# Contents

**Preface and acknowledgements** ..... 3
**Contents** ..... 4
**1. Introduction** ..... 6
**1.1 Background** ..... 6
**1.2 Purpose** ..... 7
**2. Sources** ..... 8
**2.1 Introduction** ..... 8
**2.2 Analysis of available data** ..... 8
2.2.1 Labour force survey ..... 8
2.2.2 Short-term statistics ..... 10
2.2.3 Business statistical surveys ..... 11
2.2.4 Administrative data ..... 11
**3. Estimation procedures: from source to national accounts** ..... 13
**3.1 Introduction** ..... 13
**3.2 Labour force statistics** ..... 13
**3.3 Short-term statistics** ..... 15
**3.4 Business statistical surveys** ..... 15
**3.4 Administrative data** ..... 16
**4. Forecasting missing data and adjusting for outliers** ..... 20
**4.1. Introduction to a model strategy** ..... 20
**4.2. ARIMA models** ..... 23
**4.3. ADL models** ..... 27
4.3.1. Model selection ..... 27
4.3.2 Estimation and diagnostics ..... 28
**4.4 Structural time series models** ..... 29
**4.5 Multivariate extensions** ..... 30
**Annex 1. Employment flash estimation methods by country** ..... 33
**Belgium** ..... 33
**Czechia** ..... 35
**Denmark** ..... 37
**Germany** ..... 39
**Estonia** ..... 41
**Spain** ..... 42
**Croatia** ..... 44

Italy ..... 45
Lithuania ..... 47
Hungary ..... 48
Austria ..... 49
Poland ..... 50
Slovakia ..... 51
United Kingdom ..... 53

**Annex 2. Software and programming languages for time series analysis, forecasting and seasonal adjustment ..... 55**