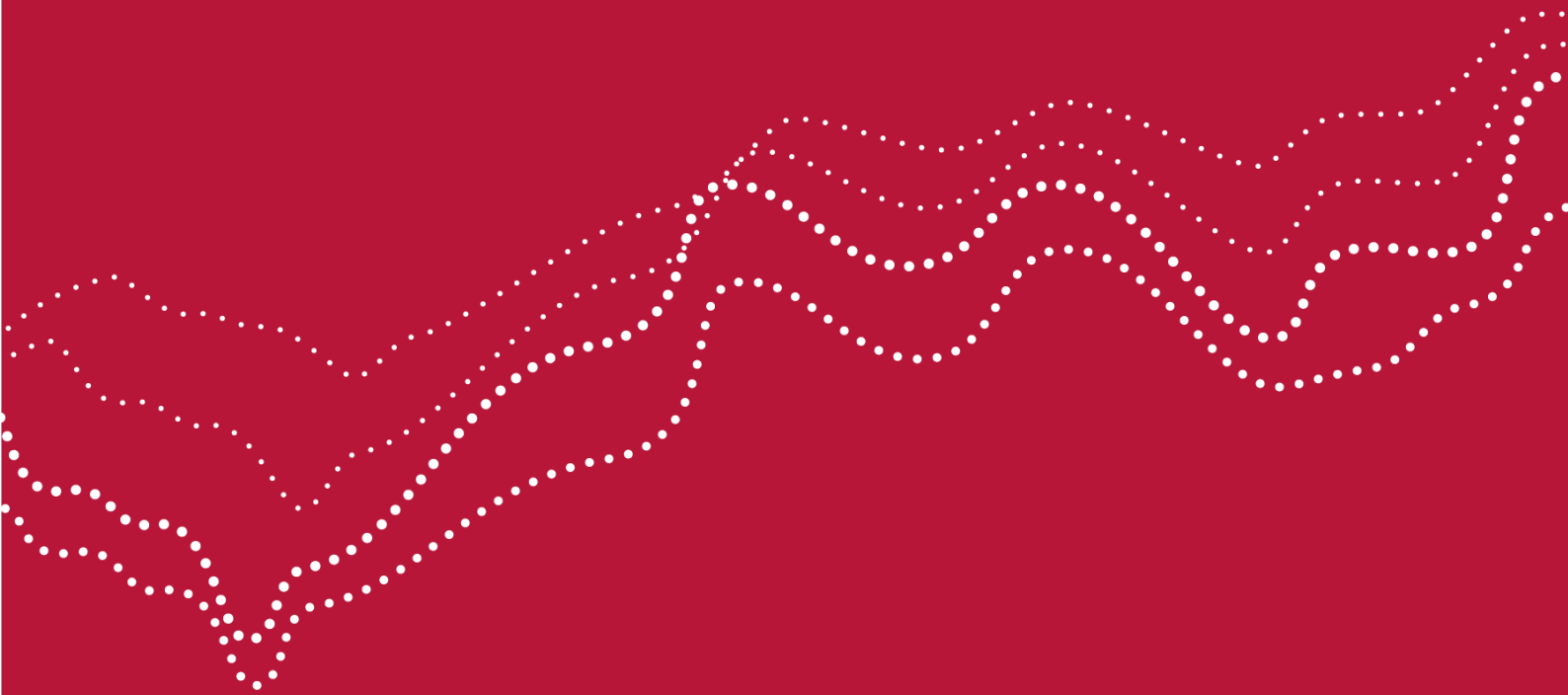# Youth labour market: indicators of demand and availability before and during Covid-19

KAROLINA   BOLESTA   (WARSAW   SCHOOL   OF
ECONOMICS)

Youth labour market: indicators of demand and availability before and during Covid-19

ABSTRACT

Youths in the labour market today have been facing numerous challenges. The purpose of the research presented in this article is to measure the changes in the labour market due to the pandemic outbreak in Spain, Hungary, Italy and Poland in the light of labour indicators. There are eight analysed indicators and they come from the Eurostat database. Data are measured annually and the time range consists of five years, from 2016 to 2020. To decompose the structure of variables, I conducted principal component analysis. This enabled identification of two components which describe the the ability of the labour market to absorb youth labour supply and the availability of young people to be employed in the private sector. Furthermore, the trend in these two components of the labour market for each of the four countries is presented.

Karolina Bolesta (Warsaw School of Economics) [1]

IMPLEMENTED BY:

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1.   Introduction

Currently, the labour market has been undergoing irreversible changes (Sobotka, 2021). This has been forced by Covid-19 pandemic which appeared in late 2019. As it was an unprecedented situation, the labour market has started to adjust with no planned regulations. Over time restrictions in the labour market were introduced for an indefinite period, especially in the workplaces mostly occupied by youths: tourism, restaurants, accommodation. Whereas the pandemic influenced every age group, youths are usually seen as more vulnerable to the unfavorable trends in the labour market (O'Higgins et al., 2017). This was the case this time as well. As an inexperienced group of people, youths struggle with finding a suitable job. They are also more exposed to a path dependency – having finished education, they may take up an unpaid or little paid job which does not make it easy to find a better one. Although they are just starting their careers and make numerous decisions when shaping their professional lives, lack of experience does not always appear to be an advantage in employers' eyes.

Among the characteristics of youth employment that turned out to be detrimental during the pandemic is the higher share of temporary occupations with their relatively high risk of layoff.

Whereas policymakers have intended to smooth the effects of the pandemic, the actions are mostly directed to the general public rather than youths whose needs require another treatment. Youths are usually the first candidates to be made redundant due to their lack of experience and possessing low-critical positions. That is why they are usually called "last in, first out" (OECD, 2009). Furthermore, it is one of the most heterogeneous groups, making it even harder to take a proper action.

In order to analyse the challenges holistically, both supply and demand information need to be taken into account. In this case different labour market indicators are analysed to show comprehensive labour market transformations. In this paper I consider Spain, Hungary, Italy and Poland in the 5-year time period, from 2016 to 2020. The purpose of the article is to analyse the changes in the youth labour market, taking the Covid-19 pandemic as the main perspective.

The article is structured as follows. First, I provide the background on what actions have been taken in the chosen countries in the context of Covid-19 pandemic. I mostly focused on the tools and programmes dedicated for youths. While this gives an overview of the analysis, in the next part I depict the situation in the labour market using the existing data, concentrating on unemployment and NEET rates. I explain the background for principal component analysis and perform it on selected Eurostat

variables. Then, I analyse the trends for each country. In the last part I sum up the findings and provide recommendations based on the performed analysis.

2. Actions taken against the Covid-19 pandemic in the context of the labour market

Whereas each country has implemented its specific actions, there were also some programmes introduced under the common European umbrella. The main one was Next Generation EU which amounts to EUR 750 billions for EU members. The Youth Guarantee is particularly dedicated to creating job opportunities for all people aged below 30 within 4 months of becoming unemployed or leaving education (the reinforced Youth Guarantee, Eurostat). The majority of support consisted of social protection and providing education for youths (Eurofound, 2021).

2.1. Spain

The Youth Guarantee was implemented in June 2021, having consulted with all-level national institutions, starting from business units, to youth stakeholders. The previous youth strategy expired in 2020 so it was a good moment to implement a new one. Spanish actions for youths focused on providing learning opportunities, as well as entry-level positions, such as internships. The main purpose was to provide flexible solutions so that combining work and studying is manageable. Even before the Covid-19 pandemic, employers were encouraged to provide job offers to youths. For instance, if they hired someone aged 16 to 24 for a contract from 1 to 3 years, employers would be entitled to receive contributions and subsidies. Working hours could be shortened if a person spent extra time on education. In the context of labour contracts, the minimum contribution requirements were suspended, both for temporary and permanent workers.

2.2. Hungary

Per national arrangements, the National Youth Strategy that is in place has been implemented for the time range 2009-2024. It has three foundations: enforcing social integration, strengthening youths and promoting youth organisations. For the time being, Hungary does not plan to implement a new strategy as a result of the pandemic outbreak. However, help for youths was available in many sectors. Youth employment was enhanced by releasing hiring subsidies and through creating job vacancies dedicated to youths. These were already in place before the Covid-19 outbreak. Small and medium

enterprises could receive wage subsidies for nine months. The subsidies were implemented for companies recruiting youths. To support youths' financial situation, in April 2020 it was decided that starting in 2022, people aged under 25 do not need to pay income tax. There was temporary help for companies hiring people for longer than 9 months. The employees would receive a hiring subsidy. This assistance was adapted in October 2020 to encompass low-skilled youths, and could be up to half of the salary. Based on the data it was shown that as of June 2021 the subsidy enabled employment of 5600 youths. Later, the programme was modernised again. The target group got broader and included youths aged under 25 who were registered as unemployed for 1 month as well as had been looking for a job for at least 6 months.

2.3. Italy

In Italy, numerous employment policies were implemented to tackle youths' situations. Hiring subsidies were already implemented before the Covid-19 outbreak. These not only enabled job opportunities, but also by learning experiences. More than 25% of youths were supported by a job retention scheme for 3 months, from April 2020 to June 2020. This programme was also extended to young temporary workers. The employers were boosted as well by hiring subsidies of up to 100% of salary over three years if they hired NEETs (those neither in employment, nor in education or training) younger than age 36. The current focus is put on empowering youths who are starting their careers, and support is also visible through career guidance. There were some financial incentives implemented to encourage employees to take up a job. To support it, the employer contribution rate was reduced by 14 percentage points, to 10%. Small companies (defined as hiring fewer than ten employees) were eligible to get reimbursed.

2.4. Poland

There is no youth strategy at the national level, however, there is a document summarizing priorities for youths in s 10-year perspective, from 2020 to 2030. The key areas are labour market, health, innovation and culture. The document is being updated to adjust to the Youth Guarantee. Apart from that, one of the priorities for Poland was to provide additional income for youths through temporary jobs. The support did not focus on the labour market itself, but it was broader, as also provided health services. New centers for training health professional were opened in April 2020. This action was already being implemented before Covid-19 and by January 2021, financial support amounting to 220 million was announced. The help was directed to children and adolescence. Similar to Italy and Hungary, Poland used hiring subsidies to boost youth employment. These subsidies were offered for people aged under 29 within the

framework of the European Social Fund. It is estimated that 150,000 youths took part in this programme. Regarding work and study initiatives, some were already in place before the pandemic. Employers were eligible for reimbursement when hiring students. This has not formally changed, but the initiatives became even more flexible when the pandemic started. Support has also been provided for people in weaker positions, e.g. NEETs, those becoming unemployed as a result of the pandemic and people with disabilities.

3. Picture of the youth labour market

In order to show the current state of the labour market for youths, I used the Eurostat data from the Labour Force Survey.

Figure 1 Youth employment rate (aged: 15-29), 2016-2020 (%).
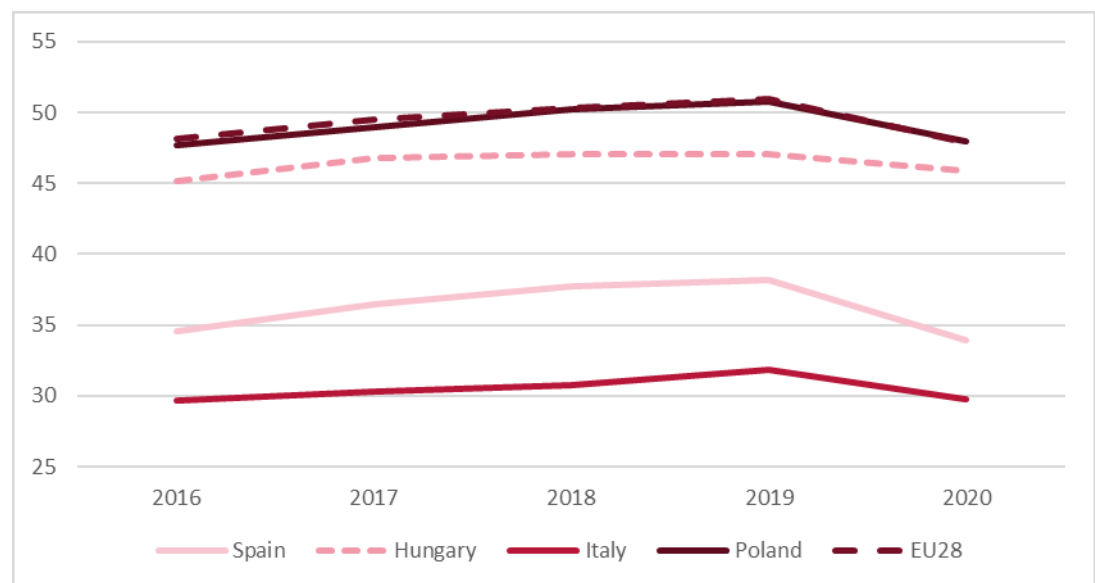
Source: Eurostat, Youth employment rate by sex, age and country of birth [yth_empl_020].

Spain, Hungary and Italy are below the EU average throughout the time range. Although the youth employment rate has different values for all of the countries, the trend is the same for all: it had been slowly increasing until 2019 and then a marked decline was observed. In 2020, for the analysed countries, the value declined from 2.6% in Hungary to 12.6% in Spain comparing to the value in 2016. Furthermore, in 2020 the values were almost the same as in 2016.

Figure 2 Young people neither in employment nor in education and training (aged: 15-29), 2016-2020 (%).
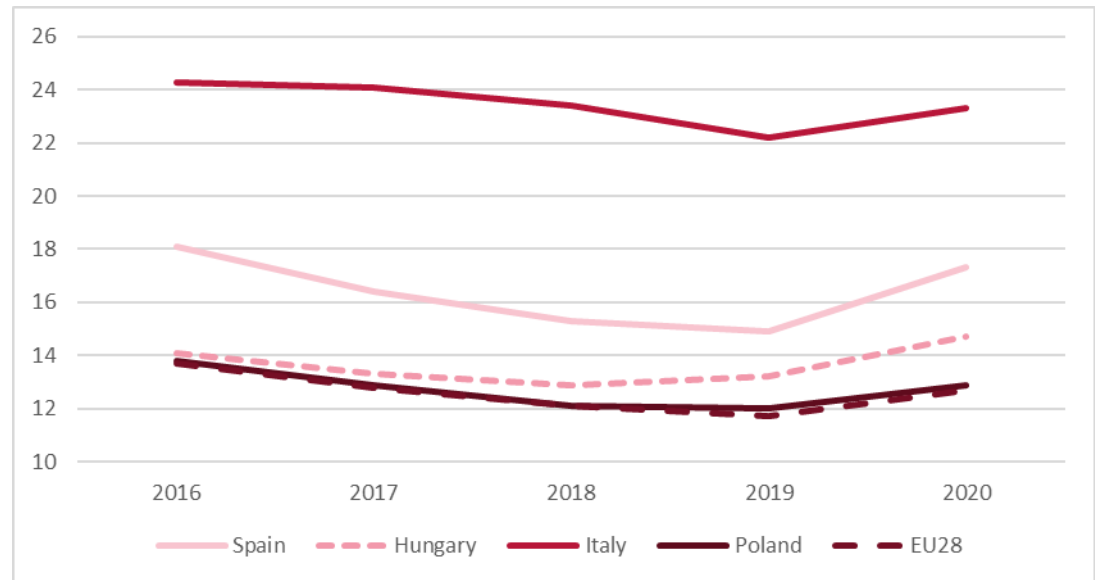
Source: Eurostat, Young people neither in employment nor in education and training by sex, age and labour status (NEET rates) [yth_empl_150].

The especially vulnerable group in the labour market were those neither in employment, nor in education or training (NEET). This is a "social category specific to today's society characterised by increasing inequalities between people, precariousness, and insecurity" (Gabriela, 2021). The future situation of a person in the labour market depends on previous experiences which can be understood broadly: professional experience as well as education and volunteer initiatives. In this time period, the average share of NEETs in the European Union was 12.6%. Italy has the highest share: about one out of four youths is a NEET. In all four countries the trend is quite similar within the analysed period: the general tendency of a decline in the share of NEETs has been sharply interrupted by the Covid pandemic. The NEET results are associated with the youth employment rate – whenever the NEET value is decreasing, the youth employment rate is increasing.

4.   Data and methodology

4.1.   Data

The data source is the Labour Force Survey (LFS). It focuses on participation in the labour market, taking into account multiple aspects, such as an overview of the population, unemployment, labour status and working time. It is an anonymised sample survey conducted in private households and provides comparable data (European Union Labour Force Survey). All of the chosen variables were analysed for the total population of the

country. They are all expressed as a percentage and the age range is 15-29. The analysed variables are as follows:

X_1 - Youth employment rate

X_2 - Youth self-employment rate

X_3 - Young temporary employees rate

X_4 - Part-time employment rate

X_5 - Involuntary part-time employment rate

X_6 - Youth unemployment rate

X_7 - Youth long-term unemployment rate

X_8 - Young people neither in employment nor in education and training (NEET rates)

4.2. Methodology

Before conducting the analysis, I checked whether the method was adequate for these data. This was done using the Kaiser-Meyer-Olkin (KMO) test[2], which can be calculated both for the whole database and for every separate variable.

The formula for the Kaiser-Mayer-Olkin test for the entire dataset is as follows:

$$KMO = \frac{\sum_{\substack{j=1, \\ j \neq j'}}^{m} \sum_{\substack{j'=1 \\ j' \neq j}}^{m} r_{jj}^2}{\sum_{\substack{j=1 \\ j \neq j'}}^{m} \sum_{\substack{j'=1 \\ j' \neq j}}^{m} r_{jj}'^2 + \sum_{\substack{j=1 \\ j \neq j'}}^{m} \sum_{\substack{j'=1 \\ j' \neq j}}^{m} r_{j,j'}^2}$$

where:

$r_{j,j'}^2$ - the partial correlation coefficient of the j-th variable with the j'-th variable

The Kaiser-Mayer-Olkin test for the single variable is as follows.

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[2] The Kaiser-Meyer-Olkin test is a measure of the sampling adequacy method which is based on examined variables. The purpose of this test is to analyse the data structure to check the feasibility for further calculation. While the KMO test can be calculated for both the whole dataset and individual variables, only the aggregated value is taken into account (Kaiser and Rice, 1974).

$$KMO_j = \frac{\sum_{\substack{j'=1, \\ j' \neq j}}^{m} r_{jj}^2}{\sum_{\substack{j'=1 \\ j \neq j'}}^{m} r_{jj}'^2 + \sum_{\substack{j'=1 \\ j \neq j'}}^{m} r_{j,j'}^2}$$

where: $j = 1,2, \ldots, m$

The value for KMO can be from 0 to 1. It is commonly accepted that for the entire data set it should be greater than 0.5 to justify using principal component analysis (Hair et al., 2006).

After checking the condition, I conducted the principal component analysis (PCA) to simplify the data structure and identify the hidden patterns.

PCA was first proposed by Pearson in 1901 and then improved by Hotelling in 1933. Throughout this method, the dataset of output variables $X_1, \ldots, X_p$ is transformed into the base of main components $Z_1, \ldots, Z_p$. The number of variables was reduced while maintaining the greatest possible variability of data.

The variables are shown below:

$$X_1 = a_{11}Z_1 + a_{12}Z_2 + \cdots + a_{1p}Z_p$$

$$X_2 = a_{21}Z_1 + a_{22}Z_2 + \cdots + a_{2p}Z_p$$

$$\vdots$$

$$X_p = a_{p1}Z_1 + a_{p2}Z_2 + \cdots + a_{pp}Z_p$$

The existing system of variables was transformed to the new, uncorrelated variables that are called principal components. The real observed variables X_i for $i \in \{1, \ldots, p\}$ are expressed as linear combinations of unobservable variables Z_j for $j \in \{1, \ldots, p\}$, called principal components. Later on, the coefficients a_{ij} for $\in \{1, \ldots, p\}$ determine the weight of a given component in the variable description.

One can describe $X = (X_1, \ldots, X_p)^T$ as the vector of analysed variables.

Principal components are a linear combination of the initial variables:

$$Z_1 = a_{11}X_1 + a_{12}X_2 + \cdots + a_{p1}X_p$$

$$Z_2 = a_{21}X_1 + a_{22}X_2 + \cdots + a_{p2}X_p$$

$$\vdots$$

$$Z_p = a_{1p}X_1 + a_{2p}X_2 + \cdots + a_{pp}X_p$$

The principal components are ordered in a way that the variances of the successive main components (constituting the measure of their information resources about the studied phenomenon) were smaller and smaller.

The results are interpreted using factor loadings.

$$r_{x_i z_j} = \sqrt{\lambda_j} a_{ij}$$

where:

$r_{x_i z_j}$ - correlation ratio between the i-th variable X_i and the j-th component Z_j for i, j $\in \{1, \ldots, p\}$

$\sqrt{\lambda_j}$ - standard deviation of the Z_j component

The sum of all eigenvalues of the correlation matrix $\lambda_1 + \cdots + \lambda_p$ is the total variance of the system. Moreover, the sum of the variances of all input variables is equal to the sum of the variances of the principal components, which means that transforming the input variables into principal components does not lead to any loss of information about the studied phenomenon. The first few main components contain the vast majority of information about the studied phenomenon, provided by the input variables, which allows the reduction of the number of principal components with the smallest possible loss of input information.

The part of the total variance determined by the j component:

$$h_j = \frac{\lambda_j}{\lambda_1 + \cdots + \lambda_p} * 100\%$$

Percentage share of total variability can be explained by the first k components:

$$H_k = \sum_{j=1}^{p} h_j$$

5.   Results

The correlation matrix for the existing variables is as follows.

Table 1 Correlation matrix for the analysed variables.

	Empl rate	Self-empl	Temp empl	Part-time	Involun part-	Unempl rate	Long-term	NEET

		rate	rate	empl rate	time empl rate		unempl rate	
Empl rate	1							
Self-empl rate	-0.5747	1						
Temp empl rate	-0.4601	0.4964	1					
Part-time empl rate	-0.9092	0.4961	0.7276	1				
Involun part-time empl rate	-0.9808	0.5989	0.4864	0.9059	1			
Unempl rate	-0.8954	0.3981	0.6706	0.9739	0.877	1		
Long-term unempl rate	-0.9387	0.6977	0.4825	0.8605	0.9585	0.8514	1	
NEET	-0.931	0.7595	0.3359	0.7493	0.9303	0.7167	0.9427	1

Source: own calculation based on Eurostat data.

The correlation between specific variables is from medium to high which supports using PCA. The higher the correlations between the variables, the stronger the rationalisation for using principal components analysis.

Table 2 KMO test for the analysed variables.

Variable	Label	KMO
yth_empl_020	Youth employment rate	0.6865
yth_empl_040_010	Youth self-employment rate	0.5732
yth_empl_050	Young temporary employees rate	0.5477
yth_empl_060	Part-time employment rate	0.7812
yth_empl_080	Involuntary part-time employment rate	0.721
yth_empl_100	Youth unemployment rate	0.6511
yth_empl_120	Youth long-term unemployment rate	0.6719
yth_empl_150	Young people neither in employment nor in education and training (NEET rates)	0.7112
Overall	n/a	0.6787

Source: own calculation based on Eurostat data.

KMO is greater than 0.5 both for every single variable and for the whole dataset. The overall value is greater than 0.5, which also validates use of PCA.

Figure 3 Scree plot of eigenvalues after PCA.
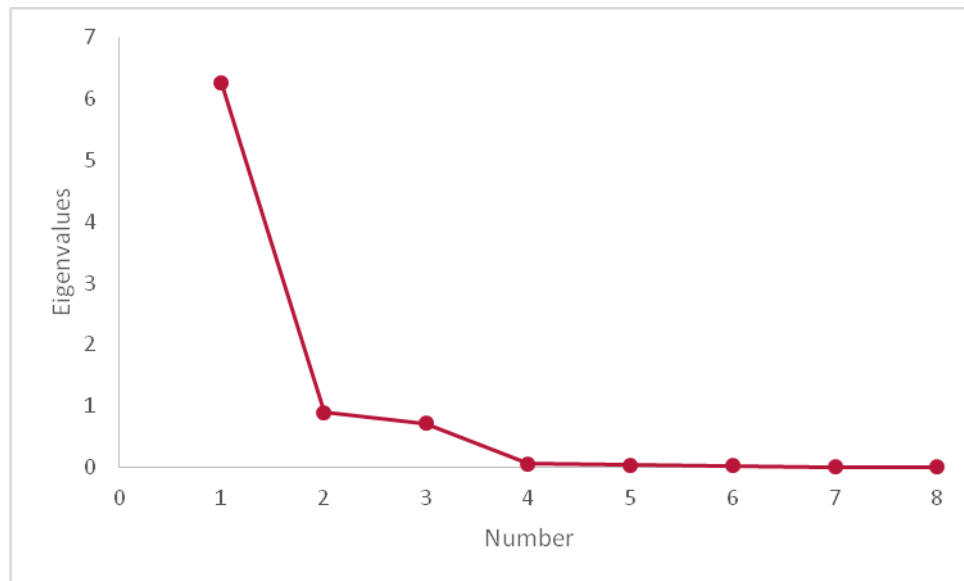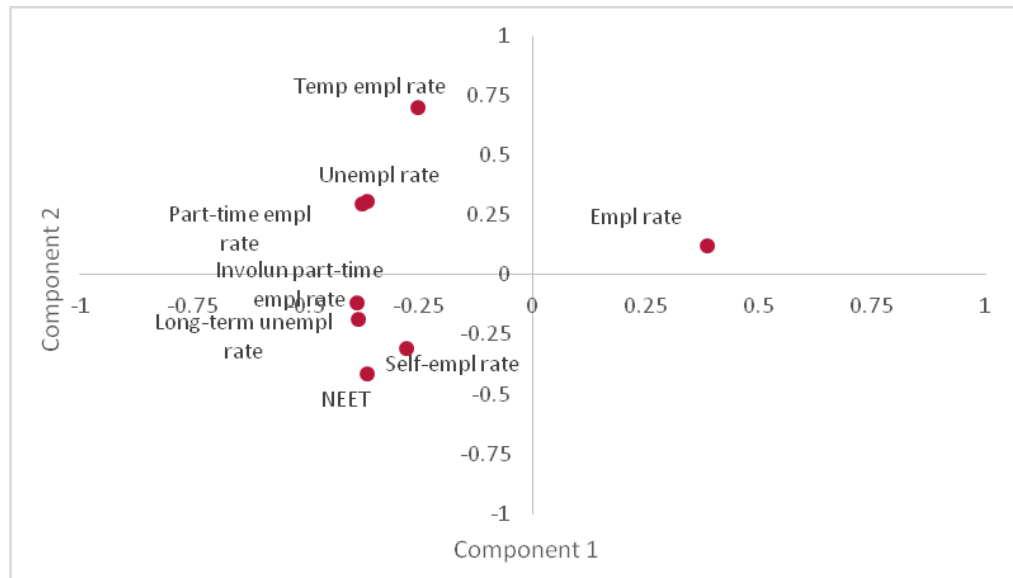

Source: own calculation based on Eurostat data.

The scree plot helps to identify how many components should be taken into account in the further analysis. As the first two components explain most of the variance, only those are analysed.

Table 3 Principal components.

Variable	Label	Comp1	Comp2
yth_empl_020	Youth employment rate	-0.3859	0.1208
yth_empl_040_010	Youth self-employment rate	0.2775	-0.3097
yth_empl_050	Young temporary employees rate	0.2534	0.6995
yth_empl_060	Part-time employment rate	0.3776	0.2950
yth_empl_080	Involuntary part-time employment rate	0.3880	-0.1197
yth_empl_100	Youth unemployment rate	0.3658	0.3074
yth_empl_120	Youth long-term unemployment rate	0.3861	-0.1838
yth_empl_150	Young people neither in employment nor in education and training (NEET rates)	0.3659	-0.4130

Source: own calculation based on Eurostat data.

*Figure 4 The analysed variables placed in two components.*

Source: own calculation based on Eurostat data.

Based on the results, the following variables have a higher weight according to the first component: youth employment rate (with a negative sign), part-time employment rate, involuntary part-time employment rate, youth unemployment rate and youth long-term unemployment rate. Given its content this component can be seen as representing the inability of the labour market to absorb the youth labour supply: the higher the value of the component, the lower the quantity of youth labour employed in the labour market. To ease the readability of the indicators I reversed their signs so that the figure can be read as an indicator of the quantity of youth employment such that when the indicator increases it means that youth employment is increasing. This transformed component can be named the "youth employment quantity", and thus mainly refers to the demand side of the youth labour market.

In the second component the variables that have the highest weight are: youth self-employment rate (with a negative sign), young temporary employees rate and NEET rates (with a negative sign). Although less straightforward than the first component, the second component can be seen as a measure of the availability of young people to be employed in the private sector. An increase in the self-employment and NEET rates, in fact, reduces the value of the component. Simplifying a bit, we can label this component as "youth labour availability (for private firms)". The second component is therefore mainly connected to the supply side of the youth labour market.

*Figure 5 Youth employment quantity along the analysed period.*
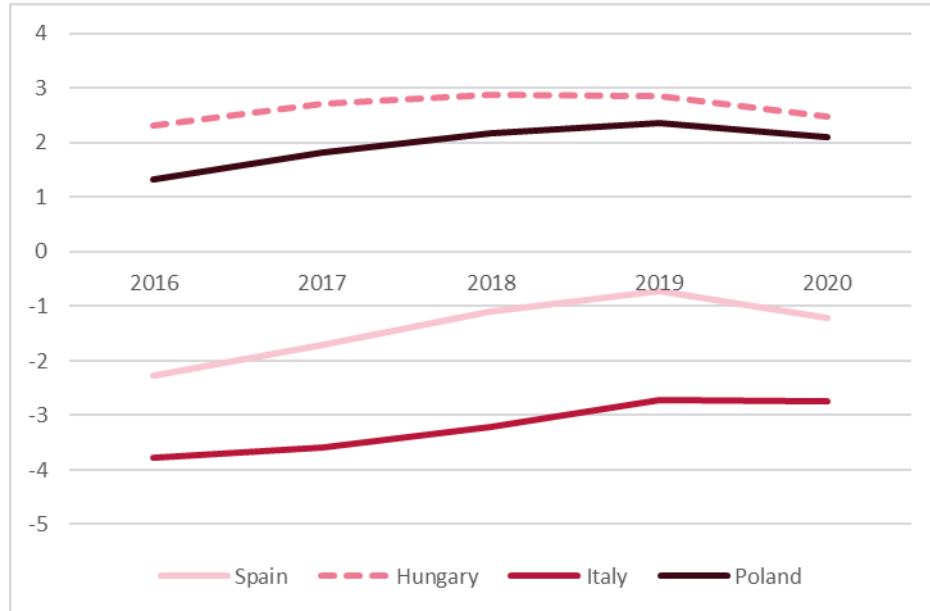
Source: own calculation based on Eurostat data.

As already shown while presenting the single indicators, the ability of the labour market to absorb the youth labour supply is particularly low in Italy and Spain, as confirmed by the trend observed in the first component (Figure 5).

The trend for labour market quantity in the five years considered is similar for all of the countries. It had been slowly increasing until 2019 and then a reverse trend is observed in 2020. The sharpest inversion in the trend seems to have happened in Spain followed by Italy. In Poland and Hungary, the negative (initial) effect of the pandemic is somewhat less pronounced.

Figure 6 Youth (private) labour availability along the analysed period.
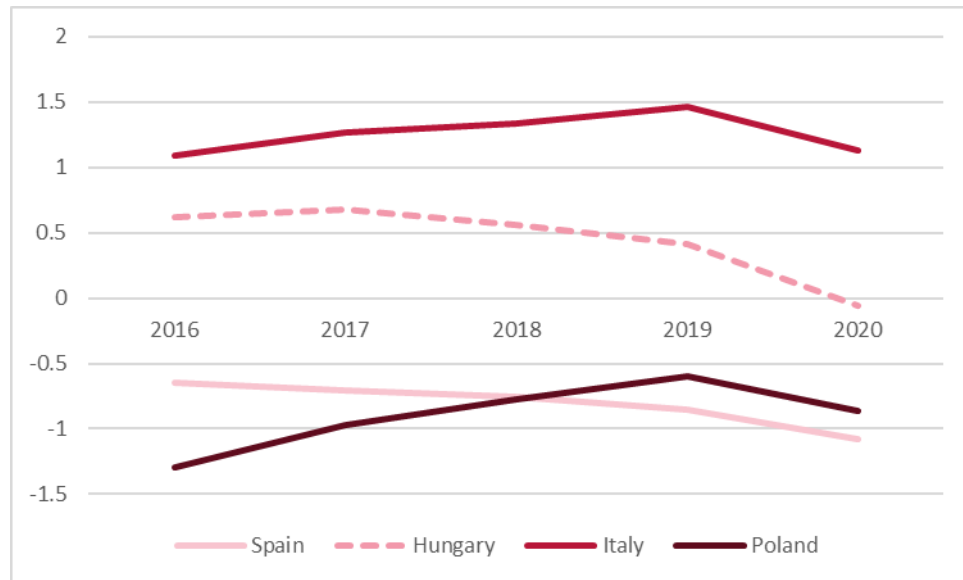
Source: own calculation based on Eurostat data.

Turning to the second component, the availability of young people to be employed in the private sector, the common element in the four countries analysed is the sharp decline in the component observed in 2020. Driven by the strong increase in the NEET rate coupled with a rise in the share of self-employment rate and a decline in the share of temporary employment, the trend in the component highlights an increase in the discouragement towards private employment experienced by European youth as a consequence of the pandemic. The discontinuity observed in 2020 is present both in the countries which were experiencing an increasing trend in youth labour availability (Poland and Italy) and in those presenting an already declining trend (Hungary and Spain).

6.   Conclusions

The outcome of this analysis is two synthetic indicators which describe some features of the youth labour market before and during COVID-19 in Italy, Spain, Hungary and Poland. I have performed principal component analysis to combine different indicators of the youth labour market into two major components. The first measures the ability of the labour market to absorb youth labour supply; the second the availability of young people to be employed in the private sector. The two components explain 97.5% of the variability of the eight indicators considered. The first component, which is particularly low in Italy and Spain, has a common trend in the four countries considered: increasing

until 2019 and then declining. The second component shows a sharp decline in 2020 for all four countries. The trend in the two components clearly indicates a strong worsening of the employment prospects for youth as a consequence of the COVID-19 pandemic. In 2020, in fact, a reduction both in the demand and in the supply of youth labour is observed.

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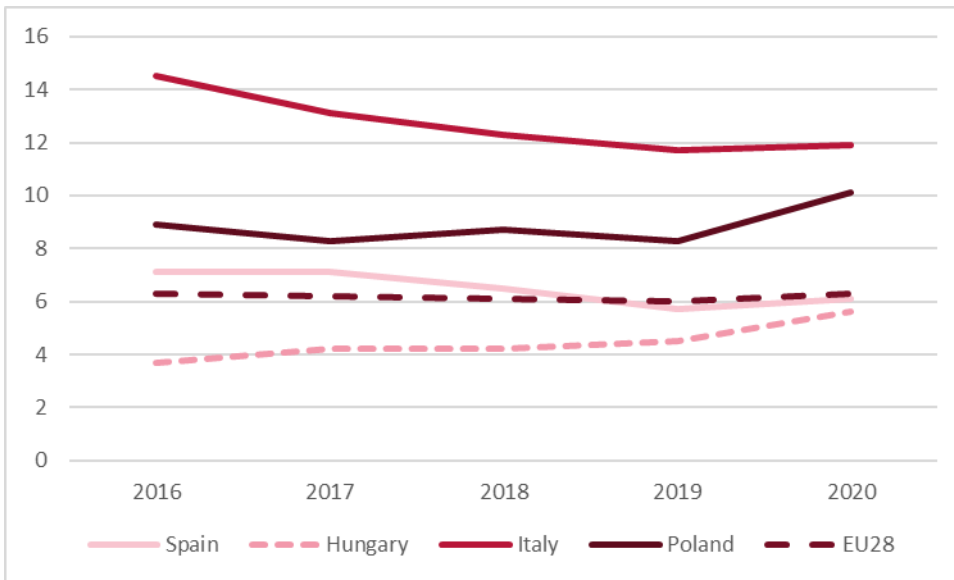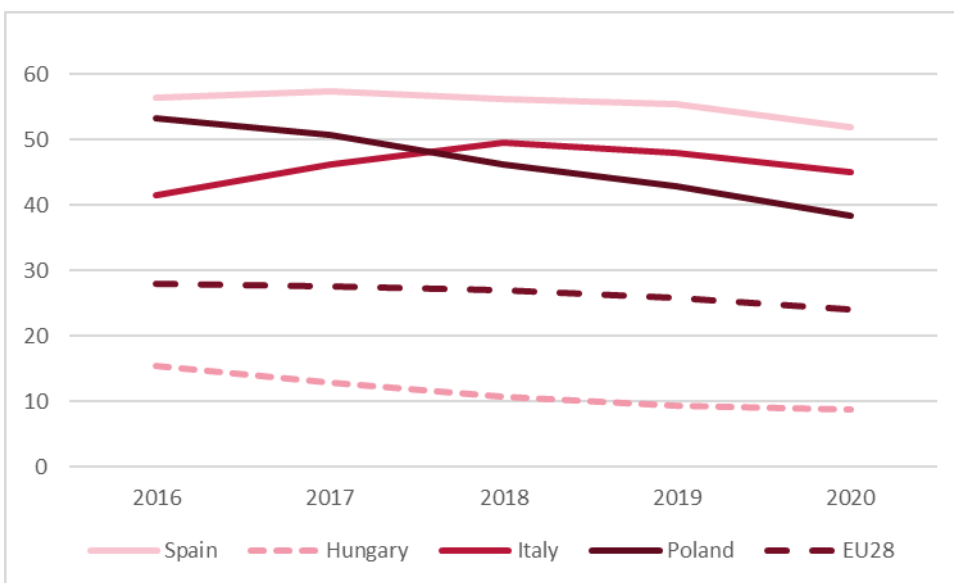
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Appendix

*Figure 7 Youth self-employment rate (aged: 15-29), 2016-2020 (%).*

Source: Eurostat, Youth self-employment by sex, age and educational attainment level [yth_empl_040], Youth employment by sex, age and educational attainment level [yth_empl_010].

*Figure 8 Young temporary employees (aged: 15-29), 2016-2020 (%).*

Source: Eurostat, Young temporary employees as percentage of the total number of employees, by sex, age and country of birth [yth_empl_050].

*Figure 9 Part-time employment for young people (aged: 15-29), 2016-2020 (%).*
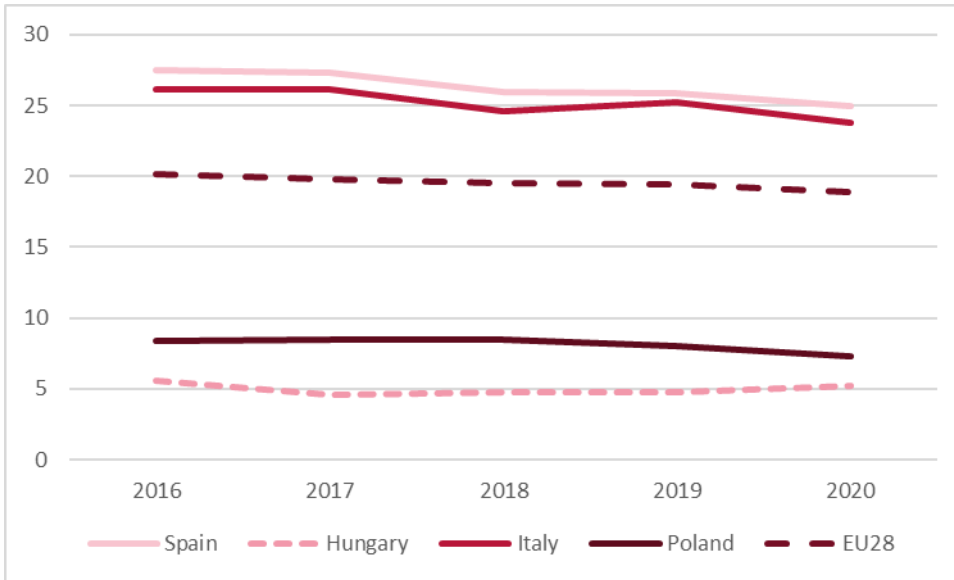
Source: Eurostat, Part-time employment as percentage of the total employment for young people by sex, age and country of birth [yth_empl_060].

*Figure 10 Involuntary part-time employment for young people (aged: 15-29), 2016-2020 (%).*
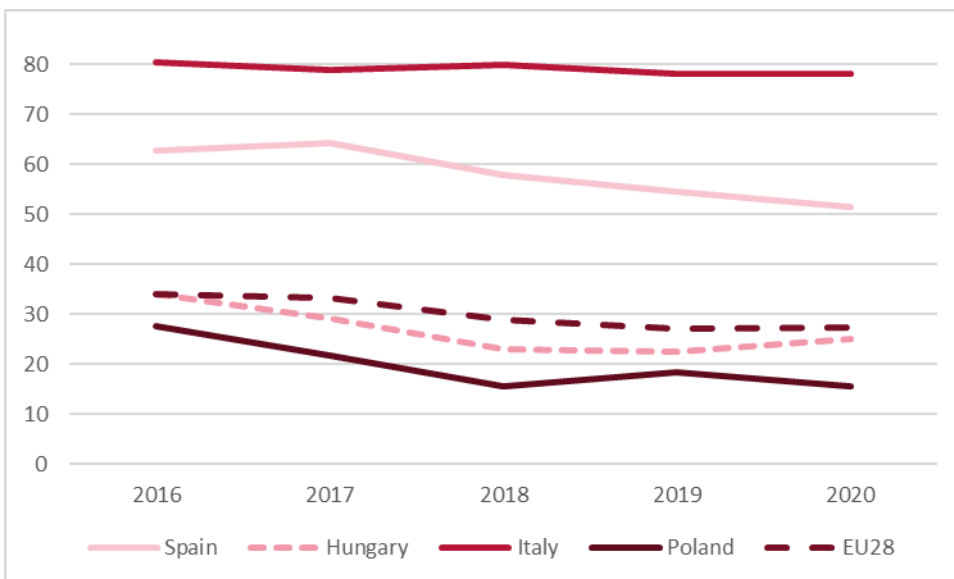
Source: Eurostat, Involuntary part-time employment as percentage of the total part-time employment for young people by sex and age [yth_empl_080].

Figure 11 Youth unemployment rate (aged: 15-29), 2016-2020 (%).
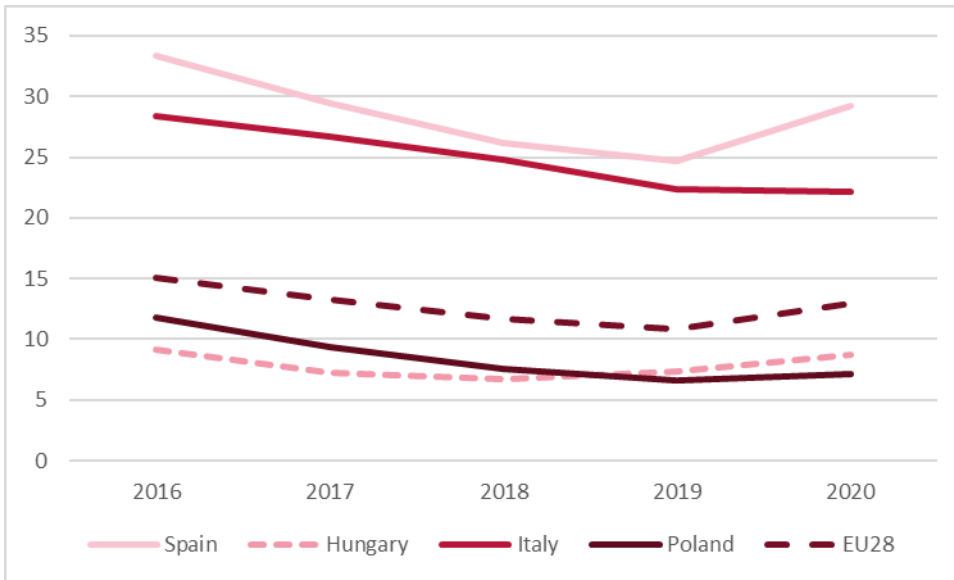
Source: Eurostat, Youth unemployment rate by sex, age and country of birth [yth_empl_100].

Figure 12 Youth long-term unemployment rate (aged: 15-29), 2016-2020 (%).
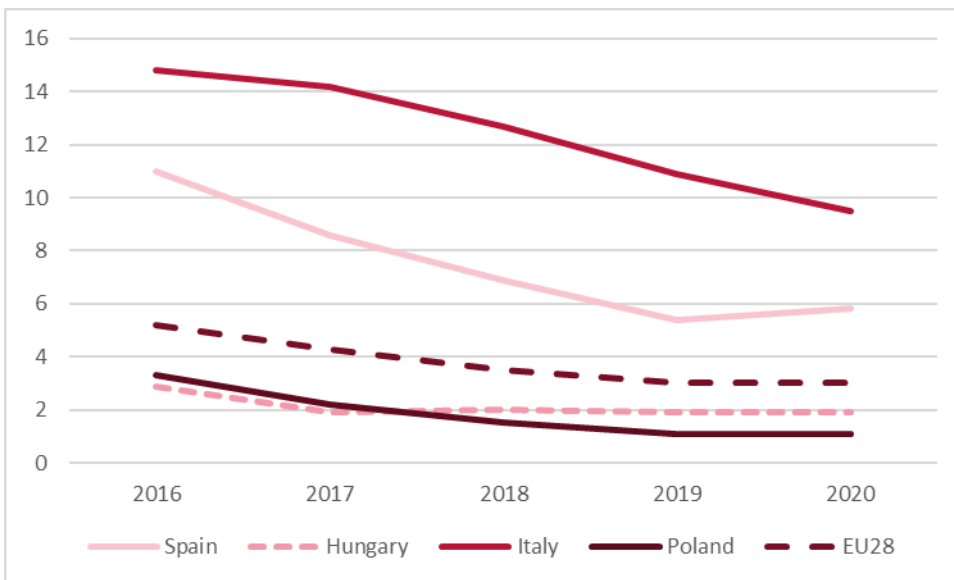
Source: Eurostat, Youth long-term unemployment rate (12 months or longer) by sex and age [yth_empl_120].

Table 4 Principal components for all components.

Variable	Label	Comp 1	Comp 2	Comp 3	Comp 4	Comp 5	Comp 6	Comp 7	Comp 8
yth_empl_020	Youth employment rate	-0.3859	0.1208	0.2353	0.4099	0.2812	0.1946	0.0342	0.7035
yth_empl_040_ 010	Youth self-employment rate	0.2775	-0.3097	0.7689	0.0565	-0.3256	0.2482	0.2526	-0.0355
yth_empl_050	Young temporary employees rate	0.2534	0.6995	0.4614	-0.1462	0.3084	-0.3195	-0.0922	-0.0806
yth_empl_060	Part-time employment rate	0.3776	0.2950	-0.1511	-0.1372	-0.2332	0.6410	-0.4612	0.2252
yth_empl_080	Involuntary part-time employment rate	0.3880	-0.1197	-0.1844	-0.2783	0.5814	0.2814	0.5403	0.1207
yth_empl_100	Youth unemployment rate	0.3658	0.3074	-0.2856	0.3887	-0.4460	-0.2535	0.4658	0.2427
yth_empl_120	Youth long-term unemployment rate	0.3861	-0.1838	-0.0394	0.7162	0.3578	0.0240	-0.2938	-0.2962
yth_empl_150	Young people neither in employment nor in education and training (NEET rates)	0.3669	-0.4130	0.0241	-0.2169	0.0225	-0.4935	-0.3443	0.5342

Source: own calculation based on Eurostat data.

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