QUADERNI

Università degli Studi di Siena
DIPARTIMENTO DI ECONOMIA POLITICA

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Labour Market Institutions and Employment Performance

n. 364 – Settembre 2002

"Identifying the role of differences in institutions in generating differences in macroeconomic short and medium-run evolutions is likely to be an important topic of research in the future." (O. Blanchard, 2000)

Abstract - The aim of the paper is to produce both a theoretical and empirical analysis on the existence and nature of a causal link between the set of labour market institutions (the industrial relations systems) and national employment performance.

In Section 2, the existing literature is briefly discussed with particular attention to methodological and measurement difficulties. In Section 3, a simple model is presented for highlighting the possible existence of a complex causal link. The relationship between industrial relations systems and national employment performance is analysed in Section 4, using a comparative approach for 19 developed countries. In Section 5, we present a second empirical investigation using the principal components analysis methodology. The empirical results of Sections 4 and 5 confirm the existence of a complex relationship between labour market institutions and national employment performances. In particular, both empirical investigations support the idea of a "double asymmetry": a "good" industrial relations system seems to be a necessary but not sufficient condition for a high(er) national employment performance while a "bad" industrial relations system appears to be a sufficient (but not necessary) condition for a low(er) employment performance.

J.E.L. codes: J50, J23

Keywords: labour market institutions, industrial relations systems, employment performance.

* The authors would like to thank an anonimous referee.

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1. INTRODUCTION

The aim of the paper is to produce both a theoretical and empirical analysis on the existence and nature of a causal link between the set of labour market institutions (the industrial relations systems) and national employment performance.

In Section 2, the existing literature is briefly discussed with particular attention to methodological and measurement difficulties. In Section 3, a simple model is presented for highlighting the possible existence of a complex causal link. The relationship between industrial relations systems and national employment performance is analysed in Section 4, using a comparative approach for 19 developed countries. In Section 5, we present a second empirical investigation using the principal components analysis methodology. The empirical results of Sections 4 and 5 confirm the existence of a complex relationship between labour market institutions and national employment performances. In particular, both empirical investigations support the idea of a "double asymmetry" in the relationship between industrial relations systems and employment performance.

2. A CRITICAL REVIEW OF THE LITERATURE

The relationship between labour market institutions and economic (employment) performances has been largely considered in the last two decades. A part of the literature considers each institutional factor as "an independent variable" (e. g. OECD, 1994 and Scarpetta, 1997), while other authors consider some "sets of institutional characteristics" as defining different industrial relations systems (e. g. Calmfors – Driffils, 1998, and Soskice, 1990).

Assessments of the impact of different industrial relations systems on measures of economic (and employment) performances are very difficult because of measurement and methodological problems. The methodology used in empirical analysis is that of correlating ranking of the various countries according to economic performance indicators and indicators of the level of neocorporatism and / or centralisation of industrial relations. The main factors considered in the literature as indicators of economic performances are the following: 1) real GNP growth rate; 2) inflation rate; 3) unemployment rate; 4) misery index (inflation rate + unemployment rate); 5) productivity growth. There are different definitions of "neocorporatism" (e.g. Calmfors and Driffill, 1988, p. 24) but, in short, the main indicators used to determine the degree of "neocorporatism" are the level of centralisation of wage negotiations and the degree of bargaining' co-ordination. Some empirical researchers have found a positive relationship between a nation's economic performance and its degree of "neocorporatism" (e.g. Bruno – Sachs, 1985; Crouch, 1985; Tarantelli, 1986; Soskice, 1990). They argue that a more "neocorporatist" industrial relations system is able to internalise the main macroeconomic effects of any agreement, permitting better economic performances. Calmfors and Driffill (1988) found a non-monotonic relationship ("U" shaped) between the degree of centralised bargaining and the economic performance. Decentralised bargains are constrained by competition in the product market, while in

centralised negotiations trade unions and employers internalise more of the negative externalities of wage increases. Thus, the authors argue that countries with an intermediary type of collective wage bargaining are in the worst situation: interest organisations are strong enough to impose their conditions in the wage negotiations, but are not encompassing enough to consider the social costs of their actions. It is interesting to highlight that the crucial condition for the decentralised systems to perform well is the absence of monopolistic (or oligopolistic) firms that, facing non-infinitely elastic demand curve, could pass, at least partly, wage increases on to their customers by increasing product prices[1]. There are also many difficulties in the classification of the different countries according to the industrial relations systems. For example, Soskice (1990) claims that Japan and Switzerland were wrongly classified as decentralised systems by Calmfors and Driffill (1988) who ignore the role of powerfully co-ordinated employer organisations and networks in these countries. If these two countries are re-classified, Soskice shows that unemployment would be a monotonic decreasing function of the degree of "neocorporatism". Other important difficulties for the analysis are the problems of determine the primary direction of causality, the possible existence of feedback, the possible strong dependence of conclusions on the reference period, and the (in)stability of the relationships. Calmfors (1993) analysed some of these difficulties and produced more prudent and less general conclusions compared to Calmfors-Driffill (1988). Furthermore, international comparisons could be misleading due to differences in measuring methods of the economic (employment) performance. In our opinion, even a standardised unemployment rate is not an appropriate indicator as a unique measure of the labour market performance of a national economy. In fact, the level and dynamics of the unemployment rate (unemployed / labour force[2]) are the result of the levels and dynamics of both the employment rate (employed / working-age population[3]) and the participation rate (labour force / working-age population). So, two countries can have similar unemployment rates but very different employment rates, due to differences in the participation rates. Also a comparison using the net job creations (NJC) could be misleading if we do not consider the different levels of employment rates in the starting year[4]. Finally, also the distinction between the short-term and long-term unemployment rate and differences according to sex, region and age are important for a better comparison of the overall employment performances of different economic systems. Therefore, many of the methodological and statistical difficulties remain (and probably increase in some cases) if we consider "employment performance" instead of "economic performance"[5] as dependent variable.

[1] As for the crucial importance of a high degree of competition in the product market, see Nickell (1999).
[2] Labour force = employed + unemployed
[3] The working-age is usually considered to be from 15 to 64 years.
[4] The employment performance of a country with a high employment rate at the beginning of the period can not be defined only using the NJC indicator. Obviously, for this country a non-negative NJC is a sufficient value for a high employment performance.
[5] In fact, it is well known that the employment performance of a national economic system is potentially affected by a large number of economic, social and institutional factors and policy instruments (e. g. Solow, 1990; OECD, 1994; Scarpetta, 1996; Nickell – Layard, 1997).

3. A SIMPLE MODEL

A simple model is presented for highlighting the possibility of a "complex" causal link between industrial relations systems (IRS) and national employment performances (NEP). In equation (1) the National Employment Performance (NEP) is defined as a direct function of the Employment Rate (ER) and Net Job Creation (NJC), an inverse function of the Unemployment Rate (UR), the Dualism (D) and, with some ambiguities, the Irregular Employment (IE)[6]. Equation (2) highlights the possible complex nature of the causal link between the quality ("good" or "bad") of the industrial relations system (IRS) and the NEP, considering the effects of the ("positive" or "negative") External Conditions (EC). Generally, a "good" IRS (IRS^+) is a necessary but not sufficient condition for a "high(er) NEP", while a "bad" IRS (IRS^-) is a sufficient but not necessary condition for a "low(er) NEP". Indeed, a "good" IRS only has a positive effect on the NEP if the External Conditions are "positive" (EC^+). If the EC are "negative", also a "good" IRS is not able to produce a positive effect on the NEP. Differently, a "bad" IRS has a negative effect on NEP also in the case of a "positive" EC. The possible existence of sistemic effects (SE), deriving from the interaction among all the (internal and external) variables, can have a further effect on NEP. In equation (3) a "good" IRS is defined as a system in which the positive internal factors overcome the negative internal factors[7]. Consequently, equation (4) defines a "bad" IRS. Analogously, in equation (5) the presence of "positive" External Conditions is defined as a situation in which the positive external factors overcome the negative external ones. Consequently, the presence of "negative" EC is defined in equation (6).

[1] $NEP = f(ER, NJC, UR, D, IE)$

with: $f'(ER) > 0$; $f'(NJC) > 0$; $f'(UR) < 0$; $f'(D) < 0$; $f'(IE) < (>) 0$

[2] $NEP = g(IRS / EC) + SE$

with: $g' > 0$ if: IRS^+ and EC^+

$g' < 0$ if: IRS^+ and EC^-

$g' < 0$ if: IRS^- and EC^+

$g' << 0$ if: IRS^- and EC^-

[3] IRS^+ if: $a_1CPC + a_2CDPT + a_3META + a_4\tau TS + a_5\alpha ALP - a_6\alpha PLP + a_7\beta LTW + a_8\gamma RLR > 0$

with: $0 < \tau, \alpha, \beta, \gamma < 1$

[6] The ambiguities are mainly due to the fact that (ceteris paribus) the presence of irregular employment is not necessarily a "negative" indicator of employment performance.

[7] The distinction between positive and negative factors is based on the potential effects on employment performance. So, in accordance with our definition of NEP, in this research we do not consider the differences in the "quality" of the jobs (e.g. the weight of the so-called "working poors") and other fairness aspects.

[4] IRS^{-} if: $a_1CPC + a_2CDPT + a_3META + a_4\tau TS + a_5\alpha ALP - a_6\alpha PLP + a_7\beta LTW + a_8\gamma RLR < 0$

[5] EC^{+} if: $b_i EXPF - c_i EXNF + d_1(1-\tau)TS + d_2(1-\alpha)ALP - d_3(1-\alpha)PLP + d_4(1-\beta)LTW + d_5(1-\gamma)RLR > 0$

[6] EC^{-} if: $b_i EXPF - c_i EXNF + d_1(1-\tau)TS + d_2(1-\alpha)ALP - d_3(1-\alpha)PLP + d_4(1-\beta)LTW + d_5(1-\gamma)RLR < 0$

The factors considered in the model are divided into three groups. A first group of factors which are internal to the industrial relations system: (1) co-operation and participation (+) vs. conflictuality (-) (CPC); (2) co-ordination of collective wage negotiations or decentralised wage negotiations with "price-taker" firms (+) vs. non-co-ordination or decentralisation with "price maker" firms (-) (CDPT); (3) unions' and employer associations' membership plus "third actor" role (+/-) (META). A second group of factors which are partly internal and partly external: (4) effectiveness of the training system (+/-) (TS); (5) active labour policies (+) (ALP) and passive labour policies (-) (PLP); (6) labour tax wedge (-) (LTW); (7) rigidity of labour regulation (-) (RLR). The fiscal and income policies can, in some periods, be completely external to the IRS, but often they are factors that are partly internal to the industrial relations system. Obviously, the third group of external positive factors (EXPF) and external negative factors (EXNF) is composed of a large number of variables which are completely external to the IRS but with potentially significant effects on the NEP.

Let's us now discuss the potential effect of each (set of) internal variable(s) on national employment performance. The degrees of industrial relations co-operation (at macro and micro levels), participation (at micro level) and conflictuality (at macro and micro levels) are important internal factors. The adoption of co-operative strategies by the unions and employers' associations can favour the creation and distribution of positive net employment benefit in a non-zero sum game. A significant degree of worker' participation can determine a higher worker' "effort" and favour a better solution of bargaining on the employment level and dynamics. On the contrary, a low degree of co-operation and participation together with a high degree of industrial relations conflictuality can negatively affect employment levels and dynamics. In particular, a high degree of industrial relations conflictuality contributes to increase economic uncertainty and a highly uncertain milieu for the firms remarkably affects the (quantitative and qualitative) decisions of investment in employment (Signorelli, 1990 and 1997). The great amount of literature based on the degree of centralisation / co-ordination of wage negotiations (e.g. Calmfors and Driffill, 1988, and Soskice, 1990) suggests that highly co-ordinated collective wage negotiations with "price-taker" firms allow a path of wage moderation that is an important condition for higher employment performances. The first two authors argue that also a decentralised system of wage negotiations leads to high performance, if the product markets are

characterised by a high degree of competition ("price-taker" firms). On the contrary, an intermediate (sectoral) level of collective wage bargaining without co-ordination favours higher wage dynamics (Calmfors and Driffill, 1988). The employment effects deriving from the strategies of unions and employers' associations depend on the membership composition and the "third actor" role. A high representation of pensioned and the usual absence of unemployed in the unions' membership can be counterbalanced by a strong active role of the "third actor"[8] in supporting the unemployed (and, secondarily, employed) interests. As for the employers' associations membership, an inadequate representation of the different groups of firms, divided according to dimension, sectors, regions, etc., can favour anomalous wage dynamics and negative effects on overall employment. These negative effects can be avoid by an active role of the "third actor" in the wage negotiation process.

As regards the second group of variables, a crucial positive factor that can favour a higher employment performance is the existence of an effective training system. It is important that the bargaining process between unions and employers' associations also regard (private and public) decisions to invest in vocational training, on-the-job training and permanent training, with an active role of the "third actor", due to some characteristics of "public good" of the "training production". Another positive factor is the adoption of active labour policies (effective services that favour matching between labour supply and labour demand; incentives for permanent training; incentives for the emersion of irregular employment; etc.), while the passive labour policies (high and lasting "unemployment benefits", early retirement, etc.) are potentially negative factors because they reduce the job search. A high (and increasing) labour tax wedge is a negative factor, favouring the diffusion of irregular employment and the substitution of labour with capital. Also the rigidity of labour regulation (limits to the types of contracts permitted; hire and fire rules; etc.) can be (rarely) autonomously decided by the government, (often) bargained with the social parts or (sometimes) "imposed" by the unions and employers' organisations. The effects on the national employment performance of rigid regulation and passive labour policies can be negative (a lower regular employment rate and higher irregular employment) especially in conditions of high economic uncertainty (Signorelli, 1997).

A large number of relevant external factors exists and we will only present some of them. Two crucial external factors are due to economic fluctuations (recession and recovery) with remarkable effects on short term dynamics and the long run level of national employment performance[9]. Another crucial positive (negative) factor is a high (low) degree of economic, social and institutional innovation and adaptability to changing conditions. This sort of systemic flexibility is crucial, especially in conditions of high systemic uncertainty (Killick, 1995). Other important factors are fiscal and monetary policies, the level and degree of (in)stability of economic growth, employment / growth elasticity, the

[8] The "third actor" is composed of the central government and regional/local administrations.
[9] Blanchard – Wolfers (1999) produced an interesting analysis of the possible joint effects of shocks and institutions on employment performance.

quality of the basic and academic educational system and the quantity and quality of R&D investment. All these factors can reinforce each other and have remarkable potential effects on the employment performance of a national economic system.

Therefore, in our opinion, it is extremely difficult to deny the possible existence of a causal link between industrial relations systems and national employment performances, but its nature could be more complex than expected. We argue that an important "asymmetry" probably exists: a "bad" industrial relations system is probably a sufficient but not necessary condition for low(er) national employment performance, while a "good" industrial relations system is probably a necessary but not sufficient condition for high(er) national employment performance. Obviously, the role played by the external conditions immediately derives from this proposition: the prevalence of the positive external factors can allow high(er) national employment performance (NEP) if the industrial relations system is "good", but it cannot avoid low(er) NEP in the presence of a "bad" industrial relations system. On the other hand, the prevalence of negative external conditions produces, in any case (also with a "good" industrial relations system), low(er) national employment performance. This "asymmetry" creates methodological problems to the traditional comparative approach, based on the correlation between ranking of countries according to performance indicators and IRS characteristics. In fact, low(er) employment performance can be associated with both a "bad" industrial relations system and a "good" industrial relations system, while high(er) employment performance can be associated only with a "good" industrial relations system.

Finally, it is important to highlight the probable existence of the following two characteristics in the complex relationship among IRS, EC and NEP. The first is due to the (probable) instability of the parameters of the explicative variables. We cannot exclude that the relative importance of each variable will change over time. The second, and more important, problem derives from the probable existence of "systemic effects" (SE). Different qualitativre and quantitative combinations of internal and external variables can produce, through complex interactions, additional (positive or negative) effects on NEP[10]. Thus, it is possible that different industrial relations systems have similar effects on national employment performance and, furthermore, we cannot exclude that similar industrial relations systems have significantly different effects on NEP. As a consequence, the relative importance of each internal variable can differ from one country to another and from one period to another, making it impossible to order the variables in a general and stable ranking.

4. INDUSTRIAL RELATIONS SYSTEMS (IRS) AND NATIONAL EMPLOYMENT PERFORMANCES (NEP)

Starting from the theoretical framework presented in Section 3, in this part we consider many indicators of labour market institutions (defining the industrial relations systems) and national

[10] Some recent research defines and tries to demostrate the possible "institutional equivalence" of different institutional systems (Bruno – Garofalo, 1999).

employment performances in order to make a first attempt to investigate the existence and nature of the causal link between IRS and NEP.

4.1. AN ASYMMETRICAL RELATIONSHIP ?

In the existing literature on industrial relations systems the authors generally use one or several simple institutional indicators to define IRS characteristics: (i) the level of collective bargaining and/or (ii) the degree of co-ordination of wage negotiations and/or (iii) the degree of co-operation.

The degree of centralisation is particularly low in the U.S.A., Canada and the U.K., while it is recognised as being very high in Austria, Norway, Sweden, Denmark and Finland. A significant degree of co-ordination and co-operation usually exists in the highly centralised systems, but also in Japan, Switzerland and Germany. As for Italy, it is generally recognised as a system with a low degree of co-operation (e.g. Blyth, 1979), co-ordination (e.g. Layard, Nickell and Jackman, 1991) and centralisation (e.g. Schmitter, 1981; Calmfors and Driffill, 1988). Although we completely agree with the first two propositions, we strongly disagree with the third one. In fact, in our opinion, Italy has been characterised by a high degree of "anomalous" centralisation[11], especially in the period 1975-1992, mainly due to the existence of an automatic system of wage indexation.

However, as has been highlighted in Section 3, for a better definition of the structural quality of the different industrial relations systems it is necessary to consider all the relevant internal variables[12] jointly.

The degree of industrial relations co-operation and participation was particularly high in Japan and significantly low in Italy and the U.S.A.. The degree of industrial relations conflictuality was particularly high in Italy. The effectiveness of the training system was high in Germany and low in Italy and Spain. As for the wage bargaining process, it was particularly positive[13] in the U.S.A. (decentralisation of wage bargaining with a high degree of competition in the product markets), Scandinavian countries (centralisation with co-ordination), Japan and Switzerland (decentralisation with co-ordination). In Italy the wage structure and dynamics were affected by the existence of an automatic system of wage indexation (1975-1992) and by the existence of non co-ordinated collective wage bargaining[14]. As for union membership, the weight of the pensioned is particularly high in Italy. Furthermore, in Italy a high degree of political instability considerably reduced the role of the "third actor", favouring the prevalence of union and employers' association strategies. The labour tax wedge was particularly high in Belgium, Italy, Germany and Sweden, while it was extremely low in Japan, Australia, New Zealand, Switzerland and the U.S.A. Employment protection and labour regulations

[11] A similar interpretation is expressed by Somaini (1998).
[12] The complete data-base is presented in the Appendix (Tables 3a, 3b, 3c and 3d).
[13] We only consider the effects on NEP, without analysing the fairness effects.
[14] As for the Italian case, see Signorelli (2000).

were particularly rigid in Italy, Spain and Portugal, while it was much more flexible in the U.S.A., Canada, New Zealand, Australia and Denmark.

Considering jointly (adding) the scores of (completely and partly) internal factors, it is possible to produce a synthetic index for each country and a new ranking of them according to the "quality" of the industrial relations system (Table 1 in the Appendix).

Japan, Norway and Switzerland received a high score and were characterised by a strong presence of all the positive factors and by a weak presence of the negative ones. The countries with a "bad" industrial relations system are France, Spain and Italy (up to 1992). In the Italian case the "negative" factors dominated almost all the period, especially in the 1970s, with the (partial) exception of the 1990s. On the contrary, the "positive" factors were very weak during the whole period, with a significant increase in the 1990s. Thus, the Italian industrial relations system was very "bad", until a significant positive change in the 1990s (Signorelli, 2000).

For a compared analysis of national employment performances (NEP)[15], we first consider the following three indicators: the employment rate, the net job creation and the unemployment rate. The compared employment performance significantly depends on the indicator used. As regards net job creation (NJC), in the period 1973-1996 it was particularly positive in the U.S.A. (+9.9), the Netherlands (+9.7), Norway (+9.1) and New Zealand (+7.8), while it was negative in Spain (-12.9), Finland (-7.8), France (-6.3), Germany (-4.7), Belgium (-4.1) and Italy (-3.8). In 1996 the employment rate was particularly high in Norway (76.8), Switzerland (76.1), U.S.A. (75.0), Denmark (74.7) and Japan (74.6), while it was particularly low in Spain (48.1), Italy (51.3), Belgium (56.6) and France (59.6). Considering the unemployment rate in 1996, it was particularly low in Japan (3.4), Switzerland (3.8), Norway (4.9), Austria (5.3) and the U.S.A. (5.4), while it was high in Spain (21.9), Finland (16.1), France (12.3) and Italy (12.0).

It is interesting to take into consideration the working-age population (WAP) composition divided into full-time employment, part-time employment, non-participating WAP, long-run unemployment and short-run unemployment. The ER levels are affected by the weight of part-time employment. The full time employment rate is higher in Portugal (61.4) and the U.S.A. (61.3), while it is lower in the Netherlands (41.9), Spain (44.3), Italy (47.9) and Belgium (48.7). The part-time employment rate is higher in the Netherlands (24.1), Switzerland (20.9) and Norway (20.4). The long term unemployment rate (as percent of working age population) is particularly high in Spain (7.4), Italy (4.7), Belgium (4.4) and Finland (4.3), while it is particularly low in the U.S.A. (0.4), Norway (0.5), Japan (0.5), New Zealand (0.7) and Austria (0.7). The non-participation rate (NPRWAP) is generally higher in countries with a lower employment rate: Italy (41.5), Spain (38.7), Belgium (36.2) and France (32.2). So, active participation in the labour market (participation rate) is positively correlated to the existence of

[15] The complete data-base is presented in the Appendix (Tables 4a and 4b).

employment opportunities (employment rate). As highlighted in our model, another important indicator for the definition of the NEP is the relevance of dualism in performance. For a better view of these differences ("dualism") in the structure of national employment performances, the unemployment rate and the employment rate should be divided into sex and age-classes. Dualism is particularly high in Spain and Italy, while it is quite low in Sweden, Japan, Norway, the U.S.A. and Germany. The weight of irregular employment in the various countries is not analysed due to limitations in the availability of reliable and comparable data[16].

In short, it arises that, during the period 1973-1996, Japan, Norway and Switzerland are quite stable in the top of the ranking, while Italy, Spain and France remain for the whole period at the bottom of the ranking. The U.S.A. experimented during the whole period a significant improvement in the NEP. On the contrary the NEP decreased significantly in Finland, but also partly in Sweden, during the period 1983-1996. Belgium, after a remarkable negative NJC in the period 1973-1983, remained at the bottom of the ranking.

By reformulating the compared empirical evidence for six variables, using a "benchmarking" methodology (Table 2 in Appendix), it is possible to obtain a synthetic index of the employment performances of each country and a new international ranking.

The synthetic index highlighted the extremely low performance of Spain (-3.15), the low NEP of Italy (a) and (b) (-0.94 and -1.13, respectively) and Belgium (-0.90), but also the inadequate NEP of Finland (-0.78), France (-0.65) and Germany (-0.34). According to the synthetic index the top of the ranking was obtained by Norway (+2.45) followed by the U.S.A. (+2.34), New Zealand (+1.88), Sweden (+1.49), Japan (+1.40) and Canada (+1.36).

Consider the synthetic index of the IRS "quality" together with the synthetic index of NEP, the following results arise (Graph 1 in Appendix): (A) all the countries with a structurally "bad" IRS [Italy (a), Spain and France] are characterised by a (stable) low(er) NEP; (B) all the countries with a (stable) high(er) NEP [Japan, Norway and Switzerland] are characterised by a structurally "good" IRS; (C) Belgium was characterised by a structurally "good" IRS and by a low(er) NEP; (D) Finland (and partly Sweden) experienced a period (1983-1996) of relevant reduction in NEP without significant structural changes in IRS; (E) Italy experienced a remarkable improvement in the quality of IRS (since 1992-93) without increases in NEP (1993-1996)[17]; (F) the U.S.A. experienced remarkable increases in NEP without significant changes in the IRS, for a long period (1973-1996).

All this evidence is compatible and, in our opinion, support the idea of an asymmetrical relationship (as highlighted in Section 3): a "good" IRS seem to be a necessary but not sufficient

[16] As for an analysis of the irregular employment in various countries, see Dallago (1990).
[17] As well-known, in the second half of 1990s Italy showed a significant increase in NEP, recovering the remarkable decrease in NEP during the first half of the 1990s

condition for a high(er) NEP, while a "bad" IRS seem to be a sufficient but not necessary condition for a low(er) NEP.

5. A PRINCIPAL COMPONENTS ANALYSIS

Using the principal components analysis we produce a second empirical investigation of the relationship between labour market institutions and employment performances.

5.1. METHODS

A statistical analysis was carried out by selecting the variables of IRS and NEP in nineteen OECD countries. Using all the variables selected in empirical investigation, we have no homogeneous data-time. In order to reduce this problem, the evaluation was carried-out considering some years in the period 1991-1995. The sample for the statistical analysis was created considering 20 variables (see Tables 3 and 4 in the Appendix). Due to the existence of quantitative and qualitative variables, the statistical investigation was conducted by means of the technique of principal component (PCA). Consequently, only the continous variables were used to extract information, i.e. factorial axes, whereas the variables with the categorical data were used as *supplementary nominal variables* (Lebart et al., 1997).

The factorial axes, extracted using the information from continous variables coming from the nineteen OECD countries, were used as benchmarks in relationships between IRS and NEP, while the variables relative to different years were treated as supplementary information. This approach allows the variations in some proxies (and the relative instability) to be taken into consideration. Indeed, the projection in the factorial axes represents a measure of correlation between the variables. Changes in the time-position is interpretable as a modification in the structure of the IRS and NEP, but not necessarily in their relationship. On the other hand, the time-invariant of the proxies show persistency in the benchmark structure. We use ALP97 (active labour market spending in 1997), EPL198 (Employement Protection Legislation for Regular Contracts in 1998) and EPL298 (Employement Protection Legislation for Temporary Contracts in 1998) to analyze the dynamic direction inside the factorial axes.

The next step was to carry out more through investigation by introducing *supplementary nominal* indicators capable of illustrating and interpreting the presence of constraints in the NEP and IRS separately. Technically, we link the nominal variable with *m* modalities at the *n* groups of the countries defined for the modalities of the variables. We use these *n* country groups as supplementary information (individual supplementary). The nearness in the projection of the modalities in the countries' space represents the dominant characteristics or, in some cases, the constraint factors in the relationship between IRS and NEP indicators. The variables used are the degree of centralisation of wage negotiations (CENT) and the degree of co-ordination of wage negotiations (CDPT). In particular, the first variable is distinguished in CENT1 (high decentralisation), CENT2 (intermediate decentralisation)

and CENT3 (high centralisation). The relationships are directly interpreted as a function of the distance between country projections and variable modalities. Similarly, the degree of co-ordination is distinguished in CDPT1 (high) and CDPT2 (low).

5.2 Investigation Results: a Complex Relationship

The results of the statistical analysis (Table 9 in the Appendix) show a good level of variance in the first five factorial axes (85%), the first representing 44% of all the information contained in the data: Graph 2-5 give the representation of the initial variables projected onto the factorial axes. The number of factorial axes considered in the principal component analysis respect the rule of selecting those with an eigenvalue of more than 1.

The analysis of the first component (factor 1) indicates the dichotomy between countries with a high level of unemployment (and non-employment) indicators (URW, SRW and NRW) and countries with a high net job creation (NJC), part-time and full-time employment (PTER and FTER) and employement rate (ER). The IRS indicators are not statistically significant, as highlighted in Graph 2 and Table 5 (low correlation between initial variables and projection in the first factorial axis). In short, the first factorial axis distinguishes countries with a low NEP in the positive semi-axis from countries with a high NEP in the negative semi-axis.

The second component (factor 2) is negatively characterised in NEP indicators (employment rate dualism, ERD), while the positive semi-axis is characterised in IRS indicators. In particular, in Graph 2**,** the positive semi-axis is characterised by the union density (ME1), bargaining coverage (ME2) and active labour market policies (ALP). In short, the second factorial axis is characterised by "good" IRS indicators opposed to a specific NEP indicator (ERD).

The third component (factor 3) is characterised by the presence of the following variables in the positive semi-axis of Graph 3: employment protection legislation for regular contracts (EPL1), employment protection legislation for atypical contracts (EPL2), long-term unemployment (LTW), employment dualism, male-female (ERD), and net job creation (NJC). In the negative semi-axis we have the variables: working-days not worked due to strikes (CPC) and short term unemployment (SRW). In short, the third axes is characterized by "good" IRS indicators opposed to low NEP indicators.

The fourth component extracted (factor 4) is characterized by negative values of the IRS indicators, while the NEP indicators resulted close to zero, with the exception of part-time employment (PTER) in the negative semi-axis and full-time employment (FTER) in the positive semi-axis (Graph 4). Thus, as regards the forth factorial axis, we cannot find a relationship between IRS indicators and NEP indicators. However, a characteristic of this axis is the negative sign of benefit duration (BD) together with the part-time indicator.

The fifth axis (Graph 5) is characterised by the relationship between benefit replacement rate (BRR) and two important NEP indicators: net job creation (NJC) and full-time employment rate (FTER). In short, the fifth axis highlights the relations between IRS indicators in the positive semi-axis and NEP indicators in the negative semi-axis.

On examination of the position of the projections of countries compared to the first axis (Graph 6 and Table 6 in the Appendix), it is evident that two large, separate groups exist; the proximity of two countries within the group shows similar profiles regarding the variables introduced in the statistical analysis. On one side we find Italy, Spain and Belgium, while the USA, Japan and Norvay are in the opposite side. However, the projections in the principal components are not a sufficient condition to express the similarities between two group of countries. For this reason a measure of the quality of the representation was inserted (Lebart – Morineau - Piron, 1997) (Table 7 in the Appendix).

The countries that contribute most to the second axis (Graph 6 in Appendix) are, in decreasing order, Sweden, Finland, and Denmark in a positive direction. In the negative direction, the axis is characterized above all by Japan, the USA, Italy, Spain and, to a lower degree, New Zealand.

Finland, Spain and Canada are the countries that typify the third factorial axis in the positive space (Graph 7 in Appendix). The countries on the negative side of the axis are Netherlands**,** Belgium, Austria and Germany, but they are not statistically significant. In fact, the indicators CPC and SRW, characterising the negative semi-axis, do not have a statistically significance and, as a consequence, also the countries in this semi-axis are not statistically significative.

The countries that contribute most to the fourth axis (Graph 8 in the Appendix) are Portugal and Japan, in the positive semi-axis, and Australia, New Zealand, the Netherlands and The United Kingdom, in the negative semi-axis. Also in that case, only the indicator BD (benefit duration) resulted in being significative in characterising the negative semi-axis.

The fifth factorial axis (Graph 9 in the Appendix**)** is characterised in the positive part by Spain, Switzerland and the Netherlands, while in the negative semi-axis we find Italy, Portugal, Austria and New Zealand.

The results in Table 7, as a measure of efficiency value, show on the average a good representation of the 19 countries, with values ranging from 0.61 for Great Britain to 0.89 for Italy. Moreover, the relative contribution of the countries for each factorial axis was extracted. In accordance with what emerged from the analysis of the principal components, the first five countries assumed almost 64% of the weight in the first axis; in the second factorial axis the weight was reduced to 51%. The third and fourth axes have values of around 60%. Finally, in the fifth axis the countries explain 55%. These results, along with the relative contributions of the countries to the factorial axes, favour a simultaneous interpretation of the factors extracted and the countries.

As regards the projection of the supplementary nominal variables, it clearly shows that Japan, New Zealand and the USA have a high degree of decentralisation, in opposition to Sweden, Denmark and

Finland which are characterised by high centralisation. The countries with decentralised wage bargaining were characterised by high NEP, while the countries with higher centralisation can have both a high or low NEP. As regard the CDPT indicator, a high degree of coordination (CDPT3) is found in Norway, Finland, Denmark and Sweden, where the IRS indicator assumes a high and positive value, while lower levels of coordination are near zero. A high degree of coordination is associated with higher active labour market spending, while a low degree of coordination can be associated with high or low ALP.

Finally, the projection of the illustrative variables on the axes of the principal components shows great variability. The first axis is only characterised by NEP indicators. The second axis is characterised by a reduction of ALP, especially in the Scandinavian countries. In the third axis a reduction in ELP1 and ELP2 indicators is highlighted. In the fourth axis the indicators ELP198 and ALP97 (illustrative variables) are statistically significative, with a reduction on active labour policies in Australia, UK, the Netherlands and New Zealand.

5.3 Clusters and Asymmetrical Relationships

As highlighted in Section 3, any empirical investigation is particularly difficult, due to the probable instability of the parameters and to the presence of "systemic effects". The results of a statistical analysis of the principal components does not support the idea of a simple direct relationship between IRS indicators and NEP indicators and tend towards a more complex causal link.

The information in the first factorial axis highlighted indicators of high NEP in the negative side and indicators of low NEP in the positive semi-axis. The IRS indicators in the second, third, fourth and fifth axes allowed the fundamental characteristics of the relationship between industrial relations systems (IRS) and national employment performances (NEP) to be highlighted. As summarised in Table 8, a "good" IRS is related to high NEP in Japan, the USA, Sweden, Norway, Denmark and Switzerland, while a "bad" IRS is related to a low NEP in Italy, Belgium and France. Spain, Finland and Canada are characterised by a "good" IRS and low NEP, highlighting a possible asymmetrical relationship. As for the other countries, an undefined NEP corresponds to the IRS characterisation. Notice that there are no countries with a "bad" IRS and a high NEP.

All this evidence is compatible with and supports the idea of an asymmetrical relationship (as highlighted in Section 3): a "good" IRS seems to be a necessary but not sufficient condition for high(er) NEP, while a "bad" IRS seems to be a sufficient condition for low(er) NEP.

6. Conclusions and Policy Implications

It is certainly problematic to support the idea of a simple direct causal link between industrial relations systems and national employment performance, but it seems to be much more difficult to deny the possible existence of any kind of relationship. The model presented highlights the possible complex

and asymmetrical nature of the causal link between industrial relations systems and national employment performance. Some results of two empirical analyses surely confirm the idea of a complex relationship between labour market institutions and performance and, furthermore, both investigations support the idea of a "double asymmetry" in the relationship between IRS and NEP (Table 1).

Therefore, the main finding of this research is that the existence of a "good" industrial relations system does not guarantee high(er) national employment performance, due to the possible dominant negative effects of external factors, while the presence of "bad" industrial relations systems is a sufficient condition for a low(er) national employment performance, without significant possibilities for the (positive) external factors to change the performance.

Table 1 - The "double asymmetry"

"GOOD" INDUSTRIAL RELATIONS SYSTEM	"BAD" INDUSTRIAL RELATIONS SYSTEM
necessary condition for high(er) national employment performance	not necessary condition for low(er) national employment performance
not sufficient condition for high(er) national employment performance	sufficient condition for low(er) national employment performance

The above results have a number of quite important implications. Despite asymmetrical effectiveness, the crucial role of the industrial relations system for high national employment performance is strongly confirmed. The "decision makers" of unions, employers' associations and, especially, the "third actor" have a great behavioural responsibility in avoiding the creation and / or the permanence of a "bad" industrial relations system [with consequently low(er) employment performance] and in favouring the realisation and / or the maintenance of a "good" industrial relations system [without blocking the possibility of a high(er) employment performance].

Furthermore, a higher national employment performance permits higher investment in human capital[18] and produces a larger labour income distribution, with positive consequences on the economic competitiveness and social cohesion of a national system. In conditions of national systems that are increasingly being opened and integrated, high economic competitiveness and social cohesion are crucial positive factors affecting the medium / long run national employment performance. This important virtuous circle can be allowed by a "good" industrial relations system or blocked by a "bad" industrial relations system.

REFERENCES

Amendola A. (1998) (a cura di) *Istituzioni e Mercato del Lavoro*, ESI, Napoli.

Amendola A., Caroleo F. E. e Garofalo M. R. (1997) "Labour Market and Decentralised Decision-making: An Institutional Approach", *Labour*, 3.

Bassanini A. and Ekkehard Ernst (2002) "Labour Market Institutions, Product Market Regulation, and Innovation: Cross-Country Evidence", *OECD Economic Department Working Papers n. 316*.

Biagioli M. (1997) (a cura di) *L'Analisi Economica delle Relazioni Industriali*, ESI, Napoli.

Blanchard O. (2000) "What Do we Know About macroeconomics that Fisher and Wicksell Did Not ?", *Working Paper 7550 NBER*.

Brunetta R. - Dell'Aringa C. (eds.) (1990) *Labour Relations and Economic Performance*, Macmillan, London.

Bruno B. – Garofalo M. R. (1999) "Equivalenza Istituzionale e Modelli di Contrattazione" in M. Biagioli, F.E. Caroleo and S. Destefanis (eds.) *Struttura della Contrattazione, Differenziali Salariali e Occupazione in Ambiti Regionali*, ESI, Napoli.

Calmfors L. and Driffill J. (1988) "Bargaining Structure, Corporatism and Macroeconomic Performance", *Economic Policy*, n. 6, pp. 13-47.

Calmfors L. (1993) "Centralisation of Wage Bargaining and Economic Performance: A Survey", *OECD Economic Department Working Papers*, n. 131.

Cella G. P. and Treu T. (eds.) (1998) *Le Nuove Relazioni Industriali*, Il Mulino, Bologna.

Chiesi A., Regalia I. and Regini M. (eds) (1995) *Lavoro e Relazioni Industriali in Europa*,

Crouch C. (1993) *Industrial Relations and European State Traditions*, Oxford University Press.

Dallago B. (1990) *The Irregular Economy. The "Underground" Economy and the "Black" Labour Market*, Dartmouth.

Del Boca D. (1990) *Relazioni Industriali e Mercato del Lavoro*, NIS, Roma.

Genda Y., Pazienza M. G. and Signorelli M. (2000) "Labour Market Performance and Job Creation", in A. Boltho, A. Vercelli and H. Yoshikawa (eds.) *Comparing Economic Systems: Italy and Japan*, Palgrave, London and New York.

Killick T. (1995) *The Flexible Economy. Causes and Consequences of the Adaptability of National Economies*, Routledge, London.

Layard R., Nickell S. and Jackman R. (1994) *The Unemployment Crisis*, Oxford University Press, Oxford.

Lebart L., Morineau A., Piron M. (1997) Statistique exploratoire multidimensionnelle, Dunod Paris.

Lindbeck A. and Snower D. (1998) *The Insider-Outsider Theory of Employment and Unemployment*, MIT Press, Cambridge , Mass.

[18] The investment in human capital is a positive function of the employment rate due to learning by doing process and on-the-job training.

Locke R. and Baccaro L. (1996) "Learning from Past Mistakes? Recent Reforms in Italian Industrial Relations", *Industrial Relations Journal*, n. 4.

Locke R., Kochan T. and Piore M. (1995) "Reconceptualizing Comparative Industrial Relations: Lesson from International Research", *International Labour Review*, n. 2.

Metcalf D. (1993) "Industrial Relations and Economic Performance", *British Journal of Industrial Relations*, 31:2 June.

Modigliani F., Fitoussi J. P., Moro B., Snower D., Solow R., Steinherr A. and Sylos Labini P. (1998) "Manifesto Contro la Disoccupazione nell'Unione Europea", *Moneta e Credito*, September.

Moro B. (2000) "Occupazione e Politiche per l'Occupazione in Europa", *Rivista di Politica Economica*, luglio-agosto.

Nickell S. (1999) "Product Markets and Labour Markets", *Labour Economics*, n. 6, pp. 1-20.

Nickell S. and Layard R. (1997) "Labour Market Institutions and Economic Performance", Institute of Economics and Statistics, *Working Paper N. 60*, University of Oxford.

Nicoletti G., Scarpetta S. and Boylaud O. (2000) "Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation", *OECD Economic Department Working Papers n. 226*.

OECD (1994) *The OECD Jobs Study: Facts, Analysis and Strategies*, Paris.

OECD (1995) *The OECD Job Study: Implementing the Strategy*, Paris.

OECD (1997) *Labour Force Statistics*, Paris.

OECD (1997) "Recent Labour Market Developments and Prospects", *Employment Outlook*, Paris.

OECD (1997) "Economic Performance and the Structure of Collective Bargaining", *Employment Outlook*, Paris.

OECD (1999) *Implementing the OECD Jobs Strategies – Assessing Performance and Policy*, Paris

Regini M. (1995) *Uncertain Boundaries. The Social and Political Construction of European Economies*, Cambridge University Press, Cambridge.

Reyneri E. (1998) "Mercato e Politiche del Lavoro", in Cella and Treu (eds) *Le Nuove Relazioni Industriali*, Il Mulino, Bologna.

Rogers J. and Streek W. (1995) (eds.) *Work Council, Consultation, Representation and Cooperation in Industrial Relations*, The University of Chicago Press, Chicago.

Scarpetta S. (1996) "Assessing the Role of Labour Market Policies and Institutional Settings on Unemployment: A Cross-Country Study", OECD *Economic Studies*, n. 26.

Signorelli M. (1990) "Incertezza, Flessibilità e Domanda di Lavoro. Un Tentativo di Chiarificazione Concettuale", *Economia & Lavoro*, n. 3.

Signorelli M. (1997) "Uncertainty, Flexibility Gap and Labour Demand in the Italian Economy", *Labour*, n.1, pp. 141-175.

Signorelli M. (2000) “Relazioni Industriali e Occupazione in Italia in una Prospettiva Comparata”, *Stato e Mercato*, n. 3.

Signorelli M. and Vercelli A. (1994) “Structural Changes in the Post-War Italian Economy”, in *Economic Performance: a Look at Austria and Italy*, Boehm B. and Punzo L. F. (ed.), Physica-Verlag, Heidelberg.

Solow R. (1990) *Labour Market as a Social Institution*, Oxford: Basil Blackwell.

Somaini E. (1998) “Politica Salariale e Politica Economica”, in Cella and Treu (eds) *Le Nuove Relazioni Industriali*, Il Mulino, Bologna.

Soskice D. (1990a) “Reinterpreting Corporatism and Explaning Unemployment: Coordinated and Non-Coordinated Market Economies”, in Brunetta R. and Dell’Aringa C. (eds) *Labour Relations and Economic Performance*, Macmillan, London.

Soskice D. (1990b) “Wage Determination: the Changing Role of Institutions in Advanced Industrialized Countries”, *Oxford Review of Economic Policy*, vol. 6.

Tarantelli E. (1986) *Economia Politica del Lavoro*, Utet, Torino.

APPENDIX A: LIST OF THE VARIABLES

A1 – Industrial Relations System Variables

(eventual different variable acronyms used in PCA are in bracket)

CPC* = annual average of working days not worked per 1,000 employees in all industries and services; period 1986-1995; Before 1993 West Germany; From 1993 Germany; Italy (a) = 1986-90; Italy (b) = 1991-95. Source: ILO.

CDPT* (CDPT1; CDPT2; CDPT3) = Oecd average value (1980, 1990 and 1994) on the degree of co-ordination [value between 1= low co-ordination and 3= high co-ordination]. Source: OECD - Employment Outlook 1997.

META1*(ME1) = average of union density (1980, 1990 and 1994); Italy (a) = average 1980 and 1990; Italy (b) = 1994. Source: OECD - Employment Outlook 1997.

META2*(ME2) = average of bargaining coverage (1980, 1990 and 1994); Italy (a) = average 1980 and 1990; Italy (b) = 1994. Source: OECD - Employment Outlook 1997.

META3* = government involvement in wage bargaining (1989-1994). Source: Golden, Lange and Wallerstein (1997).

ALP = active labour market spending (1991) as % of GDP divided by current unemployment. Source: OECD (1995).

ALP**-99 = active labour market spending (1999) as % of GDP. Source: OECD (2000).

ALP**-90 = active labour market spending (1990) as % of GDP. Source: OECD - Employment Outlook.

ALP**-95 = active labour market spending (1995) as % of GDP. Source: OECD - Employment Outlook.

ALP**-97 (ALP97) = active labour market spending (1997) as % of GDP. Source: OECD - Employment Outlook..

PLP**-99 = passive labour market spending (1999) as % of GDP. Source: OECD (2000).

LTW* = labour tax wedge: include all the social contributions and the direct income taxation for a single worker (average between 1985 and 1995); Italy (a) = 1985; Italy (b) = 1995. Source: OECD, The Tax / Benefit Position of Production Workers, Paris.

RRLR1* = Employment Protection: country ranking with 20 as the most strictly regulated (1990). Source: OECD Job Study (1994), part II, Table 6.7, Col 5.

EPL1**-90 (EPL1) = Employment Protection Legislation for Regular contracts (1990). Source: Nicoletti - Scarpetta - Boylaud (2000), Table A3.9. Ranking from 0 (soft regulation) to 6 (strict regulation).

EPL1**-98 (EPL198) = Employment Protection Legislation for Regular contracts (1990). Source: Nicoletti - Scarpetta - Boylaud (2000), Table A3.9. Ranking from 0 (soft regulation) to 6 (strict regulation).

EPL2**-90 (EPL2) = Employment Protection Legislation for Temporary contracts (1990). Source: Nicoletti - Scarpetta - Boylaud (2000), Table A3.10. Ranking from 0 (soft regulation) to 6 (strict regulation).

EPL2**-98 (EPL298) = Employment Protection Legislation for Temporary contracts (1990). Source: Nicoletti - Scarpetta - Boylaud (2000), Table A3.10. Ranking from 0 (soft regulation) to 6 (strict regulation).

RRLR2* = Labour Standard: this is a synthetic index whose maximum value is 10 and refers to labour market standards enforced by legislation on, successively, working time, fixed term contracts, employment protection, minimum wages and employees representation rights. Each of these is scored from 0 (lax or no legislation) to 2 (strict legislation) and the scores are then added up. Source: OECD Job Study (1994), Table 4,8, Col 6, extended by Nickell and Layard (1997).

CENT (CENT1; CENT2; CENT3) = degree of centralisation of wage negotiations; value between 1 (high decentralisation) and 3 (high centralisation); average 1980, 1990 and 1994; Italy (a) = average 1980 and 1990; Italy (b) = 1994. Source: OECD - Employment Outlook (1997).

WTR = working time regulation (from 0 to 3).

FTCR = fixed term contract regulation (from 0 to 3).

MWR = minimum wage regulation (from 0 to 3).

ERR = employment right regulation (from 0 to 3).

BRR = benefit replacement rate (unemployment benefit as % of income) (1994).

BD = benefit duration (years) (1994).

A2 – National Employment Performance Variables

(eventual different variable acronyms used in PCA are in bracket)

ER =employment rate (1996); Italy (a) = 1993; Italy (b) = 1996; Finland (a) = 1983; Finland (b) = 1996; Sweden (a) = 1983; Finland (b) = 1996; U.S.A. (a) = 1973; U.S.A. (b) = 1996. Source: Oecd - Employment Outlook (1997)

UR = unemployment rate (1996); Italy (a) 1993; Italy (b) = 1996; Finland (a) = 1983; Finland (b) = 1996; Sweden (a) = 1983; Finland (b) = 1996; U.S.A. (a) = 1973; U.S.A. (b) = 1996. Source: Oecd - Employment Outlook (1997)

NJC = net job creation (1973-1996); Italy (a) = 1973- 1993; Italy (b) = 1993-1996; Finland (a) = 1973-1983; Finland (b) = 1983-1996; Sweden (a) = 1973-1983; Finland (b) = 1983-1996. Source: Oecd - Employment Outlook (1997)

LTURWAP (LTU) = long term unemployment (more than one year) x 100 / working age population (15-64) 1996. Source: Oecd - Employment Outlook (1997)

ERD = ER male - ER female (1996). Source: Oecd - Employment Outlook (1997).

ER55-64 = employment rate for the age-class 55-64. Source: Oecd - Employment Outlook (1997).

PTER = part-time employment x 100 / working age population (15-64) 1996. Source: Oecd - Employment Outlook (1997).

FTER = full-time employment x 100 / working age population (15-64) 1996. Source: Oecd - Employment Outlook (1997).

URWAP (URW) = unemployment x 100 / working age population (15-64) 1996. Source: Oecd - Employment Outlook (1997)

STURWAP (SRW) = short term unemployment (less than one year) x 100 / working age population (15-64) 1996. Source: Oecd - Employment Outlook (1997)

NPRWAP (NRW) = non participation rate as % of WAP = 100 - (ER + URWAP)1996. Source: Oecd - Employment Outlook (1997).

APPENDIX B - TABLES AND GRAPHS

Table 1 – Industrial Relations Systems: Structural Characteristics and Synthetic Index

	CPC (+/-)	CDPT (+/-)	META (+/-)	τTS (+)	α(ALP-PLP) (+/-)	βLTW (-)	γRRLR (-)	SYNTHETIC INDEX		RANKING (S. I.)
Australia	+2	+4	-2	+3	+1	-1	-1	**+6**		**Japan**
Austria	+7	+7	-1	+4	+2	-3	-3	**+13**		**Norway**
Belgium	+5	+4	-2	+3	+1	-5	-3	**+3**		**Switzerland**
Canada	+2	+6	-1	+3	+1	-2	-1	**+8**		**Sweden**
Denmark	+4	+5	-3	+3	+3	-4	-1	**+7**		**Germany**
Finland	+1	+6	+2	+4	+4	-3	-2	**+12**		**Austria**
France	-2	0	-2	+2	+1	-3	-2	**-6**		**Finland**
Germany	+7	+7	+1	+5	+4	-4	-2	**+18**		**U.S.A.**
Italy (a)	-7	-6	-5	+1	-3	-5	-5	**-30**		**Canada**
Italy (b)	+3	+4	-1	+2	+2	-5	-3	**+2**		**Denmark**
Japan	+9	+8	+2	+5	+2	-1	-1	**+24**		**Netherlands**
Netherlands	+4	+3	+1	+3	+1	-4	-1	**+7**		**U.K.**
New Zealand	+1	+2	-1	+2	+2	-2	0	**+4**		**Australia**
Norway	+7	+7	+2	+4	+4	-3	-1	**+20**		**N. Zealand**
Portugal	+2	+1	-2	+2	+3	-2	-3	**+1**		**Belgium**
Spain	-6	-1	-2	+1	-1	-3	-4	**-16**		**Italy (b)**
Sweden	+7	+6	+2	+4	+5	-4	-3	**+17**		**Portugal**
Switzerland	+8	+7	+3	+3	+2	-2	-1	**+20**		**France [-]**
U. K.	-1	+5	+1	+2	+2	-2	-1	**+6**		**Spain [-]**
U.S.A.	0	+8	+1	+1	+2	-2	0	**+10**		**Italy (a) [-]**
Mean (20)	+2.65	+4.15	-0.35	+2.85	+1.90	-3.00	-1.90	**+6.30**		

Legend:

CPC = co-operation and participation (+) vs. conflictuality (-) (from -10 to +10). The score of this index is based on quantitative information, working days lost due to strikes per 1,000 employees (-) (ILO – Yearbook of Labour Statistics) with few adjustments based on qualitative information (degree of workers' partecipation to the firms' decisions; existence of "quality circles", etc.).

CDPT = co-ordination and firms' "price-takers" (+) vs. non co-ordination and firms' "price-makers" (-) (from -10 to +10). The score of this index is based on the degree of co-ordination of wage negotiations (+) (OECD, 1997) and on the degree of competition in the product markets (+).

META = Active "third actor" role (+) vs. union and employer associations' membership (-) (from -10 to +10). The score of this index is based on the union density (-), pensioned / employed ratio in union membership (-) and political stability (+).

TS = effective training system (from +1 to +10). The score of this index is based on the "quality" of the training system (+), the quantity of training investment compared to GDP (+) and the diffusion of bargaining related to training investment (+).

(ALP-PLP) = active labour policies and passive labour policies (from -10 to +10). The score of this index is based on the prevalence of ALP (+) or PLP (-).

LTW = labour tax wedge (from -1 to –10). The score of this index is based on the level of "non wage costs".

RLR = rigidity of the regulation of labour relations (from -1 to -10). The score of this index is based on OECD (1994) and Nickell – Layard (1997).

SYNTHETIC INDEX = the synthetic index for each country is simply obtained from the algebric sum of the seven scores. Notice that the first three variables, completely internal to IRS, have been scored on a scale of –10 to +10, because they are a combination of both positive and negative factors. The same is true for the indicator (ALP-PLP), but due to the parameter α=0.5, it has been scored on a scale of –5 to +5. The other three indicators, considering the same parameter equal to 0.5, have been scored on a scale of +1 to +10 (TS) and of –1 to –10 (LTW and RRLR).

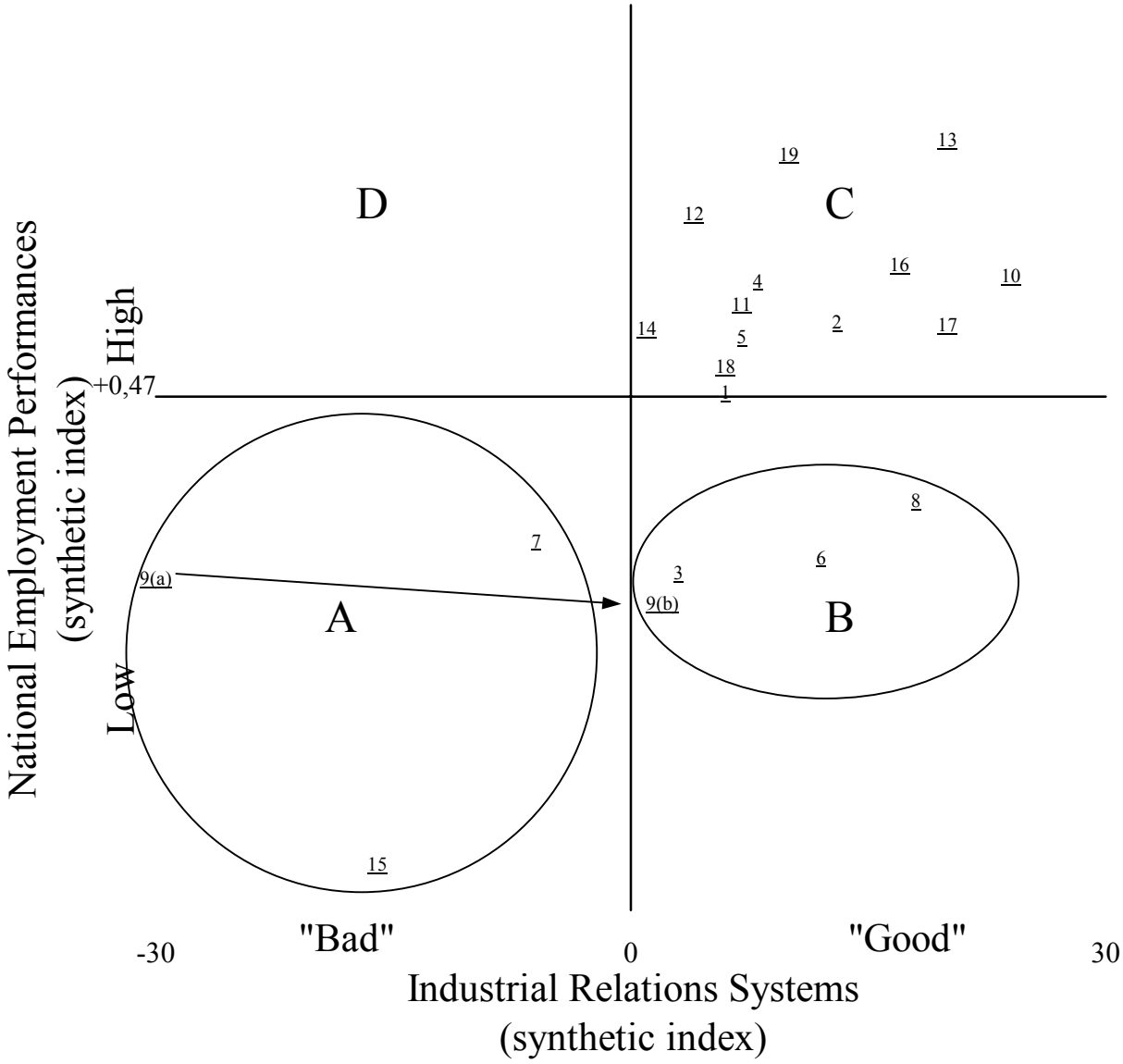
Note: 1) We consider that all the second group of factors are considered as internal to the IRS at 50% .
2) Italy (a): 1970-1992; Italy (b): 1993-2000.

Table 2 – National Employment Performances: Compared Evisences and Synthetic Index

	er (+)	njc (+/-)	ur (-)	ltur (-)	erd (+)	er 55-64 (+)	SYNTETIC INDEX		RANKING (S. I.)
Australia	+0.89	-0.02	-0.28	-0.20	-0.54	+0.65	**+0.50**		**Norway**
Austria	+0.89	+0.37	-0.10	-0.04	-0.53	+0.45	**+1.04**		**U.S.A.**
Belgium	+0.74	-0.41	-0.33	-0.57	-0.67	+0.34	**-0.90**		**New Zealand**
Canada	+0.89	+0.55	-0.34	-0.09	-0.33	+0.68	**+1.36**		**Sweden**
Denmark	+0.97	-0.05	-0.19	-0.16	-0.37	+0.73	**+0.93**		**Japan**
Finland	+0.81	-0.79	-0.69	-0.56	-0.09	+0.54	**-0.78**		**Canada**
France	+0.78	-0.64	-0.48	-0.40	-0.43	+0.52	**-0.65**		**Netherlands**
Germany	+0.83	-0.47	-0.30	-0.37	-0.58	+0.55	**-0.34**		**Austria**
Italy (a)	+0.69	-0.24	-0.39	-0.50	-0.93	+0.43	**-0.94**		**Switzerland**
Italy (b)	+0.66	-0.14	-0.46	-0.61	-1.00	+0.42	**-1.13**		**Portugal**
Japan	+0.97	+0.38	0.00	-0.01	-0.92	+0.98	**+1.40**		**Denmark**
Netherlands	+0.86	+0.98	-0.17	-0.27	-0.68	+0.46	**+1.18**		**U.K.**
New Zealand	+0.94	+0.79	-0.15	-0.04	-0.49	+0.83	**+1.88**		**Australia**
Norway	+1.00	+0.92	-0.08	-0.01	-0.34	+1.00	**+2.45**		**Germany**
Portugal	+0.88	+0.48	-0.22	-0.34	-0.52	+0.71	**+0.99**		**France**
Spain	+0.63	-1.30	-1.00	-1.00	-0.99	+0.51	**-3.15**		**Finland**
Sweden	+0.95	-0.09	-0.25	-0.10	0.00	+0.98	**+1.49**		**Belgium**
Switzerland	+0.99	-0.16	-0.02	-0.06	-0.62	+0.89	**+1.02**		**[Italy (a)]**
U. K.	+0.92	-0.04	-0.26	-0.29	-0.37	+0.74	**+0.70**		**[Italy (b)]**
U.S.A.	+0.98	1.00	-0.11	0.00	-0.39	+0.86	**+2.34**		**Spain**
mean (20)	+0.87	+0.06	-0.29	-0.24	-0.52	+0.68	**+0.47**		

Legend:
$er_i = ER_i / ER_{max}$ [(1996), except Italy (a): 1993]
[employment rate of the country i / highest employment rate (Norway)]
$njc_i = NJC_i / NJC_{max}$ [1973-1996, except Italy (a): 1973-1993 and Italy (b): 1993-1996]
[net job creation (+) or destruction (-) of the country i / NJC U.S.A.]
$ur_i = (UR_i – UR_{min}) / (UR_{max} - UR_{min})$ [range: from 0 to 1] [(1996), except Italy (a): 1993]
[(unemployment rate in the country i – the lowest unemployment rate) / (the highest unemployment rate – the lowest unemployment rate)]
$ltur_i = (LTURWAP_i – LTURWAP_{min}) / (LTURWAP_{max} - LTURWAP_{min})$ [range: from 0 to 1] [(1996), except Italy (a): 1993]
[(long term unemployment rate in the country i – the lowest long term unemployment rate) / (the highest long term unemployment rate – the lowest long term unemployment rate)]
$erd_i = [(ERM–ERF)_i – (ERM–ERF)_{min}] / [(ERM–ERF)_{max} – (ERM–ERF)_{min}]$ [range: from 0 to 1] [(1996), except Italy (a): 1993]
[(gender gap of the employment rate in the country i – the lowest gender gap in employment rate) / (the highest gender gap in employment rate – the lowest gender gap in employment rate)]
$er\ 55\text{-}64 = (ER\ 55\text{-}64)_i / (ER\ 55\text{-}64)_{max}$ [(1996), except Italy (a): 1993]

Graph 1 - Industrial Relations Systems and National Employment Performances



Legend: - Industrial Relations Systems (IRS): synthetic index of Table 1.
- National Employment Performance (NEP): synthetic index of Table 2.
- (1) Australia; (2) Austria; (3) Belgium; (4) Canada; (5) Denmark; (6) Finland; (7) France; (8) Germany; (9a) Italy 1973-1993; (9b) Italy 1993-1996; (10) Japan; (11) Netherlands; (12) New Zealand; (13) Norway; (14) Portugal; (15) Spain; (16) Sweden; (17) Switzerland; (18) United Kingdom; (19) United States.
- The distinction between Low and High NEP is based on the mean of the synthetic index.

A: "Bad" IRS and Low NEP [Spain, Italy (a) and France]

B: "Good" IRS and Low NEP [Italy (b), Belgium, Finland and Germany]

C: "Good" IRS and High NEP [13 countries]

D: "Bad" IRS and High NEP [0]

Table 3a - Industrial Relations Systems Data-base

	CPC	CPC	CPC	CDPT*	CDPT	CDPT	CDPT	META1*	META1	META1	META1
		86-90	91-95		1980	1990	1994		1980	1990	1994
Australia	176	224	130	1.83	2	2	1.5	41.3	48	41	35
Austria	4	2	6	3	3	3	3	48	56	46	42
Belgium	38	48	32	2	2	2	2	53.7	56	51	54
Canada	292	429	159	1	1	1	1	36.7	36	36	38
Denmark	43	41	45	2.17	2.5	2	2	74.3	76	71	76
Finland	321	410	218	2	2	2	2	74.3	70	72	81
France	102	111	94	2	2	2	2	12.3	18	10	9
Germany	12	5	17	3	3	3	3	32.7	36	33	29
Italy (a)	315	315		1.5	1.5	1.5		44	49	39	
Italy (b)	183		183	2.5			2.5	39			39
Japan	4	5	3	3	3	3	3	26.7	31	25	24
Netherlands	24	13	33	2	2	2	2	29	35	26	26
New Zealand	242	425	55	1.17	1.5	1	1	43.7	56	45	30
Norway	102	142	62	2.5	2.5	2.5	2.5	57	57	56	58
Portugal	57	82	34	2	2	2	2	41.6	61	32	32
Spain	534	602	469	2	2	2	2	13.7	9	13	19
Sweden	94	134	50	2.17	2.5	2	2	84.7	80	83	91
Switzerland	1	0	1	2	2	2	2	28.3	31	27	27
U.K.	81	137	24	1.17	1.5	1	1	41	50	39	34
U.S.A.	62	82	42	1	1	1	1	18	22	16	16

Table 3b - Industrial Relations Systems Data-base

	META2*	META2	META2	META2	META3*	ALP*	ALP**	ALP**	ALP**	ALP**	PLP**
		1980	1990	1994			1999	1990	1995	1997	1999
Australia	82.7	88	80	80	10	3.2		0.3	0.7	0.7	
Austria	98	98	98	98	6	8.3	0.53	0.3	0.4	0.4	1.2
Belgium	90	90	90	90	4	14.6	1.34	1.2	1.4	1.5	2.51
Canada	37	37	38	36	2	5.9		0.5	0.6	0.5	
Denmark	69	69	69	69	5	10.3	1.77	1.3	2	1.8	3.13
Finland	95	95	95	95	8	16.4	1.21	1	1.6	1.6	2.34
France	90.7	85	92	95	3	8.8	1.34	0.8	1.3	1.3	1.8
Germany	91	91	90	92	3	25.7	1.31	1	1.4	1.3	2.12
Italy (a)	84	85	83		3.7	10.3		0.7	1.1	1.1	
Italy (b)	82			82	3.7	10.3	1.09				0.64
Japan	24	28	23	21	4	4.3		0.1	0.1	0.1	
Netherlands	76	76	71	81	6	6.9	1.79	1	1.3	1.5	2.81
New Zealand	55	67	67	31	10	6.8		0.8	0.7	0.7	
Norway	74.7	75	75	74	5	14.7	0.82	1	1.3	0.9	0.47
Portugal	73.3	70	79	71	0	18.8		0.7	0.8	1	
Spain	76.6	76	76	78	0	4.7	0.8	0.8	0.8	0.5	1.41
Sweden	87	86	86	89	8	59.3	1.84	1.7	3	2.1	1.7
Switzerland	52	53	53	50	3	8.2		0.2	0.5	0.8	
U.K.	54.7	70	47	47	2	6.4	0.37	0.6	0.5	0.4	0.82
U.S.A.	20.7	26	18	18	2	3		0.2	0.2	0.2	

Table 3c - Industrial Relations Systems Data-base

	LTW*	LTW	LTW	RRLR1 *	EPL1**	EPL1**	EPL2**	EPL2**	RRLR2*	CENT	CENT
		1985	1995		1990	1998	1990	1998			1980
Australia	23.2	22.9	23.5	4	0.9	0.9	1.2	1.2	3	1.8	2
Austria	40	40.3	39.7	16	2.8	2.8	2	2	5	2	2
Belgium	53.9	54.2	53.5	17	1.6	1.6	4.4	2.6	4	2	2
Canada	29.2	26.9	31.4	3	0.9	0.9	0.3	0.3	2	1	1
Denmark	46.5	47.8	45.2	5	1.8	1.7	3.1	1.2	2	2	2
Finland	38.7	38	39.4	10	2.5	2.3	1.9	1.9	5	2.17	2.5
France	43.5	43.4	43.6	14	2.4	2.5	3	3.7	6	2	2
Germany	46.4	44.5	48.3	15	2.9	3	4.2	2.5	6	2	2
Italy (a)	50	50		20	3	3	5.3	3.6	7	2	2
Italy (b)	49.9		49.9	20					7	2	
Japan	21.6	21.6	21.6	8	2.5	3	2.7	2.3	1	1	1
Netherlands	47.8	49.9	45.6	9	3.1	3.2	3	1.5	5	2	2
New Zealand	26.1	27.9	24.3	2	1.5	1.6	0.5	0.5	3	1.5	2
Norway	39.4	41.8	36.9	11	2.9	2.9	3.2	2.8	5	2	2
Portugal	32.5	30.7	34.3	18	5	4.3	3.5	3.2	4	2	2
Spain	37.7	36.6	38.8	19	3.8	2.8	3.5	3.7	7	2	2
Sweden	48.9	50.9	46.8	13	3.1	3	3.8	1.8	7	2.3	3
Switzerland	28.8	28.8	28.7	6	1.3	1.3	1.2	1.2	3	2	2
U.K.	35.6	37.8	33.3	7	0.7	0.7	0.3	0.3	0	1.8	2
U.S.A.	32.4	33.6	31.2	1	0.1	0.1	0.3	0.3	0	1	1

Table 3d - Industrial Relations Systems Data-base

	CENT	CENT	WTR	FTCR	MWR	ERR	BRR	BD
	1990	1994						
Australia	2	1.5	0	0	0	0	36	4
Austria	2	2	2	2	1	3	50	2
Belgium	2	2	1	2	2	2	60	4
Canada	1	1	2	1	1	2	59	1
Denmark	2	2	1	1	1	3	90	2.5
Finland	2	2	2	2	2	2	63	2
France	2	2	2	2	3	2	57	3
Germany	2	2	2	2	2	3	63	4
Italy (a)	2		2	3	3	1	20	0.5
Italy (b)		2	2	3	3	1	20	0.5
Japan	1	1	0	0	0	0	60	0.5
Netherlands	2	2	2	1	2	3	70	2
New Zealand	1.5	1	0	0	0	0	30	4
Norway	2	2	2	3	1	2	65	1.5
Portugal	2	2	2	2	2	1	65	0.8
Spain	2	2	3	2	3	1	70	3.5
Sweden	2	2	2	3	2	3	80	1.2
Switzerland	2	2	2	2	1	1	70	1
U.K.	2	1.5	1	1	1	1	38	4
U.S.A.	1	1	1	1	1	1	50	0.5

Table 4a - National Employment Performance Data-base

	ER	ER	ER	ER	ER	UR	UR	UR	UR	UR	NJC	NJC
		1973	1983	1993	1996		1973	1983	1993	1996		73-83
Australia	68.3	68.5	62.1	65	68.3	8.5	1.8	9.8	11	8.5	-0.2	-6.4
Austria	68.1	64.4	62.9	66.3	68.1	5.3	….	4.1	4.3	5.3	3.7	-1.5
Belgium	56.6	60.7	53.5	56.3	56.6	9.5	2.4	13.2	12	9.5	-4.1	-7.2
Canada	68.5	63.1	64.8	67.7	68.5	9.7	5.5	10.9	11.2	9.7	5.4	1.7
Denmark	74.7	75.2	71.8	73.8	74.7	6.9	0.9	11.4	10.7	6.9	-0.5	-3.4
Finland	62.2	70	73.2	61	62.2	16.1	2.3	5.4	17.7	16.1	-7.8	3.2
Finland (a)	73.2					5.4					3.2	
Finland (b)	62.2					16.1					-11	
France	59.6	65.9	62	59.5	59.6	12.3	2.7	8.3	11.6	12.3	-6.3	-3.9
Germany	64	68.7	62.2	65.8	64	9	1	7.9	7.9	9	-4.7	-6.5
Italy	51.3	55.1	55	52.7	51.3	12	6.2	9.3	10.6	12	-3.8	-0.1
Italy (a)	52.7					10.6					-2.4	
Italy (b)	51.3					12					-1.4	
Japan	74.6	70.8	71	74.2	74.6	3.4	1.3	2.6	2.5	3.4	3.8	0.2
Netherlands	66	56.3	52	64.1	66	6.5	2.2	11.8	6.2	6.5	9.7	-4.3
New Zealand	72.2	64.4	61.6	66.8	72.2	6.1	0.2	5.6	9.4	6.1	7.8	-2.8
Norway	76.8	67.7	77.3	73.8	76.8	4.9	1.5	3.4	6	4.9	9.1	9.6
Portugal	67.2	62.4	69.7	67.7	67.2	7.5	2.5	7.8	5.5	7.5	4.8	7.3
Spain	48.1	61	49.5	46.7	48.1	21.9	2.5	17	22.4	21.9	-12.9	-11.5
Sweden	72.7	73.6	80.2	73.9	72.7	8.1	2.5	3.5	8.2	8.1	-0.9	6.6
Sweden (a)	80.2					3.5					6.6	
Sweden (b)	72.7					8.1					-7.5	
Switzerland	76.1	77.7	…	78.5	76.1	3.8	….	0.9	3.8	3.8	-1.6	….
U.K.	71	71.4	67	69.5	71	8.2	2.2	11.2	10.3	8.2	-0.4	-4.4
U.S.A.	75	65.1	68	73.2	75	5.4	4.8	9.5	6.8	5.4	9.9	2.9
U.S.A. (a)	65.1											
U.S.A. (b)	75											

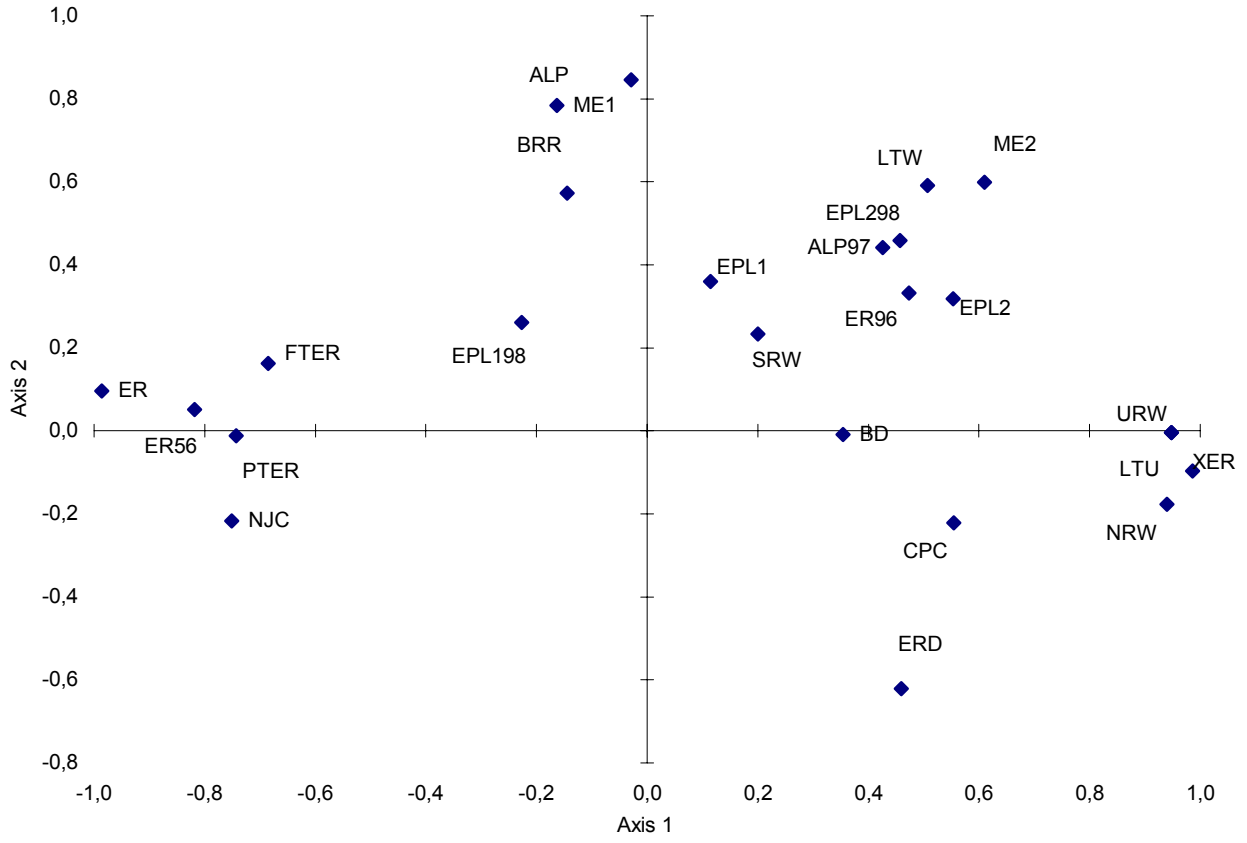
Table 4a - National Employment Performance Data-base

	NJC	NJC	LTURWAP	ERD	ER55-64	PTER	FTER	LTURWAP	STURWAP	NPRWAP	100-ER
	83-93	93-96									
Australia	2.9	3.3	1.8	18	42.3	17.1	51.2	1.8	4.6	25.3	31.7
Austria	3.9	1.8	0.7	17.7	29.4	10.1	58	0.7	2.2	29	31.9
Belgium	2.8	0.3	4.4	21.5	21.8	7.9	48.7	4.4	2.8	36.2	43.4
Canada	2.9	0.8	1	12.6	44.2	12.9	55.6	1	6.2	24.3	31.5
Denmark	2	0.9	1.5	13.6	47.5	16.1	58.6	1.5	4	19.8	25.3
Finland	-12.2	1.2	4.3	6.5	34.8	5	57.2	4.3	7.6	25.9	37.8
France	-2.5	0.1	3.2	15.1	33.5	9.5	50.1	3.2	5	32.2	40.4
Germany	3.6	-0.2	3	19.1	35.7	10.4	53.6	3	3.3	29.7	36
Italy	-2.3	-1.4	4.7	29.1	27.3	3.4	47.9	4.7	2.5	41.5	48.7
Japan	3.2	0.4	0.5	27.8	63.6	16	58.6	0.5	2.1	22.8	25.4
Netherlands	12.1	1.9	2.3	21.6	30	24.1	41.9	2.3	2.3	29.4	34
New Zealand	5.2	5.4	0.7	16.8	53.8	16.2	56	0.7	3.6	23.5	27.8
Norway	-3.5	3	0.5	13	64.7	20.4	56.4	0.5	3.4	19.3	23.2
Portugal	-2	-0.5	2.8	17.4	46.2	5.8	61.4	2.8	2.4	27.6	32.8
Spain	-2.8	1.4	7.4	29.6	33	3.8	44.3	7.4	5.8	38.7	51.9
Sweden	-6.3	-1.2	1.1	4.1	63.4	17.2	55.5	1.1	5.2	21	27.3
Switzerland	….	-2.4	0.8	20.1	57.5	20.9	55.2	0.8	2.4	20.7	23.9
U.K.	2.5	1.5	2.4	13.6	47.7	15.7	55.3	2.4	3.7	22.9	29
U.S.A.	5.2	1.8	0.4	14.2	55.9	13.7	61.3	0.4	3.8	20.8	25

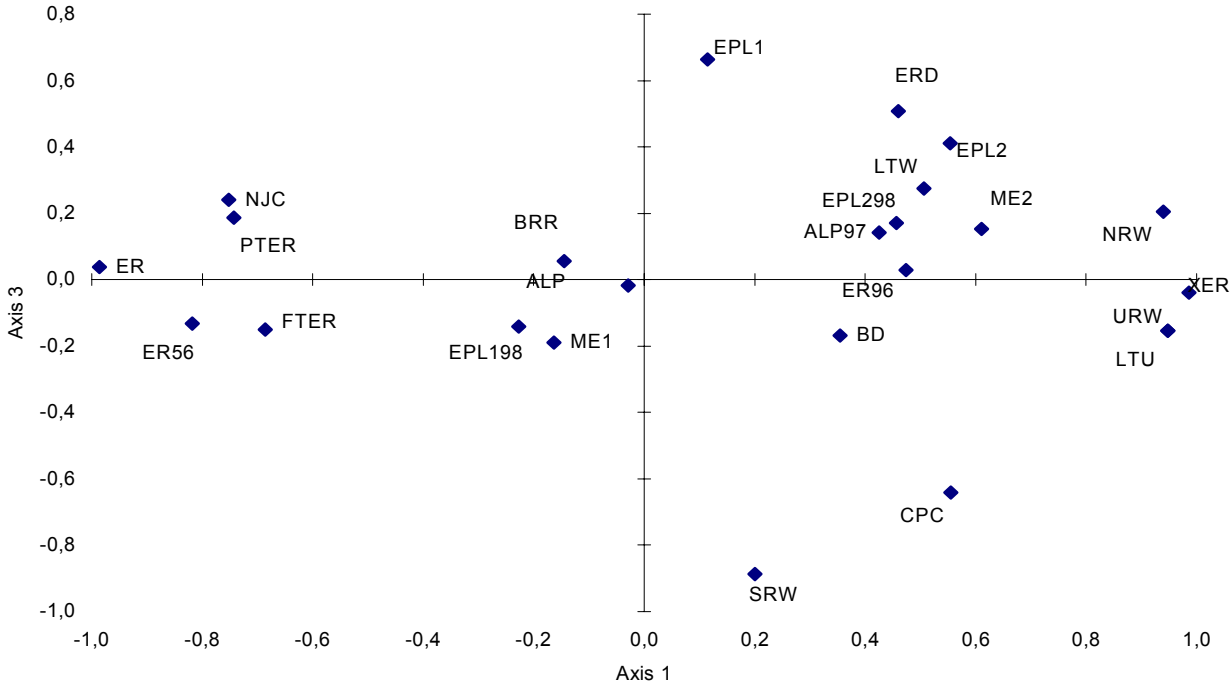
Table 5 - Results of Principal Component Analysis (A)

Variables					
	Axis 1	**Axis 2**	**Axis 3**	**Axis 4**	**Axis 5**
CPC	0.5545	-0.2218	-0.6416	0.1944	0.0572
ME1	-0.1637	0.7841	-0.1903	-0.0322	-0.2804
ME2	0.6105	0.5984	0.1520	-0.2621	-0.1772
ALP	-0.0290	0.8456	-0.0173	0.1202	-0.0308
LTW	0.5066	0.5919	0.2743	-0.2174	-0.0756
BRR	-0.1449	0.5720	0.0557	0.1097	0.6961
BD	0.3541	-0.0095	-0.1690	-0.7308	0.0199
ER	-0.9864	0.0964	0.0388	-0.0475	0.0347
NJC	-0.7515	-0.2173	0.2406	-0.0780	-0.4346
LTU	0.9477	-0.0044	-0.1529	0.0614	0.1504
ERD	0.4598	-0.6207	0.5073	0.1430	0.1897
ER56	-0.8185	0.0508	-0.1329	0.2761	0.2144
PTER	-0.7431	-0.0121	0.1869	-0.4666	0.3155
FTER	-0.6856	0.1619	-0.1498	0.4500	-0.4900
URW	0.9477	-0.0044	-0.1529	0.0614	0.1504
SRW	0.1999	0.2332	-0.8864	0.0250	0.1716
NRW	0.9396	-0.1774	0.2056	0.0370	-0.1286
XER	0.9864	-0.0964	-0.0388	0.0475	-0.0347
EPL1	0.1147	0.3598	0.6632	0.2154	0.2071
EPL2	0.5537	0.3184	0.4109	0.2976	-0.0799
EPL198	-0.2269	0.2614	-0.1418	-0.4386	-0.2678
EPL298	0.4566	0.4592	0.1707	0.0696	0.0553
ALP97	0.4254	0.4419	0.1424	-0.4128	-0.0860
ER96	0.4738	0.3318	0.0284	0.2769	0.2483

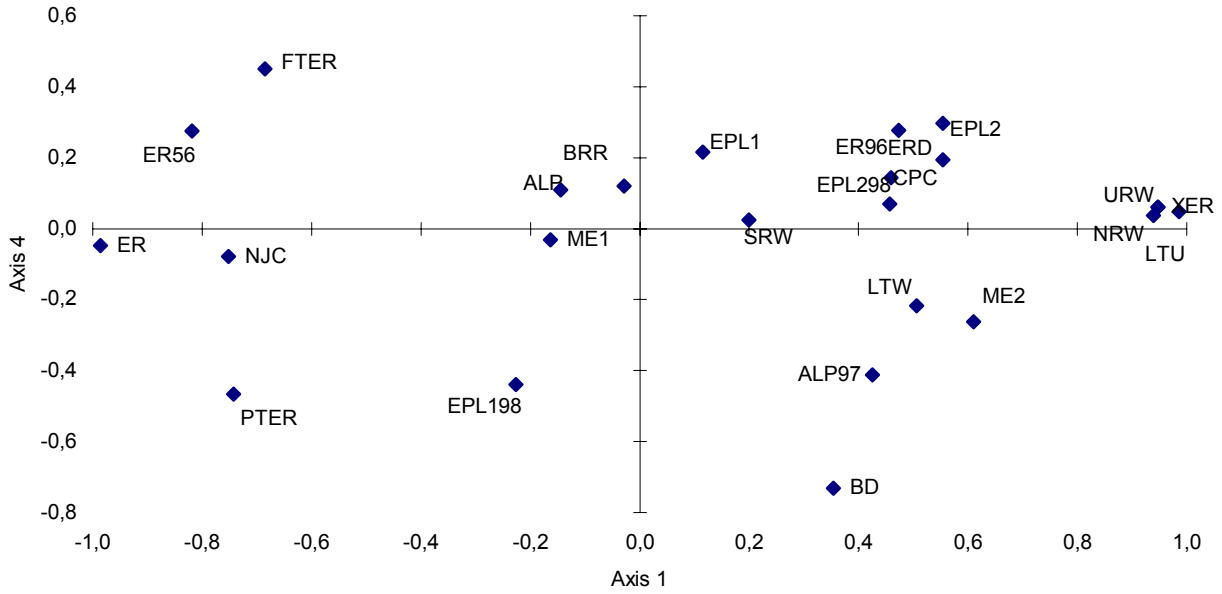
Graph 2 - Axes 1-2



Graph 3 - Axes 1-3



Graph 4 - Axes 1-4



Graph 5 - Axes 1-5

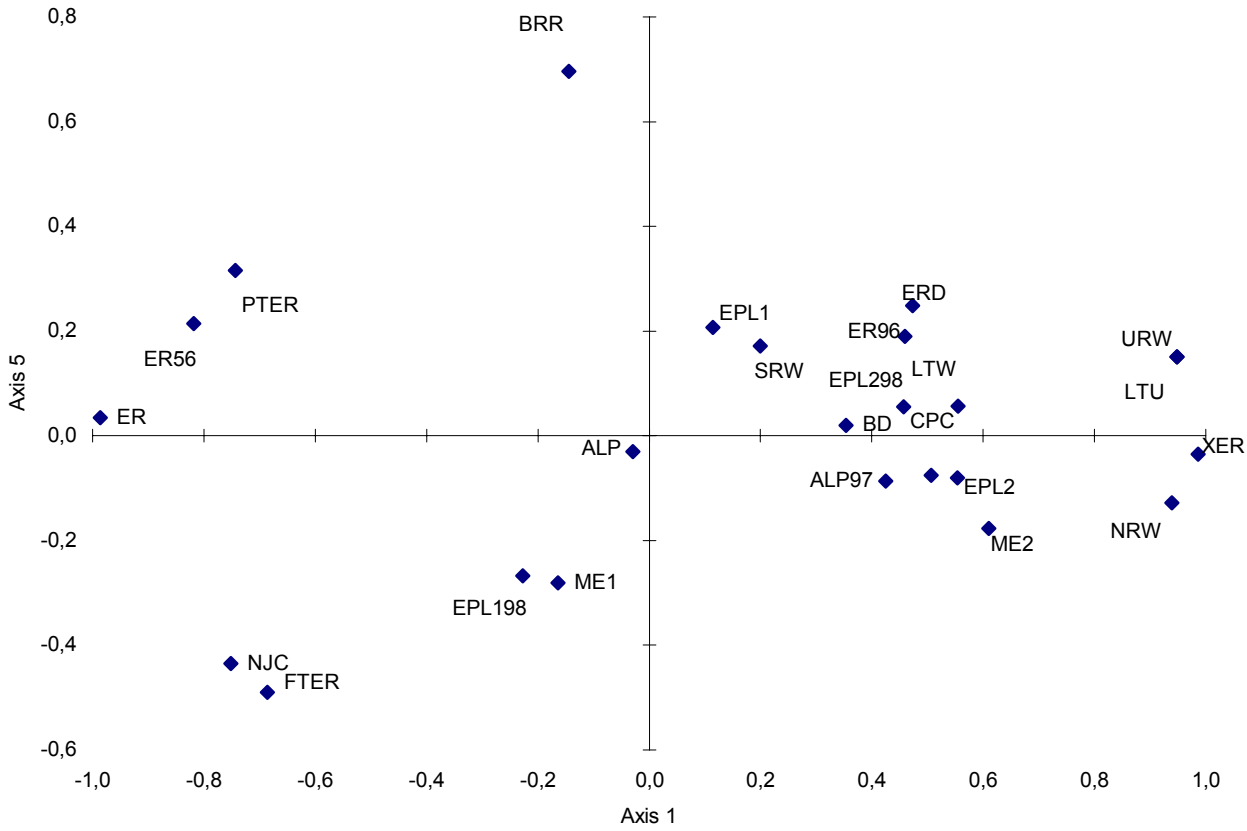


Table 6 - Results of Principal Component Analysis (B)

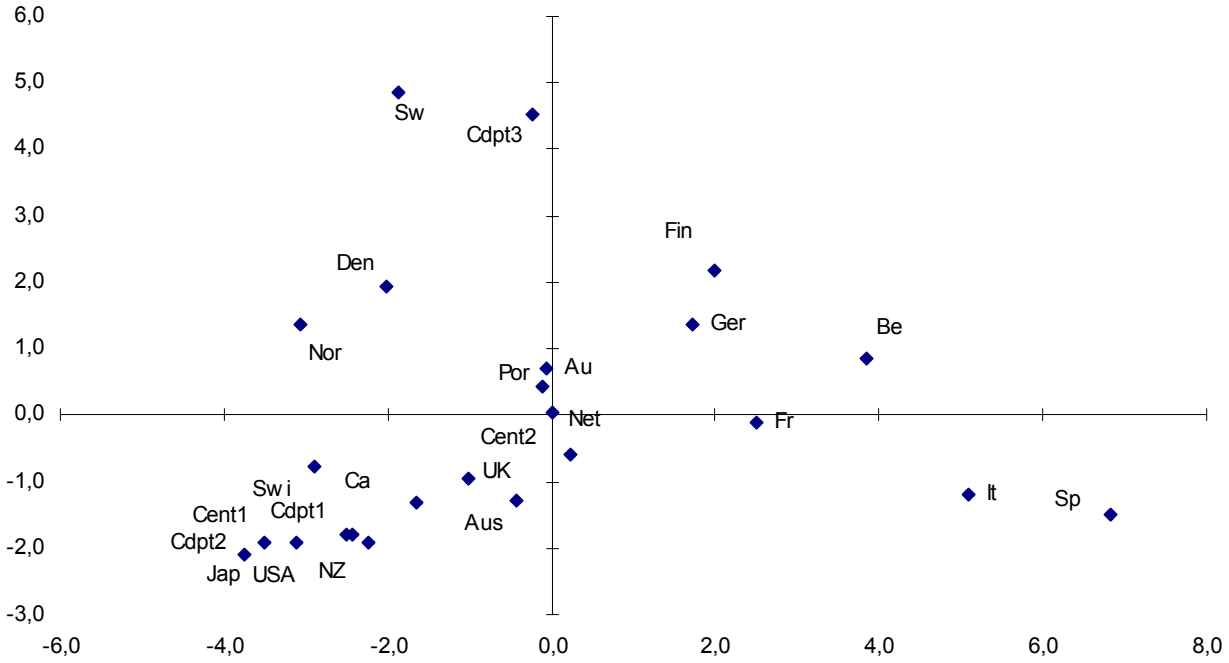
Country					
	Axis 1	**Axis 2**	**Axis 3**	**Axis 4**	**Axis 5**
Aus	-0.4271	-1.2886	-0.8959	-1.5709	-0.2397
Au	-0.0702	0.6874	2.2240	0.1459	-1.5485
Be	3.8586	0.8518	1.2168	-1.1883	-0.5004
Ca	-1.6546	-1.3179	-2.4898	0.5118	0.0110
Den	-2.0205	1.9338	-0.3082	-0.5239	0.8126
Fin	1.9786	2.1771	-3.1222	0.7422	-0.3466
Fr	2.5009	-0.1014	-0.1232	-0.5772	0.3189
Ger	1.7205	1.3650	1.4495	-0.5420	0.2922
It	5.0966	-1.1819	1.1403	1.2903	-1.8582
Jap	-3.1225	-1.9301	1.8518	1.9334	1.0857
Net	0.2325	-0.6022	2.1203	-2.1428	1.0770
NZ	-2.2354	-1.9137	-1.4688	-1.2778	-1.2472
Nor	-3.0763	1.3537	0.9843	0.1939	0.3405
Por	-0.1016	0.4327	0.8763	2.0347	-0.8097
Sp	6.8335	-1.5082	-1.4451	0.8475	2.2408
Sw	-1.8787	4.8530	-0.8853	0.4026	0.1732
Swi	-2.8868	-0.7794	0.8772	0.2683	1.3746
UK	-1.0036	-0.9387	-1.1353	-1.3809	-0.6822
USA	-3.7440	-2.0923	-0.8665	0.8333	-0.4940
Cent1	-3.5109	-1.9065	1.0543	1.4465	0.0567
Cent2	0.0021	0.0457	-0.1210	-0.2101	-0.0005
Cdpt1	-2.5098	-1.8065	1.2099	-0.5623	-0.4563
Cdpt2	-2.4351	-1.7855	1.1343	-0.6542	-0.4865
Cdpt3	-0.2340	4.5320	0.0654	-0.0345	-0.1299

Table 7 - Relative contribute of the countries to the factors and rappresentation quality

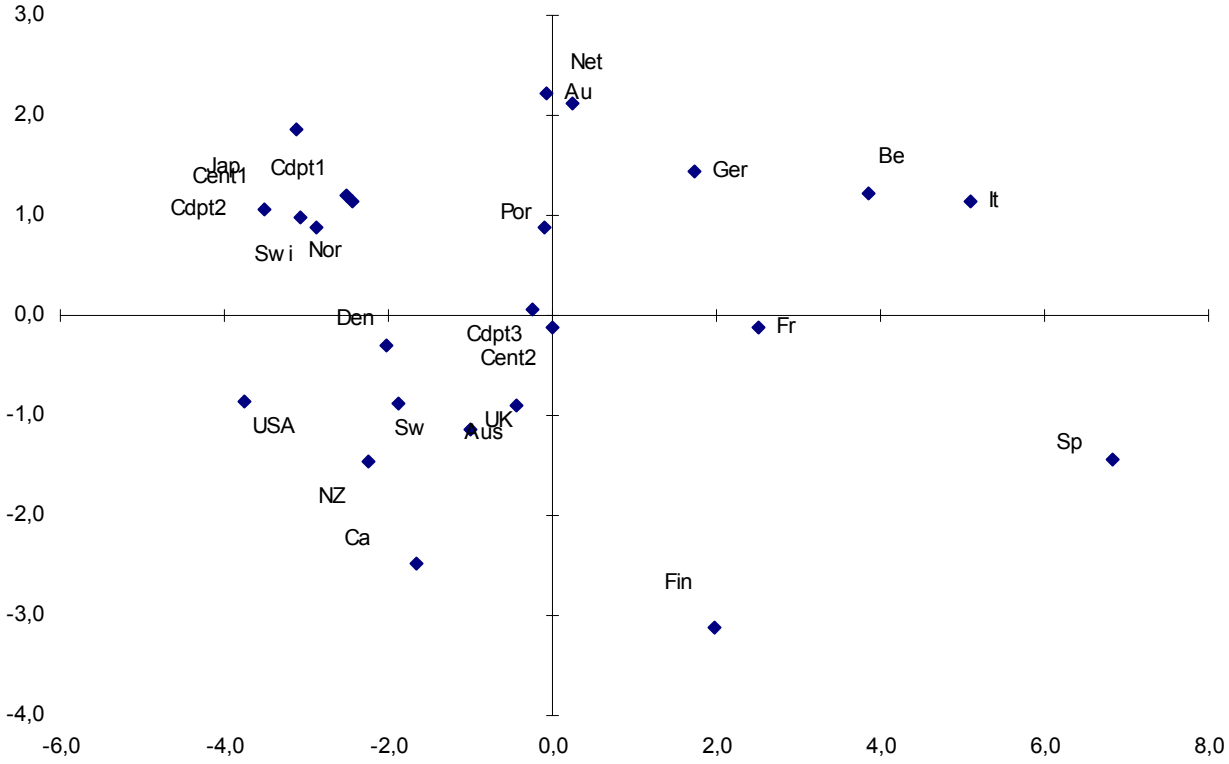
Country	$\cos^2 q_{ij}$	Contribute				
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Aus	0.792	0.003	0.018	0.021	0.008	0.001
Au	0.702	0.001	0.009	0.018	0.141	0.075
Be	0.651	0.129	0.013	0.033	0.023	0.015
Ca	0.631	0.020	0.008	0.152	0.025	0.015
Den	0.697	0.019	0.089	0.012	0.013	0.017
Fin	0.676	0.042	0.091	0.171	0.023	0.002
Fr	0.645	0.056	0.043	0.052	0.044	0.037
Ger	0.683	0.012	0.017	0.047	0.038	0.038
It	0.890	0.157	0.097	0.065	0.068	0.162
Jap	0.706	0.111	0.134	0.006	0.024	0.044
Net	0.779	0.006	0.004	0.023	0.003	0.102
NZ	0.698	0.066	0.076	0.052	0.162	0.125
Nor	0.674	0.086	0.086	0.056	0.075	0.004
Por	0.682	0.043	0.026	0.052	0.043	0.082
Sp	0.645	0.124	0.077	0.145	0.026	0.098
Sw	0.665	0.001	0.112	0.062	0.003	0.043
Swi	0.683	0.003	0.001	0.022	0.033	0.107

UK	0.610	0.002	0.013	0.004	0.211	0.021
USA	0.802	0.119	0.087	0.007	0.037	0.011

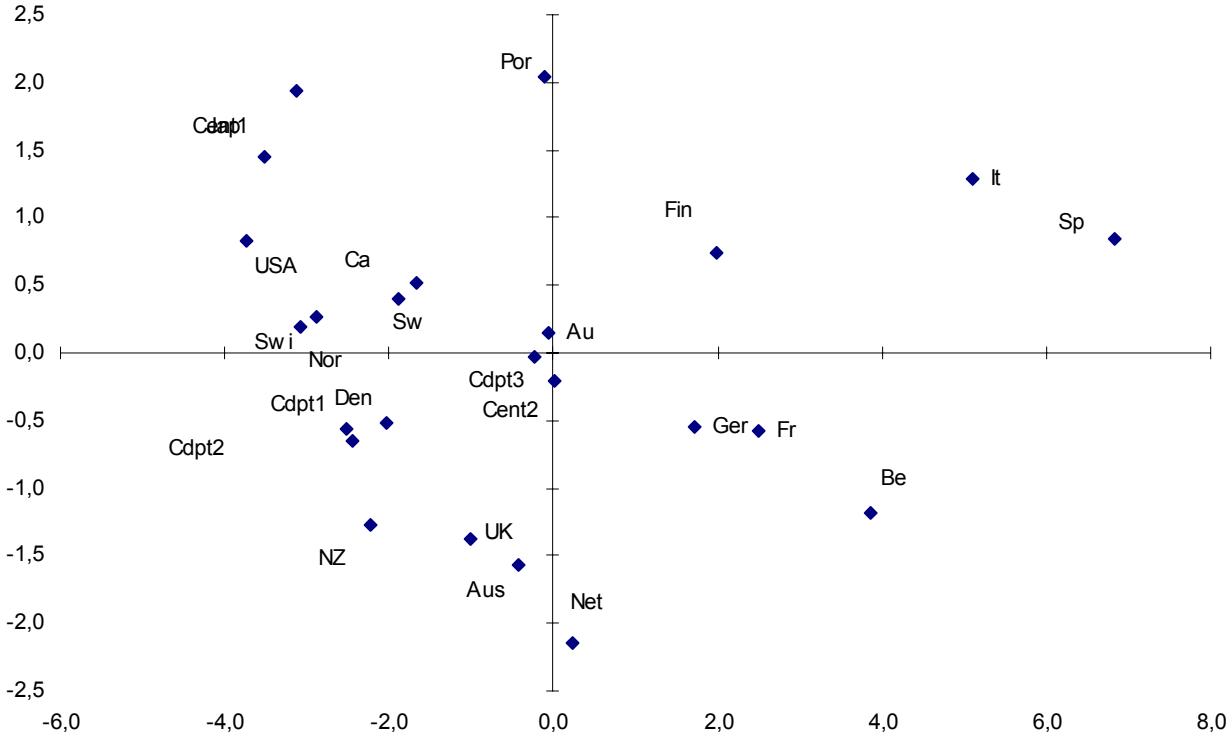
Graph 6 - Countries projections on axes 1-2



Graph 7 - Countries projections on axes 1-3



Graph 8 - Countries projection on axes 1-4



Graph 9 - Countries projection on axes 1-5

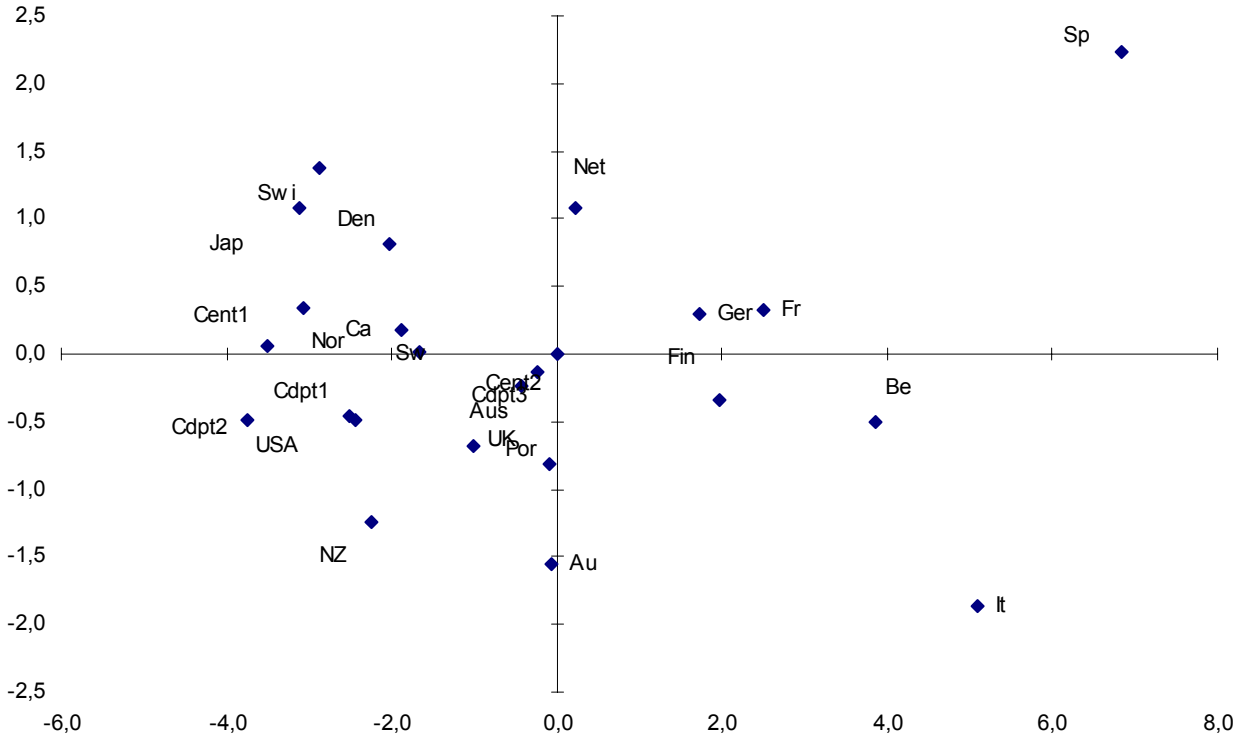


Table 8 - IRS and NEP relationships

"good" IRS and "high" NEP	"bad" IRS and "low" NEP
Japan USA Sweden Norwey Denmark Switzerland	Italy Belgium France
"good" IRS and low NEP	**"bad" IRS and high NEP**
Spain Finland Canada	
"bad" IRS and "not defined" NEP	**"good" IRS and "not defined" NEP**
New Zealand UK	Austria Germany

Australia	the Netherlands Portugal

Table 9 - Measure of Explaned Variance

Principal		Explaned variance	
Components	Autovalue	Proportional	Cumulative
PRIN1	8.8257	0.4413	0.4413
PRIN2	3.2115	0.1606	0.6019
PRIN3	2.4549	0.1227	0.7246
PRIN4	1.3874	0.0694	0.7940
PRIN5	1.0801	0.0540	0.8480
PRIN6	*0.8843*	*0.0442*	*0.8922*
PRIN7	*0.6220*	*0.0311*	*0.9233*
PRIN8	*0.5084*	*0.0254*	*0.9487*