of the microeconomic foundations of the institutional setting rather than “by continued regression mongering of weak cross-country data.” (Freeman 2005: p. 143)

An extensive comparison of the existing empirical analysis shows a very ambiguous picture. A deeper assessment of the underlying empirical measurements, assumptions and approaches (cp. inter alia Baker et al. 2004: p. 72ff; Bassanini & Duval 2006: pp. 61–69 Table A1) supports Freeman’s concerns and challenges the robustness of former empirical findings. The case of employment protection in Spain reveals such problematic treatment of empirical measurements. Therefore, the empirical measurements of the employment

protection index has been constructed ex-post in order to capture the political reforms of the labour market but, at the same time, the high unemployment rate has been well known. Such approaches reveal that researchers often try to trace explanations which often reflect “ex-post rationalizations” (Blanchard 2006: p. 44). Therefore, the robustness of empirical results concerning employment protection is very fragile and depends on the contribution of Spain to a large extent (cp. Bassanini & Duval 2006: p. 12).

According to Bassanini and Duval (2006), there are special country-specific historical factors such as the collapse of the Soviet Union for Finland, the German Reunification and the Scandinavian banking and real estate crisis for Sweden which demand for a modification of the data for the relevant countries and periods. Therefore, e.g. Bassanini and Duval exclude some observations in their analysis which are hard to explain by institutional change but they have pointed out, that “the main conclusions from the analysis are not dependent on whether these observations are excluded or not from the sample” (Bassanini & Duval 2006: p. 12. Bassanini & Duval 2009: p. 42; referring to Biagi & Lucifora 2008).

Further problems of the empirical analysis concern potential endogeneity and multicollinearity of OECD labour market institutions. Hence, the causalities between unemployment and labour market institutions are not so clear and it can be assumed that e.g. the tax wedge or benefit replacement rates are modified due to increasing unemployment (cp. Bassanini & Duval 2009: p. 45; 54ff). Moreover, the endogeneity of institutional variables with regard to unemployment is not uniquely clear and difficult to test. According to Bassanini and Duval (2006), who address this issue with the help of instrument variable techniques, the results seem to be robust to the assumption of endogenous institutional variables (cp. Bassanini & Duval 2006: p. 17). Whereas Bassanini and Duval (2009) highlight that, “once methods that correct for potential endogeneity bias are used, virtually none of the standard interactions which have been highlighted in the past appear to be robust” (Bassanini & Duval 2009: p. 41). With regard to the multicollinearity, it can be assumed that cross-country correlations of the institutional indicators usually have been strong particular if a set of time invariant variables is used such as in Chapter 4.5. In the present work, multicollinearity seems to be relevant due to the high cross-country correlation between a couple of institutional variables such as the union density rate and active labour market policies, the coverage rate and employment protection, product market regulation and the tax wedge or employment protection and high corporatism (cp. Annex III). Unfortunately, there is no proper alternative to address those multicollinearity problems unless to test a huge number of potential combinations in order to identify the most confided set of variables (cp. Bassanini & Duval 2006: p. 36). The implication for the following analysis is that the results have to be handled with care and the multicollinearity between the different institutions has to be taken into account.

4.3 Simple effects of institutional change and macroeconomic shocks

The first model specification can be seen as a common reduced baseline model for the panel analysis of the direct effects of institutions and adverse macroeconomic shocks on actual unemployment. Comparable model specification was used, *inter alia*, from Blanchard and Wolfers (2000); Nickell et al. (2005), Bassanini and Duval (2006, 2009). The argumentation based on the formal WS-PS model which shows that institutions can affect both, the elasticity of wages on employment and labour demand as well as the level of wages and labour demand. The interaction between those factors determines the output of the market – here in terms of unemployment (cp. Bassanini & Duval 2009: p. 45f).

Within the first step, the analysis focuses on the institutional variables which we assumed to determine equilibrium unemployment and explaining cross-country differences in the long-run. The initial model can be described in a common standard static and reduced unemployment equation:

$$u_{it} = \sum_j \beta_j X_{it}^j + \chi G_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (38)$$

where i and t capture the country and time suffices, u is the actual unemployment rate, X^j describes the institutional and political explanatory variables, that means the structural determinants, G reflects the explanatory control variables of cyclical fluctuations such as the output gap or further specific shocks, α_i and λ_t are the country and time effects.

As mentioned before, the set of indicators is based on the theoretical assumptions and depends on accessibility of the data. Accordingly, the structural determinants consist of the indicators of the collective wage bargaining system, namely the union density rate, the coverage of collective agreements, the degree of coordination, the level of bargaining and the government interventions as well as dummies for high and intermediated corporatism which combines the different dimensions (respectively the coordination, level and government intervention).²⁸ With regard to the variables which indicate the structure of the bargaining process (particular the degree of corporatism) it becomes a common practice to estimate the effects of either high, intermediated or low corporatism on unemployment in respect to the underlying assumptions about a hump-shaped relation. The variables of the unemployment benefit system consist of the average gross replacement rates which indicate the level of unemployment benefits. The variables of regulation consist of an aggregated indicator of employment protection and product market regulation. The labour taxes are captured by the variable of the overall tax wedge. Furthermore, additional variables are discussed such as government spending on active labour market policies in relation to the unemployment rate and the degree of globalization captured by actual foreign trade flows and weak trade barriers and restrictions which are included in the baseline equation.

With regard to the relevance of additional indicators discussed above (such as indexation mechanism, minimum wages or house ownership) it has to be noted here, that the used

²⁸ Please cp. Annex I for a detailed description.

collection of institutional variables reflects the most common set which is discussed in economic literature. Moreover, it can be assumed that controlling for additional variables does not change the main results of the estimation (cp. Bassanini & Duval 2006: p. 15f).

According to common practice for panel data analysis, time effects are included to control for common unobserved shocks and country effects are included in order to control for country-specific averages of unobserved institutions and policies. Furthermore, it can be assumed that the institutional indicators are correlated across countries rather than within countries or over time. In that case, country effects seem to reflect the missing institutional characteristics (cp. Bassanini & Duval 2006: p. 47).

Table 1 shows the results of the baseline model which focuses on the direct effects of institutions, institutional changes and macroeconomic shocks including time and country fixed effects. In Column 1, all variables of the collective bargaining system have been entered apart and in Column 2, the corporatism indicators are combined into two dummy variables which reflect either high corporatism or intermediated corporatism. In both cases, the results have been comparable. Thus Column 1 and 2 show that most of the explanatory variables have significant direct effects on unemployment with exception of the employment protection legislation, the level of bargaining in Column 1 and the dummy for intermediated corporatism in column 2. These variables seem to have no direct effect on unemployment or it can be suggested that potential effects are hidden due to multicollinearity (cp. Bassanini & Duval 2006: p. 36). On the other hand, all relevant and significant variables affect unemployment more or less in the expected direction.

Table 1: Unemployment explained by institutions and adverse shocks, 1980-2010

	1	2	3	4	5
	= baseline	= baseline incl. dummies for corporatism	= baseline incl. output gap	= baseline incl. observed shocks	= baseline incl. labour demand shock
<i>union density</i>	0.1616***	0.1303***	0.0819***	0.1283***	0.2230***
<i>coverage</i>	-0.0477***	-0.0429***	-0.0332***	-0.02	-0.0710***
<i>coordination</i>	-1.2816***		-0.8687***	-0.9651***	-0.7260***
<i>level</i>	0.237		0.2057	0.2966*	-0.0643
<i>government</i>	0.3416*		0.2846*	0.1214	0.0439
<i>high corporatism</i>		-1.7035**			
<i>intermediate corporatism</i>		-0.05			
<i>unemployment benefit</i>	0.0660***	0.0577***	0.0739***	0.0706***	0.0412
<i>employment protection</i>	0.0124	0.1159	-0.3823	0.2302	-0.6938
<i>product market regulation</i>	-0.3598*	-0.4286**	-0.1586	-0.3997*	0.064
<i>tax wedge</i>	0.0439*	0.0637***	0.0423**	0.0193	0.0216

<i>active labour market policies</i>	-0.1146***	-0.1160***	-0.0848***	-0.1069***	-0.1002***
<i>trade flows</i>	0.0433***	0.0543***	0.0349**	0.0297*	-0.0072
<i>trade restrictions</i>	0.0498**	0.0357*	0.0183	0.0680***	0.1242***
<i>output gap</i>			-0.4336***		
<i>productivity shock</i>				7.1424	7.5083
<i>interest rate shock</i>				0.2777***	0.1924**
<i>terms of trade shock</i>				0.0833***	0.0562
<i>labour demand shock</i>					16.0974***
<i>country effects</i>	yes	yes	yes	yes	yes
<i>time effects</i>	yes	yes	yes	yes	yes
<i>N</i>	511	511	511	493	333
<i>r2</i>	0.59	0.57	0.68	0.61	0.68

Legend: * p<.1; ** p<.05; *** p<.01

Estimation: OLS allowing for heteroscedastic; all estimations including time and country effects which control for common unobserved macroeconomic developments as well as unobserved country characteristics (not represented in the table).

Source: Estimations based on data described in Annex I.

Note: Data for labour demand shock is taken from Bassanini and Duval (2006) and covers the period 1980 to 2003.

Therefore, estimations in column 5 cover the period 1980 to 2003 as well.

The density rate is positively correlated with unemployment as well as the benefit replacement rate, the tax wedge and the globalization indicators (actual foreign trade flows and weak trade restrictions). Whereas the coverage of collective agreements as well as active labour market policies and product market regulations are significant negatively related with unemployment in that specification.

Thus, the union density rate seems to reflect the negative impact of inadequate wage claims whereas the coverage rate affects unemployment in the opposite direction reducing unemployment (cp. Chapter 4.6). With regard to the corporatism indicators, all variables which indicate high coordination have the expected negative effect on unemployment whereas the negative effect of intermediated corporatism is not significant in that context. These results can be seen as a support of the *hump-shape thesis* (cp. Chapter 4.6). The positive effect of unemployment benefits seems to be in-line with theoretical considerations and to be robust even if controlled for different macroeconomic shocks (Column 3-5) except of labour demand shocks (Column 5). The results for the direct effects of employment protection and product market regulation have to be handled with caution (cp. Chapter 4.6). With regard to the globalization indicators, the results seem to be more clearly, foreign trade flows (which reflect the openness of the economy) increase unemployment as well as weak trade restrictions have a significant positive effect on unemployment. These results have been controlled for common unobserved macroeconomic shocks in terms of common time effects (Column 1 and 2), country-specific unobserved shocks (in terms of the output gap (Column 3)), country-specific observed shocks (without labour

demand shocks (Column 4) and including labour demand shocks (Column 6)). The output gap as a proxy for unobserved macroeconomic shocks seems to be very suitable to explain the development of unemployment over the time. The empirical evidence is given in a couple of empirical studies which states highly significant estimation coefficients in various specifications (cp. Bassanini & Duval 2006: p. 14). Additionally, the use of the output gap as a proxy for macroeconomic shocks seems suitable, the replacement of the output gap by more specific macroeconomic shocks (such as productivity, interest rate or terms of trade shocks) does not affect the reported estimation coefficients (cp. Bassanini & Duval 2009: p. 43). The control for labour demand shocks seems to be highly significant and affects the results more than the other shocks. But, as mentioned before, the interpretation and robustness of these results has to be handled with care.

The results reveal that most of the detected significant effects are robust to the control for macroeconomic cyclical developments whereas some are not. Thus, the direct effects of the different measurements of macroeconomic shocks capture some of the direct effects of the institutions such as the effect of product market regulation (cp. Table 1). Thereby, the output gap has the expected significant negative effect on unemployment, whereas the productivity shock seems to be not significant. The interest rate shock, the terms of trade shock and the labour demand shock have significant positive effects on unemployment. Even if the estimation coefficient of the output gap is significant, the result has to be handle with caution due to potential endogeneity of the variable (cp. Bassanini & Duval 2006: p. 14).

4.4 Institutional interactions and complementarities

The second model specification can be seen as an expansion of the *baseline model* explaining unemployment by institutional interactions. This section is directly referred to the second set of working hypotheses. As mentioned above, the interaction of institutions is to a large extent indisputable and plays a major role within the analysis of the effects of institutions on unemployment and other macroeconomic indicators. There is a broad spectrum of possible interactions between different institutions and the theoretical and empirical correlations are complex and still ambiguous. The simple interaction between two institutions X^k and X^h can be expressed by the model modification of the baseline model which is described above. Thus, institutional interactions can be modelled as multiplicative terms which reflect the product of deviations of the institutions from their sample mean (cp. Bassanini & Duval 2006: p. 18f):

$$u_{it} = \sum_j \beta_j X_{it}^j + \gamma_{kh} (X_{it}^k - \bar{X}^k)(X_{it}^h - \bar{X}^h) + \chi G_{it} + \alpha_i + \lambda_t + \varepsilon_{it} \quad (39)$$

where \bar{X}^k and \bar{X}^h capture the cross-country sample means of an institution variable over time. Thus, the associated coefficient β_k indicates the marginal effect of institution X^k at the sample mean \bar{X}^k in the case where all other variables are stable at their sample means. In order to illustrate the effects of institutional interactions in the model, a simple interaction between two institutions which are expected to increase unemployment (e.g. the

tax wedge and unemployment benefits) can be analysed. Thus, a positive interaction coefficient γ_{kh} can be interpreted as evidence for institutional or political complementarities. That means, the marginal effect of institution X^k (e.g. tax wedge) is larger the lower the value of X^h (e.g. unemployment benefits). Consequently, a large set of potential institutional interactions can be analysed within such framework but the empirical analysis runs into statistical and technical problems. An extension of the equation to more interaction terms demands for the inclusion of all implicit interactions with reducing the risk of coefficient bias. However, theory suggests that all potential interactions are possible but the addition of more than two institutions (and all potential combination terms) leads to a loss of degrees of freedom (cp. Bassanini & Duval 2006: pp. 18, 49). A systematic analysis of institutional interactions has been described by Bassanini and Duval (2006), who are starting with a pair-wise comparison of all potential interaction terms of the variables from the baseline model. Despite the statistical and theoretical problems of implicit interactions such an analysis of the single interaction effect provides a good overview about all potential effects and gives first insights. According to the results of various sensitive checks reported in Bassanini and Duval (2006) only a few of these interaction effects can be expected to be robust, respectively the negative effect of interaction between unemployment benefit and union density (cp. Bassanini & Duval 2006: p. 23f). The following specifications have been based on theoretical assumptions on the interaction between institutions and different bargaining regimes such as high or intermediated corporatism and interactions between institutions and globalization.

Table 2 shows the results of the second model specifications which focus on the effects of institutional interactions. Column 1 shows the effects of the interactions between the baseline variables with the dummies for high corporatism and intermediated corporatism as well as the interaction with globalization in terms of foreign trade flows. The interaction effects have been controlled for the direct effects of the baseline variables as well as for common macroeconomic shocks (time effects) and the output gap. The results for the interactions with high and intermediated corporatism show that the marginal effects are nearly the same for high or intermediated corporatism. With regard to the interaction effects of the institutional variables with foreign trade flows, the coverage rate, product market regulation, the tax wedge and weak trade restrictions seem to have significant negative interaction effects while the interaction effect of employment protection and foreign trade flows is significant and positive. The other interaction effects are not significant in that estimation specification.²⁹

²⁹ The reasons for insignificant (interaction) effects surely should be discussed in more detail, at this point it solely can be considered that potential multicollinearity has been taken into account (e.g. between employment protection and product market regulation or trade restrictions).

Table 2: Unemployment explained by interactions between globalization and bargain regimes, 1980-2010

	1	2	3	4
	interaction incl. corporatism dummies and globalization	within sample of high corporatism	within sample of intermediate corporatism	within sample of low corporatism
direct effects				
<i>union density</i>	0.080***	0.001	0.100	0.068
<i>coverage</i>	0.002	-0.056	0.007	0.071
<i>high corporatism</i>	-5.991***			
<i>intermediate corporatism</i>	-5.646***			
<i>gross replacement rate</i>	0.079***	0.032	-0.124	0.019
<i>employment protection</i>	-3.209***	-2.480*	-0.781	-6.843
<i>product market regulation</i>	0.115	-1.027***	0.111	0.239
<i>tax wedge</i>	0.117***	0.245***	0.068	0.055
<i>active labour market policies</i>	-0.066***	-0.103***	-0.054***	-0.350***
<i>foreign trade flows</i>	0.055***	0.054*	-0.003	0.008
<i>trade restrictions</i>	0.067***	-0.038	0.063	0.070
interacting with corporatism				
	<i>high</i>	<i>intermediate</i>		
<i>union density</i>	0.185	0.189		
<i>coverage</i>	-0.345***	-0.288***		
<i>unemployment benefit</i>	-0.107	-0.085		
<i>employment protection</i>	0.146	0.880		
<i>product market regulation</i>	2.369**	2.845***		
<i>tax wedge</i>	0.239**	0.249**		
<i>active labour market policies</i>	-0.420***	-0.391***		
<i>foreign trade flows</i>	0.251*	0.291**		
<i>trade restrictions</i>	0.244*	0.238		
interacting with foreign trade flows				
<i>union density</i>	-0.002	-0.004**	0.000	-0.007
<i>coverage</i>	-0.003**	-0.004	-0.002	0.001
<i>gross replacement rate</i>	0.000	0.004*	0.008	0.003
<i>employment protection</i>	0.304***	0.041	0.225***	0.334
<i>product market regulation</i>	-0.039**	-0.03	-0.047	-0.174***
<i>tax wedge</i>	-0.010***	-0.026***	-0.001	-0.009
<i>active labour market policies</i>	-0.001	0.002	-0.002	0.012
<i>trade restrictions</i>	-0.003*	0.008***	-0.006*	-0.026***
<i>output gap</i>	-0.430***	-0.419***	-0.328***	-0.236***
<i>country effects</i>	yes	yes	yes	yes
<i>time effects</i>	yes	yes	yes	yes
<i>N</i>	511	255	158	98
<i>r²</i>	0.77	0.79	0.84	0.97

Legend: * p<.1; ** p<.05; *** p<.01

Estimation: OLS allowing for heteroscedastic; all estimations including time and country effects which control for common unobserved macroeconomic developments as well as unobserved country characteristics (not represented in the table).

Source: Estimations based on data described in Annex I.

Surprisingly, the interaction effects of the baseline variables with either high or intermediated corporatism have been nearly the same. One explanation is that this can be the result of the particular model specification where the institutions have been modelled as deviations from the sample mean. In order to understand the interaction effects of labour market institutions and globalization *and* to capture the different bargaining regimes, Column 2-4 represent the interaction model for each of the three bargaining subtypes. Thus, the results for the subsample of high corporatism are represented in Column 2, for the subsample of intermediated regimes in Column 3 and for the subsample of low corporatism economies in Column 4. The main results can be summarized as follows. The direct effects of the baseline variables become more or less insignificant in the context of the single subsamples except of the active labour market policies which are significant negative related with unemployment in all three subsamples with a higher impact in the sample of low corporatism and a lower in the subsample of intermediated bargaining regimes. Only in the sample of high corporatism, other direct effects seems to be relevant respectively the negative effect of product market regulation on unemployment and the positive effects of tax wedge and actual foreign trade flows. With regard to the interaction of the institutions with foreign trade flows, there are some remarkable differences across the results of the single subsamples. In the sample of high corporatism, the tax wedge as well as union density has significant negative effects and unemployment benefits and weak trade restrictions have significant positive effects while interacting with foreign trade flows. In the subsample of intermediated corporatism, the results change significantly where only the interaction of employment protection with foreign trade flows is significant positive related with unemployment and the interaction between weak trade restrictions and foreign trade is negative related to unemployment. In the subsample of low corporatism, the relations change again where the interactions between product market regulation and weak trade restrictions with foreign trade flows reduce unemployment significant.

4.5 Interactions between institutions and macroeconomic shocks

Finally, the baseline model can be expanded in order to capture the interaction between institutions and observed or unobserved macroeconomic shocks (cp. Blanchard & Wolfers 2000: p. 19ff; for the following formal description cp. Bassanini & Duval 2006: pp. 35–40). According to Blanchard and Wolfers (2000) the interaction between time-invariant institutions and macroeconomic developments can be expressed in an unemployment equation such as:

$$u_{it} = \sum_j \beta_j X_{it}^j + \lambda_t \left(1 + \sum_j \gamma_j (\bar{X}_i^j - \bar{X}^j) \right) + \alpha_i + \varepsilon_{it} \quad (40)$$

where the direct effects of institutions are capture by the first term $\sum_j \beta_j X_{it}^j$ used in the estimations above. Unobserved, that means undefined and common, macroeconomic shocks are captured by the time-effects λ_t which interact with time-invariant institutions described by \bar{X}_i^j the country average of institution j for country i minus the sample average

of institution j . Thus, the time-invariant institution has been multiplied with each coefficient of the time-dummies for each year. In other words, the common time-effects (the average development of unemployment over the time) have been weighted by the country-specific deviation of the institution from the sample mean.³⁰

Such estimation can be modified for unobserved but country-specific macroeconomic shocks such as the output gap or observed macroeconomic shocks such as a productivity slowdown or terms of trade shocks expressed in the following equation:

$$u_{it} = \sum_j \beta_j X_{it}^j + \left(\sum_l \varphi_l Z_{it}^l \right) \left(1 + \sum_j \gamma_j (\bar{X}_i^j - \bar{X}^j) \right) + \alpha_i + \varepsilon_{it} \quad (41)$$

where the common undefined variable of time-effects λ_t is substituted by the output gap or a set of observed that means country-specific shocks Z_{it}^l . The assumption behind such specification is that macroeconomic shocks either observed or not, affect unemployment not directly but indirectly through the country-specific institutional framework.

The results represented in Table 3 show the estimation models which are specified for the interaction effects of institution and macroeconomic shocks. Interactions with common unobserved shocks (time-effects) are included in Column 1, the interaction with the county-specific output gap is included in Column 2 and Column 3 represents the interaction effects of the baseline variables with country-specific observed macroeconomic shocks. The interaction effects are controlled for the direct effects of the institutions as well as country and time effects.

³⁰ Note that this approach follows directly Bassanini and Duval (2006) whereas their description is not that clear at this point.

Table 3: Unemployment explained by interactions between institutions and macroeconomic shocks, 1980-2010

	1	2	3			
	common unobserved shocks	specific unobserved shocks	specific observed shocks (1980-2003)			
<i>direct effects</i>						
<i>union density</i>	0.122***	0.085***	0.260***			
<i>coverage</i>	-0.041***	-0.052***	-0.059***			
<i>high corporatism</i>	-1.635**	-0.611	-3.288***			
<i>intermediate corporatism</i>	-0.264	0.918	-2.297**			
<i>gross replacement rate</i>	0.043**	0.058***	0.013			
<i>employment protection</i>	0.978*	0.215	0.363			
<i>product market regulation</i>	-0.634***	-0.234	0.035			
<i>tax wedge</i>	0.124***	0.054**	0.063*			
<i>active labour market policies</i>	-0.113***	-0.107***	-0.070***			
<i>foreign trade flows</i>	0.062***	0.062***	-0.049**			
<i>trade restrictions</i>	0.031	0.034*	0.080**			
<i>interacting with</i>						
<i>macroeconomic shocks</i>	<i>time effects</i>	<i>output gap</i>	<i>productivity shock</i>	<i>interest rate shock</i>	<i>terms of trade shock</i>	<i>labour demand</i>
<i>union density</i>	0.006	0.001	-1.666***	-0.007	0.002	0.434
<i>coverage</i>	0.011	-0.018***	1.582***	0.025***	-0.001	1.383***
<i>high corporatism</i>	0.569	-0.204	-45.075	-0.589	0.324	-68.758**
<i>intermediate corporatism</i>	1.577**	0.263	-63.754	-1.171**	-0.262	-102.001***
<i>gross replacement rate</i>	0.038***	-0.012***	-0.703	0.020**	-0.008	-1.103
<i>employment protection</i>	0.530*	0.231**	-8.094	0.043	-0.145	10.316
<i>product market regulation</i>	-0.523***	0.022	-9.95	0.058	-0.045	-12.117***
<i>tax wedge</i>	-0.058***	0.061***	-0.632	-0.062***	0.000	0.714
<i>active labour market policies</i>	-0.080***	-0.009	1.407	0.018	-0.007*	0.404
<i>foreign trade flows</i>	0.004	0.013***	-0.816*	-0.014**	-0.009**	-0.717
<i>trade restrictions</i>	0.058***	-0.005	-0.315	0.019	0.020**	-0.568
<i>country effects</i>	yes	yes	yes			
<i>time effects</i>	yes	yes	yes			
<i>N</i>	511	511	333			
<i>r2</i>	0.66	0.68	0.82			

Legend: * p<.1; ** p<.05; *** p<.01

Estimation: OLS allowing for heteroscedastic; all estimations including time and country effects which control for common unobserved macroeconomic developments as well as unobserved country characteristics (not represented in the table). Column 3 represents interactions between all institutions and 4 specific observed macroeconomic shocks which are included in a single estimation equation. This model covers the period from 1980 to 2003.

Source: Estimations based on data described in Annex I.

The main results can be summarized as follows. Column 1 shows that the interaction effects of institutions with common macroeconomic developments have been significant. Thus, the common developments of unemployment have been increased through the interaction with intermediated corporatism, unemployment benefits, employment protection and weak trade restrictions whereas the interaction with product market regulation, the tax wedge and active labour market policies reduce unemployment in the observed sample.

Column 2 shows that some significant changes accrue when the same interaction effects of the baseline variables are interacting with the output gap instead of common time-effects. The results point out that the coverage rate as well as the unemployment benefit level have negative interaction effects on unemployment when interacting with the output gap. On the other hand, employment protection, the tax wedge and actual foreign trade flows are positive related to unemployment when interacting with the output gap. With regard to the interaction of the variables with specific observed macroeconomic shocks, Column 3 shows that the interaction of a productivity shock with the union density rate has a significant negative effect on unemployment and the interaction of a productivity shock with the coverage rate a significant positive interaction effect. At the same time, the interaction of interest rate shock with the tax wedge and intermediated wage bargaining is negative correlated with unemployment. The interaction of an interest rate shock with the coverage rate and unemployment benefits are positive related. With regard to a terms of trade shock, the interaction with active labour market policies as well as foreign trade flows have negative marginal effects and positive effects if interacting with weak trade restrictions. The interaction of a labour demand shocks with institutions seems to be significant in the case of the coverage rate which shows positive marginal effects. High and intermediated corporatism as well as product market regulation show negative interaction effects. Beside the main results described above, there have been a lot more information in the result tables which have the potential to be discussed in another context.

4.6 Summary and discussion of the results

The empirical analysis reveals several potential problems concerning the data and the used econometric methods. Nevertheless, the research question stated in the beginning can be discussed in the light of the represented theoretical framework and empirical analysis. First of all it seems to be clear and unambiguous that, generally spoken, institutions affect actual unemployment.

The results from Table 1 provide good evidence on the direct effects of institutions on actual unemployment even if controlled for country- and time effects as well as for specific macroeconomic developments. Therefore, the first set of hypotheses seems to be true for that couple of institutions. Thus, the union density rate, unemployment benefits, the tax wedge, foreign trade flows and weak trade restrictions have been significantly positive related with actual unemployment in the most specifications. On the other hand, the coverage rate, the coordination of collective wage bargaining, product market regulation and

active labour market policies have been significantly negative related to actual unemployment in the most specifications. Other labour market institutions which were expected to be relevant were not significant in most specifications such as the level of bargaining or employment protection. The results of Table 1 suggest that the effects of those institutions have been captured by other institutions due to interaction effects and/or multicollinearity. With regard to the second part of analysis targeting on the explanation of unemployment trough institutional interactions, the picture is less clear. The results represented in Table 2 show that the interaction of institutions with globalization changed over the three subsample of different corporatism regimes. Thus, some interaction effects are significant in one subsample such as the negative interaction effect of the tax wedge and globalization in high corporatism economies whereas the same interaction effect is not significant in the other subsamples. Therefore, the results have to be handled with caution due to potential implicit interaction effects. With regard to the third part of analysis, the interaction between time-invariant institutions and macroeconomic shocks, the results are less convincing. Even if some of the proven interaction effects seem to be significant and relevant, the overall benefit from such an approach in order to explain unemployment is weak. By comparing the predictions of the three different approaches, the interaction between macroeconomic shocks and institutions provide no additional explanation of actual unemployment in the OECD. This observation is in-line with former findings, hence, “interactions between average values of these institutions and shocks make no significant additional contribution to our understanding of OECD unemployment changes” (Nickell et al. 2005: p. 1).

But do the results correspond with other existing empirical findings? In order to assess an overview about existing empirical research, Bassanini and Duval (2006) delivered a useful comprehensive and detailed survey about the existing empirical studies and their results (cp. Table A1 in Bassanini & Duval 2006: p. 61ff). On that basis, the results from the empirical analysis presented above can be compared and discussed in the following section. Thereby, the discussion concerns the theoretical argumentation and the expected relation between single institutions and unemployment (instead of technical considerations concerning the methodology). The discussion of the results is subsumed under the following dimensions i) the wage-setting system and coordination of bargaining, ii) the social security system, flexibility and regulation of labour markets and iii) additional indicators referring to globalization and competitiveness.

The relevance of the collective bargaining systems on the wage- and price setting process and on aggregated labour demand and supply, and therefore on unemployment, is obvious. According to the theoretical considerations and empirical studies, *bargaining power* - in terms of trade union membership and the coverage of collective agreements - affects the wage-setting through higher wage claims over the equilibrium level or warrant wage. Thus, bargaining power seems to be positive correlated with unemployment (cp. Bassanini & Duval 2006: p. 70f). Thus, the wage claims of the working union members – the insiders – do not have to take into account the negative effects on employment. The consequences strongly affect those groups where labour supply is more elastic such as youth, women and

old-age workers which alternatives are education, household production and retirement. Whatever the bargaining power comes from, the effect of the bargaining power on wages and unemployment depends on the specific structure of the collective bargaining as well (cp. Traxler & Kittel 2000: p. 1154ff). With regard to the results presented above, the current analysis supports the former findings that high union density is positively related to unemployment whereas the effect of the coverage rate is not that clear. Especially, the interaction between the coverage rate and high (or intermediated) corporatism seems to reduce unemployment.

The dimension of the structure of the collective bargaining, namely the coordination and centralization within collective bargaining systems, is a central aspect of the analytic framework and relevant for the understanding of the Philips curve relation. Accordingly, the literature has been extensive and the data base steadily increases. The discussion follows the argumentation, that decentralized wage bargaining on firm level is most employment-friendly allowing wage-setting at the factor price frontier. But on the other hand, a (negative) effect of centralized and coordinated collective bargaining is less clear and still ambiguous. According to the *hump-shape thesis*, economies with liberal and decentralized wage-setting as well as economies with a high degree of corporatism are associated with good labour market performance and low unemployment. Whereas in economies with an intermediated wage-setting regime (where collective bargaining take place at the regional or sectoral level without coordination), is associated with bad performance and high unemployment. A series of different studies have been related to the effects of corporatism on unemployment Where some studies postulate a positive effect of strong and coordinated unions and unemployment (e.g. Flanagan et al. 1983; Bruno & Sachs 1985; Soskice 1990; Calmfors 2001: p. 34), other studies support the hump-shaped relation (e.g. Calmfors et al. 1988; Scarpetta 1996; Elmeskov et al. 1998). Nevertheless, it can be noted that the positive effect of coordination on employment has been widely accepted and there has apparently existed a broad consensus about that relation (cp. Driffill 2006: p. 8; Bassanini & Duval 2006: p. 71). With regard to the empirical analysis above, the represented results can be seen as a support of the positive effects of coordination or high corporatism on unemployment whereas the hump-shape relation or the negative effect of intermediated corporatism is not that clear. The findings suggest, that particular high corporatism is significant and negative related with unemployment whereas intermediated corporatism is not that significant. An interesting aspect is that labour market institutions have very different effects in the different subsamples of corporatism (cp. Table 2). Thus, the significance as well as the strength of the effects depend to a large extend on the particular specification whereas the direction of the effect is clear and unambiguous in most cases. Moreover, the results point out that the interaction effects of several institutions with high corporatism (such as product market regulation, the tax wedge or high globalization) have been positive on unemployment.

The entire social security system as well as all institutions and political regulations which affect the flexibility of labour markets have been seen as relevant factors determining actual and particular equilibrium unemployment. In the context of the current analysis the

unemployment benefits, the employment protection legislation and the regulation of product markets are relevant due to the theoretical and empirical findings. The theoretical analytic framework as well as the existing empirical studies have suggested a significant positive impact of the benefit replacement rates and the benefit duration on unemployment (e.g. Scarpetta 1996; Nickell 1997; Elmeskov et al. 1998; Nickell et al. 2005). Thus, high benefit replacement rates and long benefit duration seem to increase unemployment through two mechanisms. On the one hand, it can be considered that unemployment benefits reduce the job-search intensity and the acceptance of job-offers and therefore, reduce the efficiency of the matching-process between unemployment and vacancies. On the other hand it can be assumed that unemployment benefits increase the pressure on wage-claims due to lower economic cost of unemployment. This results in lower vacancies and finally in higher unemployment. Additionally, higher unemployment benefits demand for higher taxes which can result in higher unemployment as well. With regard to the results of the empirical analysis above, the positive relation between unemployment benefits and unemployment seems to be relative robust in most of the specifications.

But the theoretical considerations are not that clear as such empirical findings suggest. With regard to the matching process, unemployment benefits allows job-seekers for better matches inducing lower successive job separations and enhancing productivity. Furthermore, the unemployment benefit system has to be reflected in the light of the entire social security system. Thus, unemployment benefits are often seen as a necessary social function ensuring social stability and cohesion. In conclusion, the effects of unemployment benefits can be described as a kind of trade-off between efficiency and equality. On the one hand, if the negative effects on job-search and wage claims prevail the positive effects on the quality of the matches, the argument demands for low and short unemployment benefits. On the other hand, unemployment benefits protect the whole society in the case of unexpected job-losses and allow the unemployed further job-searches. That function is strongly related to the effects of employment protection (cp. Bassanini & Duval 2006: p. 60). The regulation of labour and product markets is theoretical and empirical ambiguous. Therefore, employment protection affects unemployment via various mechanisms and the net-effect depends on the elasticity of labour demand and supply and the initial unemployment level. Thereby, the data seems to be very fragile and invalid and the results are highly influenced by the developments of a couple of countries such as Spain and Portugal where institutions and unemployment changes to a large extend (cp. Bassanini & Duval 2006: p. 12). According to the flow models of the search- and matching theory, the effects of employment protection on actual or equilibrium unemployment are unclear and ambiguous. Hence, two different mechanism of employment protection affect the unemployment rate. It can be assumed that i) high employment protection decreases the job destruction and the inflow in unemployment through strong protection of regular workers and high firing cost for the firms and ii) high employment protection decreases the flexibility of job allocation and job construction through higher risk and cost for the firms (cp. Boeri & Van Ours 2013: p. 2). Whereas the net-effect on unemployment is still unclear, the effects on the duration of unemployment are obvious, the higher employment protection the higher the average unemployment duration. The effects of unemployment benefits as well as of

employment protection seem to be influenced by their specific interactions with other institutions. Consequently, the argumentation captures only a part of the entire system and hides supplementary effects of the benefit system which demands for an analysis of institutional interactions and complementarities. The debate of the so-called two-tier reforms of the European labour markets reflects such potential complementarities (Boeri & Garibaldi 2007; Boeri & Van Ours 2013: p. 290f).

A quite good example is the reform of the Danish benefit system – broad discussed under the term of *flexicurity*. Thus, the Danish system which obviously consist of a high level of unemployment benefits is characterized by a couple of reforms towards tight incentives and strict sanctions or active labour market policies on the one hand and flexible employment protection on the other hand. This comprehensive political reforms have been seen as a key factor for a decrease of Danish unemployment rate (cp. Layard et al. 2005: p. xxix; referring to Finansministeriet 1999: chap. 2).³¹ The new credo of active labour market policy and flexicurity has been supported by an increase of global competition (cp. Driffill 2006: p. 12f). According to Blanchard (2013) the right motto for labour markets should follow “protect workers no jobs” (Blanchard et al. 2013: p. 5). There is an increasing attention on the effects of product market regulation which are usually seen as one of the main causes for (European) unemployment (cp. Blanchard & Giavazzi 2003: p. 879). According to Blanchard and Giavazzi (2003) product market deregulation “comes with a strong intertemporal trade-off” (Blanchard & Giavazzi 2003: p. 880), hence deregulation seems to reduce unemployment in the long-run but the effects in short-run have been associated with lower real wages and higher unemployment. Thus, the political economy plays a major role in the understanding of product market regulation reforms where deregulation of product markets influenced labour market regulation through reducing workers opposition to deregulation (cp. Blanchard & Giavazzi 2003: p. 900f).

The results of the represented empirical analysis do not provide a clear relation between employment protection, product market regulation, unemployment benefits and actual unemployment which can be seen in-line with the former existing ambiguous findings described above. Nevertheless, the postulated negative effects of active labour market policies on unemployment have been highly supported by the results presented above. But even if the negative effects of active labour market policies on actual unemployment seem to be clear they have to be handled with caution. Thus, active labour market policies often affect actual unemployment directly through the status of unemployed persons. Often, persons in active labour market programs have been subtracted from the unemployment rate without being employed.

In the course of the debate about globalization, labour taxation has been one of the most mentioned cause of unemployment in the context of increasing global competition (cp. Daveri & Tabellini 2000: p. 47ff). But even if there is a large consensus that the effects are similar for all kind of payroll taxes, individual income taxes as well as consumption taxes,

³¹ It has been postulated that the decline of unemployment reflects a decline of equilibrium unemployment due to the absence of inflation pressure.

the empirical evidence of the overall effects is unclear (cp. Nickell et al. 2005: p. 8f; Blanchard 2006: pp. 31–34). Thus, the sum of those relevant taxes, the so-called *tax-wedge*, describes the difference between the cost of labour for the employees and the net benefits for the employers and seems to be the relevant criteria in order to analyze the effects on unemployment. In the course of an increasing mobility of capital and a growing product market competition, the discussion about the tax-wedge has been moved into the focus of research. With regard to the mobility of capital in the long-run, labour demand depends on the real labour cost including the exogenous real capital cost and the level of technological progress, the so-called *factor price frontier*. Although in a world of a perfectly competitive labour market, the total tax burden is held solely by the workers and therefore does not affect the labour market equilibrium, such assumptions do not hold for several reasons (cp. Bassanini & Duval 2006: p. 60ff). Hence, recent empirical findings are ambiguous, some studies have postulated positive effects of labour taxation on unemployment (e.g. Nickell 1997; Belot & Van Ours 2004) whereas other researchers are less clear (e.g. Scarpetta 1996; Nunziata 2002; Di Tella & MacCulloch 2005). An interesting aspect is the interaction with the collective bargaining system, whereas the positive effect of the tax wedge on unemployment increases with the bargaining power of trade unions in low or intermediated coordinated bargaining systems (e.g. Elmeskov et al. 1998; Daveri & Tabellini 2000). In the context of strong trade unions but less coordination in bargaining process, it can be assumed that higher taxes have been compensated by higher wage claims. The results of the represented empirical analysis support the direct positive effects of taxes on unemployment whereas the postulated interaction with different types of corporatism is less clear. But Table 2 shows that the positive direct effect of the tax-wedge is only significant in the context of high corporatism.

According to the empirical findings of Gozgor (2013), globalization (measured by different indicators) seems to be significant and negative related with unemployment which have been in-line with theoretical considerations (cp. Gozgor 2013: p. 16). This relation is not supported by the current empirical results where the KOF indicators for economic globalization are significant positive related with unemployment in most of the specifications (cp. Table 1-3). Thus, the recent Financial Crisis 2007 revealed another aspect of globalization which can be described as higher risk and fluctuations due to the strong dependencies and deep financial connections (cp. Giannone et al. 2011: p. 111ff; Gozgor 2013: p. 2; Boeri & Van Ours 2013: p. 3).

5 Conclusion

To which extent can OECD unemployment be explained by institutions, institutional interactions and interactions between institutions and macroeconomic shocks?

The historical developments represented in Chapter 2 illustrate the major theoretical and empirical problems which have been mentioned in the beginning. Labour market institutions can explain cross-country differences but rarely the developments over time due to relative small changes over time. Certainly, a close look to the developments of the relevant institutions such as the collective bargaining system, unemployment benefits,

labour taxes or employment protection shows that a lot of changes accrue. But those changes cannot explain the developments of unemployment alone. The developments of labour market institutions as well as the developments of unemployment in the OECD do not follow any unique trend or direction. There is no clear trend or convergence towards employment- and market friendly labour markets such as Sachs and Warner (1995) have postulated. On the other hand, there is no clear direction towards the often cited varieties of capitalism which have been characterized by varied institutional settings and comparative institutional advantages (cp. Hall & Soskice 2001: p. 36ff). Consequently, the relation and interactions seem to be much more complex than former theories suggest and include the whole political economy.

In order to answer the central research question, the theoretical framework and the empirical assessments, which are represented above, deliver some important answers. Thus, the first and most evident impression is surely that the extent of different theoretical perspectives and the huge amount of empirical data and potential results provide too much information for one clear answer. It is rather a question for a comprehensive effort which can deal with the whole spectrum of aspects determining (equilibrium) unemployment in the OECD. The extensive works from Layard et al. (2005) or Pissarides (2000) can be seen as good examples for the demand of a completed and closed theory. But even if they have established a useful and differentiated fundament of unemployment explanations, economic research is still far from that universal understanding of unemployment. Consequently, a main challenge is the management of the huge amount of data in order to connect theoretic assumptions with empirical approaches. The present work has to be seen in this context. Therefore, clear answers or political recommendations are surely limited.

The main implications from the experience of the empirical analysis with *up-to-date* data are that: i) institutions can explain actual unemployment to a large extent due to direct effects as well as institutional interactions, ii) macroeconomic shocks contribute to the explanation of actual unemployment due to direct effects as well as interactions with time-invariant institutions and iii) the empirical analysis of institutional interactions and interactions between institutions and macroeconomic shocks provides useful insights but contains several technical challenges and theoretical and empirical problems. Where the analysis of specific institutional complementarities can provide fruitful insights of the developments of unemployment in the OECD, the analysis of the interaction between macroeconomic shocks and institutions depends to a large extent on the specific statistical approach. Thus, in order to provide robust results, a special focus has to be on the particular econometric approach including sensitive and robustness checks or extensive estimation methods such as Bassanini and Duval (2006, 2009) or Nymoen and Sparman (2013) presented. But even if the empirical analysis of OECD labour markets seems to be still at the beginning and a lot of additional efforts have been necessary, the results are actual and relevant. The specific effects of institutions and institutional complementarities are particularly relevant in the context of an increasing globalization, the Financial Crisis 2007 and the ongoing Euro crisis.

The explanations of the Financial Crisis 2007 have primarily focused on i) the deregulation of the financial markets, ii) the increasing global current account imbalances and iii) the rise of economic inequality in nearly each OECD economy (cp. Stiglitz et al. 2009; De Grauwe 2009; Horn et al. 2009; Reich 2010; Rajan 2011). In the case of the EMU, the single currency area suffers still from the persistent macroeconomic imbalances and inequalities due to the strongly diverging competitiveness (cp. European Commission 2013c: p. 26f; European Commission 2014). Thus, the large heterogeneity of national institutional conditions was seen as the source of the inner-European inequalities and imbalances. These explanations include particular aspects of the institutional framework of an economy and consider the entire political economy of the system (cp. inter alia Iversen & Soskice 2010; Gabor & Ban 2012; Carlin 2013). Within such a framework of “deep-seated differences in institutions, culture and trust” (Boltho & Carlin 2013: p. 387), the consequences of the Financial Crisis 2007, which affect the national economies of the EMU cause a different and asymmetric reaction as well. Thus, the effects of the Financial Crisis 2007 have influenced the following debate on economic asymmetries in the EMU to this day (cp. European Commission 2014). A good example is the individual success of the German economy to recover from the crisis. The export-orientated growth model under the strict focus on competitiveness, German labour and product markets have become more and more competitive in terms of the relative unit labour costs particularly in relation to their European neighbours in the South (cp. inter alia Rinne & Zimmermann 2013; Spielmann 2006). At the same time, national economic adjustments are implemented through structural policies (rather than monetary policies). But fiscal policy programs supporting national economies are limited due to the restrictions and fiscal discipline enforced by the Stability and Growth Pact (SGP). However, the success of political reforms, such as the EC growth and convergence strategy *Europe 2020*, will depend on the specific understanding of the national labour market institutions. Therefore, the EC recommended comprehensive adjustments of the national labour markets including collective bargaining systems (cp. European Commission 2013c: p. 18).

The present work shows that unemployment is not only affected by national labour market institutions but as well by increasing global dependencies and the so-called *financialization*. Whereas globalization is used to be negative related with unemployment, the Financial Crisis 2007 has had the greatest impact on employment in those economies which are highly globalized and where firm financing depends to a large extend on financial markets such as in Ireland, United Kingdom, United States, New Zealand and (since deregulation of the financial markets) Spain (cp. Figure 6). In the light of the current adverse shock, the financial crisis, a useful explanation for the different impacts are the differences in the degree of the “financial deepening” (Boeri & Van Ours 2013: p. 3) which, in turn, produce the economic turbulences described above. Freeman (2010) summarized the threat of financialization with regard to the OECD Employment Outlook 2009 as a “laissez-faire experiment failed on two counts. Deregulation of finance produced greater instability in capital markets, with no compensating boost for growth of output, profits, or earnings save in the finance sector itself. When finance collapsed, efforts to increase labour flexibility did little to insulate workers and the real economy from the costs

of financial mismanagement – costs that are, by any measure, massive.”(Freeman 2010: p. 171) Therefore, recent research efforts targeted on the theoretical interactions and empirical measurements of the rising financialization of the OECD economies (cp. Epstein 2005: p. 3; Palley 2007: p. 3f) and recent empirical analysis of the effects of financialization on unemployment suggested a significant positive correlation (cp. Assa 2012: p. 38). Labour markets are strongly influenced by changes of corporate governance, corporate finance and financial markets. The measurement of institutions which reflect such financial deepening or (de-)regulation of financial markets is still at the beginning. The work of Chinn and Ito (2008) on the so-called *Chinn-Ito Index* (cp. Chinn & Ito 2008 updated in 2013 (up to 2011)) can be seen as a potential source for new empirical studies on the relation and interaction between unemployment, labour market institutions and institutions of financialization. The current work suggests an increasing demand for a more comprehensive perspective on labour market institutions which takes into account the interaction between financial and labour markets. Therefore, the effect of financial deepening or financialization on unemployment can be seen as one of the future challenges of labour market research.

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Annex

Annex I: Data description

The data used in the empirical analysis covers the following 20 OECD member states over the period from 1960 to 2012:

<i>Australia (AUS)</i>	<i>Austria (AUT)</i>	<i>Belgium (BEL)</i>	<i>Canada (CAN)</i>
<i>Denmark (DNK)</i>	<i>Finland (FIN)</i>	<i>France (FRA)</i>	<i>Germany (DEU)</i>
<i>Ireland (IRL)</i>	<i>Italy (ITA)</i>	<i>Japan (JPN)</i>	<i>Netherlands (NLD)</i>
<i>Norway (NOR)</i>	<i>New Zealand (NZL)</i>	<i>Portugal (PRT)</i>	<i>Spain (ESP)</i>
<i>Sweden (SWE)</i>	<i>Switzerland (CHE)</i>	<i>United Kingdom (GBR)</i>	<i>United States (USA)</i>

The range of the single time-series depends on the availability of the data and varies across the indicators. Cases where the coverage is limited or a variable shows deviations are described below in more detail. Most of the data originates from the OECD Statistical Database (<http://stats.oecd.org/>) as well as from additional source such as the database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) from the Amsterdam Institute for Advanced Labour Studies (AIAS) (<http://www.uva-aias.net/208>), the CEP-OECD Institutions Data Set (1960-2004) from the Centre of Economic Performance (CEP) in London (<http://cep.lse.ac.uk/pubs/download/data0759.zip>) and from indicators which have been provided by previous researchers. Particular acknowledgments count for the work from Blanchard and Wolfers (2000), Nickell and Nunziata (2001), Nickell et al (2005) and Bassanini and Duval (2006, 2009) which serve as a base for data collection. The following descriptions refer to the used dataset which is available on request.³²

Unemployment rate (%)

u: Unemployment rate as a percentage of civilian labour force (active working age (15-64) population). Data is taken from the OECD Labour Force Statistics.

NAIRU (%)

u_nairu: The unemployment rate with non-accelerating inflation rate (NAIRU) describes the structural unemployment rate consistence with constant price inflation (or wage inflation (NAWRU)). The data is taken from the OECD Economic Outlook Statistics.

Long-term unemployment rate (%)

u_longterm: The long-term unemployment rate reflects the share of unemployed persons for more than one year in relation to all unemployed persons. Data is taken from the OECD labour force statistics.

³² Please contact knirsch.f@gmail.com. Note that some of the following variables are not directly used in the current paper but complement the database and the ***bold*** terms referring to the variable names within the dataset.

Youth unemployment rate (%)

u_young: The youth unemployment rate reflects the share of unemployed persons in the age between 15 and 24 in relation to all unemployed persons. Data is taken from the OECD labour force statistics.

Old-age unemployment rate (%)

u_old: The old-age unemployment rate reflects the share of unemployed persons in the age between 55 and 64 in relation to all unemployed persons. Data is taken from the OECD labour force statistics.

GDP growth rate (%)

growth: Real annual GDP growth per capita. Data is taken from the OECD Economic Outlook statistics.

Output gap (%)

og: The output gap describes the difference between actual and potential GDP as a percent of potential GDP. The data is taken from OECD Economic Outlook Statistics.

Inflation (%)

cpi: Change of the consumer price index as an annual percentage change on the same period of the previous year. Data is taken from the OECD Economic Outlook statistics.

Short-term interest rates (%)

irs: Short-term interest reflects usually the three month interbank offer rate (%). Data is taken from the OECD Economic Outlook Statistics.

Immediate interest rates (%)

irm: The *immediate interest rates, Call Money or interbank rate* reflects usually the overnight (24 hours) or immediate rate (%). Data is taken from the OECD Economic Outlook Statistics.

Long-term interest rates (%)

irl: Long-term interest reflects usually the 10 years government bond yields. Data is taken from the OECD Economic Outlook Statistics.

Total factor productivity shock

tfp_shock: The indicator describes the difference of the log of total factor productivity from its trend measured by means of the Hodrick-Prescott (HP) filter (using a common smoothing parameter for annual data ($\lambda=100$)). Data is taken from the OECD Economic Outlook Statistics.

The calculation follows Bassanini and Duval (2006) where i) the growth in the Solow residual in the business sector is given by:

$$\Delta \log(\text{tfp}) = [\Delta \log(Y) - \alpha \Delta \log(N) + (1 - \alpha) \Delta \log(K)] / \alpha$$

where y reflects real business sector GDP, N total employment, K gross capital stock and α labour income as a share of business income, ii) an index of $\log(\text{tfp})$ describes the cumulating annual values of $\Delta\log(\text{tfp})$ and iii) the final productivity shock is expressed as the differences between $\log(\text{tfp})$ and its HP filtered trend (cp. Bassanini & Duval 2006: p. 83).

Real interest rate shock

rir_shock: The indicator of real interest rate shock is constructed as the difference between long-term interest rate on government bonds (%) and the annual change in GDP deflator (%). Data is taken from the OECD Economic Outlook statistics.

Terms of trade shock

tot_shock: The indicator of terms of trade shock is constructed as the logarithm of relative import prices weighted by the share of imports in GDP. Data is taken from the OECD Economic Outlook Statistics.

The calculation follows Bassanini and Duval (2006),

$$\text{tot}_{\text{shock}} = \frac{M}{Y} * \log\left(\frac{p_m}{p_y}\right)$$

where M and Y reflects nominal imports and GDP and $\left(\frac{p_m}{p_y}\right)$ the relation of import deflator to GDP deflator (cp. Bassanini & Duval 2006: p. 83).

Labour demand shock

lds_shock: The indicator of labour demand shock is directly taken from Bassanini and Duval (2006) which refer to the approach and methodology of Blanchard (1998) and Blanchard and Wolfers (2000). Therefore, a labour demand shock is defined as the

“logarithm of the labour share in business sector GDP purged from the shortrun influence of factor prices. [...].

The simplest possible measure of labour demand shocks would be the negative of the sum of the logarithm of the ratio of labour input in efficiency units to real output in the business sector, on the one hand, and the logarithm of real wages in efficiency units, on the other hand. [...] However, this simple measure of labour demand shocks is accurate only to the extent that the production function is Cobb-Douglas and factor proportions adjust instantaneously to changes in factor prices. Insofar as the latter assumption is unlikely to be verified in the shortrun, changes in the labour share reflect both genuine labour demand shocks and the lagged adjustment of factor proportions to changes in factor prices.

Therefore, it is necessary to purge the labour share from the short-run influence of factor prices. [...] The negative sign implies that an increase in this variable should be interpreted as an adverse labour demand shock. Finally, this variable is set equal to zero in 1970 (or in the first year of data availability for those countries where long time series are unavailable).” (Bassanini & Duval 2006: p. 84)

Union density rate (%)

cbs_ud: Union density rate indicates the net union membership as a proportion of wage and salary earners in employment {0,100}. Data is taken from the ICTWSS Database.

Coverage rate of collective agreements (%)

cbs_uc: Employees covered by collective wage bargaining agreements as a proportion of all wage and salary earners in employment {0,100}. Data is taken from the ICTWSS Database.

Coordination of bargaining {1,5}

cbs_coor: Index of the degree of coordination within the collective wage bargaining {1,5} where:

- 5 = economy-wide bargaining, based on: a) enforceable agreements between the central organizations of unions and employers affecting the entire economy or entire private sector, or on b) government imposition of a wage schedule, freeze, or ceiling.
- 4 = mixed industry and economy-wide bargaining: a) central organizations negotiate non-enforceable central agreements (guidelines) and/or b) key unions and employers associations set pattern for the entire economy.
- 3 = industry bargaining with no or irregular pattern setting, limited involvement of central organizations, and limited freedoms for company bargaining.
- 2 = mixed or alternating industry- and firm level bargaining, with weak enforceability of industry agreements.
- 1 = none of the above, fragmented bargaining, mostly at company level.

Data is taken from the ICTWSS Database.

Level of bargaining {1,5}

cbs_level: Index of the dominant level at which collective wage bargaining takes place {0,5} where the dominant level is:

- 5 = National or central level.
- 4 = National or central level, with additional sectoral/local or company bargaining.
- 3 = Sectoral or industry level.
- 2 = Sectoral or industry level, with additional local or company bargaining.
- 1 = Local or company bargaining.

Data is taken from the ICTWSS Database.

Government intervention {1,5}

cbs_government: Index of the government interventions {0,5} where:

- 5 = Government imposes private sector wage settlements, places a ceiling on bargaining outcomes or suspends bargaining.
- 4 = Government participates directly in wage bargaining (tripartite bargaining, as in social pacts).

- 3 = Government influences wage bargaining outcomes indirectly through price ceilings, indexation, tax measures, minimum wages, and/or pattern setting through public sector wages.
- 2 = Government influences wage bargaining by providing an institutional framework of consultation and information exchange, by conditional agreement to extend private sector agreements, and/or by providing a conflict resolution mechanism which links the settlement of disputes across the economy and/or allows the intervention of state arbitrators or Parliament.
- 1 = None of the above.

Data is taken from the ICTWSS Database.

High corporatism {0,1}

cbs_high: The indicator describes the degree of corporatism in terms of coordination, centralization and government intervention. The indicator is a dummy variable which takes 1 if either coordination, the level or government intervention is coordinated and/or centralized (national or central) and zero otherwise.

Intermediated corporatism {0,1}

cbs_inter: The indicator describes the degree of corporatism in terms of coordination, centralization and government intervention. The indicator is a dummy variable which takes 1 if collective bargaining is *intermediated* that means either coordinated and/or centralized (national or central) nor uncoordinated and decentralized (none or firm) and zero otherwise.

Low corporatism {0,1}

cbs_low: The indicator describes the degree of corporatism in terms of coordination, centralization and government intervention. The indicator is a dummy variable which takes 1 if either coordination, the level or government intervention is uncoordinated and decentralized (none or firm) and zero otherwise.

Unemployment benefit level (%)

ub_grr: The average gross replacement rate over two income situations (100% and 67% of APW earnings), three family types (single, married single earnings, married couple earnings) and three unemployment durations (1st ; 2nd and 3rd ; 4th and 5th). Data is taken from OECD Benefits and Wages Statistics and missing values were expanded by a linear interpolation.

Employment protection {0,2}

epl: Index of the strictness of employment protection legislation. The data is a combination of the index developed by Lazear (1990) (cp. Lazear 1990; Nickell et al. 2001) {0,2} which has been expanded with the 1st version of the index developed by the OECD {0,5} (for a detailed description and differences cp. Venn 2009). Therefore, the OECD index has to be normalized between 0 and 2, where higher values indicate a stricter protection. Data

is taken from CEP-OECD Institutions data set (cp. Nickell 2006) and the OECD Employment Database.

Product market regulation {0,6}

pmr: The OECD indicators of regulatory reforms indicate regulatory provisions in seven non-manufacturing sectors: telecoms, electricity, gas, post, rail, air passenger transport, and road freight and has been estimated over the period of 1975 to 2003. This measurement is expanded by an interpolation with the OECD economy-wide product market regulation indicator from 2013 (including values for 1998, 2003, 2008 and 2013). The range is {0,6} where high values indicate a high degree of regulation. Data is taken from CEP-OECD Institutions data set (cp. Nickell 2006) and from the OECD Product Market Statistics for 1998, 2003, 2008 and 2013.

Tax wedge (%)

tw: The tax wedge describes the gap between the cost of labour to the employer and the employee's take-home pay that means the average sum of all personal income tax, payroll taxes and total social security contributions (including employee and employer contribution) expressed as a percentage of total labour cost. Data is taken from CEP-OECD Institutions data set (cp. Nickell 2006) and from the OECD Taxing Wages Statistics.

Active labour market policies (%)

almp_u: The indicator describes the expenditures on active labour market programs as a percentage of GDP *in relation to the actual unemployment rate*. Data is taken from OECD Social Expenditures Statistics and OECD Labour Force Statistic.

KOF economic globalization index {0,100}

kof_economic: The KOF economic globalization index consists of data on actual economic flows (including trade (percent of GDP), Foreign Direct Investment stocks (percent of GDP), Income Payments to Foreign Nationals (percent of GDP)) and trade restrictions (including Hidden Import Barriers, Mean Tariff Rates, Taxes on International Trade (percent of current revenue), Capital Account Restrictions). The index is constructed that higher values indicate a higher degree of globalization. For a detailed description please see as well the definition, method and calculations from the ETH Zürich (<http://globalization.kof.ethz.ch/>). Data is taken from the KOF Index of Globalization Database from the ETH Zürich.

KOF actual foreign trade flows {0,100}

kof_flow: The sub-index of the KOF economic globalization index consists of data on actual foreign trade flows including data on trade (percent of GDP) from the World Bank's World Development Indicators (<http://data.worldbank.org/data-catalog/world-development-indicators>), data on foreign direct investment stocks (percent of GDP) from UNCTAD STAT (<http://unctadstat.unctad.org>), data on portfolio investment from the IMF Financial Statistics Indicators (<http://elibrary-data.imf.org/>) and data on income payments to foreign nationals (percent of GDP) from the World Bank's World Development

Indicators (<http://data.worldbank.org/data-catalog/world-development-indicators>). The index is constructed so that higher values indicate a higher degree of globalization. For a detailed description please see the definition, method and calculations from the ETH Zürich (<http://globalization.kof.ethz.ch/>). Data is taken from the KOF Index of Globalization Database from the ETH Zürich.

KOF trade restrictions {0,100}

kof_restrictions: The sub-index of the KOF economic globalization index consists of data trade restrictions including data on hidden import barriers from the Economic Freedom of the World database (cp. Gwartney et al. 2012), data on mean tariff rates from the Economic Freedom of the World database (cp. Gwartney et al. 2012), data on taxes on international trade (percent of current revenue) from the World Bank's World Development Indicators (<http://data.worldbank.org/data-catalog/world-development-indicators>) and data on capital account restrictions from the Economic Freedom of the World database (cp. Gwartney et al. 2012). The index is constructed so that higher values indicate less restrictions and a higher degree of globalization. For a detailed description please see the definition, method and calculations from the ETH Zürich (<http://globalization.kof.ethz.ch/>). Data is taken from the KOF Index of Globalization Database from the ETH Zürich.

Annex II: Descriptive statistics of variables**Table 4: Descriptive statistics of variables**

	<i>mean</i>	<i>sd</i>	<i>min</i>	<i>max</i>	<i>obs.</i>	<i>years</i>
<i>unemployment rate</i>	5.47	3.99	0.00	25.13	1060	1960-2012
<i>NAIRU</i>	5.98	3.10	0.08	20.76	894	1965-2012
<i>long-term unemployment</i>	0.31	0.18	0.02	0.76	601	1975-2012
<i>youth unemployment</i>	13.86	8.31	0.46	53.16	755	1960-2012
<i>old-age unemployment</i>	4.79	3.03	0	21.03	755	1960-2012
<i>GDP growth</i>	2.68	2.42	-8.54	11.20	858	1960-2011
<i>output gap</i>	-0.38	2.69	-12.21	16.02	802	1970-2012
<i>inflation</i>	4.85	4.45	-4.50	31.00	1036	1960-2012
<i>short-term interest rates</i>	6.88	4.53	0.08	24.9	846	1960-2012
<i>productivity shock</i>	0.00	0.02	-0.10	0.11	862	1960-2012
<i>interest rate shock</i>	2.67	3.17	-17.08	11.15	1019	1960-2012
<i>terms of trade shock</i>	6.15	6.89	-9.90	33.77	792	1970-2011
<i>labour demand shock</i>	0.02	0.06	-0.14	0.24	597	1970-2003
<i>union density</i>	39.05	19.86	0.09	83.90	1009	1960-2012
<i>coverage rate</i>	67.51	24.26	13.10	100.00	1012	1960-2012
<i>bargaining coordination</i>	3.28	1.35	1	5	1060	1960-2012
<i>bargaining level</i>	2.68	1.18	1	5	1060	1960-2012
<i>government intervention</i>	2.64	1.27	1	5	1060	1960-2012
<i>high corporatism</i>	0.57	0.49	0	1	1060	1960-2012
<i>intermediated corporatism</i>	0.28	0.45	0	1	1060	1960-2012
<i>low corporatism</i>	0.15	0.36	0	1	1060	1960-2012
<i>unemployment benefits</i>	25.11	13.64	0.00	65.00	1060	1960-2012
<i>employment protection</i>	0.96	0.54	0	2	1045	1960-2012
<i>product market regulation</i>	3.78	1.48	0.72	6	854	1970-2012
<i>tax wedge</i>	30.91	10.25	4.5	53.3	824	1970-2012
<i>ALMP</i>	14.16	12.11	1.57	103.56	580	1985-2012
<i>KOF foreign trade flows</i>	58.47	22.39	13.13	99.08	820	1970-2010
<i>KOF trade restriction</i>	79.95	11.80	31.75	98.51	820	1970-2010

Notes: For a detailed description of data see Annex I.

Annex III: Correlation between institutional variables**Table 5: Cross-country correlation of the institutional variables**

	<i>union density</i>	<i>coverage</i>	<i>high corporatism</i>	<i>un-employment benefits</i>	<i>employment protection</i>	<i>product market regulation</i>	<i>tax wedge</i>	<i>ALMP</i>	<i>KOF foreign trade flows</i>	<i>KOF trade restrictions</i>
<i>union density</i>	1									
<i>coverage</i>	0.3943*	1								
<i>high corporatism</i>	0.2051*	0.4714*	1							
<i>unemployment benefits</i>	0.2948*	0.4896*	0.3870*	1						
<i>employment protection</i>	0.0102	0.5591*	0.5566*	0.1474*	1					
<i>product market regulation</i>	0.0506	0.5416*	0.4270*	0.2659*	0.6683*	1				
<i>tax wedge</i>	0.3952*	0.7581*	0.4664*	0.4822*	0.5060*	0.4366*	1			
<i>ALMP</i>	0.6397*	0.4199*	0.3230*	0.4989*	0.2096*	0.1846*	0.5606*	1		
<i>KOF foreign trade flows</i>	0.4061*	0.2844*	0.2419*	0.5448*	-0.1530*	0.2143*	0.1500*	0.4615*	1	
<i>KOF trade restrictions</i>	0.2602*	0.4287*	0.1583*	0.4872*	0.0684*	0.1196*	0.5547*	0.4888*	0.4961*	1

Note: The values represent the cross-country correlation between (time-invariant) country means of the institutional indicators. The star * indicates significances at the 5% level or better. For a detailed description of data see Annex I.

Annex IV: Comparison with other sources**Table 6: Variables compared with other sources**

	<i>used data 1970-2012</i>	<i>Bassanini and Duval (2006) 1970-2003</i>	<i>Nickell and Nunziata (2001) 1960-1995</i>
<i>unemployment rate</i>	1	0.9167*	0.9586*
<i>obs</i>	860	669	515
<i>union density</i>	1	0.9964*	0.9298*
<i>obs</i>	819	654	515
<i>coverage</i>	1	0.9071*	
<i>obs</i>	842	674	
<i>coordination</i>	1		0.6845*
<i>obs</i>	860		515
<i>high corporatism</i>	1	0.5652*	
<i>obs</i>	860	674	
<i>unemployment benefits</i>	1	0.9814*	0.7014*
<i>obs</i>	860	674	515
<i>employment protection</i>	1	0.8974*	1
<i>obs</i>	855	669	515
<i>product market regulation</i>	1	0.9942*	
<i>obs</i>	854	674	
<i>tax wedge</i>	1	0.8155*	0.6800*
<i>obs</i>	824	505	474
<i>active labour market policies</i>	1	0.8431*	
<i>obs</i>	580	394	
<i>output gap</i>	1	0.9318*	
<i>obs</i>	802	616	
<i>productivity shock</i>	1	0.6567*	0.7109*
<i>obs</i>	837	622	508
<i>interest rate shock</i>	1	0.8936*	0.9062*
<i>obs</i>	860	674	515
<i>terms of trade shock</i>	1	0.5879*	0.2059*
<i>obs</i>	792	615	474
<i>labour demand shock</i>	1	1	-0.0862
<i>obs</i>	597	597	466

Note: Table indicates correlation coefficients and number of observations of the used data, the data from Nickell and Nunziata (2001) and Bassanini and Duval (2006). The star * indicates a significant level of 5% or better. For a detailed description of the data see Annex I particular with regard to the adoption of values from other sources.

Annex V: Tables of data developments

Table 7: Unemployment rate (%)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	2.3	-0.6	1.7	0.3	2.0	2.1	4.1	2.3	6.3	2.3	8.7	-0.5	8.1	1.1	9.2	-2.4	6.8	-1.7	5.1	0.0	5.1	5.4	2.8
Austria	2.1	-0.1	1.9	-0.4	1.5	0.0	1.5	0.9	2.4	1.3	3.7	-0.3	3.4	0.6	4.0	-0.1	3.9	0.9	4.7	-0.4	4.3	3.0	2.2
Belgium	2.6	-0.8	1.8	0.4	2.3	2.2	4.5	4.7	9.1	3.5	12.6	-2.8	9.8	2.9	12.7	-4.4	8.3	-0.1	8.2	-0.6	7.6	7.2	5.0
Canada	6.7	-2.4	4.3	1.1	5.4	1.2	6.6	1.8	8.4	2.1	10.5	-1.5	9.0	1.0	10.0	-2.5	7.5	-0.7	6.8	0.6	7.4	7.5	0.8
Denmark	1.9	-0.4	1.5	-0.4	1.0	3.6	4.6	3.9	8.6	-0.9	7.7	0.6	8.3	-0.4	7.8	-2.8	5.1	-0.2	4.9	1.6	6.5	5.3	4.6
Finland	1.3	0.4	1.8	0.9	2.7	0.5	3.2	2.4	5.7	-0.4	5.3	0.6	5.9	9.3	15.2	-5.2	9.9	-1.8	8.2	-0.5	7.7	6.1	6.4
France	1.2	0.2	1.5	0.9	2.3	1.1	3.5	2.6	6.0	3.1	9.1	-0.5	8.6	1.8	10.4	-1.7	8.7	-0.3	8.4	0.5	9.0	6.2	7.7
Germany	0.8	0.1	0.9	0.0	0.8	2.2	3.0	1.2	4.3	2.8	7.1	-1.3	5.8	2.9	8.7	-0.3	8.4	1.6	10.0	-3.2	6.8	5.1	6.0
Ireland	5.7	-0.6	5.1	0.8	5.9	1.8	7.7	1.2	8.9	7.2	16.1	-1.2	14.9	-1.9	13.0	-7.7	5.4	-0.7	4.7	7.6	12.3	9.1	6.7
Italy	1.5	-0.2	1.2	0.0	1.2	0.5	1.7	0.5	2.2	0.5	2.7	-0.5	2.2	0.8	3.1	1.7	4.8	-0.3	4.5	0.1	4.6	2.7	3.1
Japan	1.5	5.8	7.3	-2.6	4.6	-0.7	3.9	0.3	4.2	-0.5	3.7	-1.2	2.5	-0.1	2.4	2.6	5.0	-1.5	3.5	-0.1	3.4	3.8	2.0
Netherlands	0.6	0.2	0.8	0.6	1.4	2.9	4.3	3.2	7.5	3.5	11.0	-3.2	7.8	-1.3	6.5	-3.4	3.1	0.9	4.0	0.1	4.1	4.6	3.5
New Zealand	0.1	0.0	0.1	0.3	0.4	-0.1	0.2	2.4	2.6	2.2	4.8	3.6	8.4	-0.9	7.5	-1.2	6.3	-2.3	4.0	2.0	6.1	3.7	6.0
Norway	1.1	-0.1	1.0	0.1	1.1	0.6	1.7	0.3	2.0	0.6	2.7	2.3	5.0	0.1	5.1	-1.6	3.5	0.4	3.9	-0.7	3.2	2.8	2.1
Portugal	2.2	0.4	2.6	0.0	2.6	1.9	4.6	3.2	7.8	0.3	8.2	-3.4	4.8	1.9	6.7	-2.2	4.5	2.8	7.3	4.0	11.3	5.7	9.1
Spain	1.4	0.1	1.5	0.5	2.0	2.1	4.1	7.4	11.5	8.7	20.1	-2.6	17.6	5.0	22.5	-8.5	14.1	-4.4	9.7	9.6	19.3	11.3	17.9
Sweden	1.6	0.1	1.6	0.6	2.2	-0.2	1.9	0.7	2.6	0.5	3.1	-0.3	2.9	6.9	9.7	-3.4	6.4	0.3	6.7	1.1	7.8	4.2	6.2
Switzerland	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.0	0.3	0.6	0.9	0.3	1.2	2.4	3.6	-0.8	2.8	1.1	3.9	-0.1	3.8	1.5	3.8
United Kingdom	1.4	0.1	1.5	0.9	2.5	1.1	3.5	3.5	7.0	4.2	11.2	-3.0	8.2	0.5	8.8	-3.3	5.5	-0.5	5.0	2.3	7.3	5.6	5.9
United States	5.9	-1.3	4.6	0.1	4.7	2.0	6.7	0.5	7.3	0.2	7.5	-1.4	6.1	-0.3	5.8	-1.1	4.6	0.5	5.2	3.2	8.3	6.1	2.4
Ø	2.1	0.0	2.1	0.2	2.3	1.3	3.6	2.1	5.7	2.1	7.8	-0.8	7.0	1.6	8.6	-2.4	6.2	-0.3	5.9	1.4	7.3	5.3	5.2

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 8: NAIRU (%)

country	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia			3.2	1.1	4.3	1.7	6.0	1.5	7.5	0.2	7.7	0.3	8.1	-1.5	6.5	-1.1	5.4	-0.2	5.2	6.0	2.0
Austria	1.8	0.1	1.8	0.1	2.0	0.5	2.5	0.8	3.3	0.4	3.7	0.2	3.8	0.2	4.1	0.2	4.3	0.0	4.3	3.2	2.6
Belgium	1.8	0.9	2.7	1.7	4.4	2.0	6.4	1.4	7.8	0.2	8.0	0.3	8.3	-0.2	8.1	-0.1	8.0	-0.1	7.9	6.3	6.2
Canada			5.8	1.1	6.8	1.6	8.4	1.0	9.5	-0.2	9.3	-0.1	9.2	-1.3	8.0	-0.7	7.2	0.0	7.3	7.9	1.5
Denmark	0.4	1.0	1.5	1.9	3.4	1.9	5.3	0.9	6.2	0.5	6.7	-0.3	6.4	-1.1	5.4	-0.3	5.0	0.4	5.4	4.6	5.0
Finland	1.7	2.7	4.4	0.1	4.5	0.1	4.5	0.7	5.3	2.5	7.7	4.7	12.4	-2.0	10.5	-2.1	8.4	-0.9	7.5	6.7	5.8
France	2.0	0.9	2.9	0.9	3.7	2.0	5.8	2.2	8.0	0.7	8.7	1.1	9.8	-0.7	9.1	-0.4	8.6	0.2	8.8	6.7	6.8
Germany							3.5	0.9	4.4	1.2	5.6	1.6	7.2	0.5	7.7	0.3	7.9	-0.9	7.1	6.2	3.5
Ireland	5.0	1.4	6.4	1.1	7.5	2.3	9.8	4.3	14.1	0.2	14.3	-2.7	11.6	-3.0	8.6	-1.1	7.5	1.8	9.4	9.4	4.4
Italy	4.5	1.0	5.4	0.2	5.7	0.5	6.1	1.5	7.6	1.3	8.9	0.5	9.4	-0.3	9.1	-1.3	7.8	0.0	7.8	7.2	3.3
Japan			1.4	0.1	1.5	0.3	1.8	0.5	2.3	0.3	2.5	0.5	3.1	0.7	3.8	0.3	4.1	0.2	4.3	2.7	2.9
Netherlands	0.1	1.5	1.5	1.3	2.8	2.1	4.9	2.2	7.2	-0.6	6.5	-1.0	5.6	-1.5	4.1	-0.2	3.8	-0.1	3.7	4.0	3.7
New Zealand							3.6	1.4	5.0	2.3	7.3	0.1	7.4	-1.4	6.0	-1.6	4.4	1.3	5.7	5.6	2.1
Norway			1.7	0.1	1.8	0.4	2.2	0.7	2.9	1.4	4.3	0.3	4.6	-0.8	3.8	-0.1	3.7	-0.4	3.3	3.1	1.6
Portugal	2.1	0.8	2.9	1.9	4.8	2.0	6.8	-0.1	6.7	-0.7	6.0	-0.1	6.0	0.0	5.9	1.4	7.4	2.2	9.5	5.8	7.5
Spain	2.1	1.0	3.1	2.4	5.5	2.4	7.9	5.5	13.4	1.1	14.5	1.2	15.6	-1.9	13.8	-0.9	12.8	5.2	18.0	10.7	15.9
Sweden	1.1	1.2	2.2	0.6	2.9	0.4	3.2	0.7	3.9	1.3	5.2	2.5	7.7	-0.1	7.6	-0.3	7.3	-0.1	7.2	4.8	6.1
Switzerland					0.5	0.1	0.6	0.4	1.0	0.7	1.7	1.1	2.9	0.3	3.2	0.5	3.7	0.2	3.9	2.2	3.4
United Kingdom	1.5	2.0	3.5	1.6	5.1	2.5	7.6	2.2	9.8	-0.8	9.0	-0.9	8.1	-1.9	6.2	-0.5	5.7	1.0	6.6	6.3	5.2
United States			5.6	0.5	6.2	0.2	6.4	0.0	6.4	-0.4	6.0	-0.4	5.6	-0.2	5.4	0.2	5.6	0.4	6.0	5.9	0.4
Ø	2.0	1.2	3.3	1.0	4.1	1.3	5.2	1.4	6.6	0.6	7.2	0.4	7.6	-0.8	6.8	-0.4	6.4	0.5	7.0	5.8	4.5

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 9: Long-term unemployment rate (%)

country	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	0.29	-0.02	0.26	0.07	0.33	-0.05	0.28	-0.09	0.19	-0.01	0.17	0.13	-0.11
Austria					0.25	0.01	0.26	0.01	0.26	-0.02	0.24	0.14	-0.01
Belgium	0.69	0.00	0.68	-0.09	0.59	-0.03	0.56	-0.06	0.50	-0.03	0.47	0.30	-0.22
Canada	0.12	-0.02	0.09	0.07	0.17	-0.06	0.11	-0.02	0.09	0.02	0.11	0.06	-0.01
Denmark	0.33	-0.06	0.27	0.01	0.28	-0.06	0.22	-0.01	0.20	-0.01	0.19	0.12	-0.14
Finland	0.20	-0.14	0.05	0.28	0.33	-0.06	0.27	-0.03	0.24	-0.04	0.21	0.12	0.01
France	0.44	-0.02	0.41	-0.04	0.38	0.00	0.38	0.03	0.41	-0.02	0.39	0.21	-0.05
Germany	0.46	-0.05	0.41	0.05	0.46	0.05	0.51	0.03	0.54	-0.06	0.48	0.26	0.02
Ireland	0.55	0.08	0.63	-0.03	0.60	-0.21	0.40	-0.07	0.32	0.13	0.45	0.26	-0.10
Italy	0.64	0.03	0.67	-0.04	0.63	-0.02	0.61	-0.10	0.51	-0.02	0.49	0.31	-0.16
Japan	0.16	0.03	0.18	0.00	0.18	0.07	0.25	0.08	0.33	0.02	0.35	0.15	0.20
Netherlands	0.52	-0.04	0.47	0.02	0.50	-0.10	0.39	-0.02	0.37	-0.06	0.31	0.21	-0.21
New Zealand	0.09	0.13	0.22	0.05	0.27	-0.08	0.18	-0.09	0.10	-0.01	0.08	0.09	-0.01
Norway	0.09	0.09	0.17	0.04	0.21	-0.15	0.07	0.03	0.10	-0.01	0.09	0.07	0.00
Portugal	0.54	-0.12	0.42	0.08	0.49	-0.09	0.40	0.05	0.45	0.03	0.48	0.25	-0.06
Spain	0.60	-0.08	0.52	0.00	0.52	-0.10	0.42	-0.15	0.26	0.06	0.33	0.22	-0.27
Sweden	0.12	0.01	0.13	0.13	0.27	0.00	0.27	-0.10	0.17	-0.01	0.16	0.10	0.04
Switzerland			0.18	0.09	0.27	0.04	0.31	0.05	0.36	-0.01	0.34	0.18	0.07
United Kingdom	0.48	-0.12	0.36	0.06	0.42	-0.14	0.28	-0.06	0.22	0.08	0.30	0.17	-0.18
United States	0.10	-0.03	0.07	0.03	0.10	-0.03	0.07	0.04	0.11	0.12	0.23	0.07	0.13
Ø	0.36	-0.03	0.33	0.03	0.36	-0.05	0.31	-0.03	0.29	0.01	0.29	0.17	-0.05

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 10: Youth unemployment (%)

country	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	total
Australia	12.72	3.32	16.04	-1.14	14.91	1.67	16.57	-3.31	13.26	-2.59	10.68	0.31	10.99	10.84	-1.73
Austria							5.70	-0.14	5.55	3.41	8.96	-0.18	8.78	7.25	3.08
Belgium			23.02	-7.97	15.05	5.65	20.71	-2.45	18.25	2.51	20.76	-0.61	20.16	19.66	-2.86
Canada	14.11	2.03	16.14	-2.56	13.57	2.34	15.92	-2.23	13.69	-1.21	12.48	1.53	14.01	14.13	-0.10
Denmark			12.28	-1.20	11.08	-0.41	10.67	-2.77	7.90	0.35	8.25	4.19	12.44	10.44	0.16
Finland	11.14	-0.93	10.21	2.76	12.97	14.48	27.45	-7.28	20.17	-1.75	18.42	0.44	18.86	13.38	7.72
France			23.49	-2.90	20.59	7.01	27.61	-5.55	22.06	-2.21	19.85	2.25	22.10	22.62	-1.40
Germany	5.78	3.55	9.33	-3.66	5.67	3.05	8.71	0.12	8.83	3.89	12.72	-3.18	9.54	7.26	3.77
Ireland	11.93	11.34	23.26	-1.77	21.49	-0.89	20.60	-11.05	9.55	0.22	9.78	16.04	25.81	14.88	13.88
Italy	25.89	7.57	33.46	-0.84	32.61	-1.53	31.08	-1.83	29.25	-6.12	23.13	4.66	27.79	25.48	1.90
Japan	3.73	1.19	4.92	-0.43	4.49	1.52	6.00	3.19	9.19	-0.39	8.80	-0.50	8.30	5.60	4.57
Netherlands	11.42	10.16	21.58	-10.52	11.06	-0.30	10.76	-4.43	6.33	1.73	8.06	-0.06	7.99	9.42	-3.43
New Zealand			7.97	7.39	15.37	-1.08	14.28	-0.95	13.34	-3.36	9.98	6.00	15.98	12.82	8.01
Norway	6.08	0.57	6.65	4.92	11.58	0.71	12.28	-2.12	10.16	0.10	10.27	-1.62	8.65	8.52	2.57
Portugal	16.70	1.86	18.56	-7.87	10.68	4.25	14.93	-5.19	9.75	5.99	15.73	9.58	25.31	15.23	8.61
Spain	25.12	16.10	41.22	-9.00	32.22	8.07	40.29	-14.19	26.09	-5.98	20.11	20.63	40.74	26.41	15.62
Sweden	7.20	0.25	7.45	-0.56	6.89	14.57	21.45	-8.06	13.39	5.07	18.46	4.80	23.26	10.99	16.06
Switzerland					3.95	1.82	5.77	-0.30	5.46	2.48	7.95	-0.06	7.89	6.20	3.94
United Kingdom			17.78	-5.39	12.39	2.97	15.35	-3.84	11.52	1.02	12.54	6.13	18.67	14.71	0.89
United States	14.11	-0.08	14.03	-1.87	12.15	0.09	12.24	-1.79	10.45	0.88	11.33	5.15	16.48	12.24	2.37
Ø	12.76	4.31	17.08	-2.93	14.14	2.78	16.92	-3.71	13.21	0.20	13.41	3.78	17.19	13.40	4.42

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 11: Old-age unemployment (%)

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	1.07	0.81	1.88	1.34	3.22	2.57	5.79	1.06	6.85	1.60	8.45	-3.51	4.93	-1.61	3.33	-0.13	3.20	3.98	2.13
Austria											3.99	1.03	5.02	-1.17	3.85	-1.27	2.58	3.86	-1.41
Belgium							5.53	-1.61	3.92	0.40	4.32	-0.09	4.23	-0.23	4.00	0.53	4.52	4.42	-1.01
Canada			4.70	0.64	5.34	2.59	7.93	-0.67	7.26	1.31	8.58	-2.51	6.07	-0.50	5.56	0.82	6.38	6.48	1.68
Denmark							5.61	1.66	7.27	-0.38	6.90	-2.59	4.30	0.28	4.58	0.10	4.68	5.56	-0.93
Finland	2.42	0.08	2.50	2.77	5.27	0.92	6.19	-0.90	5.29	12.90	18.19	-8.08	10.11	-3.11	7.00	-0.76	6.25	6.48	3.82
France							6.98	0.07	7.05	0.27	7.32	-0.33	6.99	-1.65	5.34	0.87	6.21	6.65	-0.77
Germany	1.64	2.01	3.64	2.19	5.83	1.36	7.20	1.13	8.33	4.34	12.67	-0.07	12.59	-1.06	11.53	-4.21	7.32	7.86	5.68
Ireland	8.37	-0.53	7.84	-0.85	6.99	3.10	10.09	-1.02	9.07	-1.60	7.47	-4.28	3.19	-0.70	2.49	4.86	7.35	6.93	-1.02
Italy	0.64	0.36	1.00	2.13	3.13	-1.01	2.12	0.24	2.37	1.34	3.70	0.73	4.44	-1.11	3.33	0.51	3.84	2.73	3.20
Japan	1.33	0.91	2.24	0.84	3.08	0.88	3.96	-1.10	2.85	0.79	3.64	1.86	5.50	-1.23	4.27	0.10	4.37	3.47	3.04
Netherlands	1.87	1.13	3.00	0.83	3.83	4.44	8.27	-4.86	3.41	-0.38	3.03	-0.69	2.35	1.60	3.95	-0.06	3.89	3.73	2.01
New Zealand							1.69	2.98	4.67	-0.35	4.33	-0.03	4.30	-1.99	2.31	0.87	3.17	3.41	1.48
Norway	1.43	-1.02	0.41	0.31	0.72	0.26	0.98	1.35	2.33	0.06	2.39	-0.87	1.52	-0.25	1.27	-0.06	1.21	1.36	-0.22
Portugal			0.74	0.18	0.92	1.24	2.15	-0.22	1.93	2.29	4.22	-0.94	3.28	2.50	5.78	3.60	9.37	3.55	8.64
Spain	1.47	0.81	2.28	2.81	5.09	4.66	9.75	-1.11	8.64	3.18	11.81	-3.25	8.56	-2.23	6.33	6.94	13.27	7.47	11.81
Sweden	2.00	-0.31	1.69	0.43	2.12	1.51	3.63	-1.67	1.97	5.46	7.43	-1.63	5.79	-1.28	4.51	0.53	5.04	3.55	3.04
Switzerland									1.74	1.58	3.33	-0.84	2.48	0.64	3.12	-0.09	3.03	2.74	1.28
United Kingdom							8.98	-1.10	7.87	0.13	8.00	-3.69	4.31	-1.26	3.05	1.34	4.39	6.10	-4.59
United States	2.65	1.02	3.67	-0.03	3.65	0.81	4.46	-0.68	3.78	-0.05	3.73	-0.80	2.93	0.53	3.46	2.55	6.01	3.83	3.36
Ø	2.26	0.47	2.74	1.04	3.78	1.85	5.63	-0.54	5.08	1.59	6.67	-1.53	5.14	-0.69	4.45	0.85	5.30	4.71	3.04

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 12: GDP growth rate (%)

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	5.0	-2.5	2.5	-0.2	2.3	2.2	4.5	-2.2	2.3	1.8	4.1	-0.5	3.6	0.0	3.6	-1.7	1.9	3.5	-3.1
Austria	5.7	-2.0	3.6	-1.9	1.7	0.1	1.8	1.6	3.4	-1.3	2.1	0.6	2.7	-0.1	2.6	-2.0	0.6	2.7	-5.1
Belgium	4.5	-1.4	3.1	-1.1	2.0	-0.3	1.7	1.2	2.9	-1.0	2.0	0.3	2.3	0.0	2.3	-1.7	0.6	2.4	-3.9
Canada	4.8	-0.6	4.2	-2.1	2.1	1.9	4.0	-2.7	1.3	1.8	3.2	0.8	3.9	-1.3	2.6	-1.7	0.9	3.0	-3.9
Denmark	4.2	-2.2	2.0	-0.2	1.7	1.5	3.2	-2.2	1.1	1.8	2.9	-1.0	1.9	0.1	2.0	-3.2	-1.1	2.3	-5.3
Finland	5.0	-2.5	2.5	1.4	4.0	-0.8	3.1	-2.8	0.3	3.1	3.3	0.4	3.7	0.1	3.8	-4.3	-0.5	2.8	-5.6
France	5.5	-1.9	3.6	-1.2	2.5	-0.7	1.8	1.0	2.8	-1.4	1.4	1.2	2.6	-0.6	2.0	-2.0	0.0	3.1	-5.5
Germany	3.7	-1.1	2.6	-0.9	1.7	0.3	2.1	1.9	4.0	-2.8	1.1	0.5	1.7	0.0	1.7	-0.9	0.8	2.2	-2.9
Ireland	5.0	-0.1	4.8	-1.1	3.8	-1.5	2.3	2.7	5.0	2.4	7.3	0.2	7.5	-2.6	4.9	-7.3	-2.4	4.2	-7.4
Italy	2.8	1.3	4.0	-1.3	2.8	-0.1	2.6	-0.3	2.4	-1.0	1.4	0.3	1.8	-0.5	1.3	-2.4	-1.1	2.0	-3.9
Japan	6.6	-2.9	3.7	0.6	4.2	-0.1	4.2	0.3	4.4	-3.0	1.4	-1.3	0.1	1.7	1.8	-2.6	-0.7	2.9	-7.3
Netherlands	4.3	-1.0	3.4	-2.3	1.1	1.4	2.5	0.8	3.2	-0.2	3.0	-0.1	2.9	-0.5	2.4	-2.2	0.2	2.6	-4.2
New Zealand	4.5	-2.6	1.8	-0.3	1.6	0.6	2.2	-1.8	0.4	3.9	4.3	-0.8	3.4	-0.3	3.2	-2.9	0.3	2.4	-4.1
Norway	5.4	-0.8	4.7	-1.8	2.9	1.3	4.2	-2.3	1.9	2.6	4.5	-2.2	2.3	0.2	2.5	-2.4	0.1	3.2	-5.3
Portugal	7.3	-3.2	4.1	-0.7	3.4	-1.1	2.3	2.4	4.7	-2.4	2.3	0.9	3.2	-2.1	1.0	-1.8	-0.8	3.0	-8.1
Spain	6.4	-2.4	4.0	-3.1	1.0	2.0	2.9	0.5	3.4	-1.4	2.1	2.0	4.1	-0.6	3.5	-4.2	-0.7	3.0	-7.1
Sweden	3.7	-1.8	1.8	-0.2	1.7	1.3	2.9	-2.1	0.8	1.2	2.0	1.4	3.4	0.1	3.5	-2.4	1.1	2.7	-2.6
Switzerland	3.6	-4.0	-0.3	1.9	1.6	0.6	2.2	-0.1	2.1	-1.2	0.8	1.0	1.8	0.7	2.5	-1.2	1.3	1.7	-2.3
United Kingdom	2.8	-0.8	2.0	-1.1	1.0	2.8	3.7	-2.3	1.4	2.4	3.7	-0.5	3.2	-0.1	3.1	-3.7	-0.6	2.3	-3.4
United States	4.5	-1.4	3.1	-1.2	1.8	2.7	4.5	-2.0	2.5	1.0	3.6	-0.3	3.3	-0.5	2.7	-2.5	0.2	2.9	-4.3
Ø	4.8	-1.7	3.1	-0.8	2.2	0.7	2.9	-0.4	2.5	0.3	2.8	0.1	3.0	-0.3	2.7	-2.7	0.0	2.7	-4.8

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 13: Inflation rate (%)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	1.9	0.8	2.7	1.5	4.3	8.8	13.1	-3.4	9.6	-2.0	7.7	-2.4	5.2	-3.0	2.2	0.6	2.9	-0.1	2.7	0.1	2.8	5.0	0.9
Austria	3.3	0.3	3.5	0.8	4.3	3.4	7.6	-2.5	5.2	-2.1	3.1	0.0	3.0	-0.6	2.4	-0.7	1.7	0.2	1.9	0.4	2.3	3.5	-1.0
Belgium	0.9	2.6	3.5	0.6	4.0	5.7	9.7	-3.4	6.4	-2.0	4.4	-1.7	2.7	-0.6	2.1	-0.4	1.7	0.3	2.0	0.6	2.6	3.6	1.7
Canada	1.2	1.5	2.6	1.3	3.9	5.0	8.9	1.4	10.3	-5.7	4.6	-0.4	4.2	-2.7	1.5	0.6	2.0	0.2	2.2	-0.4	1.8	3.9	0.6
Denmark			7.7	-1.6	6.1	4.7	10.8	0.0	10.8	-5.7	5.1	-1.8	3.3	-1.3	1.9	0.5	2.4	-0.7	1.7	0.7	2.4	5.2	-5.3
Finland	3.2	2.7	5.9	-0.4	5.5	8.9	14.3	-4.8	9.6	-4.0	5.5	-0.5	5.0	-3.8	1.2	0.8	2.0	-0.8	1.2	1.1	2.3	5.0	-0.9
France	3.9	-0.7	3.3	2.2	5.5	4.9	10.4	1.4	11.8	-6.0	5.8	-2.8	3.0	-1.2	1.8	-0.5	1.3	0.6	1.8	-0.1	1.7	4.6	-2.2
Germany	2.2	0.6	2.8	0.8	3.5	2.0	5.6	-0.8	4.7	-3.1	1.6	1.6	3.2	-0.7	2.4	-1.2	1.3	0.4	1.6	0.0	1.6	2.8	-0.6
Ireland							15.7	-0.4	15.3	-9.0	6.3	-3.2	3.2	-1.3	1.9	1.9	3.8	-0.4	3.4	-2.8	0.6	6.3	-15.1
Italy	3.1	1.7	4.8	-0.9	3.9	12.2	16.1	0.4	16.5	-7.5	9.0	-3.1	5.9	-1.9	4.0	-1.7	2.3	-0.1	2.2	0.1	2.3	6.4	-0.8
Japan	5.3	0.0	5.2	0.5	5.7	7.1	12.8	-8.2	4.7	-3.3	1.4	0.8	2.2	-1.4	0.8	-1.2	-0.4	0.4	0.0	-0.1	-0.2	3.4	-5.4
Netherlands	1.5	2.9	4.4	1.6	6.0	2.6	8.6	-3.1	5.5	-3.9	1.5	0.6	2.1	0.2	2.3	0.5	2.8	-1.2	1.6	0.4	2.0	3.5	0.5
New Zealand	1.7	1.8	3.6	3.0	6.6	6.5	13.1	1.8	14.9	-3.3	11.6	-7.2	4.4	-2.3	2.1	-0.2	1.8	0.8	2.6	0.1	2.7	5.9	1.0
Norway	2.6	1.5	4.1	2.0	6.1	3.3	9.4	0.4	9.8	-2.5	7.3	-3.1	4.2	-2.2	2.0	0.4	2.4	-0.9	1.5	0.6	2.1	4.7	-0.6
Portugal	2.4	1.5	3.9	4.9	8.8	12.3	21.1	-1.2	19.9	-1.1	18.8	-7.2	11.6	-7.2	4.4	-1.2	3.2	-0.5	2.7	-0.8	1.9	9.0	-0.5
Spain	2.6	5.7	8.3	-2.4	5.9	11.4	17.2	-1.2	16.0	-6.7	9.3	-3.2	6.0	-2.1	3.9	-1.1	2.8	0.3	3.1	-0.9	2.2	7.0	-0.3
Sweden	3.7	0.7	4.4	0.6	5.0	4.6	9.6	0.7	10.3	-3.8	6.5	0.3	6.9	-4.8	2.1	-1.0	1.1	0.1	1.3	0.3	1.6	4.8	-2.1
Switzerland	2.5	1.2	3.7	0.6	4.4	1.3	5.7	-1.5	4.2	-1.9	2.3	1.8	4.1	-2.6	1.5	-0.7	0.8	0.1	0.9	-0.5	0.4	2.8	-2.1
United Kingdom	2.9	0.4	3.3	3.3	6.6	9.8	16.4	-4.3	12.0	-7.4	4.6	1.0	5.6	-3.3	2.3	-1.0	1.2	0.6	1.9	1.4	3.3	5.5	0.4
United States	1.3	0.7	2.0	2.7	4.6	3.1	7.7	2.0	9.8	-6.4	3.3	1.0	4.3	-1.6	2.7	-0.4	2.3	0.6	2.9	-0.8	2.1	3.9	0.8
Ø	2.6	1.6	4.2	1.1	5.3	6.4	11.7	-1.3	10.4	-4.4	6.0	-1.5	4.5	-2.2	2.3	-0.3	2.0	0.0	2.0	0.0	1.9	4.8	-1.5

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 14: Short-term interest rates (%)

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	6.0	3.6	9.6	3.1	12.7	1.4	14.1	-1.8	12.3	-6.1	6.2	-1.1	5.2	0.6	5.7	-1.0	4.7	8.5	-1.3
Austria	5.1	1.3	6.4	2.1	8.5	-3.0	5.5	2.5	8.0	-3.3	4.7	-1.0	3.7	-0.9	2.8	-1.1	1.7	5.2	-3.3
Belgium	5.5	2.5	8.1	4.2	12.3	-3.0	9.3	-0.5	8.8	-3.7	5.1	-1.3	3.7	-0.9	2.8	-1.1	1.7	6.0	-3.8
Canada	6.4	2.2	8.5	4.8	13.3	-3.7	9.6	0.5	10.1	-5.0	5.1	-0.7	4.5	-1.1	3.4	-1.9	1.5	6.5	-4.9
Denmark					15.5	-4.9	10.6	-0.4	10.2	-4.0	6.2	-2.0	4.2	-1.3	2.9	-0.7	2.2	7.4	-13.3
Finland	8.8	2.3	11.1	-0.6	10.6	2.9	13.5	-0.9	12.6	-7.4	5.2	-1.4	3.7	-0.9	2.8	-1.1	1.7	7.8	-7.1
France	6.9	2.7	9.6	2.4	12.0	-1.9	10.0	-0.5	9.5	-3.8	5.7	-2.0	3.7	-0.9	2.8	-1.1	1.7	6.9	-5.2
Germany	6.3	0.8	7.1	1.1	8.2	-3.0	5.2	2.6	7.7	-3.0	4.8	-1.1	3.7	-0.9	2.8	-1.1	1.7	5.1	-4.6
Ireland							12.1	-1.3	10.8	-4.3	6.5	-2.5	4.1	-1.3	2.8	-1.1	1.7	6.3	-10.4
Italy	5.5	6.9	12.4	3.5	15.9	-0.8	15.1	-2.7	12.4	-3.4	9.0	-5.0	4.0	-1.2	2.8	-1.1	1.7	8.7	-3.7
Japan	6.7	2.6	9.2	-1.9	7.3	-1.5	5.8	0.1	5.9	-4.4	1.5	-1.3	0.3	0.0	0.3	0.2	0.5	4.2	-6.2
Netherlands	5.4	1.4	6.8	2.5	9.3	-3.5	5.8	2.1	7.9	-3.4	4.6	-0.9	3.7	-0.9	2.8	-1.1	1.7	5.3	-3.7
New Zealand			10.2	4.3	14.5	3.9	18.3	-6.4	11.9	-4.1	7.8	-1.8	6.0	0.9	6.9	-3.0	3.9	9.9	-6.3
Norway	8.8	2.3	11.1	0.9	12.0	1.6	13.6	-1.8	11.8	-6.3	5.5	1.2	6.6	-3.3	3.3	0.0	3.3	8.4	-5.6
Portugal	4.5	2.8	7.3	9.7	17.0	2.9	19.9	-4.1	15.8	-6.4	9.4	-5.6	3.9	-1.1	2.8	-1.1	1.7	9.1	-2.8
Spain			15.5	0.9	16.4	-1.5	14.9	-1.2	13.7	-5.3	8.4	-4.6	3.8	-1.0	2.8	-1.1	1.7	9.7	-13.8
Sweden					13.3	-2.0	11.3	0.6	12.0	-5.1	6.9	-3.0	3.9	-1.3	2.5	-1.0	1.6	7.4	-11.7
Switzerland			4.6	-0.1	4.5	-0.2	4.3	2.8	7.1	-4.0	3.1	-1.1	2.0	-0.9	1.2	-0.5	0.7	3.4	-3.9
United Kingdom	7.3	3.8	11.1	2.0	13.1	-2.6	10.6	1.5	12.0	-5.8	6.2	-0.6	5.6	-0.8	4.8	-2.9	1.8	8.1	-5.5
United States	6.2	1.0	7.2	5.0	12.1	-4.0	8.2	-1.3	6.9	-1.9	4.9	-0.4	4.5	-1.2	3.4	-2.5	0.9	5.9	-5.3
Ø	6.4	2.8	9.2	2.9	12.0	-1.1	10.9	-0.5	10.4	-4.5	5.8	-1.8	4.0	-0.9	3.1	-1.2	1.9	7.0	-6.1

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 15: Output gap (%)

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	1.1	-1.3	-0.2	0.4	0.1	-2.1	-2.0	-0.9	-2.9	1.0	-1.9	2.7	0.9	0.4	1.3	-1.8	-0.5	-0.5	-1.6
Austria	0.2	0.8	1.0	-0.8	0.2	-2.4	-2.2	2.9	0.7	-1.2	-0.5	1.8	1.3	-0.3	1.0	-1.7	-0.7	0.1	-0.9
Belgium	0.3	1.1	1.4	-1.2	0.2	-3.4	-3.2	3.5	0.3	-2.3	-2.0	2.5	0.4	0.4	0.8	-0.8	0.0	-0.2	-0.3
Canada	-0.2	1.9	1.7	-2.0	-0.3	-1.9	-2.2	2.2	-0.1	-2.3	-2.4	2.3	-0.2	1.6	1.4	-2.2	-0.7	-0.3	-0.6
Denmark	0.8	0.0	0.8	-1.6	-0.8	1.6	0.8	-1.4	-0.7	-0.8	-1.4	2.1	0.7	1.5	2.2	-4.1	-1.9	0.1	-2.6
Finland			-2.0	1.8	-0.3	0.6	0.3	0.6	0.9	-8.9	-8.0	7.8	-0.2	1.9	1.7	-2.2	-0.6	-1.0	1.5
France	0.7	-0.3	0.5	-0.1	0.3	-3.3	-2.9	3.9	1.0	-2.9	-2.0	1.9	0.0	1.3	1.3	-2.6	-1.3	-0.3	-2.0
Germany	0.7	-1.3	-0.6	0.7	0.1	-2.5	-2.4	5.1	2.6	-4.2	-1.6	1.8	0.2	-1.0	-0.8	-0.1	-0.9	-0.3	-1.7
Ireland					1.5	-4.8	-3.3	3.2	-0.1	-3.6	-3.7	6.2	2.5	4.0	6.5	-11.5	-5.0	-0.2	-6.5
Italy	1.0	-0.9	0.1	0.6	0.6	-3.4	-2.8	2.6	-0.2	-1.8	-2.0	2.5	0.5	1.0	1.4	-3.9	-2.5	-0.4	-3.5
Japan	0.9	-2.6	-1.7	2.3	0.5	-2.4	-1.9	4.5	2.6	-2.0	0.6	-2.7	-2.1	2.3	0.2	-1.7	-1.5	-0.3	-2.4
Netherlands	-1.1	0.6	-0.6	-2.4	-3.0	0.1	-2.9	4.1	1.2	-1.2	0.0	2.7	2.7	-2.7	0.0	-0.1	-0.1	-0.4	1.0
New Zealand					0.1	1.4	1.5	-4.6	-3.1	3.5	0.4	0.0	0.4	1.8	2.3	-3.2	-0.9	0.1	-1.0
Norway					1.7	-1.2	0.5	-4.7	-4.2	2.8	-1.4	3.2	1.8	-0.9	0.9	-1.2	-0.3	-0.1	-2.0
Portugal	8.2	-2.9	5.3	-5.2	0.1	-8.2	-8.0	10.5	2.4	-3.9	-1.4	3.2	1.8	-2.5	-0.8	-2.4	-3.1	0.5	-11.3
Spain					-4.1	1.4	-2.7	4.9	2.2	-5.3	-3.2	3.2	0.1	2.1	2.1	-4.1	-2.0	-1.1	2.1
Sweden	1.8	0.0	1.7	-3.9	-2.2	1.6	-0.6	0.5	-0.2	-4.4	-4.6	5.0	0.4	1.5	1.9	-3.2	-1.3	-0.3	-3.1
Switzerland					-0.1	0.0	-0.1	1.3	1.2	-3.9	-2.6	2.9	0.2	-0.3	-0.1	0.1	0.0	-0.2	0.1
United Kingdom	-1.7	1.1	-0.6	-2.7	-3.4	1.0	-2.3	3.0	0.7	-2.3	-1.6	1.8	0.2	1.9	2.1	-3.7	-1.5	-0.9	0.2
United States	-1.1	0.3	-0.8	-0.1	-0.9	-0.5	-1.4	1.1	-0.3	-1.1	-1.4	1.1	-0.3	2.2	1.8	-4.5	-2.7	-0.8	-1.6
Ø	0.8	-0.4	0.4	-0.9	-0.5	-1.4	-1.9	2.1	0.2	-2.2	-2.0	2.6	0.6	0.8	1.4	-2.7	-1.4	-0.3	-1.8

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 16: Total factor productivity shock

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	0.012	-0.021	-0.008	0.006	-0.003	0.017	0.015	-0.032	-0.017	0.017	0.000	0.008	0.008	-0.001	0.007	-0.015	-0.008	0.000	-0.021
Austria	-0.021	0.037	0.016	-0.011	0.006	-0.019	-0.014	0.028	0.014	-0.036	-0.022	0.030	0.008	0.006	0.014	-0.024	-0.010	-0.001	0.011
Belgium	-0.012	0.021	0.008	-0.005	0.004	-0.009	-0.006	0.005	0.000	0.003	0.003	-0.005	-0.002	0.009	0.007	-0.014	-0.007	-0.001	0.005
Canada	-0.005	0.012	0.007	-0.016	-0.008	0.014	0.006	-0.010	-0.004	-0.001	-0.005	0.015	0.010	-0.005	0.005	-0.013	-0.007	0.000	-0.002
Denmark	0.009	-0.005	0.004	-0.007	-0.003	0.013	0.010	-0.033	-0.022	0.029	0.007	-0.001	0.005	0.004	0.009	-0.022	-0.013	-0.002	-0.021
Finland	-0.011	0.017	0.006	-0.004	0.003	-0.009	-0.006	0.002	-0.004	0.008	0.004	-0.006	-0.002	0.018	0.017	-0.028	-0.012	0.000	-0.001
France	0.002	0.002	0.005	-0.004	0.001	-0.007	-0.006	0.011	0.005	-0.009	-0.004	0.006	0.001	0.005	0.006	-0.013	-0.007	0.000	-0.009
Germany	-0.009	0.010	0.001	-0.004	-0.003	0.015	0.012	-0.005	0.006	-0.031	-0.025	0.033	0.009	0.004	0.013	-0.021	-0.008	0.000	0.000
Ireland	-0.008	0.015	0.006	-0.001	0.005	-0.018	-0.013	0.023	0.010	-0.022	-0.012	0.023	0.011	0.001	0.012	-0.026	-0.014	0.000	-0.006
Italy	-0.015	0.023	0.008	0.002	0.009	-0.023	-0.013	0.007	-0.006	0.018	0.012	-0.006	0.006	-0.005	0.000	-0.007	-0.007	-0.001	0.008
Japan	-0.008	0.014	0.006	-0.007	-0.001	-0.012	-0.013	0.036	0.023	-0.025	-0.002	-0.013	-0.015	0.028	0.013	-0.021	-0.008	-0.001	0.000
Netherlands	-0.020	0.040	0.020	-0.023	-0.003	0.011	0.008	-0.022	-0.014	0.015	0.001	0.003	0.004	-0.001	0.002	-0.006	-0.004	-0.001	0.016
New Zealand	-0.021	0.042	0.022	-0.041	-0.020	0.036	0.016	-0.032	-0.016	0.016	0.000	0.010	0.010	-0.002	0.008	-0.015	-0.007	-0.001	0.013
Norway	-0.003	0.004	0.001	0.000	0.001	0.004	0.005	-0.020	-0.014	0.024	0.010	-0.017	-0.007	0.027	0.021	-0.036	-0.015	0.000	-0.012
Portugal	-0.016	0.020	0.004	0.023	0.027	-0.061	-0.034	0.043	0.009	-0.001	0.008	-0.003	0.004	-0.011	-0.007	0.005	-0.002	-0.001	0.014
Spain	-0.016	0.029	0.013	-0.016	-0.004	0.008	0.004	-0.019	-0.014	0.032	0.018	-0.012	0.006	-0.025	-0.019	0.026	0.006	-0.001	0.023
Sweden	0.023	-0.007	0.016	-0.039	-0.022	0.025	0.003	0.004	0.007	-0.008	-0.002	0.007	0.005	-0.025	-0.020			0.001	-0.043
Switzerland			-0.002	0.005	0.002	-0.002	0.000	0.004	0.004	-0.017	-0.013	0.013	0.000	0.005	0.004	-0.009	-0.005	-0.001	-0.005
United Kingdom	-0.005	0.010	0.005	-0.015	-0.010	0.026	0.016	-0.034	-0.018	0.023	0.004	-0.003	0.001	0.015	0.016	-0.027	-0.011	0.000	-0.007
United States	-0.001	0.005	0.004	-0.011	-0.007	0.011	0.004	-0.003	0.001	-0.008	-0.007	0.013	0.005	0.002	0.007	-0.012	-0.005	0.000	-0.005
Ø	-0.006	0.014	0.007	-0.008	-0.001	0.001	0.000	-0.002	-0.003	0.001	-0.001	0.005	0.003	0.002	0.006	-0.013	-0.008	0.000	-0.001

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 17: Real interest rate shock

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia					1.2	-5.0	-3.9	6.2	2.3	3.6	5.9	0.5	6.5	-0.6	5.9	-2.9	3.0	-0.1	2.9	-0.8	2.1	2.9	2.1
Austria			3.0	0.5	3.5	-2.1	1.4	2.7	4.0	0.5	4.6	0.2	4.8	-0.7	4.2	-0.8	3.3	-1.3	2.1	-0.9	1.2	3.2	1.2
Belgium	4.6	-1.8	2.9	0.3	3.2	-4.4	-1.2	6.3	5.1	0.9	6.0	0.2	6.3	-1.5	4.8	-1.5	3.3	-1.3	1.9	-0.8	1.2	3.5	-3.5
Canada	4.0	-1.2	2.8	0.6	3.3	-3.6	-0.3	2.2	1.9	4.2	6.2	-0.8	5.4	0.6	6.0	-2.5	3.5	-1.3	2.2	-1.0	1.2	3.3	-2.8
Denmark	2.3	0.1	2.4	1.7	4.1	0.1	4.2	4.5	8.7	-1.3	7.3	-0.9	6.4	-1.0	5.4	-2.7	2.8	-0.5	2.3	-1.7	0.5	4.2	-1.8
Finland	2.0	0.6	2.6	-0.8	1.8	-6.6	-4.8	5.6	0.8	3.6	4.3	2.6	6.9	-0.1	6.8	-3.7	3.0	-0.3	2.8	-1.9	0.9	2.5	-1.1
France	1.6	1.2	2.8	-0.2	2.6	-2.6	0.0	1.7	1.7	4.1	5.9	0.2	6.1	-1.2	4.9	-1.3	3.6	-1.5	2.1	-0.5	1.7	3.0	0.1
Germany	3.9	0.3	4.1	-0.2	4.0	-1.0	3.0	0.5	3.5	2.0	5.5	-1.0	4.5	-0.5	4.0	-0.5	3.5	-1.3	2.3	-1.1	1.2	3.6	-2.7
Ireland	3.3	-1.9	1.4	-1.4	0.0	-0.4	-0.4	0.6	0.2	6.2	6.4	-0.1	6.4	-0.8	5.6	-4.4	1.2	-0.6	0.5	5.1	5.7	2.8	2.3
Italy	2.0	-1.4	0.6	1.8	2.4	-7.7	-5.4	5.0	-0.3	5.2	4.9	1.9	6.9	-0.8	6.1	-3.3	2.8	-0.8	2.0	0.5	2.5	2.2	0.5
Japan			2.0	-0.4	1.6	-6.4	-4.9	8.2	3.4	1.6	5.0	-1.5	3.5	-0.7	2.8	-0.8	1.9	-0.4	1.5	-0.1	1.4	1.8	1.4
Netherlands	2.1	-1.0	1.1	0.2	1.4	-1.3	0.1	4.1	4.2	1.7	5.9	-0.1	5.7	-1.7	4.1	-2.0	2.1	0.3	2.4	-1.2	1.2	2.8	-0.9
New Zealand	4.0	-1.6	2.4	-2.9	-0.5	-5.5	-5.9	3.2	-2.7	6.1	3.4	3.7	7.0	-1.6	5.4	-0.8	4.7	-1.3	3.4	-0.9	2.5	2.2	-1.5
Norway	0.0	1.2	1.2	-1.8	-0.6	-1.7	-2.3	3.1	0.8	4.8	5.6	1.0	6.6	-1.7	4.9	-1.4	3.5	-0.6	2.9	-1.5	1.4	2.2	1.4
Portugal					-2.8	-8.0	-10.9	11.5	0.6	6.0	6.6	1.6	8.3	-2.4	5.9	-3.9	1.9	-0.6	1.3	3.7	5.0	1.8	5.0
Spain			0.0	2.2	2.2	-8.9	-6.7	5.3	-1.4	6.3	4.9	1.9	6.8	-1.4	5.4	-3.2	2.2	-1.4	0.8	1.7	2.5	1.7	2.5
Sweden	1.7	-0.5	1.2	0.9	2.1	-2.8	-0.7	2.4	1.7	3.9	5.6	-1.2	4.4	2.1	6.5	-2.5	4.0	-1.2	2.8	-1.5	1.2	2.8	-0.4
Switzerland	0.6	-0.3	0.2	0.4	0.7	-0.7	0.0	0.2	0.2	1.9	2.1	-0.5	1.6	1.2	2.8	-0.3	2.5	-0.8	1.7	-0.4	1.3	1.2	0.8
United Kingdom	3.1	-0.2	2.9	-1.3	1.6	-5.3	-3.6	5.0	1.3	4.6	6.0	-1.4	4.6	0.9	5.5	-1.5	3.9	-1.1	2.8	-2.7	0.1	2.6	-3.0
United States	2.7	-0.2	2.5	-0.8	1.8	-2.0	-0.2	1.7	1.5	5.2	6.7	-2.9	3.9	-0.1	3.7	-0.8	3.0	-1.5	1.5	-0.6	0.9	2.5	-1.8
Ø	2.5	-0.5	2.0	-0.3	1.7	-3.8	-2.1	4.0	1.9	3.6	5.4	0.2	5.6	-0.6	5.0	-2.0	3.0	-0.9	2.1	-0.3	1.8	2.6	-0.7

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 18: Terms of trade shock

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	7.8	1.7	9.5	3.0	12.6	0.1	12.7	-3.0	9.7	-0.1	9.6	-0.6	9.0	-4.6	4.4	-2.1	2.3	8.6	-5.5
Austria	10.0	-0.1	9.9	0.4	10.2	-2.8	7.4	-2.6	4.8	-2.8	2.0	0.0	2.0	-1.7	0.3	0.3	0.6	5.2	-9.3
Belgium	11.3	3.2	14.5	4.2	18.7	4.9	23.6	-10.7	12.9	-10.1	2.8	-0.8	2.0	-1.6	0.4	0.1	0.5	9.6	-10.8
Canada	9.9	2.8	12.6	1.1	13.7	-4.5	9.3	-4.6	4.7	2.8	7.5	1.1	8.6	-6.5	2.1	-1.4	0.7	7.7	-9.2
Denmark	16.7	2.5	19.3	-2.8	16.5	-3.0	13.5	-7.3	6.2	-2.8	3.4	-1.5	1.8	-1.8	0.1	-1.8	-1.7	8.4	-18.5
Finland	4.0	2.0	6.0	2.7	8.7	-2.8	5.9	-4.7	1.2	0.9	2.1	-3.3	-1.1	-0.5	-1.6	-1.0	-2.6	2.5	-6.6
France	6.0	3.1	9.1	2.0	11.1	-0.5	10.6	-4.8	5.8	-3.2	2.6	-0.7	1.9	-1.9	0.0	-0.3	-0.3	5.2	-6.3
Germany									5.2	-3.1	2.0	-0.1	2.0	-1.8	0.1	-0.7	-0.6	1.7	-5.8
Ireland									3.0	-0.2	2.8	-0.7	2.1	-10.2	-8.1	2.6	-5.5	-1.2	-8.5
Italy	2.6	6.8	9.4	2.5	11.9	-4.7	7.3	-6.0	1.3	0.0	1.3	-0.5	0.7	-0.7	0.0	0.4	0.5	3.9	-2.2
Japan	3.3	3.2	6.5	0.8	7.3	-3.0	4.3	-3.9	0.3	-1.5	-1.2	-0.3	-1.4	1.8	0.4	1.5	1.8	2.4	-1.4
Netherlands	21.1	2.4	23.4	3.9	27.3	-0.5	26.8	-8.4	18.4	-7.4	11.0	-5.2	5.8	-5.8	0.0	1.9	1.9	15.1	-19.1
New Zealand	7.7	6.3	14.0	1.3	15.3	-1.7	13.6	-10.9	2.7	-2.4	0.4	0.9	1.3	-5.3	-4.0	0.5	-3.5	5.3	-11.2
Norway	8.3	4.3	12.6	0.5	13.0	-2.9	10.1	-3.8	6.3	-3.2	3.0	-1.9	1.1	-1.1	0.1	0.4	0.5	6.1	-7.8
Portugal	10.9	4.4	15.3	6.4	21.6	0.1	21.8	-8.0	13.8	-8.8	5.0	-1.9	3.0	-3.4	-0.3	-0.5	-0.8	10.0	-11.7
Spain	8.6	2.8	11.3	-0.3	11.0	2.4	13.3	-8.0	5.3	-2.2	3.1	-0.2	2.9	-2.9	0.0	-0.6	-0.6	6.1	-9.1
Sweden	2.5	5.0	7.5	2.7	10.2	0.1	10.2	-7.0	3.2	-1.1	2.1	-0.5	1.6	0.2	1.8	0.4	2.2	4.6	-0.3
Switzerland	19.8	-3.6	16.3	-1.2	15.0	-4.5	10.6	-3.3	7.3	-5.7	1.5	-0.4	1.1	-0.9	0.2	-0.3	-0.1	8.0	-19.9
United Kingdom	5.5	8.2	13.7	-4.4	9.3	-0.6	8.7	-4.2	4.4	-0.5	3.9	-4.7	-0.8	-1.7	-2.5	2.6	0.1	4.7	-5.4
United States	0.0	2.8	2.9	2.1	5.0	-1.8	3.1	-0.5	2.6	-1.1	1.5	-1.7	-0.2	0.3	0.1	0.8	0.9	1.8	0.8
Ø	8.7	3.2	11.9	1.4	13.2	-1.4	11.8	-5.9	6.0	-2.6	3.3	-1.2	2.2	-2.5	-0.3	0.1	-0.2	5.8	-8.4

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 19: Labour demand shock

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Ø	Δ total
Australia	0.001	-0.035	-0.034	-0.004	-0.038	0.023	-0.016	0.026	0.011	-0.021	-0.010	0.001	-0.010	0.026	0.016	-0.010	0.015
Austria	-0.003	-0.011	-0.013	-0.013	-0.026	0.015	-0.012	0.009	-0.002	0.030	0.028	0.046	0.074	0.043	0.117	0.020	0.120
Belgium	-0.009	-0.037	-0.046	-0.041	-0.087	0.003	-0.084	0.011	-0.073	0.004	-0.069	0.003	-0.066			-0.062	0.009
Canada	-0.005	0.003	-0.002	0.017	0.015	0.002	0.017	-0.023	-0.006	-0.034	-0.040	-0.013	-0.053	0.025	-0.028	-0.013	-0.023
Denmark	0.006	0.033	0.038	0.003	0.042	0.007	0.049	0.011	0.060	0.025	0.085	0.016	0.101			0.054	-0.006
Finland			0.011	0.016	0.027	0.017	0.044	0.002	0.047	0.048	0.094	0.017	0.112	0.032	0.144	0.069	0.144
France	0.013	0.026	0.038	-0.025	0.014	-0.009	0.004	0.045	0.050	0.067	0.117	0.013	0.130	0.023	0.153	0.065	0.140
Germany	0.009	0.006	0.015	-0.009	0.006	0.011	0.017	0.006	0.023	0.018	0.040	0.005	0.046	0.010	0.055	0.026	0.046
Ireland	-0.001	-0.006	-0.007	0.017	0.010	0.038	0.048	0.039	0.087	0.041	0.128	0.039	0.167			0.062	0.001
Italy	0.005	-0.006	-0.001	0.005	0.004	0.033	0.037	0.036	0.073	0.032	0.105	0.047	0.152	0.030	0.182	0.070	0.177
Japan	0.007	-0.032	-0.026	-0.062	-0.087	0.004	-0.084	0.050	-0.034	0.060	0.026	0.023	0.049			-0.021	-0.007
Netherlands	-0.006	-0.030	-0.036	-0.005	-0.041	0.031	-0.010	0.014	0.005	0.014	0.019	0.009	0.028	0.019	0.046	0.001	0.052
New Zealand							0.000	0.032	0.032	-0.030	0.001	-0.001				0.011	0.000
Norway					0.009	0.003	0.012	0.032	0.044	0.012	0.055	0.029	0.084	0.017	0.101	0.051	0.101
Portugal			0.000	0.057	0.057	0.100	0.157	0.062	0.218							0.108	0.000
Spain	-0.003	0.016	0.013	0.018	0.031	-0.029	0.002	0.010	0.012	0.014	0.026	-0.009	0.017	0.013	0.030	0.016	0.033
Sweden	0.011	0.028	0.038	-0.007	0.031	0.020	0.051	0.015	0.066	0.051	0.117	-0.019	0.099	-0.022	0.077	0.061	0.067
Switzerland			0.000	-0.002	-0.002	-0.024	-0.026	-0.034	-0.060	-0.030	-0.090	-0.037	-0.127			-0.051	0.000
United Kingdom	0.004	0.002	0.006	0.013	0.019	-0.011	0.008	-0.003	0.005	0.016	0.021	0.023	0.044	0.002	0.046	0.019	0.042
United States	0.001	0.020	0.021	0.023	0.044	0.005	0.048	0.009	0.057	0.012	0.069	0.007	0.076	0.004	0.080	0.049	0.079
Ø	0.002	-0.001	0.001	0.000	0.001	0.012	0.013	0.017	0.031	0.007	0.038	0.013	0.051	0.027	0.078	0.026	0.077

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 20: Union density rate (%)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	49.7	-2.5	47.2	-2.2	45.0	4.2	49.2	-0.6	48.5	-3.2	45.4	-5.8	39.6	-7.0	32.6	-7.8	24.8	-3.9	20.9	-2.6	18.3	38.3	-31.4
Austria	67.3	-1.1	66.2	-4.0	62.2	-3.0	59.1	-2.9	56.2	-4.7	51.5	-4.8	46.7	-5.8	40.9	-4.3	36.7	-4.1	32.6	-4.0	28.6	49.8	-38.7
Belgium	40.3	-0.2	40.1	3.3	43.4	8.0	51.3	1.9	53.3	-1.4	51.9	1.4	53.3	2.0	55.3	-4.2	51.1	1.9	53.0	-1.0	51.9	49.5	11.7
Canada	28.2	-0.8	27.4	3.4	30.8	3.7	34.5	1.8	36.3	0.4	36.7	-0.4	36.2	-0.8	35.4	-5.2	30.3	-0.4	29.8	-0.6	29.2	32.3	1.0
Denmark	57.6	0.5	58.1	2.1	60.3	8.4	68.7	10.0	78.7	-0.6	78.1	-2.9	75.3	1.7	77.0	-1.8	75.1	-4.3	70.9	-2.7	68.2	69.8	10.6
Finland	32.9	5.7	38.6	12.8	51.4	13.4	64.8	3.4	68.2	1.3	69.5	4.8	74.3	5.9	80.2	-4.8	75.5	-3.3	72.1	-3.2	68.9	63.3	36.0
France	19.6	-0.2	19.5	2.0	21.5	0.2	21.7	-3.2	18.5	-4.7	13.8	-3.5	10.3	-1.5	8.8	-0.8	8.1	-0.3	7.7	-0.1	7.6	14.3	-12.0
Germany	34.2	-1.3	32.9	-0.9	32.1	2.1	34.2	1.0	35.2	-0.8	34.4	-1.0	33.3	-4.1	29.2	-4.6	24.6	-3.1	21.5	-2.7	18.8	30.0	-15.4
Ireland	44.5	1.4	45.9	3.7	49.6	2.8	52.4	1.8	54.2	-2.8	51.3	-2.7	48.6	-3.3	45.3	-7.1	38.2	-3.7	34.4	-0.3	34.1	45.3	-10.4
Italy	24.9	0.9	25.8	10.8	36.6	11.0	47.6	1.3	48.9	-6.1	42.7	-3.6	39.1	-1.2	37.9	-3.1	34.8	-1.2	33.6	0.8	34.4	36.9	9.5
Japan	33.5	1.4	35.0	-0.2	34.7	-0.9	33.8	-2.4	31.4	-2.7	28.7	-3.2	25.5	-1.8	23.8	-2.3	21.5	-2.6	18.9	-0.4	18.5	27.8	-15.0
Netherlands	39.4	-1.4	38.0	-1.4	36.7	0.6	37.2	-2.5	34.7	-6.9	27.9	-3.4	24.5	0.8	25.3	-2.4	22.9	-2.6	20.2	-1.6	18.7	29.6	-20.8
New Zealand	0.4	0.0	0.4	33.6	34.0	26.6	60.6	6.3	66.9	-10.6	56.3	-9.7	46.6	-18.9	27.7	-5.6	22.1	-1.1	21.1	-0.2	20.9	32.4	20.5
Norway	60.2	-1.4	58.8	-3.3	55.6	-2.1	53.5	3.3	56.8	0.6	57.3	0.4	57.8	-0.8	57.0	-2.3	54.7	0.0	54.7	-0.5	54.3	56.4	-6.0
Portugal							0.6	55.3	55.9	-12.2	43.8	-13.9	29.9	-4.2	25.6	-3.5	22.1	-1.0	21.1	-1.1	20.0	27.4	20.0
Spain	0.1	0.0	0.1	0.0	0.1	0.0	0.1	3.6	3.7	6.4	10.1	3.1	13.2	3.5	16.7	-0.5	16.2	-0.9	15.3	0.2	15.5	8.3	15.4
Sweden	72.5	-6.0	66.5	2.6	69.1	5.0	74.1	3.9	77.9	3.3	81.2	-0.9	80.3	2.9	83.1	-4.0	79.1	-4.0	75.1	-6.9	68.2	75.2	-4.3
Switzerland	35.2	-2.6	32.7	-3.1	29.5	1.8	31.4	-2.2	29.2	-4.1	25.1	-2.2	22.8	-0.3	22.6	-1.8	20.7	-1.5	19.2	-1.2	18.0	26.0	-17.2
United Kingdom	38.7	-0.1	38.6	3.4	42.0	2.3	44.3	5.0	49.3	-3.9	45.4	-6.2	39.2	-5.7	33.5	-3.6	29.9	-1.3	28.7	-2.0	26.7	37.8	-12.1
United States	29.9	-1.7	28.2	-1.0	27.2	-2.2	25.0	-3.0	22.0	-4.3	17.7	-2.1	15.6	-1.3	14.4	-1.3	13.1	-1.2	11.9	-0.3	11.6	19.7	-18.3
Ø	37.3	-0.5	36.8	3.2	40.1	2.1	42.2	4.1	46.3	-2.8	43.4	-2.8	40.6	-2.0	38.6	-3.6	35.1	-1.9	33.1	-1.5	31.6	38.5	-5.7

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 21: Collective bargaining coverage (%)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	85.0	0.0	85.0	0.0	85.0	-0.1	84.9	-0.6	84.2	0.2	84.5	-2.8	81.7	-1.0	80.7	-11.2	69.5	-21.5	48.0	-8.0	40.0	75.3	-45.0
Austria	95.0	0.0	95.0	0.0	95.0	0.0	95.0	1.8	96.8	1.4	98.3	0.3	98.6	0.2	98.8	-0.4	98.4	0.6	99.0	0.0	99.0	97.2	4.0
Belgium	80.0	0.0	80.0	0.6	80.6	4.6	85.2	5.4	90.5	-0.2	90.4	0.7	91.1	-0.4	90.7	3.2	93.9	2.1	96.0	0.0	96.0	88.6	16.0
Canada	34.6	-1.0	33.6	2.4	36.0	2.6	38.6	0.0	38.6	0.2	38.8	-1.0	37.8	-2.5	35.3	-2.8	32.5	-0.6	31.9	-0.3	31.6	35.4	-3.0
Denmark	67.2	0.7	67.9	0.4	68.2	1.8	70.1	2.3	72.4	1.1	73.5	-2.4	71.1	0.8	71.9	9.7	81.6	0.8	82.4	-2.4	80.0	73.3	12.8
Finland	95.0	0.0	95.0	0.0	95.0	-0.1	94.9	-0.6	94.2	0.5	94.8	-0.5	94.3	0.3	94.6	-2.6	92.0	-2.0	90.0	0.0	90.0	93.6	-5.0
France	70.0	0.0	70.0	0.0	70.0	3.6	73.6	8.2	81.8	9.3	91.1	1.0	92.1	1.6	93.7	-1.7	92.0	-2.0	90.0	0.0	90.0	83.1	20.0
Germany	90.0	0.0	90.0	0.0	90.0	-0.4	89.6	-1.9	87.7	1.5	89.2	-1.5	87.8	-0.8	86.9	-17.0	69.9	-6.0	64.0	-1.9	62.1	82.5	-27.9
Ireland	50.4	1.9	52.3	4.6	56.9	3.6	60.6	2.1	62.7	-1.2	61.5	-1.4	60.1	-0.1	60.0	-3.0	57.0	-4.6	52.5	-8.5	44.0	56.2	-6.4
Italy	90.8	-0.9	89.9	-2.0	87.9	-2.6	85.2	-1.0	84.2	0.4	84.6	-1.5	83.1	-0.8	82.3	-0.6	81.7	-1.7	80.0	0.0	80.0	84.5	-10.8
Japan	30.8	1.0	31.8	-0.1	31.7	-0.9	30.8	-2.7	28.1	-2.6	25.5	-2.5	23.0	-2.5	20.5	-2.1	18.4	-1.7	16.6	-0.6	16.0	24.8	-14.8
Netherlands	98.7	-5.1	93.6	-6.4	87.3	-6.4	80.9	-4.9	75.9	2.6	78.5	-2.9	75.6	8.4	84.0	0.4	84.4	1.0	85.4	-3.1	82.3	84.2	-16.4
New Zealand					70.0	0.0	70.0	-4.1	65.9	-1.9	64.0	-4.2	59.8	-27.7	32.1	-7.2	24.9	-7.1	17.8	-0.8	17.0	46.8	17.0
Norway	65.0	0.0	65.0	0.0	65.0	0.8	65.8	4.8	70.5	-0.2	70.4	0.7	71.1	-0.4	70.7	1.6	72.3	0.3	72.6	1.4	74.0	69.3	9.0
Portugal									72.0	1.8	73.8	1.2	75.0	-1.3	73.7	4.7	78.4	-19.9	58.5	-9.5	49.0	68.6	49.0
Spain							33.0	28.4	61.4	8.6	70.0	4.5	74.5	4.3	78.8	6.9	85.7	2.9	88.6	-4.1	84.5	72.1	84.5
Sweden	83.0	0.0	83.0	0.6	83.6	0.4	84.0	-0.5	83.5	0.3	83.8	1.3	85.1	4.5	89.6	3.4	93.0	0.4	93.4	-2.4	91.0	86.6	8.0
Switzerland	50.0	0.0	50.0	0.0	50.0	0.0	50.0	1.8	51.8	1.2	53.0	0.0	53.0	-2.0	51.0	-5.2	45.8	2.2	48.0	0.0	48.0	50.1	-2.0
United Kingdom	67.0	0.1	67.1	1.2	68.4	3.1	71.5	-1.0	70.4	-8.9	61.5	-12.7	48.9	-9.8	39.0	-4.4	34.6	0.0	34.6	-1.7	32.9	54.2	-34.1
United States	28.6	-1.4	27.2	-0.6	26.6	-2.3	24.3	-1.0	23.3	-2.3	20.9	-2.7	18.2	-1.8	16.5	-1.9	14.5	-0.9	13.6	-0.3	13.3	20.7	-15.3
Ø	69.5	-0.3	69.2	0.1	69.3	-1.5	67.8	2.0	69.8	0.6	70.4	-1.3	69.1	-1.6	67.5	-1.5	66.0	-2.9	63.1	-2.1	61.0	67.4	-8.4

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 22: Coordination of collective bargaining (1-5)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	3	0	3	0	3	0	3	-1	2	2	4	-1	4	-2	2	0	2	0	2	0	2	3	-1
Austria	5	0	5	0	5	0	5	0	5	-1	4	0	4	0	4	0	4	0	4	0	4	4	-1
Belgium	4	0	4	0	4	0	4	0	4	1	5	-1	4	1	5	-1	4	0	4	0	4	4	0
Canada	1	0	1	0	1	2	3	-1	2	-1	1	0	1	0	1	0	1	0	1	0	1	1	0
Denmark	5	0	5	0	5	0	5	0	5	-1	4	-1	3	0	3	1	4	0	3	0	3	4	-2
Finland	5	0	5	0	5	-1	4	0	4	0	4	0	4	0	3	0	4	0	4	-1	3	4	-2
France	3	-1	2	0	2	1	3	-1	2	1	3	-1	2	0	2	0	2	0	2	0	2	2	-1
Germany	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	4	0
Ireland	1	0	1	1	2	1	3	0	3	-1	2	2	4	1	5	0	5	0	5	-2	3	3	2
Italy	2	0	2	0	2	0	2	0	2	1	3	-1	2	2	4	0	4	0	4	0	4	3	2
Japan	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	-1	3	0	3	0	3	4	-1
Netherlands	5	-1	4	-1	3	1	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	4	-1
New Zealand	4	0	4	0	4	1	5	0	5	-1	4	-2	2	-1	1	0	1	1	2	0	2	3	-2
Norway	5	0	5	0	5	0	4	0	4	-1	3	1	4	1	5	-1	4	0	4	0	4	4	-1
Portugal	5	0	5	0	5	0	5	-2	3	-1	3	1	3	0	3	-1	3	0	3	0	3	4	-2
Spain	5	0	5	0	5	0	5	-1	4	-1	4	-1	3	0	3	0	3	1	4	0	4	4	-1
Sweden	5	0	5	-1	4	-1	3	1	4	-1	3	0	3	0	3	0	3	0	3	0	3	4	-2
Switzerland	4	0	4	0	4	0	4	0	4	0	4	0	4	0	4	-1	3	0	3	0	3	4	-1
United Kingdom	1	2	3	1	3	0	4	-1	3	-2	1	0	1	0	1	0	1	0	1	0	1	2	0
United States	1	0	1	1	2	0	2	-1	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
Ø	4	0	4	0	4	0	4	0	3	0	3	0	3	0	3	0	3	0	3	0	3	3	-1

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 23: Level of collective bargaining (1-5)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	2	0	2	1	3	0	3	0	3	1	4	0	4	-2	2	0	2	0	2	0	2	3	0
Austria	4	0	4	0	4	0	4	0	4	-1	3	0	3	0	3	-1	2	0	3	0	2	3	-2
Belgium	4	0	4	0	4	0	4	0	3	0	3	0	4	0	3	0	4	0	3	1	4	4	0
Canada	1	0	1	0	1	1	2	-1	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
Denmark	3	0	4	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	2	0	2	3	-1
Finland	3	0	3	2	5	-1	4	0	4	0	4	0	4	0	4	0	4	0	4	-1	3	4	0
France	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	2	0
Germany	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	3	0
Ireland	1	0	1	1	2	1	3	-1	2	0	2	3	5	-1	4	0	4	0	4	-2	2	3	1
Italy	4	-1	3	-1	2	0	2	0	3	0	3	0	2	1	3	0	3	0	3	-1	2	3	-2
Japan	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
Netherlands	5	-1	4	0	4	0	4	0	4	-1	3	0	3	0	3	0	3	0	4	-1	2	4	-3
New Zealand	4	0	4	0	4	0	4	0	4	0	4	-3	1	0	1	0	1	0	1	0	1	3	-3
Norway	5	0	4	0	5	0	4	0	4	-1	3	1	4	1	5	-2	3	0	3	1	4	4	-1
Portugal	3	0	3	0	3	-1	2	0	2	0	2	1	3	0	3	0	3	0	3	-1	2	3	-1
Spain	3	0	3	0	3	0	3	1	4	0	4	-1	3	0	3	0	3	0	3	0	3	3	0
Sweden	5	0	5	-1	4	-1	3	0	4	-1	3	0	3	0	3	0	3	0	3	0	3	4	-2
Switzerland	3	0	3	0	3	0	3	0	3	-1	2	0	2	0	2	0	2	0	2	0	2	2	-1
United Kingdom	2	0	2	0	2	1	3	-1	2	-1	1	0	1	0	1	0	1	0	1	0	1	2	-1
United States	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
Ø	3	0	3	0	3	0	3	0	3	0	3	0	3	0	3	0	2	0	2	0	2	3	-1

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 24: Government interventions (1-5)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	3	0	3	0	3	0	3	0	3	2	4	0	4	0	4	-1	3	0	3	0	3	3	0
Austria	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	2	0
Belgium	2	0	2	0	2	1	3	1	4	1	5	-1	3	1	5	0	5	0	4	0	4	3	2
Canada	1	0	1	0	1	2	3	-1	2	-1	1	0	1	0	1	0	1	0	1	0	1	1	0
Denmark	3	0	3	0	3	1	4	0	4	0	4	-2	2	0	2	1	3	-1	2	0	2	3	-1
Finland	4	0	5	0	5	0	4	0	4	0	4	0	4	0	3	1	4	0	4	-1	3	4	-1
France	3	0	3	0	3	1	4	-1	3	0	3	0	3	0	3	0	3	0	3	0	3	3	0
Germany	2	0	2	0	2	0	2	0	2	0	2	0	2	0	2	1	3	-1	2	0	2	2	0
Ireland	1	0	1	0	1	0	1	2	3	0	3	1	4	0	4	0	4	0	4	-1	3	3	2
Italy	1	1	2	0	2	1	3	1	3	0	4	0	4	-1	2	0	3	0	2	0	2	3	1
Japan	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
Netherlands	5	-1	4	-1	4	1	4	0	4	-1	3	0	3	-1	2	0	2	0	3	0	3	3	-2
New Zealand	3	0	3	1	4	1	5	0	5	-1	4	-1	2	0	2	0	2	0	2	0	2	3	-1
Norway	3	0	3	0	3	1	4	0	4	-1	3	1	4	0	4	-1	3	0	3	0	3	3	0
Portugal	5	0	5	0	5	0	5	-1	4	-1	3	0	4	0	3	0	3	0	3	0	3	4	-2
Spain	5	0	5	0	5	0	5	-1	4	0	4	-1	3	0	3	0	3	0	3	0	3	4	-2
Sweden	2	0	2	0	2	0	3	0	3	-1	2	0	2	0	2	0	2	0	2	0	2	2	0
Switzerland	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
United Kingdom	2	1	3	1	4	0	4	-2	3	-2	1	0	1	0	1	0	1	0	2	0	2	2	0
United States	2	0	2	1	3	0	3	-1	1	0	1	0	1	0	1	0	1	0	1	0	1	2	-1
Ø	3	0	3	0	3	0	3	0	3	0	3	0	3	0	2	0	2	0	2	0	2	3	0

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 25: Dummy high corporatism (0;1)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total	
Australia	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	-1	0	0	0	0	0	0	0	0
Austria	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	0
Belgium	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	1	1	0	0
Canada	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Denmark	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-1
Finland	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	-1	0	1	1	-1
France	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Germany	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	0
Ireland	0	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	0	1	-1	0	1	1	0
Italy	1	-1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	1	1	0	0
Japan	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	-1	0	0	0	0	0	0	1	-1
Netherlands	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0	0
New Zealand	1	0	1	0	1	0	1	0	1	0	1	-1	0	0	0	0	0	0	0	0	0	0	1	-1
Norway	1	0	1	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	0	1	1	0	0
Portugal	1	0	1	0	1	0	1	-1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	-1
Spain	1	0	1	0	1	0	1	0	1	0	1	-1	0	0	0	0	0	1	1	0	1	1	0	0
Sweden	1	0	1	0	1	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
Switzerland	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	-1	0	0	0	0	0	0	1	-1
United Kingdom	0	0	0	0	1	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United States	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ø	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	1	0

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 26: Dummy intermediated corporatism (0;1)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	1	0	1	0	1	0	1	0	1	-1	0	0	0	0	0	1	1	0	1	0	1	1	0
Austria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Denmark	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Finland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1
France	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	1	0
Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ireland	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	1	1	0	1
Italy	0	1	1	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	1
Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Zealand	0	0	0	0	0	0	0	0	0	0	0	1	1	-1	0	0	0	0	0	0	0	0	0
Norway	0	0	0	0	0	0	0	0	0	0	1	-1	0	0	0	0	0	0	0	0	0	0	0
Portugal	0	0	0	0	0	0	0	1	1	0	1	0	0	0	1	0	1	0	1	0	1	0	1
Spain	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	-1	0	0	0	0	0
Sweden	0	0	0	0	0	0	1	0	0	1	1	0	1	0	1	0	1	0	1	0	1	1	1
Switzerland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	1
United Kingdom	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
United States	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ø	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 27: Unemployment benefit gross replacement rates (%)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	17.5	0.5	18.0	-3.6	14.4	6.7	21.1	2.4	23.5	0.2	23.7	1.9	25.6	1.4	27.0	-1.9	25.1	-1.8	23.3	-1.7	21.6	21.9	4.1
Austria	19.7	-4.0	15.7	5.7	21.4	1.1	22.5	5.8	28.3	-0.8	27.5	2.0	29.5	1.4	30.9	-0.1	30.8	-2.8	28.0	0.0	28.0	25.7	8.3
Belgium	41.3	-8.1	33.2	7.2	40.4	6.3	46.7	-1.2	45.5	-2.2	43.3	-1.4	41.9	-2.3	39.6	-2.2	37.4	-0.1	37.3	0.1	37.4	40.4	-3.9
Canada	13.8	-1.5	12.3	1.9	14.2	6.4	20.6	-2.3	18.3	0.7	19.0	0.0	19.0	-1.2	17.8	-2.8	15.0	-2.1	12.9	1.8	14.7	16.1	0.9
Denmark	20.2	0.0	20.2	9.9	30.1	9.5	39.6	12.0	51.6	1.1	52.7	-1.1	51.6	8.6	60.2	-2.1	58.1	-4.0	54.1	-11.6	42.5	43.7	22.3
Finland	5.0	-0.7	4.3	4.5	8.8	17.9	26.7	-0.9	25.8	6.1	31.9	4.7	36.6	-0.6	36.0	-0.9	35.1	0.6	35.7	-1.2	34.5	25.5	29.5
France	25.0	0.0	25.0	0.2	25.2	-0.7	24.5	3.0	27.5	6.8	34.3	3.3	37.6	-0.3	37.3	0.8	38.1	-2.8	35.3	0.1	35.4	31.4	10.4
Germany	30.0	0.0	30.0	-0.6	29.4	-0.7	28.7	0.7	29.4	-1.1	28.3	0.1	28.4	-1.8	26.6	3.2	29.8	-4.4	25.4	-3.9	21.5	28.0	-8.5
Ireland	17.0	0.3	17.3	-0.7	16.6	4.7	21.3	7.0	28.3	1.5	29.8	-1.3	28.5	-0.1	28.4	0.8	29.2	5.4	34.6	5.1	39.7	26.4	22.7
Italy	3.8	-1.2	2.6	-0.6	2.0	-0.6	1.4	-0.4	1.0	-0.7	0.3	3.8	4.1	14.0	18.1	0.8	18.9	-10.5	8.4	2.4	10.8	6.5	7.0
Japan	12.0	0.0	12.0	0.5	12.5	-0.7	11.8	-2.8	9.0	0.7	9.7	0.3	10.0	0.3	10.3	1.7	12.0	0.3	12.3	-0.3	12.0	11.2	0.0
Netherlands	13.0	23.9	36.9	10.9	47.8	0.2	48.0	-0.5	47.5	5.7	53.2	1.0	54.2	-1.9	52.3	-1.1	51.2	-11.7	39.5	-6.5	33.0	43.3	20.0
New Zealand	41.3	-6.8	34.5	-5.2	29.3	-1.6	27.7	0.5	28.2	3.4	31.6	-0.5	31.1	-1.7	29.4	1.8	31.2	-0.5	30.7	-4.0	26.7	31.1	-14.6
Norway	4.0	-0.4	3.6	1.2	4.8	7.1	11.9	12.7	24.6	11.4	36.0	3.0	39.0	0.0	39.0	9.2	48.2	6.8	55.0	-21.6	33.4	27.2	29.4
Portugal	0.0	0.0	0.0	0.0	0.0	3.5	3.5	4.1	7.6	12.6	20.2	12.8	33.0	2.0	35.0	4.9	39.9	-2.4	37.5	2.9	40.4	19.7	40.4
Spain	9.0	7.0	16.0	-0.4	15.6	3.0	18.6	5.9	24.5	7.7	32.2	1.6	33.8	0.7	34.5	-0.5	34.0	-1.0	33.0	-1.4	31.6	25.7	22.6
Sweden	4.0	0.7	4.7	1.7	6.4	11.7	18.1	7.1	25.2	3.4	28.6	0.4	29.0	-1.7	27.3	4.1	31.4	6.0	37.4	-0.2	37.2	22.7	33.2
Switzerland	1.8	-0.8	1.0	0.0	1.0	2.9	3.9	8.6	12.5	6.8	19.3	3.5	22.8	8.4	31.2	4.1	35.3	-5.7	29.6	-0.6	29.0	17.0	27.2
United Kingdom	24.2	2.1	26.3	-0.3	26.0	-2.5	23.5	0.4	23.9	-3.2	20.7	-2.5	18.2	0.1	18.3	-3.7	14.6	-3.3	11.3	-0.3	11.0	19.8	-13.2
United States	7.5	2.1	9.6	0.5	10.1	2.5	12.6	1.1	13.7	-0.2	13.5	-2.4	11.1	1.5	12.6	-1.5	11.1	-2.4	8.7	11.6	20.3	11.9	12.8
Ø	15.5	0.7	16.2	1.6	17.8	3.8	21.6	3.2	24.8	3.0	27.8	1.5	29.3	1.3	30.6	0.7	31.3	-1.8	29.5	-1.5	28.0	24.8	12.5

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 28: Employment Protection (0-2)

country	Ø1960	Δ	Ø1965	Δ	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.1	0.6	0.0	0.5	0.0	0.6	0.5	0.1
Austria	0.7	0.0	0.7	0.0	0.7	0.1	0.8	0.3	1.1	0.2	1.3	0.0	1.3	-0.1	1.2	-0.1	1.1	-0.2	0.9	0.0	0.9	1.0	0.3
Belgium	0.7	0.3	0.9	0.4	1.4	0.2	1.6	0.0	1.6	0.0	1.6	-0.1	1.4	-0.4	1.0	-0.3	0.7	0.0	0.7	0.0	0.8	1.1	0.1
Canada	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.4	0.0	0.4	0.0	0.4	0.3	0.1
Denmark	0.9	0.0	0.9	0.1	1.0	0.1	1.1	0.0	1.1	0.0	1.1	-0.1	1.0	-0.2	0.8	0.0	0.9	0.0	0.9	0.0	0.9	1.0	0.0
Finland	1.2	0.0	1.2	0.0	1.2	0.0	1.2	0.0	1.2	0.0	1.2	0.0	1.2	-0.1	1.0	-0.1	0.9	0.0	0.9	0.0	0.9	1.1	-0.3
France	0.4	0.1	0.5	0.3	0.8	0.4	1.2	0.1	1.3	0.0	1.3	0.1	1.4	-0.1	1.3	-0.3	0.9	0.1	1.0	0.0	1.0	1.0	0.6
Germany	0.4	0.2	0.6	0.7	1.3	0.4	1.7	0.0	1.7	0.0	1.7	-0.1	1.6	-0.3	1.3	-0.2	1.1	0.1	1.1	0.0	1.1	1.2	0.7
Ireland	0.0	0.1	0.1	0.2	0.2	0.2	0.4	0.1	0.5	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.6	0.0	0.5	0.0	0.5	0.4	0.5
Italy	1.9	0.1	2.0	0.0	2.0	0.0	2.0	0.0	2.0	0.0	2.0	-0.1	1.9	-0.4	1.5	-0.4	1.1	0.0	1.1	0.0	1.1	1.7	-0.8
Japan	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	1.4	-0.3	1.1	-0.4	0.7	0.0	0.7	-0.1	0.5	1.2	-0.9
Netherlands	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	1.4	0.0	1.3	-0.1	1.2	-0.1	1.2	0.0	1.2	0.0	1.1	1.3	-0.2
New Zealand	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	0.0	0.8	-0.1	0.7	-0.1	0.5	0.1	0.6	0.0	0.6	0.7	-0.2
Norway	1.6	0.0	1.6	0.0	1.6	0.0	1.6	0.0	1.6	0.0	1.6	-0.1	1.5	-0.3	1.2	-0.3	0.9	0.0	0.9	0.0	0.9	1.3	-0.6
Portugal		0.0		0.0		1.6	1.6	0.2	1.9	0.1	2.0	0.0	1.9	-0.1	1.9	0.0	1.8	-0.1	1.8	-0.1	1.7	1.8	1.7
Spain	2.0	0.0	2.0	0.0	2.0	0.0	2.0	-0.1	1.9	0.0	1.9	-0.1	1.8	-0.4	1.4	-0.4	0.9	0.0	0.9	0.0	0.9	1.6	-1.1
Sweden	0.0	0.0	0.0	0.4	0.4	1.0	1.3	0.5	1.8	0.0	1.8	-0.2	1.6	-0.4	1.3	-0.2	1.1	0.0	1.0	0.0	1.0	1.0	1.0
Switzerland	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.0	0.6	0.1	0.6	0.0	0.6	0.0	0.6	0.6	0.1
United Kingdom	0.2	0.0	0.2	0.1	0.2	0.1	0.3	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.4	0.1	0.5	0.0	0.5	0.0	0.5	0.3	0.3
United States	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0
Ø	0.8	0.0	0.8	0.1	0.9	0.2	1.1	0.1	1.1	0.0	1.2	0.0	1.1	-0.2	1.0	-0.1	0.8	0.0	0.8	0.0	0.8	1.0	0.0

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 29: Product market regulation (0-6)

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	4.0	0.0	4.0	0.0	4.0	0.0	4.0	-0.2	3.8	-1.0	2.8	-1.1	1.7	-0.2	1.5	0.1	1.6	3.0	-2.5
Austria	5.2	0.0	5.2	-0.1	5.1	-0.2	4.9	-0.4	4.5	-0.5	4.0	-1.0	3.0	-0.6	2.4	-0.3	2.1	4.1	-3.1
Belgium	5.5	0.0	5.5	0.0	5.5	0.0	5.4	-0.3	5.1	-1.1	4.1	-1.3	2.8	-0.7	2.1	-0.1	2.1	4.2	-3.4
Canada	4.3	0.0	4.3	0.0	4.3	-0.2	4.1	-1.4	2.7	-0.4	2.3	-0.4	2.0	-0.1	1.9	0.0	1.8	3.1	-2.5
Denmark	5.5	0.0	5.5	0.0	5.5	0.0	5.5	-0.7	4.8	-1.2	3.7	-1.3	2.3	-0.7	1.6	-0.7	0.9	3.9	-4.6
Finland	5.5	0.0	5.5	-0.1	5.4	-0.3	5.2	-0.4	4.7	-1.5	3.3	-0.7	2.5	-0.2	2.4	-0.1	2.3	4.1	-3.2
France	6.0	0.0	6.0	0.0	6.0	-0.1	5.9	-0.6	5.3	-0.5	4.8	-0.9	3.8	-0.8	3.0	-0.3	2.7	4.8	-3.3
Germany	5.2	0.0	5.2	0.0	5.2	-0.1	5.1	-0.2	4.9	-1.2	3.7	-1.4	2.2	-0.5	1.7	-0.4	1.3	3.9	-3.9
Ireland	5.7	0.0	5.7	0.0	5.7	-0.1	5.6	-0.6	5.0	-0.4	4.6	-0.8	3.8	-0.6	3.2	-0.4	2.7	4.7	-3.0
Italy	5.8	0.0	5.8	0.0	5.8	0.0	5.8	-0.1	5.8	-0.8	5.0	-1.4	3.6	-1.1	2.6	-0.7	1.9	4.7	-3.9
Japan	5.1	0.0	5.1	0.0	5.1	-0.2	4.9	-1.2	3.7	-0.5	3.2	-0.6	2.6	-0.4	2.2	0.0	2.2	3.8	-2.8
Netherlands	5.6	0.0	5.6	0.0	5.6	0.0	5.6	-0.2	5.3	-1.7	3.6	-1.5	2.1	-0.5	1.6	-0.9	0.7	4.0	-4.8
New Zealand	4.9	0.0	4.9	0.2	5.1	-0.6	4.5	-0.9	3.6	-1.0	2.6	-0.8	1.9	0.2	2.1	0.1	2.1	3.5	-2.8
Norway	5.5	0.0	5.5	0.0	5.5	-0.4	5.1	-0.7	4.3	-0.9	3.4	-0.6	2.8	-0.5	2.3	-0.1	2.3	4.1	-3.2
Portugal	5.9	0.0	5.9	0.0	5.9	-0.1	5.8	-0.5	5.3	-0.5	4.8	-1.3	3.5	-0.9	2.6	-0.8	1.8	4.6	-4.1
Spain	5.1	0.0	5.1	0.0	5.0	-0.1	5.0	-0.2	4.7	-0.6	4.1	-1.4	2.8	-0.7	2.0	-0.2	1.8	4.0	-3.3
Sweden	4.5	0.0	4.5	0.0	4.5	0.0	4.5	-0.2	4.4	-1.5	2.9	-0.7	2.2	-0.3	1.9	0.1	2.0	3.5	-2.6
Switzerland	4.1	0.0	4.1	0.0	4.1	0.0	4.2	0.0	4.2	-0.2	4.0	-0.9	3.1	-0.4	2.8	-0.3	2.5	3.7	-1.6
United Kingdom	4.8	0.0	4.8	-0.1	4.7	-0.5	4.2	-1.0	3.2	-1.4	1.8	-0.6	1.2	-0.2	1.0	0.1	1.1	3.0	-3.6
United States	3.7	0.0	3.7	-0.5	3.2	-0.7	2.5	-0.2	2.3	-0.4	1.9	-0.4	1.5	-0.1	1.4	-0.1	1.4	2.4	-2.4
Ø	5.1	0.0	5.1	0.0	5.1	-0.2	4.9	-0.5	4.4	-0.9	3.5	-1.0	2.6	-0.5	2.1	-0.3	1.9	3.8	-3.2

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 30: Tax wedge (%)

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	7.9	-0.2	7.8	3.5	11.2	2.9	14.2	1.8	16.0	2.8	18.8	3.3	22.1	-0.9	21.2	-1.8	19.4	15.4	11.4
Austria	32.4	-0.5	31.9	4.2	36.0	3.5	39.6	-0.9	38.6	3.6	42.2	-1.2	41.0	0.1	41.1	0.2	41.4	38.2	9.0
Belgium	32.8	3.3	36.1	5.0	41.1	5.8	46.8	-3.1	43.7	0.4	44.1	3.3	47.4	0.3	47.6	0.4	48.0	43.1	15.2
Canada	18.9	-4.0	14.9	0.5	15.4	6.4	21.8	3.2	25.0	3.2	28.2	-1.3	26.9	-2.6	24.3	-2.0	22.3	22.0	3.4
Denmark	28.2	3.1	31.3	5.3	36.5	7.0	43.5	-0.6	42.9	3.2	46.2	-7.7	38.4	-3.3	35.2	-1.6	33.5	37.3	5.4
Finland	26.7	4.5	31.3	2.7	33.9	0.7	34.6	2.6	37.2	10.1	47.3	-4.1	43.2	-3.8	39.4	-1.5	37.9	36.8	11.2
France	26.7	1.5	28.3	5.4	33.7	6.1	39.8	1.6	41.4	1.9	43.3	0.1	43.4	1.3	44.7	0.7	45.4	38.5	18.7
Germany	30.4	3.5	33.9	1.4	35.3	2.4	37.7	-1.1	36.7	2.7	39.3	3.7	43.0	1.6	44.6	-2.0	42.6	38.2	12.2
Ireland			16.7	2.3	19.0	7.3	26.3	1.7	28.0	-0.9	27.1	-7.7	19.4	-7.0	12.4	0.1	12.5	20.2	12.5
Italy	27.9	1.4	29.3	2.4	31.8	4.4	36.1	1.2	37.4	5.1	42.5	-0.6	41.9	-1.2	40.7	1.1	41.8	36.6	13.9
Japan	8.4	3.7	12.1	8.1	20.2	4.3	24.6	2.2	26.8	1.4	28.2	-1.7	26.5	-0.3	26.2	1.0	27.2	22.2	18.9
Netherlands	33.5	3.4	37.0	3.3	40.3	6.0	46.3	0.3	46.6	-0.6	46.0	-8.4	37.5	-4.1	33.4	-1.9	31.5	39.1	-2.0
New Zealand	13.0	5.0	18.0	1.9	19.9	4.8	24.7	-1.4	23.3	0.3	23.6	-5.9	17.7	-2.9	14.9	-5.3	9.6	18.3	-3.4
Norway			26.2	0.9	27.1	1.7	28.8	9.1	37.9	2.1	40.0	-3.8	36.2	-3.0	33.2	0.2	33.4	32.8	33.4
Portugal	10.2	3.3	13.5	8.6	22.0	4.0	26.1	1.0	27.0	1.1	28.2	4.3	32.5	-0.1	32.4	-0.7	31.6	24.8	21.4
Spain	14.4	2.9	17.3	7.8	25.1	5.9	31.0	0.7	31.7	1.5	33.2	1.2	34.3	1.5	35.8	0.2	36.1	28.8	21.7
Sweden	26.4	5.1	31.5	7.2	38.8	3.9	42.7	3.3	46.0	3.0	49.0	-0.4	48.5	-3.8	44.8	-4.2	40.6	40.9	14.2
Switzerland	21.4	7.6	29.0	2.2	31.2	1.2	32.4	-1.1	31.2	5.0	36.2	-19.0	17.2	-0.6	16.6	-0.8	15.9	25.7	-5.6
United Kingdom			31.2	-4.9	26.2	0.6	26.9	-2.8	24.1	1.0	25.1	1.4	26.5	2.2	28.7	-1.6	27.2	27.0	27.2
United States	16.0	0.8	16.8	3.0	19.8	0.7	20.5	2.6	23.1	1.8	24.9	0.7	25.6	-1.7	23.9	0.4	24.3	21.6	8.3
Ø	22.1	2.6	24.7	3.5	28.2	4.0	32.2	1.0	33.2	2.4	35.7	-2.2	33.5	-1.4	32.1	-0.9	31.1	30.4	9.0

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 31: Active labour market policies (%)

country	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	4.7	0.1	4.8	1.8	6.6	-0.5	6.1	1.4	7.5	-1.6	5.9	5.9	1.2
Austria	8.0	0.5	8.5	0.7	9.3	3.8	13.1	-0.2	13.0	2.7	15.7	11.3	7.7
Belgium	10.3	5.9	16.2	-1.8	14.5	2.6	17.0	-2.8	14.3	2.5	16.8	14.8	6.5
Canada	6.3	0.1	6.3	-0.4	5.9	0.0	5.9	-1.3	4.6	-0.8	3.8	5.5	-2.5
Denmark	17.4	-1.4	16.0	7.6	23.6	13.4	36.9	-4.9	32.0	-4.7	27.3	25.5	9.9
Finland	17.4	6.9	24.3	-13.9	10.4	0.7	11.1	-0.7	10.4	0.4	10.8	14.5	-6.6
France	6.6	2.7	9.3	1.5	10.7	1.3	12.0	-1.3	10.7	0.2	10.9	10.0	4.4
Germany	13.1	11.2	24.3	-3.2	21.1	-5.5	15.6	-5.9	9.7	2.2	11.9	15.9	-1.2
Ireland	8.8	1.0	9.8	2.3	12.1	17.4	29.5	-11.3	18.3	-9.9	8.4	14.5	-0.4
Italy			9.5	1.9	11.4	0.0	11.4	1.8	13.2	-4.2	9.0	10.9	9.0
Japan	6.1	0.2	6.3	-3.3	3.0	1.1	4.1	2.5	6.5	4.2	10.7	6.1	4.6
Netherlands	9.5	9.4	18.9	7.2	26.1	29.7	55.8	-23.7	32.1	1.6	33.6	26.3	24.1
New Zealand	23.4	-11.9	11.4	-1.3	10.1	-0.7	9.4	1.3	10.8	-4.8	6.0	14.0	-17.4
Norway	30.8	-11.9	18.8	2.4	21.3	2.6	23.9	-7.3	16.6	-1.0	15.6	21.2	-15.2
Portugal	4.6	8.0	12.5	-0.3	12.2	4.4	16.6	-6.9	9.7	-1.1	8.6	10.7	4.0
Spain	2.0	2.2	4.2	-1.6	2.6	3.0	5.6	2.3	7.9	-2.2	5.7	4.3	3.7
Sweden	72.2	8.9	81.1	-54.1	27.0	2.4	29.3	-10.4	19.0	-5.0	13.9	40.4	-58.3
Switzerland	25.8	4.6	30.4	-16.0	14.4	8.3	22.7	-5.5	17.3	-0.4	16.8	21.3	-9.0
United Kingdom	7.5	0.6	8.0	-2.6	5.5	2.8	8.3	1.3	9.6	-4.8	4.8	7.5	-2.6
United States	3.6	0.1	3.7	-0.4	3.4	0.4	3.8	-1.6	2.2	-0.1	2.1	3.2	-1.5
Ø	14.6	1.6	16.2	-3.7	12.6	4.4	16.9	-3.6	13.3	-1.3	11.9	14.2	-2.0

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 32: KOF actual trade flows

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	42.7	0.3	42.9	0.7	43.6	4.5	48.1	12.8	60.9	2.7	63.7	2.6	66.3	4.6	70.9	1.4	72.3	56.8	29.6
Austria	36.4	3.7	40.1	8.6	48.7	5.6	54.4	7.2	61.6	1.5	63.1	14.6	77.7	8.4	86.1	2.5	88.6	61.8	52.2
Belgium	72.0	1.5	73.4	2.3	75.8	8.8	84.6	4.1	88.7	1.8	90.6	3.3	93.8	1.5	95.3	1.0	96.3	85.6	24.4
Canada	57.7	2.9	60.5	6.6	67.1	0.5	67.6	-0.3	67.3	7.0	74.3	4.2	78.6	-3.7	74.8	-2.1	72.7	69.0	15.1
Denmark	46.8	1.6	48.4	9.3	57.7	5.2	62.8	7.4	70.2	7.2	77.4	5.1	82.5	3.2	85.7	1.2	86.9	68.7	40.1
Finland	30.0	1.3	31.3	7.4	38.8	6.4	45.2	10.5	55.7	11.7	67.4	10.3	77.7	4.9	82.6	-0.6	82.0	56.7	52.1
France	24.5	1.2	25.7	7.5	33.2	5.7	38.9	4.1	43.0	1.3	44.3	6.6	51.0	7.5	58.5	1.3	59.7	42.1	35.3
Germany	23.7	1.0	24.7	3.5	28.2	4.1	32.3	4.8	37.1	3.2	40.3	14.1	54.4	7.4	61.8	1.0	62.8	40.6	39.1
Ireland	78.0	4.1	82.1	7.9	90.0	2.3	92.3	0.6	92.8	1.7	94.6	3.0	97.5	-0.2	97.3	1.1	98.4	91.5	20.4
Italy	26.2	1.3	27.5	1.7	29.2	3.9	33.1	9.6	42.7	14.4	57.0	7.3	64.3	2.1	66.4	1.3	67.7	46.0	41.6
Japan	13.3	0.5	13.8	2.5	16.3	1.6	17.9	8.9	26.8	-2.7	24.1	-3.1	21.0	3.9	24.9	3.5	28.3	20.7	15.0
Netherlands	66.3	1.8	68.1	7.5	75.6	6.2	81.8	3.2	85.0	1.5	86.4	5.8	92.2	2.1	94.3	0.4	94.8	82.7	28.5
New Zealand	28.1	3.7	31.8	2.7	34.5	10.0	44.4	13.2	57.6	15.3	72.9	4.3	77.2	0.0	77.2	-2.0	75.3	55.4	47.2
Norway	50.3	2.3	52.7	7.4	60.1	0.4	60.5	4.0	64.4	2.3	66.7	5.8	72.6	6.8	79.4	1.7	81.1	65.3	30.8
Portugal	36.8	0.5	37.3	9.9	47.2	7.2	54.4	-7.0	47.4	10.0	57.4	15.4	72.8	5.8	78.6	3.7	82.3	57.1	45.5
Spain	18.2	0.6	18.8	4.2	23.0	8.2	31.2	10.9	42.1	13.4	55.5	12.3	67.9	5.8	73.7	2.3	76.0	45.1	57.8
Sweden	25.2	3.3	28.5	8.5	36.9	13.1	50.1	10.4	60.5	15.1	75.5	7.8	83.3	3.2	86.5	2.4	88.9	59.5	63.7
Switzerland	52.8	0.0	52.8	0.6	53.4	20.0	73.5	3.9	77.4	1.4	78.8	8.5	87.3	3.2	90.5	1.3	91.8	73.1	39.0
United Kingdom	38.7	11.1	49.8	4.8	54.6	3.2	57.8	0.4	58.2	1.9	60.1	3.0	63.0	1.7	64.7	1.2	65.9	57.0	27.2
United States	20.2	1.6	21.9	3.3	25.2	3.5	28.7	5.1	33.8	3.1	36.9	4.0	40.9	3.8	44.8	-0.2	44.5	33.0	24.3
Ø	39.4	2.2	41.6	5.4	47.0	6.0	53.0	5.7	58.7	5.7	64.4	6.7	71.1	3.6	74.7	1.1	75.8	58.4	36.4

Notes: Values are expressed in 5-year averages. For a detailed description see Annex I.

Table 33: KOF trade restrictions

country	Ø1970	Δ	Ø1975	Δ	Ø1980	Δ	Ø1985	Δ	Ø1990	Δ	Ø1995	Δ	Ø2000	Δ	Ø2005	Δ	Ø2010	Ø	Δ total
Australia	50.7	0.5	51.2	3.1	54.3	7.6	61.9	5.1	67.0	7.2	74.1	4.5	78.6	0.5	79.1	-1.6	77.5	66.1	26.7
Austria	61.3	0.3	61.6	3.1	64.7	3.8	68.5	8.9	77.4	9.7	87.1	6.6	93.7	-5.2	88.5	-6.2	82.3	76.1	20.9
Belgium	86.7	0.2	86.9	0.7	87.6	1.3	89.0	0.6	89.6	1.6	91.2	3.8	95.0	-4.9	90.1	-3.0	87.1	89.2	0.4
Canada	68.2	0.3	68.6	2.1	70.6	1.0	71.6	1.6	73.2	1.8	74.9	7.8	82.7	-2.3	80.4	-0.4	80.0	74.5	11.8
Denmark	82.1	0.1	82.1	0.4	82.5	1.3	83.8	1.7	85.5	6.7	92.1	4.4	96.6	-4.5	92.1	-5.8	86.3	87.0	4.2
Finland	65.3	0.4	65.8	3.5	69.2	3.8	73.0	2.4	75.4	13.3	88.7	7.8	96.4	-6.1	90.3	-3.5	86.9	79.0	21.5
France	65.7	0.3	66.0	2.5	68.5	3.1	71.7	7.3	79.0	5.2	84.2	5.9	90.2	-1.3	88.9	-4.5	84.4	77.6	18.7
Germany	84.9	0.2	85.0	1.2	86.2	2.7	88.9	0.7	89.6	1.9	91.5	4.1	95.6	-5.5	90.0	-8.0	82.0	88.2	-2.9
Ireland	78.4	0.2	78.6	0.7	79.3	1.3	80.7	1.6	82.2	6.9	89.1	4.6	93.7	-3.3	90.5	-2.8	87.7	84.5	9.2
Italy	73.6	0.3	73.9	2.5	76.4	1.5	78.0	1.5	79.5	6.2	85.7	5.9	91.6	-5.0	86.6	-4.3	82.4	80.9	8.7
Japan	31.8	0.3	32.0	4.9	37.0	13.4	50.4	7.0	57.4	3.0	60.4	11.2	71.7	3.8	75.5	-8.6	66.9	53.7	35.2
Netherlands	75.8	5.9	81.7	5.3	87.0	1.8	88.8	1.1	89.9	3.0	92.9	3.9	96.8	-4.4	92.3	-3.2	89.1	88.2	13.3
New Zealand	63.1	0.6	63.7	2.9	66.6	0.3	66.9	6.5	73.4	7.1	80.5	6.9	87.4	0.3	87.7	0.0	87.7	75.2	24.5
Norway	68.1	3.1	71.1	4.7	75.8	7.5	83.3	4.9	88.3	1.6	89.9	-2.2	87.7	-13.9	73.8	-4.8	69.0	78.6	0.9
Portugal	71.2	0.0	71.2	0.0	71.2	1.6	72.8	7.1	79.9	6.7	86.6	4.0	90.6	-3.0	87.7	-3.5	84.2	79.5	13.0
Spain	67.6	1.8	69.3	6.7	76.0	2.9	78.9	4.8	83.7	3.2	86.9	5.0	91.9	-6.0	85.9	-5.2	80.7	80.1	13.2
Sweden	72.3	2.9	75.1	3.0	78.1	11.7	89.8	5.7	95.5	-1.9	93.5	0.7	94.2	-3.1	91.1	-2.8	88.4	86.4	16.1
Switzerland	65.4	3.2	68.6	13.5	82.1	1.5	83.6	0.2	83.8	2.2	86.0	3.5	89.5	-15.4	74.1	-10.5	63.6	77.4	-1.8
United Kingdom	70.9	3.1	74.0	12.2	86.2	2.3	88.5	0.6	89.1	2.0	91.1	5.1	96.1	-4.0	92.1	-3.2	88.9	86.3	18.0
United States	77.9	0.5	78.4	3.4	81.8	1.6	83.4	0.7	84.1	1.4	85.5	1.9	87.4	-3.7	83.7	-5.5	78.2	82.2	0.4
Ø	69.0	1.2	70.3	3.8	74.1	3.6	77.7	3.5	81.2	4.4	85.6	4.8	90.4	-4.3	86.0	-4.4	81.7	79.5	12.6

Notes: Values are expressed in 5-year averages. For a detailed description see Annex