LABOUR FORCE REGIONAL INDEX AS A HOLISTIC MEASURE FOR LABOUR MARKET EVALUATION

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Abstract: *There are a lot of indicators that depict the situation of the labour market that consider its various aspects in individual manner, like following: the rate of employment, the monthly salary and other indicators, but there can't be easily found an example of indicator that would show the picture in its entirety, combining it's aspects. That would be useful, for example, when doing comparisons between regions of the same country. In order to elaborate such an indicator was used Republic of Moldova as an example. As source of primary data on labour force characteristics was used the National Bureau of Statistics of Moldova. In this paper we propose a composite index called Labour Force Regional Index (LAFORI Index), created through normalization and combination of the indicators that refer to aspects of labour force like the share of NEET group, the rate of employment, average monthly salary, average amount of the expenditures on work accidents per victim of work accidents. The article was developed within the framework of 23.70105.0807.10T Project for Young Researchers "Development of new working models in the context of post-pandemic consequences and strengthening of job-specific skills for occupations and areas of smart specialization in the Republic of Moldova".*

Keywords: *labour, index, indicator, employment.*
JEL Classification: *E24, J29.*

1. Introduction

The labour market is typically analyzed through various independent indicators, each focusing on specific aspects such as employment rate and average monthly earnings and some others. However, a singular, comprehensive indicator that synthesizes these diverse aspects to provide an overarching view of labour market conditions is difficult to be found. Such an indicator would be especially beneficial for making regional comparisons within a country. In order to create such an indicator in this paper we introduce a composite index coined LAFORI Index (from Labour Force Regional Index) which is designed to offer a more holistic measure of the labour market by integrating several key aspects.

The article is elaborated within the framework of 23.70105.0807.10T Project for Young Researchers "Development of new working models in the context of post-pandemic consequences and strengthening of job-specific skills for occupations and areas of smart specialization in the Republic of Moldova".

2. Literature review

In the scientific literature usually the composite indicators that reflect multiple aspects of labour market include indicators which aren't usually found in standard list of primary indicators in the National Statistics authorities. For example, Yu (2020) proposes an employment quality index which contains sub-indicators on earnings, tenure, leave, firm size. Renold et al. (2014) analyzes the Youth Labour Market Index which contains such indicators

as unemployment rate, working conditions, education, transition smoothness. Spyropoulos et al. (2021) proposes Health and Wellbeing Index as a weighted composite index that includes number of sickness days, number of various disease cases, number of employees. It should be mentioned that the weights are more or less similar, yet the number of cardiovascular condition cases has the biggest weight. Aleksynska and Cazes (2016) mention the World Bank Employing Workers Index that is based on three indicators with similar weights covering hiring practices, working hours, and redundancy to align with the standards set by the International Labour Organization. Castellano and Rocca (2020) developed Gender Gap in the Labour Market Index – a composite index based on indicators from 5 pillars: Labour market participation and conditions, Labour market integration, Employment return and discrimination, Family responsibilities, Welfare measures related to female work. While these 5 indices are very specific and comprehensive they can have a series of limitations like: age-specific limitation, complexity in measuring indicators, potentially disproportionate weights in some cases, potential bias towards business interests, gender-specific focus, complexity and data availability. The broad scope covering five pillars requires extensive data, which may not be equally available or reliable in all regions, leading to potential gaps in the indices' applicability or accuracy. In this regard we will elaborate an index that can diminish those limitations.

3. Data sources and methodology

We used the Republic of Moldova as a case study, drawing on data from the National Bureau of Statistics of Moldova to develop this index. Depending on the availability of data, its comparability and the pool of labour market indicators for the design of LAFORI index we established a set of principles:

- LAFORI Index is a composite index based on labour market indicators offered by National Bureau of Statistics with yearly periodicity;
- Labour indicators will include positive and negative indicators;
- Positive indicators will be treated as those the increasing value of which is appreciated as positive and negative indicators – the increasing value of which – appreciated as negative;
- As positive indicators are considered the following: employment rate, monthly salary;
- As negative indicators - NEET share, average expenses for work accidents per victim of work accident;
- The calculation of LAFORI Index as well as its component parts will be done through min-max normalization method;
- For positive indicators maximum value is 1 and minimum value is 0;
- To make negative indicators compatible with positive indicators and to avoid conflict in interpretation of the composite indicator their scale will be reversed by extracting from 1 the values of negative indicators (this transformation allows the indicator to align positively with positive indicators where higher values are better, facilitating a unified analysis or composite index creation);
- LAFORI Index is a composite index based on the sum of normalized negative and positive indicators, each with same weight;
- For comparability purposes data years will be taken from 2019 onwards where available and used the standard statistical region classification of Moldova (North, South, Center, ATU Gagauzia, Chisinau Municipality).

4. LAFORI index design

The LAFORI Index combines factors like the share of the NEET group (in percents), employment rate (in percents), average gross monthly salary in real terms (in MDL), average expenditures on work accidents per victim of work accidents (in MDL). In the ***Table 1*** are shown the indicators that will be used in the design of LAFORI Index. The period used is only the years 2019-2023, due to comparability issues with years before. The regions included are the statistical regions of the Republic of Moldova (Chisinau Municipality, North, Center, South). Two indicators can be considered positive (rate of employment and average gross monthly salary in real terms) and two – negative (share of NEET Group (15-29 years old) and the average work accident costs per accident victim). The total data per country were included to create also a composite indicator for whole country (LAFOCI Index – Labour Force Country Index). In order to reduce the increasing effects of inflation on nominal average gross monthly salary we calculated the average gross monthly salary in real terms, taking as the base year first year of the period – 2019.

Table 1. The indicators components of LAFORI/LAFOCI Index, by regions, 2019-2023

		Total per country (only for LAFOCI Index)	Chisinau Municipality	North	Center	South
Rate of employment, %	**2019**	40.1	52.6	42.5	33.6	31.3
	2020	38.8	48.8	41.3	33.8	30.3
	2021	39.8	49.2	43.3	35.0	30.5
	2022	40.5	50.6	45.0	35.1	30.1
	2023	43.1	49.1	47.0	38.2	35.8
Share of NEET Group (15-29 years old), %	**2019**	27.4	21.5	29.3	29.9	29.5
	2020	26.0	21.4	26.1	26.2	32.8
	2021	26.4	22.8	25.6	28.8	29.6
	2022	26.2	24.8	24.5	28.9	26.5
	2023	23.1	21.9	22.9	23.9	24.6
Average gross monthly salary in real terms (2019=100), MDL	**2019**	7356.1	8645.3	5904.5	5887.9	5538.4
	2020	7811.9	9181.0	6270.4	6252.7	5881.6
	2021	8350.9	9814.5	6703.0	6684.2	6287.4
	2022	7490.8	8803.6	6012.6	5995.7	5639.8
	2023	7745.5	9102.9	6217.0	6199.6	5831.6
Average work accident costs per accident victim, thousand MDL per person	**2019**	7.1	11.3	51.5	79.6	112.9
	2020	8.4	13.4	97.3	85.4	159.1
	2021	6.3	9.8	53.0	57.4	109.4
	2022	6.8	10.7	50.7	56.5	112.9
	2023	6.1	8.9	66.1	48.0	109.4

Source: calculated and compiled by authors based on the National Bureau of Statistics of Moldova

The analysis of the primary indicators (from ***Table 1***) has shown an increase of rate of employment after a reduction in the first year of COVID-19 pandemic period (2020) in all regions of country. The share of NEET group has slightly increased during COVID-19

pandemic period (2020-2022) in Chisinau Municipality and reduced in the analyzed period (2019-2023) in other regions. Average gross monthly salary in real terms has decreased significantly in 2022 (due to high inflation rates especially caused by high increases of gas prices), the following year (in 2023) it began to grow again. Average work accident costs per accident victim has shown in general a decrease in last three years of analyzed period (2021-2023), regardless of region.

In order to create the composite index the data from ***Table 1*** are normalized taking in consideration these conditions:

- minimum employment rate is 0% (no one is employed) and assigned value is zero, maximum employed rate is 100% (all active population is employed) and assigned value is 1;
- minimum share of NEET group is 0% (all young people study, are in training or work) with assigned value 1 since the scale is reversed due to it being a negative indicator, maximum share of NEET group is 100% (there is no young people that study, nor are in training or in work) with assigned value 0;
- minimum average gross monthly salary in real terms is 0 MDL (no salary) with assigned value 0, maximum average gross monthly salary in real terms is theoretically unlimited or is of unknown limit, but for practical reasons we will consider the actual maximum value of this indicator in the analyzed years and regions as the maximum value of the indicator with the assigned value 1;
- minimum average work accident costs per accident victim is 0 MDL (no costs due to no accidents) with assigned value 0, maximum average work accident costs per accident victim theoretically has no limit or is of unknown limit, but for practical purposes will be considered the actual maximum value of this indicator in the analyzed period and regions as the maximum value of the indicator with the assigned value 1;
- the normalization of positive indicators is calculated as the following ratio: normalized value = (current value - minimum value)/(maximum value – minimum value) and the normalization of negative indicators is calculated in the following way by reversing the scale: normalized value = 1 - (current value - minimum value)/(maximum value – minimum value).

In ***Table 2*** are shown the normalized indicators components of LAFORI/LAFOCI Index.

Table 2. The normalized indicators components of LAFORI/LAFOCI Index, by regions, 2019-2023

		Total per country (only for LAFOCI Index)	Chisinau Municipality	North	Center	South
Rate of employment, conventional units	**2019**	0.401	0.526	0.425	0.336	0.313
	2020	0.388	0.488	0.413	0.338	0.303
	2021	0.398	0.492	0.433	0.35	0.305
	2022	0.405	0.506	0.45	0.351	0.301
	2023	0.431	0.491	0.47	0.382	0.358
Share of NEET Group (15-29 years old), conventional units	**2019**	0.726	0.785	0.707	0.701	0.705
	2020	0.740	0.786	0.739	0.738	0.672
	2021	0.736	0.772	0.744	0.712	0.704
	2022	0.738	0.752	0.755	0.711	0.735
	2023	0.769	0.781	0.771	0.761	0.754
Average gross monthly salary in real terms (2019=100), conventional units	**2019**	0.750	0.881	0.602	0.600	0.564
	2020	0.796	0.935	0.639	0.637	0.599
	2021	0.851	1.000	0.683	0.681	0.641
	2022	0.763	0.897	0.613	0.611	0.575
	2023	0.789	0.927	0.633	0.632	0.594
Average work accident costs per accident victim, conventional units	**2019**	0.955	0.929	0.676	0.500	0.290
	2020	0.947	0.916	0.388	0.463	0.000
	2021	0.960	0.938	0.667	0.639	0.312
	2022	0.957	0.933	0.681	0.645	0.290
	2023	0.962	0.944	0.585	0.698	0.312

Source: calculated by authors based on the National Bureau of Statistics of Moldova

To get the composite LAFORI/LAFOCI Index to each indicator will be attached same weight and all component indicators' values will be summed (shown in the ***Table 3***). Since maximum value of each component is 1 and components are 4, the maximum value of the LAFORI/LAFOCI Index will be 4, thus its value will range from 0 – minimum value to 4 – maximum value. The points of the obtained scale can be interpreted in the following way:

- 0 (Very Poor) - reflects very low rates of employment, high rates of NEET group, low average salaries, and/or high accident costs. Indicates a struggling labour force with severe challenges in economic activity, safety, and youth engagement.
- 1 (Poor) - still below average on most components, but slightly better than the very poor conditions. Some signs of emerging employment opportunities or minor improvements in NEET rates and accident costs.
- 2 (Average) - represents an average performance across the metrics. Employment rates and salaries are at satisfactory levels, NEET rates are moderate, and accident costs are manageable.
- 3 (Good) - above average performance where employment rates are high, NEET rates are low, salaries are robust, and work accidents are infrequent and less severe. Indicates a healthy labour market and economic condition.
- 4 (Excellent) - the highest performance with very high employment rates, very low or negligible NEET rates, high average salaries, and minimal work accident costs. Represents an optimal labour market and economic environment.

Table 3. The LAFOCI/LAFORI Index, by regions, 2019-2023

		Total per country (LAFOCI Index)	Chisinau Municipality (LAFORI Index)	North (LAFORI Index)	Center (LAFORI Index)	South (LAFORI Index)
LAFORI/ LAFOCI Index, conventional units	2019	2.832	3.121	2.410	2.137	1.873
	2020	2.871	3.125	2.179	2.176	1.574
	2021	2.945	3.202	2.527	2.382	1.962
	2022	2.863	3.088	2.499	2.318	1.901
	2023	2.951	3.144	2.459	2.473	2.019

Source: calculated by authors based on the National Bureau of Statistics of Moldova

5. Results and discussions

The index values for Chisinau Municipality range from 3.088 to 3.202, indicating consistently "Good" performance, characterized by high employment rates, low NEET rates, robust salaries, and few work accidents. The North shows index values from 2.410 to 2.527, which generally can be classified as "Average". This suggests satisfactory employment levels, moderate NEET rates, manageable accident costs, and average salary conditions. The values for the Center range from 2.137 to 2.473, oscillating between "Very Poor" to "Average". This variability implies some fluctuation in economic activity, with improvements in employment and accident costs towards the latter years. The South's index values range from 1.574 to 2.019, primarily falling under "Poor" to nearly "Average" categories. These scores indicate below-average economic conditions, struggling with low employment, higher NEET rates, and higher accident costs, although showing some signs of improvement.

Overall, Chisinau Municipality demonstrates the healthiest economic conditions among the regions, while the South struggles comparatively more, with incremental improvements over the years. The North and Center show moderate performance with some annual variations indicating changes in their labour market dynamics, especially due to COVID-19 pandemic conditions in those years.

6. Conclusions

The LAFORI Index or LAFOCI Index (for the whole country), constructed from diverse labour market indicators, offers an insightful, composite measure of regional labour force conditions in the Republic of Moldova and can be useful for application in other countries as well. Through the integration of both ”positive” indicators — namely employment rates, average monthly salaries in real terms, and ”negative” indicators, as NEET group shares, and work accident costs—this index provides a nuanced perspective on the multidimensional nature of regional labour markets. Applied to regions of Republic of Moldova it has shown that Chisinau Municipality consistently showcased robust economic health, as indicated by its consistently "Good" performance in the LAFORI Index. It benefitted from high employment rates, low NEET rates, and substantial salaries, coupled with minimal accident costs. Northern and Central regions displayed more variability, with their index scores wavering between "Very Poor" to "Average". This reflected fluctuating economic conditions, which have seen gradual improvement, particularly in reducing NEET rates and stabilizing employment figures. The Southern region, despite its struggles, has shown signs of gradual economic recovery. The region's performance has incrementally improved from "Poor" to nearing "Average", underscoring a slow yet steady amelioration in labour market conditions. The

variability in regional performances could also be attributed to external economic pressures, such as the inflation spikes and economic disruptions caused by the COVID-19 pandemic, increasing gas prices, logistical chain disruptions as a consequence from the war in Ukraine. These factors have distinctly impacted employment rates and salary levels, particularly in 2022. The LAFORI/LAFOCI Index can be an essential tool for policymakers and researchers aiming to assess and compare the health of labour markets across different regions. By providing a holistic view, it facilitates targeted economic interventions and the crafting of region-specific strategies to enhance labour market conditions. Continued refinement and adaptation of the LAFORI/LAFOCI Index are necessary to maintain its relevance and accuracy, especially in light of evolving economic landscapes and labour market dynamics. Future research should focus on incorporating additional indicators that may capture emerging trends and challenges in the labour market. This composite index not only sheds light on the current state of the labour market in Moldova but also serves as a crucial benchmark for gauging regional economic vitality and guiding strategic economic planning. Its comprehensive nature makes it a useful tool in the ongoing efforts to strengthen Moldova's overall economic structure and to mitigate regional disparities in the labour market.

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