SKILLS MISMATCH BETWEEN LABOUR SUPPLY AND DEMAND IN SPAIN

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The Spanish labour market has a much higher and persistent long-term unemployment level than that of other developed countries, especially in certain groups, such as that of the lesser skilled. The causes of this problem are manifold, but one might be the mismatch between the working skills demanded and those offered by job-seekers. With a view to analysing this matter, this article estimates a skills mismatch index based on the on-the-job tasks used. It also analyses the differences in this index relative to other countries and the contributions of different types of tasks to the employability of the different groups of unemployed in Spain.

Introduction

The Spanish labour market has a much higher and persistent long-term unemployment level than that of other developed countries, especially in certain groups, such as that of the lesser skilled.[1] The causes of this problem are manifold, but one might be the mismatch between the working skills demanded and those offered by job-seekers. This matter has previously been analysed in, for example, Izquierdo, Puente and Font (2013), who compare, for the Spanish case, the formal level of educational attainment of the unemployed population with that of the employed, as an approximation to skills supply and demand, respectively. The authors show that, from 2005, the mismatch has progressively increased to twice its starting level in recent years. As a result, Spain is estimated to head the euro area countries with the biggest differences in educational attainment levels between the employed and unemployed.[2] The reason for this increase in the educational mismatch would be found in a relative increase in the demand for workers with higher studies, while the educational level of the unemployed in Spain was increasingly concentrated in low skills levels.

The foregoing analysis illustrates the importance of the educational mismatch in the development and persistence of the economic crisis and the need either to increase training for the low-skilled unemployed, which is no simple matter given the logical difficulties of their stepping back into a formal educational system after several years of working experience, or else to offer incentives for the hiring of these types of unemployed individuals. However, this prior paper assumes that all individuals with the same level of educational attainment are interchangeable, even though they may have had different working experiences previously. A more realistic approach to measuring the mismatch between labour supply and demand would require an analysis not only of the level of educational attainment reached by the unemployed individual but also of the skills acquired through work experience and their comparison with those demanded in the labour market. In this respect, Lacuesta, Puente and Villanueva (2012) analyse the mismatch between the employed and unemployed having regard to the occupational distribution of the former and the latter in their last job, instead of by levels of educational attainment, obtaining similar results to those of Izquierdo, Puente and Font (2013). Nonetheless, the classification of jobs also fails to capture accurately the tasks used in each job, since these depend on numerous factors such as the workers' professional status, the industry to which the

1 For a more detailed analysis on long-term unemployment, see Box 1.3 of the Banco de España *Annual Report 2015*. For a European perspective, see Fernández and Izquierdo (2013).
2 ECB (2012), Structural Issues Report, "Euro Area Labour Markets and the Crisis".

company belongs and the type of business structure. Data limitations meant that the previous paper had to use aggregates of skills required in the United States for each level of employment that were drawn from a US public database.[3] Given this constraint, the study concluded that the mismatch in terms of tasks was less than the educational attainment mismatch, since there was more homogeneity among the tasks required by the different jobs in the economy.

This article complements the previous studies by means of a direct analysis of the tasks used in Spain by each unemployed worker and each employee with the same educational attainment level in their respective current or previous jobs, drawing on the data from the OECD's Survey of Adult Skills (PIAAC).[4] The analysis takes into account the heterogeneity of jobs performed and demanded among the set of individuals comprising a single educational group in our country and, therefore, it approximates more realistically the measurement of worker employability given that it takes into account not only the difference between the academic levels available and demanded, but also the match between previous and required working experience.

The data

As discussed in the introduction, few data sources are available to measure the skills mismatch in the Spanish labour market. The data from the OECD's PIAAC survey help cover – at least partially – this shortcoming, as they provide information on the level of employability of the unemployed in each country in accordance with the skills acquired in their previous working experience. The data correspond to the months running from August 2011 to March 2012, whereby it is not possible at present to establish time trends on the basis of this information. However, one of the advantages of the PIAAC is that the sample is representative of the Spanish adult population aged 16-65.[5]

The survey measures and assesses participating countries' adult cognitive skills and working competencies.[6] Survey information is divided into three groups. First, a direct evaluation is made of the interviewees' skills, encompassing reading comprehension, numeracy, literacy and problem-solving in technology-rich environments. Second, information is gathered on both physical and cognitive or social tasks, performed in the current job (or in the immediately previous one, in the case of the unemployed). Finally, further contextual individual information is compiled, such as demographic characteristics, education, and employment status and income.

This article chiefly uses the group relating to the use of skills at work, which includes information on the set of tasks performed by the individuals interviewed, including most notably the frequency of different on-the-job actions. In particular, questions are asked on 37 variables relating to reading, writing, numeracy, IT skills, problem-solving, people skills, cooperation, personal time management, use of manual dexterity and use of prolonged physical force. For each type of task, the database offers a set of possible replies about their frequency of use, ranging from "never" to "every day".[7]

3 The study uses the *O'NET* database, which shows the skills used by each occupation for the US economy.
4 For more information on the database used, see the official OECD webpage: http://www.oecd.org/site/piaac/.
5 A more detailed analysis of the PIAAC database can be found in Ministerio de Educación, Cultura y Deporte (2013).
6 Specifically, the data refer to a total of 48,355 employed individuals and 5,484 unemployed individuals from the Czech Republic, Finland, France, Ireland, Italy, Korea, the Netherlands, Norway, Russia, Slovakia, Spain, Sweden and the United Kingdom. For Spain, the number of observations is 3,345 employed individuals and 647 unemployed individuals.
7 The article talks interchangeably about tasks and skills under the assumption that, by performing a task, you acquire a skill therein.

With this information, it is sought to approximate the degree of skills mismatch in the Spanish labour market by comparing skills used by employed individuals and those used by the unemployed in their last job. For the unemployed with recent work experience, information is offered on the tasks performed in the last job, but only if that job ended at most a year ago. That causes certain biases, which may be significant in Spain's case given the high incidence of youth and long-term unemployment. Error will be greater insofar as the tasks performed by this type of unemployed individual are not extrapolatable to all other unemployed persons, either because they have been unemployed for over a year or because they still had not found their first job. Specifically, greater mismatches than those set out in the article for these two groups might be expected, as a result of their previous working experience having been non-existent or different or having depreciated over time.

A skills-based mismatch index

Using the data described above, a mismatch index is constructed based on the skills acquired by the unemployed and those required by the job, as follows. For each unemployed individual, the set of tasks performed in the last job is taken into consideration. If an individual performs at any time a task on the job, whatever its frequency, it is assumed that the individual possesses this skill.[8] These skills are compared with those of each of the jobs in their country of residence occupied by workers with the same level of studies.[9] There is considered to be no skills mismatch between unemployed individual and job if there is a perfect match between the skills of each. If any of the job tasks should not have been used by the unemployed individual in his/her previous job, there is considered to be a mismatch between the skills possessed by the unemployed person and those demanded by this job. The final degree of employability of the unemployed individual is defined as the fraction of jobs for which there is no mismatch with his/her skills. To make for readier presentation, the degrees of individual employability are averaged out by groups of different educational attainment levels.

To enrich the analysis, alternative indices have also been constructed that compare the skills of the unemployed to the tasks required by job-holders in different countries. Specifically, the skills of Spanish unemployed individuals are compared with those of employees with the same level of educational attainment in the European Union. If the degree of employability for a specific country diminishes with this new group of comparison, it may be concluded that the tasks required by that country's labour market are less complex and heterogeneous, and vice versa.[10] Finally, the importance of the different skills in the employability of the unemployed in each country is studied.[11]

Results

DESCRIPTION OF SKILLS DEMANDED

Tables 1, 2 and 3 present the skills most demanded[12], according to the PIAAC, both in Spain and in the other countries considered, for each educational level.

In the case of the low educational level (see Table 1), the skills most frequently deployed by workers with this level in their respective jobs are simple problem-solving, physical

8 The results scarcely alter under alternative assumptions.

9 A distinction is drawn between three educational levels: high education corresponds to completed tertiary studies; intermediate education refers to post-obligatory secondary studies (academic or vocational); and, finally, low education comprises categories ranging from no education to obligatory secondary studies.

10 This new index might also be interpreted as the mismatch between skills supply and demand, under the extreme assumption of perfect mobility across the European Union countries, while the former index would be equivalent to the assumption of complete immobility.

11 To facilitate matters, skills are grouped into ten sets following G. Quintini (2014). Some changes are made for the inclusion, modification or exclusion of certain competencies. The groups used are: skills relating to reading, writing, cooperation, problem-solving, personal relations, use of computers, time management, dexterity, physical skills and numeracy.

12 In particular, the skills used by over 65% of workers are reported, either in the Spanish labour market or taking the average in other countries.

SKILLS USED ON THE JOB. COMPARISON BETWEEN SPAIN AND THE AVERAGE FOR THE OTHER COUNTRIES. LOW EDUCATION (a) TABLE 1

	Spain	Other	Difference Spain – Other
Simple problem-solving	80.9	81.7	-0.8
Physical skills	80.4	80.3	0.1
Manual dexterity	78.2	73.6	4.6
Information-sharing with colleagues	77.9	79.0	-1.1
Time management	77.7	72.0	5.8
Advising people	45.8	67.5	-21.7

SOURCE: OECD (PIAAC).

a Only skills with over 65% use are reported, both in Spain and on average for the other countries.

SKILLS USED ON THE JOB. COMPARISON BETWEEN SPAIN AND THE AVERAGE FOR THE OTHER COUNTRIES. INTERMEDIATE EDUCATION (a) TABLE 2

%

	Spain	Other	Difference Spain – Other
Simple problem-solving	89.0	90.0	-1.0
Time management	87.5	80.2	7.2
Information-sharing with colleagues	84.6	86.3	-1.7
Complex problem-solving	73.8	75.5	-1.7
Reading instructions	71.4	74.8	-3.5
Reading correspondence	68.6	63.8	4.8
Manual dexterity	67.4	73.0	-5.6
Reading manuals	66.2	63.3	2.9
Advising people	64.4	72.9	-8.4
Physical skills	63.7	71.4	-7.7
Using a calculator	62.7	65.1	-2.3

SOURCE: OECD (PIAAC).

a Only skills with over 65% use are reported, both in Spain and on average for the other countries.

work and manual dexterity[13], followed by time-management ability and the need to share information with their work colleagues. In terms of international comparison, no significant differences are observed in the type of work performed by these workers, although for this group in Spain a high capacity to interact with customers in connection with advisory or negotiation tasks would not appear to be required.

At the intermediate educational level (see Table 2), the range of tasks performed by the foregoing group widens. Thus, added to the skills that the low-educational-level workers were already using are others, mainly relating to literacy, and to complex problem-solving. In relative terms, the weight of both physical work and of manual dexterity diminishes. This loss of weight is not so marked in other countries. As occurred with the lesser-educated group, a smaller proportion of workers in Spain interacts directly with customers compared with what is observed in other countries.

13 Manual dexterity is understood to be any action requiring a degree of skill involving hand/eye coordination such as repairing machinery, assembling products, sewing, craft work or performing artistic activities.

SKILLS USED ON THE JOB. COMPARISON BETWEEN SPAIN AND THE AVERAGE FOR OTHER COUNTRIES. HIGHER STUDIES (a) TABLE 3

%

	Spain	Other	Difference Spain – Other
Time management	95.0	89.9	5.1
Simple problem-solving	94.8	94.8	0.1
Information-sharing with colleagues	92.2	92.1	0.1
Reading correspondence	87.6	78.5	9.1
Complex problem-solving	87.3	89.4	-2.0
Writing correspondence	85.3	75.7	9.7
Reading instructions	85.3	83.5	1.8
Reading manuals	84.3	80.3	3.9
Advising people	78.8	82.6	-3.8
Using e-mail	78.7	67.1	11.6
Completing forms	78.0	77.4	0.7
Training staff	76.7	68.4	8.4
Using the Internet	76.7	67.6	9.1
Writing reports	75.9	71.7	4.2
Using a calculator	75.8	76.2	-0.5
Using a word processor	74.9	67.8	7.2
Reading articles in professional journals	71.6	70.5	1.1
Using fractions, decimals or percentages	66.8	57.8	9.1
Convincing o influencing people	63.6	78.4	-14.8
Negotiating	57.0	72.5	-15.5
Manual dexterity	56.9	67.4	-10.6

SOURCE: OECD (PIAAC).

a Only skills with over 65% use are reported, both in Spain and on average for the other countries.

Finally, among workers with high levels of educational attainment (see Table 3), the set of tasks is once again extensive, including some relating to office automation, training, specialist reading and writing. Also, physical work skills and dexterity continue to diminish in significance with greater intensity than in the other countries. As to the remaining domains, for this high-skills group there appears to more demand in Spain for Internet-related actions and virtual interaction, while there is notably substantially less demand for tasks requiring people skills.

EMPLOYABILITY BY COUNTRY AND EDUCATIONAL LEVEL

Chart 1 shows the employability index for each educational level of the unemployed when the comparison is made with the jobs for the same level and country. Generally, and irrespective of the country of residence, the employability index derived from the PIAAC is usually higher for lower levels of educational attainment than for intermediate and higher ones. That would indicate that lower-skilled workers usually perform more uniform tasks irrespective of the sector in which they work whereas the tasks of higher-skilled employees are more heterogeneous and therefore require greater specialisation. This result would suggest a greater effectiveness of specialist training courses for higher-skilled workers.

In the low educational level segment a high relative employability of Spanish unemployed individuals is observed compared with other countries, which shows that the skills in their previous job are similar to those performed by Spanish employees with the same educational level. In this respect, the high incidence of long-term unemployment within

EMPLOYABILITY BY LEVEL OF STUDIES. JOBS WITHIN EACH COUNTRY (a) CHART 1

SOURCES: OECD and Banco de España.

a The employability index is constructed as the average for each educational level of the fraction of jobs in Spain for which there is no skills mismatch in respect of each unemployed individual.

this group would not appear to be so much related to greater skills mismatch problems in respect of demand within this same educational group, but rather to potentially low labour demand in this educational segment, as suggested by Izquierdo, Puente and Font (2013).

However, the situation is very different between those with intermediate and high educational levels, who show a very low degree of employability compared with that observed in other countries, reflecting high differences between the tasks performed in the last job and those performed by the current job-holders with their same level of skills. In this respect, the skills demanded by the labour market are more demanding than those acquired by the unemployed in their last jobs, denoting a clear need for specialised training in those tasks currently demanded by the market for these groups.

EMPLOYABILITY BY LEVEL OF STUDIES. JOBS IN THE EU AS A WHOLE (a)

CHART 2

SOURCES: OECD and Banco de España.

a The employability index is constructed as the average for each educational level of the fraction of jobs in the EU for which there is no skills mismatch in respect of each unemployed individual.

Chart 2 compares the skills of the unemployed in each country with those of job-holders with the same educational level across the EU countries considered in the sample. The employability indices are lower in Spain than those shown in Chart 1, which suggests that the tasks performed in the Spanish labour market are more homogeneous and less complex than those carried out in other countries, in particular in the case of workers with a lower level of educational attainment. This result highlights the fact that workers in Spain, and especially the lower skilled, possess a lesser relative degree of skills compared with other countries. While not the fundamental factor that determines workers' international mobility, this constraint might mean that Spanish workers, especially those with a lower educational level, face a competitive disadvantage vis-à-vis foreign workers when it comes to considering moving to another EC country for work-related reasons.

ANALYSIS OF SPECIFIC SKILLS

This section analyses what types of tasks are responsible for the mismatches between labour demand requirements and the previously observed skills of the unemployed or, what amounts to the same, what type of skills the unemployed should acquire to increase their employability. To make the results more readily readable, the 37 domains are grouped into different sets according to the type of skill required[14] and the contribution of each skill to the employability index is shown.[15]

Chart 3 shows, for each educational level, the contribution of skills to the employability index. In the lowest academic segment, it can be seen that the use of people, literacy and problem-solving skills are the most important when explaining the mismatch between the employed and the unemployed. The finding suggests that the unemployed with a low educational level should prioritise improving these three skill areas in order to increase their employability. For the unemployed with an intermediate educational level, the most important set of skills is also that associated with people skills, although in this case it is followed by physical work and reading skills. Finally, among the higher skilled, manual dexterity is the most important task and that with most weight, although once more people skills are in second place. As to the comparison with the other countries, significant differences are not observed regarding the importance of the skills groups in low and intermediate education. Where significantly different results are found is at the top skills level. The average for the other countries reflects a much greater skills mismatch in respect of people and IT skills.

The analysis of specific tasks enables certain recommendations to be formulated with a view to the design of active policies aimed at improving the employability of the unemployed. In particular, the findings of this article suggest that it might be worth reinforcing people skills training. Likewise, for highly educated workers, there also appears to be a significant mismatch in manual dexterity, possibly connected with specific technical specialities that should be identified with better data.

Conclusions

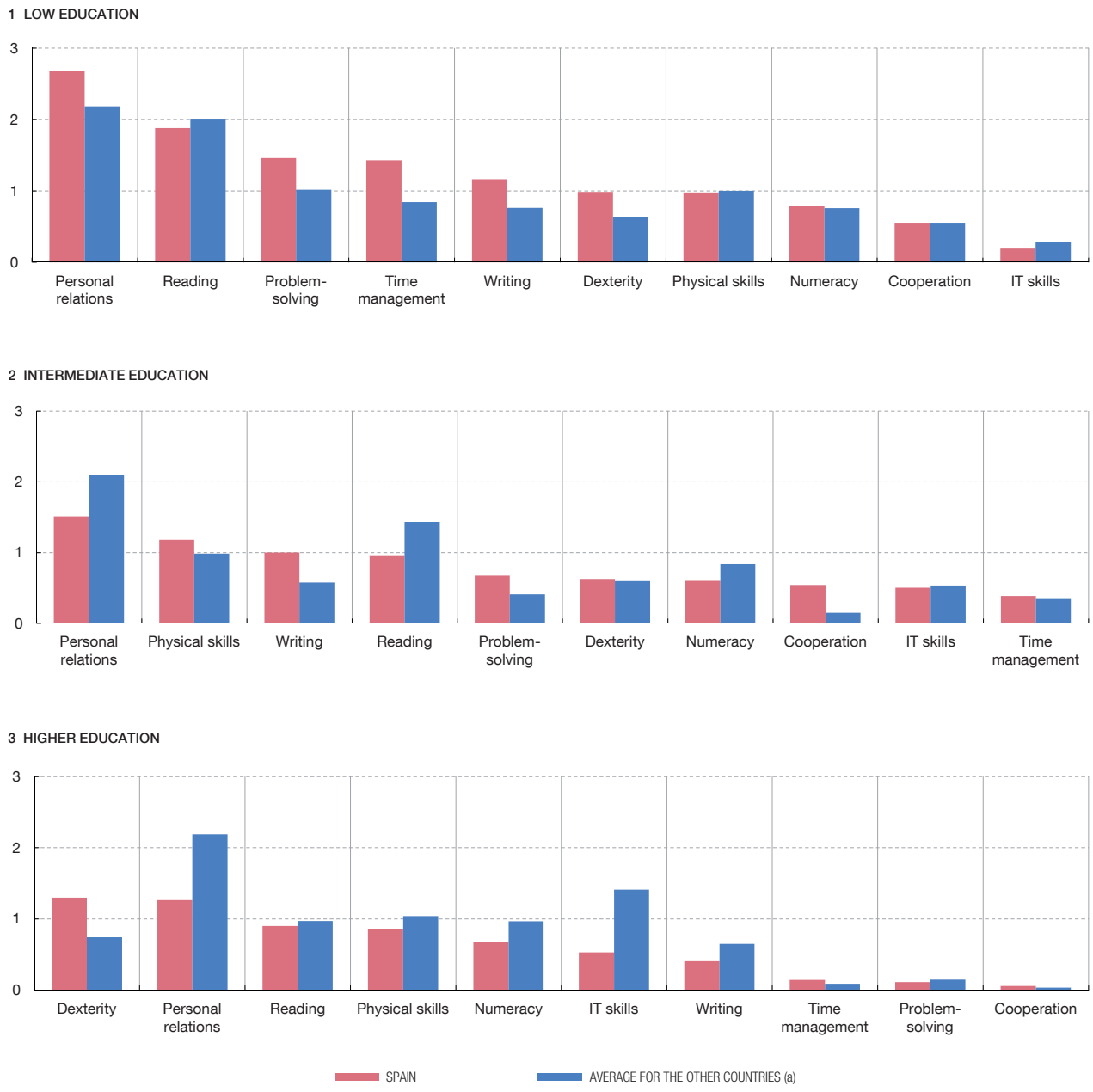
This article analyses the mismatch between the working skills demanded and those offered by job-seekers. To that end, an employability index is constructed, based on the set of tasks used in jobs held by groups of a different educational status in Spain, and these tasks are compared with those performed by the unemployed in their last job, drawing on the information provided by the OECD's PIAAC database.

According to this index, the group showing the least mismatch in skills would be that of the unemployed with a low educational level, since there is a greater correlation between

14 Group of competencies related to people skills: advising, teaching, influencing, negotiating, organising other people's activities, making presentations and sales. Group of reading competencies: reading guidelines or instructions, reading letters or e-mails, reading professional journals or publications, reading books, reading manuals or reference materials, reading financial statements and reading diagrams, maps or schemata. Group of writing competencies: writing letters or e-mails, writing articles, writing reports and completing forms. Group of IT competencies: use of a computer for using e-mail, viewing work-related information, using a word processor, conducting transactions, using spreadsheets, conducting real-time discussions and using a programming language. Group of problem-solving skills: simple problem-solving (finding a solution requiring no more than five minutes) and complex problem-solving (finding a solution requiring at least thirty minutes). Finally, there are two skills that are not grouped with any other: physical skills, which refer to the performance of a physical job over a long period of time, and manual dexterity, which refers to the use of skill or precision with one's hands or fingers.

15 Specifically, this exercise is carried out by calculating another index that excludes the task considered. The difference between employability excluding and not excluding this factor may be interpreted as its contribution to employability. Note that these contributions cannot be interpreted as the key competencies for the performance of a job but are rather those that increase to the greatest extent the difference in skills between the employed and the unemployed.

CONTRIBUTION OF EACH SKILL TO EMPLOYABILITY BY LEVEL OF STUDIES (a) CHART 3



SOURCES: OECD and Banco de España.

a The contribution of each group of skills to the employability index is calculated by taking in each case an alternative index that excludes the group considered. The difference between the overall employability index and that calculated excluding each group may be interrpreted as the contribution to employability.

the tasks performed over their previous working career and what is currently demanded. Consequently, this group's employability problems might be attributed, above all, to low demand for relatively unskilled labour, as suggested by Izquierdo, Puente and Font (2013), and not to skills mismatch problems. This mismatch is greater among individuals with intermediate and high educational levels, given that the skills the unemployed acquired in their last jobs are less similar to those current job-holders use. This finding would suggest a greater need for specialist training courses in the tasks required in the labour market for these groups. Finally, the analysis of specific skills reveals that a major source of skills mismatch in Spain arises, for all educational levels, from people skills. Compared with the contributions of each skill calculated for other countries, the

main differences are found in the higher education segment, where the mismatch attributable to people skills or skills associated with the use of computers is much less in Spain than in other countries.

Looking ahead, the type of analysis conducted in this article might be of use for assessing the relative need for training in specific skills that make up a good portion of the budget for active policies in Spain. In this connection, the availability of regular data on both the map of skills and on the characteristics of the training courses comprising these active policies would be required.

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