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# Relative age effect: a serious problem in football

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## 1. Introduction

Numerous studies have highlighted the impact of the relative age of athletes on their chances of pursuing a professional career. As youth competitions are generally organised on the basis of the year of birth, athletes born in January, February or March have a clear advantage over those born in October, November or December of the same year.

In football, players with the disadvantages of being born in the last months of the year and of later physical development currently have little chance of pursuing a career at a high level. The relative age effect has negative consequences not only for the players themselves, but also for football as a whole insofar as it leads to considerable bias in selections.

This Monthly Report analyses the impact of the relative age effect out of a sample of 28,685 footballers having played in 31 top division European leagues since the 2009/10 season (chapter 2)[1]. We then turn our attention to the differences noted by origin (chapter 3) and we test the relative age impact with regard to the players' age (chapter 4). Finally, we focus on the selection bias linked to the date of birth by taking into account the type of club where the players were trained.

[1] Leagues covered: Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Rep., Denmark, England, Finland, France, Germany, Greece, Hungary, Israel, Italy, Norway, Poland, Portugal, Romania, Russia, Scotland, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Netherlands, Turkey and Ukraine.

## 2. A considerable selection bias

According to EUROSTAT data, births in Europe are spread evenly throughout the year. In other terms, there are not more persons born on a particular day or month than any other. Insofar as there is no reason for the date of birth to have any influence on a person's talent in any given activity, it follows that one would expect the number of professional footballers to be the same regardless of the day or month of birth. This, however, is not the case.

The distribution of players by date of birth is clearly biased in favour of footballers born during the first months of the year. In the sample taken into account, there are almost twice as many players born in January than in December. The footballers born during the first three months of the year represent 30.5% of the total, as opposed to 19.3% for players born between October and December.

**Figure 1: Births per month, 28 UE countries (1996-2013)**

data: EUROSTAT

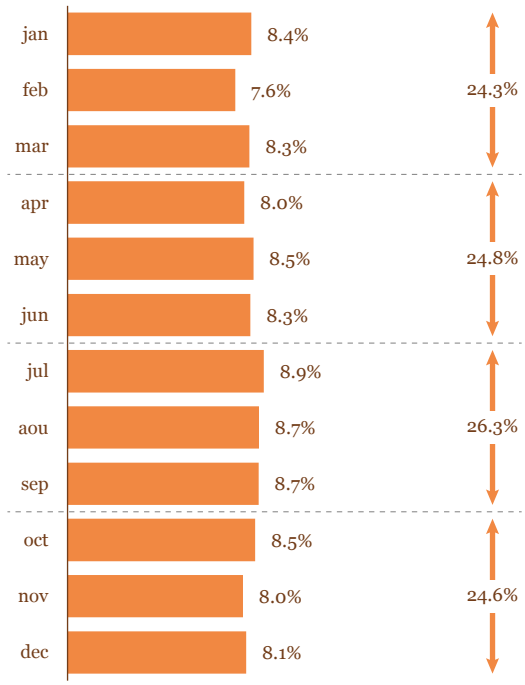



**Figure 2: % of players by month of birth (2009-15)**

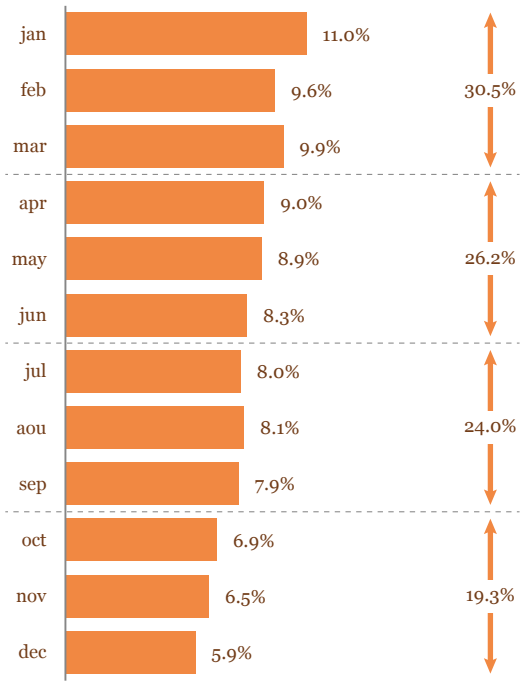
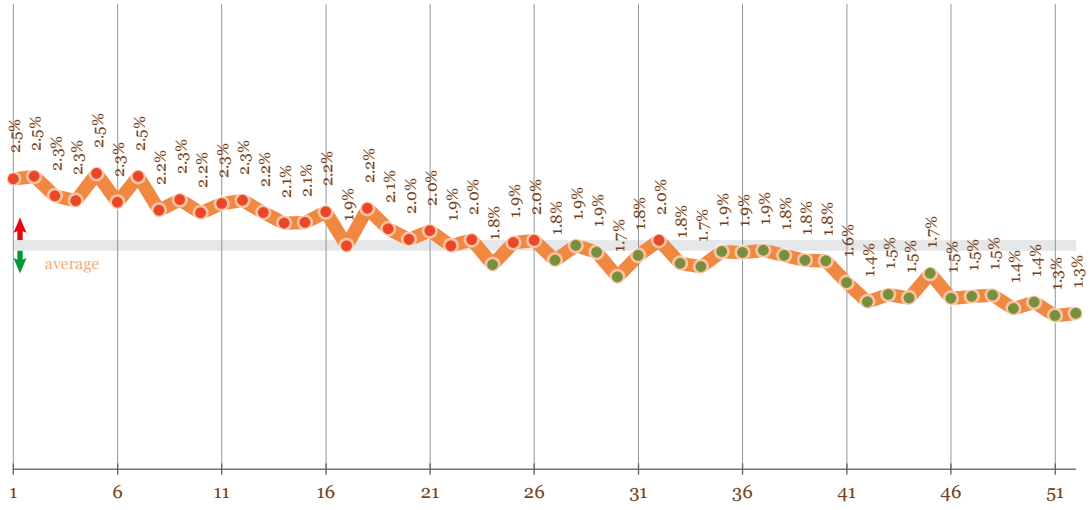


Figure 3 also illustrates the over-representation of players born in the first half of the year. The persons born during the first 23 weeks are systematically more numerous among professional footballers than in the general population. The persons born after the 33rd week are, on the contrary, systematically under-represented in football.

**Figure 3: % of players by week of birth**

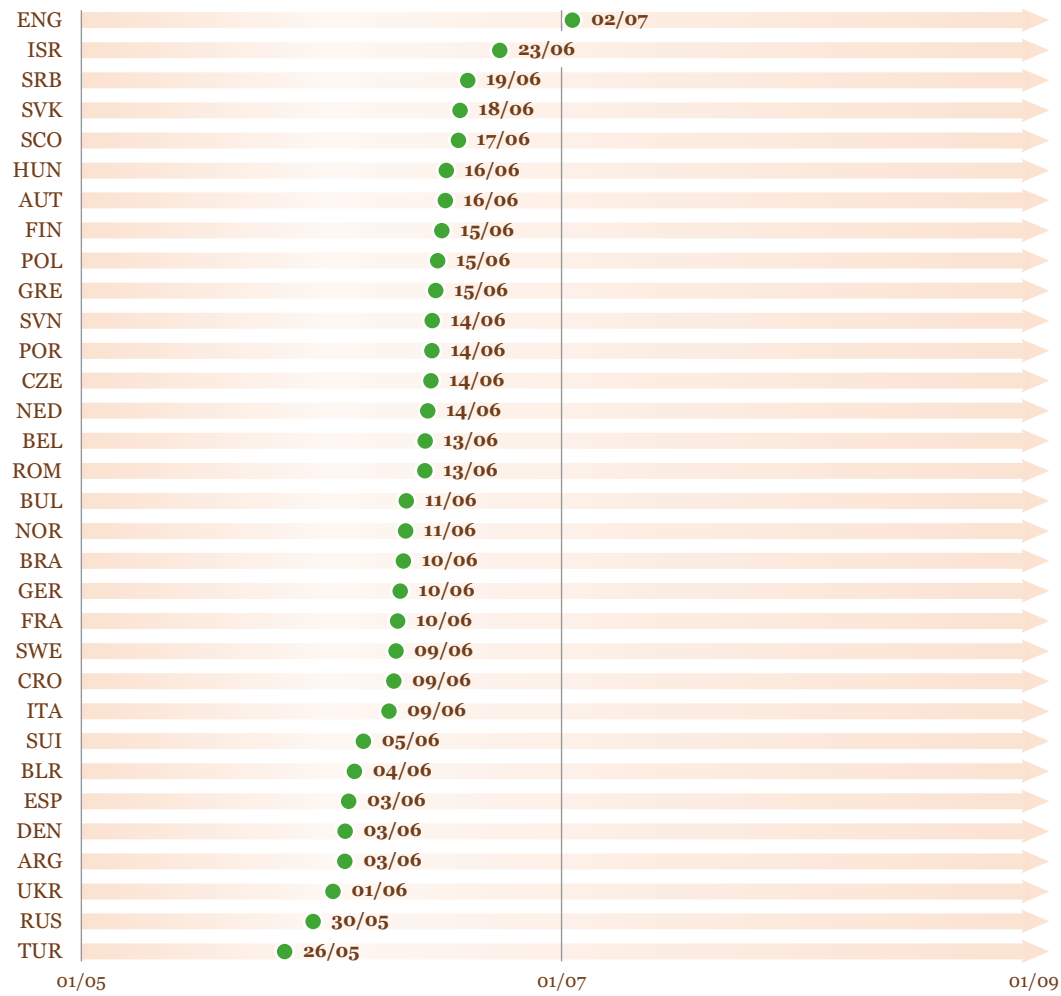


## 3. England: a unique case

The average day of birth of a typical citizen is situated in the middle of the year: the 1st of July. For a professional footballer, on the other hand, this day is the 13th June. Important differences exist according to the national origin of players. Figure 4 presents the average day of birth of players from countries with at least 300 representants within European top divisions since 2009.

The greatest relative age effect was measured for Turkish players. They were born, on average, more than one month earlier than a typical citizen. The selection bias linked to the date of birth is also particularly strong in Russia and Ukraine. England was the only country among the 32 with at least 300 representants in the study sample where no effect was observed at first glance.

**Figure 4: average day of birth, by origin**

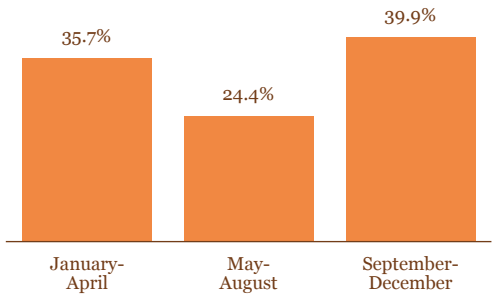


However, the specificity of the English case can be explained by the fact that age classes in football are based on the cut-off date used by the school system, the 1st September, and not the 1st January as in other countries[2].

Finally, even though different by comparison with other associations studied, the relative age also has an impact in England. Indeed, a four month term analysis shows that the players born between September and December (39.9%), are overrepresented in comparison to footballers born during the first four months of the year (35.7%) - who remain favoured when it comes to youth national selections - and, above all, with respect to players born between May and August (24.4%).

[2] Even though our analysis suggests that this is not the case, the research team of the Football Observatory would like you to let us know of countries using a cut-off date other than the 1st of January. Please write to us at football.observatory@cies.ch.

**Figure 5: % of players by date of birth in four month periods, English**

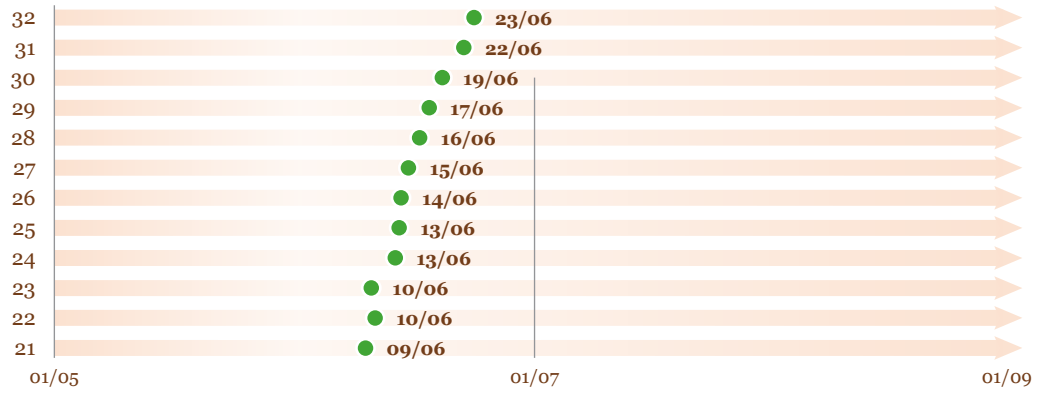


## 4. An effect that diminishes over time

The relative age effect is particularly strong during the early years of a professional career. As age increases, the average day of birth of players tends to rejoin that of the average citizen. For example, a player of 21 years of age at most is, on average, born on the 9th June, while the average date of birth of a player over 31 is 23rd June.

This result confirms the bias in selection linked to the month of birth. Thanks to their comparative advantage in terms of development, players born at the start of the year have easier access to the labour market of professional football. From 23 years of age upwards, a double mechanism is at work: precocious players who have not been able to confirm the hopes placed in them are progressively ousted in favour of those with a greater potential who had previously been cast aside. The relative age effect thus tends to lessen without, however, completely disappearing.

**Figure 6: average day of birth, by age**



## 5. The most active training clubs as poor pupils

The impact of the relative age is different with regard to the typology of the club having trained the players. Our analysis makes a distinction between the players from clubs having trained at least 50 footballers present in the sample and those trained by less productive teams. The 52 clubs included in the first category are for the most part dominant teams in their country or region.

Our analysis shows that the relative age effect is particularly strong among the principal training clubs. This suggests that when a team has first pick in terms of selecting youths, it tends to favour players with a precocious development even more. The over-representation of the latter in youth age categories does indeed allow for the optimisation of short-term success.

It seems most likely that the relative age impact on the selection of footballers is thus linked to the importance given to results from the youngest age categories. Though coaches and managers often insist that results, when it comes to young players, are not the priority, our analysis suggests that much remains to be done so that this affirmation becomes a reality.

It is thus high time that the organisations in charge of the development of youth players and the game such as FIFA, the Confederations, the national associations, the leagues and clubs take the question of the relative age effect seriously.

The elimination of, or, at least the limiting of the selection bias linked to the date of birth and to the level of physical development would indeed reinforce meritocracy in football. Over the long term, such a step forward would undoubtedly be beneficial not only to the level of spectacle that teams are able to provide, but also on the level of balance of competitions.

**Figure 7: average day of birth, by type of training club**

| | Number of players | average day of birth |
|---|---|---|
| Principal training clubs* | 4,128 | 29/05 |
| Other clubs | 24,557 | 16/06 |

* More than 50 players trained

**Appendix: average day of birth, by national team represented (at least 50 players)**

| | Number of players | Average day of birth | | Number of players | Average day of birth |
|---|---|---|---|---|---|
| Morocco | 74 | 25/05 | Chile | 51 | 19/06 |
| Tunisia | 52 | 27/05 | Cyprus | 81 | 21/06 |
| Argentina | 122 | 27/05 | Greece | 94 | 21/06 |
| Mali | 61 | 29/05 | The Netherlands | 104 | 22/06 |
| Russia | 97 | 03/06 | Montenegro | 64 | 23/06 |
| Switzerland | 83 | 03/06 | Albania | 53 | 23/06 |
| Croatia | 106 | 04/06 | Israel | 101 | 24/06 |
| Ukraine | 119 | 05/06 | Belgium | 105 | 27/06 |
| Iceland | 71 | 06/06 | Slovakia | 120 | 29/06 |
| Denmark | 120 | 06/06 | Norway | 142 | 29/06 |
| Spain | 118 | 07/06 | Serbia | 152 | 30/06 |
| Sweden | 181 | 07/06 | Slovenia | 97 | 01/07 |
| Brazil | 127 | 08/06 | Portugal | 107 | 01/07 |
| Algeria | 52 | 09/06 | Finland | 135 | 01/07 |
| Turkey | 155 | 10/06 | Belarus | 102 | 01/07 |
| Germany | 111 | 10/06 | Scotland | 97 | 01/07 |
| Czech Republic | 134 | 11/06 | England | 117 | 02/07 |
| Bulgaria | 120 | 12/06 | Bosnia Herzegovina | 105 | 02/07 |
| Lithuania | 50 | 13/06 | France | 114 | 03/07 |
| Uruguay | 65 | 13/06 | Senegal | 97 | 04/07 |
| Italy | 154 | 13/06 | Georgia | 59 | 04/07 |
| Cameroon | 80 | 14/06 | Australia | 53 | 05/07 |
| Hungary | 138 | 15/06 | Macedonia Fyr | 81 | 06/07 |
| Austria | 95 | 16/06 | Nigeria | 102 | 19/07 |
| Romania | 162 | 16/06 | Ivory Coast | 68 | 27/07 |
| Poland | 190 | 18/06 | Ghana | 85 | 02/08 |
| Rep. of Ireland | 63 | 19/06 | Total | 5,386 | 20/06 |