**Ministerul Educației și Cercetării al Republicii Moldova**

**Universitatea Tehnică a Moldovei**

**Facultatea Calculatoare, Informatică și Microelectronică**

**Disciplina: Analiza Exploratorie a Datelor**

**RAPORT**

**Lucrarea de laborator nr. 1**

**Tema:** European Development Indicators

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**Assignment 1: European Development Indicators**

**Phase 1: Country Selection & Data Acquisition**

**1. Research context**

Латвия — страна ЕС с активным трансграничным движением, особенно на восточной границе (с Россией и Беларусью).

Потоки людей и товаров через границу тесно связаны с экономической активностью, торговлей, туризмом и миграцией рабочей силы.

Поэтому анализ динамики таких индикаторов, как экспорт, туризм, занятость и транспортные потоки, может показать, как трансграничные факторы влияют на развитие страны.

This project focuses on exploring the relationship between cross-border movement, trade activity, and economic development in Latvia.

As a small open economy and EU member state, Latvia’s economic performance is strongly influenced by external trade, transport flows, and migration.

The purpose of this analysis is to uncover how border-related indicators (trade, transport, tourism, migration) interact with macroeconomic variables such as GDP, inflation, and unemployment.

**2. Research Questions**

RQ1:

How has the evolution of external trade and passenger flows correlated with Latvia’s GDP and overall economic activity in Latvia?

RQ2:

What is the relationship between unemployment, migration, and international departures of Latvian residents?

RQ3:

How do freight and passenger transport volumes relate to inflation?

**3. Selected Indicators (Eurostat / IMF / World Bank)**

The analysis will include approximately 13 economic and social indicators from Eurostat, IMF, and the World Bank.

Key indicators include GDP, consumer price index (CPI), unemployment rate, trade (exports/imports), tourism arrivals and departures, passenger and freight transport volumes, energy prices, and net migration.

Most data will be extracted from Eurostat datasets (codes: namq\_10\_gdp, prc\_hicp\_manr, une\_rt\_m, tour\_occ\_arnm, tran\_hv\_frtra, etc.) with monthly and quarterly frequencies, covering the 2000–2024 period.

These variables will provide sufficient temporal resolution for time-series and correlation-based exploratory analysis.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **№** | **Indicator** | **Source** | **Frequency** | **Identifier / Code** | **Comment** |
| 1 | Gross Domestic Product (GDP, volume index) | Eurostat | Quarterly | namq\_10\_gdp | Основной экономический индикатор |
| 2 | Harmonised Index of Consumer Prices (Inflation) | Eurostat | Monthly | prc\_hicp\_manr | Для оценки динамики цен |
| 3 | Unemployment rate | Eurostat | Monthly | une\_rt\_m | Для анализа рынка труда |
| 4 | Total employment | Eurostat | Quarterly | lfsi\_emp\_q | Контекст занятости |
| 5 | Exports of goods and services | Eurostat | Quarterly | nama\_10\_exi | Торговля и внешнеэкономическая активность |
| 6 | Imports of goods and services | Eurostat | Quarterly | nama\_10\_imi | Для расчёта торгового баланса |
| 7 | International arrivals of residents and non-residents | Eurostat | Monthly | tour\_occ\_arnm | Туризм и пересечение границы |
| 8 | International departures of residents | Eurostat | Monthly | tour\_occ\_arnm (filtered by residents) | Отражает миграционные/туристические выезды |
| 9 | Passenger transport by rail/road/air | Eurostat | Quarterly | tran\_pa\_vehtra / tran\_r\_rapa | Динамика потоков |
| 10 | Freight transport (total tonnes) | Eurostat | Quarterly | tran\_hv\_frtra | Грузоперевозки, логистика |
| 11 | Energy price index | Eurostat | Monthly | nrg\_pc\_202 | Для связи инфляции и транспорта |
| 12 | Net migration | World Bank | Annual | SM.POP.NETM | Эмиграция / иммиграция баланс |
| 13 | Population total | Eurostat | Annual | demo\_pjan | Нормализация показателей (на душу населения) |

**4. Data Sources and Acquisition**

Data will be primarily obtained from the Eurostat online database, using manual downloads in CSV format.

For each indicator, Latvia will be selected as the country of focus, and available data for 2000–2024 will be exported.

Additional data (e.g., migration balance) may be retrieved from the World Bank DataBank for consistency and completeness.

All datasets will be merged and harmonized based on date and frequency in the next phase.

**5. Expected Outcomes**

This analysis will help identify key relationships between cross-border dynamics and Latvia’s economic performance, highlighting trends in mobility, trade, and prices.

The findings may support further research into how cross-border and transport indicators reflect national resilience and integration in European economic processes.

**Concluzii**

În urma efectuării lucrării de laborator nr. 1 s-au analizat două scheme echivalente ale canalelor de comunicare in cod serie si cod parallel. În rezultatul simulărilor effectuate s-a observant:

1.

2.

3.