

RANKING OF NATIONAL SOCCER TEAMS

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0. Introduction.

Since 1993 the *Fédération Internationale de Football Associations* FIFA (and the Coca-Cola Company) have published lists (dubbed the **FIFA/Coca-Cola World Ranking**) with a ranking of national soccer teams (officially monthly but in practice ten times a year). These are based on the results of matches played between teams at world or regional championships and of friendly games. I will use “*soccer*” rather than the “*football*” that stands for the second F in the acronymm FIFA.

There are basically two possible approaches to rankings. The first is an attempt to put players or teams in a time-independent perspective. A good example of that is the extensive analysis made of baseball results in the USA by e.g. the Society of American Baseball Researchers (“Sabermetrics”). In that approach one tries to correct for temporal changes in how the game is played, changes of rules or strategy, and for technical and other developments that affect the game. Another approach is to try and quantify the *current* relative strengths of teams. In individual sports, such as track and field, this is comparable to world records (or regional, national, personal or seasonal ones), while the first approach would try and correct for the development that has occurred with time.

The FIFA has chosen for the second approach. In the explanation on the “*World Ranking*” provided on the Web-page of the FIFA, there is however no indication that this actually was a conscious decision. As a matter of fact, it doesn’t state at all what the background and rationale of the ranking are. In the extensive document “*For the Good of the Game*” I read: “...*the system may have aroused a certain scepticism at first...*”, which to me indicates that failing to clearly state the aim of the exercise and the methods followed (if indeed that was as incomplete for the general public as at present) may have been a flaw from the start. The text continues to spell out that the Ranking is “*especially valuable*” for “*smaller federations*” in soccer to evaluate their “*comparative worth*”. Even that seems to me a very limited goal.

When the World Cup finals in France (1998) were about to start, newspapers provided lists with all sorts of information on teams, playing schedule, history, etc. Among this was the “*latest FIFA ranking*” (fortunately newspapers omitted the Coca-Cola Company in their quotation of the rankings). I had heard of these, but had not paid much attention to them. To my surprise the Netherlands ranked 25th, while I would expected the team to be rated easily among the top ten or dozen. Countries like Egypt (17th) and Zambia (23rd) ranked higher. Also the third rank, the Czech Republic, had failed to qualify for the finals; if the ranking depends (at least to a major extent) on recent results of matches, one would have thought that the failure to qualify would automatically translate into a lesser ranking than third place.

The ranking was supposedly updated closely before the start of the finals (actually as it turned out in May). The Netherlands had in the previous year qualified relatively easily for the finals and had won friendly games from the USA and Mexico. In the weeks before the finals they had tied against Cameroon, but had produced clear victories against Paraguay and Nigeria. The latter were not included in the pre-World Cup Ranking, although one would have thought that the FIFA –if keen on publishing rankings as a useful indication of current relative strengths–

would have carried their release date of the last ranking before the finals to, say, a week before its start. In any case, I decided to look into things for myself.

The FIFA Web-site gives some relevant information; but although there is a description of how the ranking is determined, at vital points it is not very specific and in general completely insufficient to reproduce the calculations and to find out how surprising things as just noted could occur.

1. The competitions and matches relevant to the ranking.

The matches that are used for the ranking are those played in the World Cup competitions, the continental championship competitions and friendly games. Excepted are matches in other competitions when there are age and possibly other restrictions on the players, such as youth championships and the Olympic Games.

1.1. The World Cup.

The matters here in this subsection apply to the World Cup 1998 (France). The finals are played between 32 teams. These play first a full competition in the first round in groups of four countries. Each team plays 3 matches and the best two in each group qualify for the eighth finals. From then on there is a knock-out system. The teams that end as the last four have played at the end of the finals a total of 7 matches.

The preliminaries or qualifying rounds are quite different, dependent upon the continent. I am particularly interested to find out how many matches a country has to play.

Africa – Confédération Africaine de Football (CAF).

Here there are 36 participating countries. Four (Cameroon, Nigeria, Morocco and Egypt) were exempted from a first round. Each country is paired with another and they play a home and an away game. The aggregate result determines which sixteen teams advance. In the second round the remaining twenty countries form five groups of four and play a competition. So each team plays six matches and the five group winners qualify for the World Cup finals. The number of matches played are either six or eight for qualification, but some countries are already eliminated after two. From the original 36 countries, five remain (Nigeria, Tunisia, South Africa, Cameroon and Morocco).

Asia – Asian Football Confederation (AFC).

The 34 teams play in ten groups of three or four countries; so each team plays four or six matches. The ten group winners are divided into two groups and these play a competition. So another eight matches are added. The two group winners qualify directly for the World Cup finals. The two second place teams play one match for a third qualification. The loser has to play a home and an away match against a team from the OFC (see below) for a last possible qualification. The total number for qualification then is at least twelve and at most nineteen games, but some countries are eliminated after only four matches. From the 34 countries, three qualify directly (Saudi-Arabia, Korea Republic and Japan), while Iran played Australia and qualified as the fourth participant from the AFC.

Europe – Union of European Football Associations (UEFA).

Here 49 countries participate. They form nine groups, in which each country plays eight or ten matches. The nine group winners and the best second place country qualify directly; the remaining eight runners-up are paired, play a home and an away game and the four winners on aggregate qualify also for the World Cup finals. The number of matches ranges from eight to twelve for qualification and at least eight for elimination. From the 49 countries, fourteen remain (Denmark, England, Norway, Austria, Bulgaria, Spain, the Netherlands, Romania and Germany as group winners; Scotland as best second; Italy, Yugoslavia, Belgium and Croatia after a second round). France qualifies directly as host country.

North- and Central America and the Carribean – Confederación Norte-Centro Americana y del Caribe de Fútbol (CONCACAF).

In this area 30 countries participate. The area is in a first round divided into three zones. In two zones games are played in a pre-preliminary competition. At all stages, two countries are paired and play a home and an away match with the aggregate determining which country advances. The Caribbean zone (20 countries) plays in three rounds. In the first, eight countries play and four advance; in the second round sixteen countries play and eight advance and these play a third round, so that four countries remain. In the Central American zone four countries play and two advance. In the North American zone there are no pre-preliminary competitions. The remaining six countries are joined by six others that were exempted from the pre-preliminary competitions (USA, Canada, Mexico, Costa Rica, El Salvador and Honduras). These first play semi-finals in three groups (a competition of six matches per country) and the first and second place countries play a final round of ten matches each. The best three qualify for the World Cup finals. The number of matches may range from sixteen to twenty-two to qualify and elimination may occur already after two matches. From the original 30 countries, three remain (Mexico, USA and Jamaica).

Oceania – Oceania Football Confederation (OFC).

In this area 11 countries participate. In a first round, two groups (Melanesian and Polynesian) of three countries play a competition (two games per country) and the two group winners decide in a play-off (home and away) which country advances. In the second round these are joined by five more countries, which play a competition (four matches per country) in two groups. The two group winners advance to the third round. This is again a play-off in a home and an away game and the winner plays the fourth team in the AFC preliminary competition (see above). The total number of games varies from six to ten for qualification, but elimination may occur already after two matches. From the original 11 countries one remains (Australia, which subsequently lost to Iran).

South America – Confederación Sudamericana de Fútbol (CONMEBOL).

Nine participating countries play a competition of sixteen matches per country and the best four qualify for the World Cup finals (Argentina, Paraguay, Colombia and Chile). So even elimination takes at least sixteen matches. Brazil qualifies as defending world champion.

So, there is an enormous range in the number of matches to be played in the qualifying rounds. Poor teams may only play two, while for others it may be more than twenty, when still elimination is possible. If Brazil or France win the 1998 World Cup, they can do so with only seven matches

played in competition. For other European countries it would be 15 to 17 and for other countries in South America it is 23.

1.2 Regional championships.

African Cup of Nations (CAF).

Twelve countries play pre-preliminaries in pairs (home and away) and six teams advance. These are joined by 22 countries to play preliminaries in seven groups of four (six games each). The first and second country of each group advances to the finals and are joined by the defending cup winner and the host country. These play a first round in four groups of four teams, followed by quarter-finals, semi-finals and finals. The most recent one was held in Burkina Fasso in February 1998; Egypt won the cup. These competitions are held every two years.

Asia Cup (AFC).

Preliminaries are played among 35 countries in ten groups, playing between three and six games. The group winners qualify, together with the defending cupholder and the host country, to the finals. The finals start with three groups, playing three matches per country. The numbers one and two and the best third place countries play quarter-finals, semi-finals and finals. The last tournament was held in December 1996 in Japan; the United Arab Emirates won. The competition is held every four years.

Gold Cup (CONCACAF).

The qualification for the finals varies from time to time. The following is for the most recent one. There are qualifying matches in the different area's. Three countries out of seven qualify from Central America and two out of 23 countries from the Caribbean zone (first two in the annual Shell Caribbean Cup, mostly a knock-out system). Canada was added from the North American zone, Mexico was the defending champion, the USA the host country and Brazil was invited as world champion. After a first round in three groups of three countries, semi-finals and a final are being played. In the final in January 1996, Mexico beat Brazil. The competition is being held every two years.

European Championship (UEFA).

After preliminary rounds, playing between eight and ten matches per country, sixteen countries qualify for the finals. These are played in four groups of four countries (three matches per country), followed by quarter-finals, semi-finals and finals. In 1996 in Engeland, Germany became European champion. The competition is being held every four years.

Copa America (CONMEBOL).

Twelve countries participate. They first play in three groups of four (three matches per country), followed by quarter-finals, semi-finals and finals. In June 1997 Brazil won the cup in Bolivia. The competition is being held every two years.

Oceania (OFC).

As far as I am aware, there are no similar competitions in the Oceania area (OFC).

So, also a wide range of matches per country are played for the regional championships and also the frequencies of these vary.

2. The FIFA/Coca-Cola World Ranking.

From the description, only the general method of calculating the ranking becomes evident. It really is a *rating* method, where each country can win points and the total tally determines the order; these total points and the order determined from these are published on the Web. So although a lists of ranks is published, there actually is more information available than the term “*World Rank*” would suggest. I a pure ranking exercise, which is a *qualitative* ordering, relative positions between participants do not have to have a quantitative basis.

The algorithm to determine the number of points and from that the ranking, works in general outline as follows:

- A total of 2 points are awarded per match, but the distribution among winner and loser or among teams in case of a tie, depends on the strengths of the teams. The winner can get up to 3 points and the loser can actually loose 1 point. It is not made clear how these strengths are determined, so it is not possible to redo the calculation. More importantly, it is not possible to evaluate in detail how actual results have affected a team’s ranking.
- In an unspecified manner the actual number of goals scored in the game is translated into an award of points.
- There is a bonus for a win in an away game (0.3 points).
- There is bonus (via a multiplication factor) for matches in competitions. The multiplicative factor ranges from 1.0 (no bonus) for friendly games to 1.5 in World Cup finals.
- There is a multiplicative factor for games within a region (continent), ranging from 1.0 to 0.9. These are regularly adapted to the real situation (“*objectively evaluated*” or “*mathematically updated*”, which sounds very good, but as it is not explained in any detail I have to reserve judgement on it).

All this is done for the six previous 12-months periods with an allowance for how many matches were actually played and with a weight that goes down linearly over this period from 1.0 for the most recent 12-month period to 1/6 for the one longest ago.

It seems unlikely that a full normalisation is actually performed; the text on the Web is not entirely clear about that. It is stated that in the ranking period the eight “*best*” results are used; without specification of what determines “best”. The final number of points then depends for half the total weight on these best games and for the other half on the total. In case less than eight games are played, only the actual results are taken. There seems a bias there: if a country plays less than eight matches, they cannot get as many points as possible in principle and if more are played the results that give few points are included with a lower weight. Clearly one gets rewarded for playing many games.

In the FIFA “*Activities Report 1994-1996*” one can read the interesting sentence: “*The scepticism and indulgent smiles which tended to greet the introduction in 1993 of the FIFA/Coca-Cola World Ranking have long since disappeared.*” The tone suggests a major satisfaction, as if some persons have fought an uneven fight against all odds.

3. Evolution of the Ranking since 1993.

The first World Ranking was published in August 1993. It was based on results back to 1985. This one (and all subsequent ones) are still fully available on the Web.

It started out with the first five positions occupied by Germany, Italy, Switzerland, Sweden and Argentina and the Netherlands was at position 16. Brazil was only to be found at position 8. Completely unexplained, the table give a column “Rank Dec 92”, possibly calculated in hindsight. Some differences are large: Switzerland was at position 12, Brazil at 3 and the Netherlands at 7. For the first twenty teams the change in rank was on average more than 4 positions, for the first forty just over 5.5, for the first one hundred almost 9 and for the whole lot (167) almost 10 positions. Limiting to the top twenty or so, the average difference of more than 4 positions shows to me that the system has some undesirable instabilities. I find it very difficult to believe that the relative strengths, measured in an objective way, can change that much on a timescale as short as about half a year. The strength may change considerably for any single team, but certainly not on average by that much. So, I believe that the ranking is not a satisfactory measure of relative strengths, but rather a measure of actual recent performance. This can be made clearer by trying to pin down what has in particular cases caused large changes on short timescales over the history of the World Ranking. Of course, one could take the point of view that it is more desirable to have a measure of success in recent competition rather than a robust measure of relative strength.

Now I will first concentrate on the top five ranks. If we look at the developments since August 1993, we see that except for November 1993 (when Italy came in first), the top position has at first been alternating between Brazil and Germany (up to July 1994; the time of the World Cup in the USA); since then Brazil has held a tight grip on the first place. Second place has since November 1995 been in German hands except for four occasions (once Italy, three times Spain). There are also some notable trends, that are interesting to discuss below in somewhat more detail. Sweden has been in the top five regularly up to the end of 1995, when it disappeared up till now with one single exception. Italy has been jumping in and out without any clear longterm pattern and also Denmark and Spain have behaved somewhat erratically. France appeared at 5th place in April 1996, climbed quickly to third and stayed there until April 1997 and then rather quickly dropped out of the top five. Interesting is also the Czech Republic, which suddenly appeared in July 1996, remained at third position until the end of 1996, then re-appeared in November 1997 and has remained at third position since. And it didn't even qualify for the World Cup finals, in spite of the fact that most qualification games must have been played when the Czechs were in third rank. Mexico appeared in December 1997 and remained at 4th place. England first appeared in February 1998 at 5th position, where it also settled up till now.

In general it can be seen that few changes occur during summers and winters and in periods just after major tournaments (World Cup, continental championships). There are two interesting periods with very little change among the top five: July 1996 to November 1996 and December 1997 to May 1998. These are the periods just after the previous World Cup and after the end of the 1998 World Cup preliminaries or qualifying rounds.

What happened to the Netherlands? It came in in August 1993 at position 16, quickly climbed to second place in November 1993, but dropped to rank 7 in December. Looking over the longterm behavior, it appears that its “natural” place is somewhere around 6 or so, but there are very large deviations from that. E.g. in May 1994 it suddenly appeared at spot 11, but then rose the next month to second place. In the summer of 1995, the Netherlands suddenly fell to

17th, regaining to 5th in one month, dropping to 14th the next time (October). Since then it spent most of its time between position 6 and 10, coming in at 6 in the summer of 1997. Then it rose to 4th in September, but dropped via 12th in November, 22nd in December 1997 to 25th in February 1998. Suddenly it came in 6th in March, then 14th in April and 25th in May. What caused this erratic behavior in recent months? Certainly, if we look at the full behavior, or even that around the middle of 1997, it becomes clear that 25th place is not a rank that reflects the current relative strength of the Netherlands team.

Through the FIFA Web-pages we can also get a listing of all matches played since the World Cup finals of 1994 by each national team that qualified for the 1998 finals. So we can try and trace back some of the causes of individual behavior over the last four years. Of course a country's ranking depends also on points gained by others, but a major change is most likely due to some dramatic occurrence in a the record of that country.

The ranking just after the 1994 World Cup not surprisingly reflects to a large extent the outcome of those championships: Brazil first, Italy second and Sweden third. Bulgaria, who ended 4th, landed on position 14, up 15 from rank 29, around which position it had been for some time. The four losing quarter finalists (Spain, the Netherlands, Romania and Germany) took the ranks 4 through 7. Not bad, if one takes the point of view that the results of the championships is indeed an excellent reflection of the relative strengths and qualities. Some people may even take the viewpoint that the results of the competition is *by definition* the relative quality (scoring goals and winning matches is what soccer, after all, is all about). However, although I believe that there is a clear correlation between strength and World Cup result, there certainly is also scatter and in my mind I allow for the fact that quality not always wins. Of the eight losing teams in the eiggt^h finals, only three have ranks between 8 and 15.

It is also instructive to look at the rankings just *before* the 1994 World Cup. Let us not be too demanding and just ask how many of the eight quarter finalists were among the ranks 1 through 8. The answer is six. Not bad at all! What happened to the other two? Norway was eliminated in a group where all four teams had one win, one tie and one loss. It ended 4th on the basis of number of goals (number three, Italy, took one of the wildcards). The other one, Argentina, was eliminated in a very similar way; after two wins and one loss, it ended third in the group with the numbers one and two having the same record and number two (Bulgaria) having the same goal difference and number scored. Argentina lost out on the criterion of the score in the direct encounter. I would say, the Ranking works pretty well if you are not demanding (as you shouldn't) that it accurately predicts the World Cup outcome.

A similar situation to be looked at is that after the European Championships of 1996. Brazil competed in South America (where it won five games and lost one) and remained number one. Germany, which was already second just before the championship, became European Champion and remained second in the ranking; the losing finalist Czech Republic jumped from 10th to 4th rank. Semi-finalist France improved from five to three. Interestingly, Italy rose from 7 to 5, in spite of being eliminated in their group – by Germany and the Czech Republic. These were the later finalists, so I don't understand how this follows from the results. Certainly they had to "overtake" Sweden (which hadn't qualified), Spain (quarter finals) and Russia (eliminated in first round). A part of the answer may be, that the points are very close (59.86 for 5th place Italy to 59.17 for Russia at 9th place). Semi-finalist England rose by 11 ranks to position 13. It apparently performed (as host country) way above its expected quality on the basis of its rank. But was that rank maybe somewhat low before the championships as a result that England as

host country did not have to play qualifying games?

4. The World Ranking for the Netherlands.

As a detailed example I look at the Netherlands. It started at 5th position just after the World Cup of 1994. In the fall of 1994 the Netherlands played 4 matches in the qualifying rounds for the European championships of 1996. There were 2 wins over Luxembourg (4-0 and 5-0), and 2 ties, against Norway (away 1-1) and the Czech Republic (home 0-0). Not bad, but not too good either; in any case the drop to rank 6 is understandable. Up until June there were 4 games; first a friendly home match against Portugal, which was lost (0-1). Then 3 qualifying matches, which did not go too well. First a win at home over Malta (4-0), then two losses in away games against the Czechs (3-1) and Belarus (1-0). Not surprising that the Netherlands slowly dropped to 10th place.

The loss to Belarus is important to look at briefly. In the June 1995 Ranking, Belarus was at rank 104, in May at 100. In between these it won from the Netherlands. I would have thought that Belarus would gain significantly by beating the world's number 10. This then must have to do with performance of other teams, but I would suggest that here the ranking system does not work properly.

Now the rankings of June and July 1995. The Netherlands did not play, but suddenly dropped to position 17. What happened? There are a number of countries that "overtook" the Netherlands (Argentina, Denmark, Russia, Portugal, Colombia, Romania, Switzerland and Ireland), but except for Colombia these did not record dramatic improvements in their ratings.

In the August Ranking (after presumably little play everywhere) the Netherlands remained at rank 17. But in the September Ranking it jumped right back to 5th place; and that after winning at home from Belarus (1-0; with the large difference in ranking not a very spectacular result, to say the least). It passes back over most of the teams that got higher ranks in July. But Belarus gets really punished for this loss; it falls from rank 103 to 130 –and that for losing with only 1-0 in an away game against a supposedly much stronger opponent.

So, why without playing does the Netherlands drop 7 positions and regain by 12 positions with an average result? One thing I can think of that might have happened (but is difficult to check) is, that in the July 1995 Ranking the results at the World Cup the previous year suddenly come in with a weight 5/6 instead of 1.0. My guess is that this has caused the result; in the May ranking the Netherlands has 58.84 points against 51.26 in the July listing, and this supports my suggestion. It surely is an undesired feature, but it can be repaired. This can be done by smoothing out the weights or something like that, although I suspect that it is also a result of improper (or no) normalisation.

Before the European championships of 1996, the Netherlands first qualifies with another win over Malta (4-0) and a very important home win over Norway (3-0). As a result it fluctuates to rank 14 in October, 10 in November and 6 in December 1995, January and February 1996. In the lead-up to the European championships the Netherlands plays friendly games (all at home) against Germany (loss at 0-1), China PR (win at 2-0) and Ireland (win at 3-1). Not too bad, but still the Netherlands drops to rank 13.

In spite of not doing particularly well at the championships (barely qualifying for the quarter

finals and then being beaten by France after a tie and penalties), the Netherlands still comes in at 6th position. But then it drops to 9th and 10th position over most of the next half year (up to April 1997). This in spite of a pretty good performance in the first three matches for the World Cup qualifications (three clear wins: two over Wales (1-3 away and 7-1 at home) and Belgium; away at 3-0) and a friendly loss from France (away at 1-2).

In October 1997 we find the Netherlands at 8th rank (and a brief 4th place in September) after three reasonable qualifying matches (wins over San Marino with 4-0 and 6-0 and an away loss against Turkey at 1-0), winning a friendly away game over South Africa with 2-0 before the summer, an important home win in the qualification series against Belgium (3-1) and a tie at home against Turkey (0-0). Again not unreasonably. But then the Netherlands doesn't play for a while (who does? The World Cup qualifications are mostly finished), and then drops to 12th rank in November, 22nd in December 1997 and 25th in February 1998. In October 1997 the Netherlands had 60.59 points, in February 55.09. For comparison the top team Brazil had respectively 72.15 and 72.58 points, while playing in the period 7 friendly and 5 qualifying games; but remember that the "best" 8 per year get more weight (and I don't know how best is defined).

Then in March (after winning two friendly away matches against the USA and Mexico with 3-2 and 2-0) the Netherlands comes up at rank 6 (with 60.32 points), but dropped via 14th rank in April to rank 25 in May. No games are played in between and the points have dropped to 54.20. I think this is due to the fact that now only 6 matches have been played in the 12 months preceding the calculation of the points. The later friendly games in preparation for the World Cup (tie of 0-0 against Cameroon and two 5-1 wins against Paraguay and Nigeria; all at home) should have changed the ranking significantly as the Netherlands enters the World Cup finals.

5. Developments for some other countries.

As for the Netherlands above, I make use of the listing of matches played since the last World Cup finals USA 94 up to the last publication of the World Ranking on May 20, 1998. Over this period of 46 months, the Netherlands had played 31 games (of which only 9 were friendly); this is only just 8 games per year. With the clustering of the World Cup qualifying games it is no surprise that in some 12 month period not the 8 matches were played necessary to gain a competitive number of points.

First we will look at **Brazil**, which was at rank one during the whole period. Since the World Cup final on July 17, 1994 against Italy (0-0 and decided on penalties in Brazil's favor with 3-2), Brazil played 62 games, of which 41 friendly. This is on average 16 games per year. Since Brazil won 47 of these and had 10 ties, it is clear that the algorithm works in its favor, since with on average 12 wins per year it was able to earn many points. Of course the record *is* very good –no question about that.

Germany played 46 matches (also significantly more than the Netherlands) with 33 wins and 11 ties. Of this 18 were friendly. Again the same holds as for Brazil, except that the record is not as good and the second place is therefore justified. However, the large number of friendly games by Brazil (where one selects the opponent itself) may be in its favor.

Italy played only 36 games (as Germany 18 friendly ones). At the last Ranking Italy is in 14th place, probably due to its qualifying with difficulty for the World Cup finals. In the previous 12

months it had only 3 wins, 5 ties and 1 loss. Probably the ranking is reasonable.

France is at rank 17 before the 1998 World Cup. However, France is the host country and did not have to play qualifying matches. Since the last World Cup, France still played 38 matches, 22 of which were friendly. In the last 12 months it played 9 friendly games, of which it won only 4 and played 2 ties. Not a very good record, but the fewer games (and all of them friendly) over the last twelve months did not offer much chances for many points to be gained.

Denmark was at rank 27 in May 1998; only two places below the Netherlands. It played 17 friendly games in the period since the previous World Cup (clearly more than the Netherlands) and 38 matches in total. Just as the Netherlands, it played only 6 games in the twelve months preceding the May 1998 ranking. So the eight game rule also here worked against Denmark, making it difficult to gain sufficient points for a high ranking.

Spain is also interesting. It played only 9 friendly matches and therefore also had the problem of few games (33 matches in total or also just eight per year on average). In spite of the fact that Spain won eight of its ten qualifying games for the World Cup, it is at rank 15 as it played only six matches in the last twelve months.

Another country that qualified for the World Cup finals is **Nigeria**. It played its qualifying matches all before August 1997. Also in the whole period since USA 1994, it played only 21 games (the Olympic Games, where it won the Gold Medal, are not part of the World Ranking). No surprise that it has in May 1998 only 36.90 points and stands at rank 74 between Iceland, Togo, Guatemala and Namibia! Although it won only 7 of these matches and lost 9, a rank 74 seems very low for a qualifying country.

Norway seems to have a rank that is reasonable for its strength. It played 38 games since the previous World Cup and has a good record (21 wins and 7 ties). In the 12 months previous to the May 1998 Ranking it played 10 games.

In the May 1998 Ranking, **Argentina** is in 6th place. With 49 matches played since USA 1994, it profits from the eight-game-rule, but its record of 28 wins is not good enough for a higher spot.

Since early 1998, **Mexico** has been solidly at rank 4. But it played 70 games! Since June 1997 it played no less than 23 matches with Continental cup tournaments in June 1997 and February 1998. Much competition helps; even more than friendly games. It won only 9 of these matches, drew 7 ties and lost 7 times. But the rule of the eight matches clearly helped to improve the ranking.

Over the same period **England** has been ranked 5th. With 37 matches played since 1994 and 11 in the last twelve months, the weighing towards eight games played a role here as well. The record is good (21 wins and 12 ties).

An interesting final case is the **Czech Republic**, which did not qualify for the World Cup finals. Since December 1997 it has been permanently at rank three! This seems due to the fact that it started poorly in the qualifying matches, but ended with a very good record, although not good enough for qualification. In the latter part of 1996, it was for months at rank 4, certainly due to its second place in the 1996 European Championships. The relatively strong bias towards very recent results may be the reason why it ranks third in spite of not being qualified for the World Cup finals.

6. Conclusions.

From the analysis above I conclude that –although the general principle of the ranking algorithm is reasonable– there are some serious flaws. These are:

- The discrete changes of the weights over twelve month periods causes instabilities one year after a major championship. This is, because good teams at these tournaments have a lot of points for which the weights suddenly decreases. And teams that performed less well are at a serious disadvantage, since they usually played fewer games. If a team did well at, say, the World Cup, then it is almost guaranteed to remain highly ranked for a year and then experience a discrete jump if performing only reasonably after that. This should be a more gradual “fading away”. Also teams that had an unfortunate tournament should be given a chance to climb back more steadily.
- The most serious worry is the rule that over each period of twelve months the best eight results get a higher weight. It pays to play many friendly matches, since the losses are not taken into account much. And if a country plays few matches in anyone twelve month period, it is guaranteed a lower ranking, even if the performance is very good. The problem is compounded by the fact that there are very unequal procedures for the World Cup preliminaries and for regional championships in the various continents, so that some countries play many more games and are able to relatively easily collect many points. The current practise should be replaced by a proper normalisation, such as for example the mean number of points gained *per match*.

Groningen, May/June 1998.