

# Contents

<b>Communication from the Commission</b>	<b>1</b>
<b>Chapter 1: Productivity trends in Europe: finally turning the corner?</b>	<b>11</b>
Summary	13
1. Introduction	14
2. Slowing productivity growth in the EU and the euro area	15
3. The recent pick-up in labour productivity growth	18
4. Cycle analysis	22
5. The trend component of labour productivity growth	25
6. Trend growth of total factor productivity	30
Concluding remarks	32
References	33
1.A.1. Cycle dating	34
1.A.2. Trend labour productivity growth	35
1.A.3. Specification of the Kalman-filter and trend labour productivity growth	37
1.A.4. Stability tests	38
1.A.5. Data definitions and sources	40
<b>Chapter 2: Assessing productivity at the industry level</b>	<b>41</b>
Summary	43
1. Introduction	44
2. EU productivity trends at the economy wide level: a comparison with the US	46
3. Productivity trends at the industry level: an analysis of the March 2007 EU KLEMS Datasets	48
3.1. Basic sectoral productivity trends	48
3.2. Detailed growth accounting analysis of the manufacturing and private services sectors	49
3.3. Industry level TFP trends	53
4. Understanding the determinants of TFP growth	55
4.1. Conceptual framework	55
4.2. Existing empirical work	56
4.3. Empirical strategy	57
4.4. Regression results	58
Concluding remarks	65
References	66
<b>Chapter 3: Is there a trade-off between productivity and employment?</b>	<b>69</b>
Summary	71
1. Introduction	72
2. The stylised facts	74
3. A framework for analysis	78
4. Gauging the trade-off between employment and productivity	80
4.1. Possible sources of employment-productivity trade-offs	80
4.2. Measuring the employment-productivity trade-off	84

4.3.	The role of labour market reforms in boosting employment and productivity growth	92
4.4.	The effect on employment and productivity of policies for marginally attached people	98
	Concluding remarks	103
	References	104

## **Chapter 4: Policies in the pursuit of higher productivity: another look** **107**

	Summary	109
1.	Introduction	110
2.	Policies to foster investment in knowledge	111
2.1.	Policy lines in the areas of research and education	111
2.2.	Trends in inputs and outputs	113
2.3.	Assessing the effectiveness and efficiency of public spending on the knowledge economy	114
2.4.	The relationship between the knowledge economy and economic growth	116
2.5.	The effect of higher R&D spending in the QUEST III model	118
3.	Policies to enhance the impact of competition on innovation	122
3.1.	Introduction	122
3.2.	The link between competition and economic growth	122
3.3.	Policies to foster competition and their effects	123
3.4.	The effects of higher competition in the QUEST II model	128
3.5.	Policy conclusions	129
4.	Policies to foster reallocation	131
4.1.	Introduction	131
4.2.	How important is the reallocation effect?	131
4.3.	Economic policy measures that impact on reallocation	135
4.4.	The effect of lower administrative costs and entry in the QUEST model	139
	Concluding remarks	142
	References	143

## **Tables**

1.3.1.	Labour productivity, value added and employment, selected Member States	18
1.3.2.	Labour productivity, value added and employment, selected Member States	19
1.A.1.1.	Business cycle dating, private business sector	34
2.3.1.	GDP, labour input in hours and labour productivity per hour (annual average volume growth rates in %), EU15ex5 + US	48
2.3.2.	Results of growth accounting analysis – gross value added growth and contributions (annual average volume growth rates in %), EU15ex5 + US	52
2.4.1.	Basic specification	59
2.4.2.	The role of human capital and R&D	60
2.4.3.	The role of regulations	61
2.4.4.	Industry-specific models	63
3.2.1.	Actual GDP, Population and GDP per capita 1996-2007 period average % changes for the US and EU aggregates	75
3.2.2.	Key labour market indicators	77

3.3.1.	Relationship between employment and productivity growth	78
3.4.1.	Cross-country growth regression controlling for employment and labour force growth	87
3.4.2.	Relationship between employment and productivity growth	92
3.4.3.	Changes in labour market variables	95
3.4.4.	Changes in the Fraser Institute Indicators of product market reform and estimated changes in mark-ups	97
3.4.5.	Productivity and growth effect of wage moderation	97
3.4.6.	Simulated long-run effects of changes in labour and product markets 1995-2003 on GDP and unemployment rate	98
3.4.7.	Simulated long-run effects of changes in labour and product markets on GDP and the unemployment rate: 1995-2003	98
3.4.8.	Effects of reforms for marginally attached people on employment rate: EU25 countries, 2001-2006 (difference in difference estimation)	100
3.4.9.	Effects of reforms for marginally attached people on employment rate: EU15 countries, 2001-2006 (difference in difference estimation )	101
3.4.10.	Effects on productivity growth of reforms for marginally attached people	101
3.4.11.	Effects on the growth rate of the capital-labour ratio of reforms for marginally attached people: EU15 countries	102
4.2.1.	Efficiency gains of education spending using the same resources (in % of output)	116
4.2.2.	Tax-cut financed from consumption tax single country scenario (percent deviations from baseline)	120
4.2.3.	Tax-cut financed from consumption tax all member states scenario (percent deviations from baseline)	120
4.3.1.	Griffith results (depend variable: patents per 1000 population and interaction with competition)	123
4.3.2.	Forecasted changes in sectoral prices and productivity as a consequence of market opening	126
4.3.3.	Change in TFP growth over 10 years from adopting regulatory best practices	128
4.3.4.	The impact of changes in mark-ups on labour productivity in the QUEST model	129
4.4.1.	Economic performance in sectors with low productivity growth 1995-2004	134
4.4.2.	Reducing administrative costs (% deviations from baseline)	140

## Graphs

1.1.1.	Labour market developments in the EU	14
1.1.2.	GDP growth in the EU, the US and Japan	14
1.2.1.	GDP per employee and GDP per head in the euro area and the US	15
1.4.1.	Output and productivity growth in the euro area	22
1.4.2.	Euro-area private business sector	23
1.4.3.	Euro-area manufacturing	23
1.4.4.	Euro-area construction	23
1.4.5.	Euro-area trade services	23
1.4.6.	Euro-area financial intermediation	23
1.4.7.	Germany: private business sector	24
1.4.8.	France: private business sector	24
1.4.9.	Italy: private business sector	24
1.4.10.	Spain: private business sector	24
1.5.1.	Euro area private business sector	25

1.5.2.	Euro area manufacturing	27
1.5.3.	Euro area construction	27
1.5.4.	Euro area trade services	27
1.5.5.	Euro area financial services	27
1.5.6.	Germany: private business sector	27
1.5.7.	France: private business sector	27
1.5.8.	Italy: private business sector	27
1.5.9.	Spain: private business sector	27
1.6.1.	Trend TFP growth-Euro area	30
1.6.2.	Trend TFP growth-Germany	31
1.6.3.	Trend TFP growth-France	31
1.6.4.	Trend TFP growth-Italy	31
1.6.5.	Trend TFP growth-Spain	31
1.A.2.1.	Germany, manufacturing	35
1.A.2.2.	Germany, construction	35
1.A.2.3.	Germany, trade services	35
1.A.2.4.	Germany, financial services	35
1.A.2.5.	France, manufacturing	35
1.A.2.6.	France, construction	35
1.A.2.7.	France, trade services	35
1.A.2.8.	France, financial services	35
1.A.2.9.	Italy, manufacturing	36
1.A.2.10.	Italy, construction	36
1.A.2.11.	Italy, trade services	36
1.A.2.12.	Italy, financial services	36
1.A.2.13.	Spain, manufacturing	36
1.A.2.14.	Spain, construction	36
1.A.2.15.	Spain, trade services	36
1.A.2.16.	Spain, financial services	36
1.A.4.1.	Euro area, private business sector	39
1.A.4.2.	Germany, private business sector	39
1.A.4.3.	France, private business sector	39
1.A.4.4.	Italy, private business sector	39
1.A.4.5.	Spain, private business sector	39
1.A.4.6.	Euro area, private business sector	39
1.A.4.7.	Germany, private business sector	39
1.A.4.8.	France, private business sector	39
1.A.4.9.	Italy, private business sector	39
1.A.4.10.	Spain, private business sector	39
2.2.1.	Potential GDP per capita levels accounting	46
2.2.2.	Labour productivity per hour levels accounting	46
2.2.3.	Labour productivity per hour growth trends	46
2.2.4.	Capital deepening	47
2.2.5.	Total factor productivity	47
2.3.1.	Total economy, annual % change	49
2.3.2.	Total manufacturing, annual % change	49
2.3.3.	Total private services, annual % change	49
2.3.4.	Rest of economy, annual % change	49
2.3.5.	Capital services	52
2.3.6.	Total factor productivity	52
2.3.7.	ICT capital services	52

2.3.8.	Non-ICT capital services	52
2.3.9.	Capital services	53
2.3.10.	Total factor productivity	53
2.3.11.	ICT capital services	53
2.3.12.	Non-ICT capital services	53
2.3.13.	Sectoral contributions from ICT capital services to the total economy change in value added growth US minus EU (1996-2004)	53
2.3.14.	Sectoral TFP contributions to total economy change in value added growth US minus EU (1996-2004)	54
2.3.15.	28 Industry breakdown of total TFP contribution to value added growth US minus EU (1996-2004)	54
2.4.1.	EU+US – trend contributions from TFP in the Network Industries to the Value Added Growth Rate of the EU and US economies over the period 1981-2004 (annual % change)	62
3.2.1.	Unemployment rate and the NAIRU in the EU15: 1981-2007	74
3.2.2.	Contribution of labour productivity growth and employment to GDP growth in the EU and the US	75
3.2.3.	Total factor productivity	76
3.4.1.	Hourly productivity – comparisons of actual, trend, and balanced productivity growth – Germany	81
3.4.2.	Hourly productivity – comparisons of actual, trend, and balanced productivity growth – Spain	81
3.4.3.	Hourly productivity – comparisons of actual, trend, and balanced productivity growth – France	81
3.4.4.	Hourly productivity – comparisons of actual, trend, and balanced productivity growth – Italy	81
3.4.5.	Hourly productivity – comparisons of actual, trend, and balanced productivity growth – United Kingdom	81
3.4.6.	Correlation between productivity growth and employment, labour force and unemployment rate	82
3.4.7.	Hourly labour productivity and hours worked by low skilled: share in total hours	84
3.4.8.	Speed of convergence controlling for employment growth (rolling regression over 10-years window)	85
3.4.9.	Effect of 1% employment growth on yearly productivity (rolling regression over 10-years window)	85
3.4.10.	Effect of 1% labour force growth on yearly productivity (rolling regression over 10-years window)	85
3.4.11.	Speed of convergence controlling for labour force growth (rolling regression over 10-years window)	85
3.4.12.	Cumulative effect of a 1% labour force growth on labour productivity growth	86
3.4.13.	Cumulative effect of a 1% employment growth on labour productivity growth	86
3.4.14.	Employment and productivity trade-off: an unstable relationship	87
3.4.15.	Employment productivity trade-off: all sectors – change in HLP growth (avg 96-04 minus avg 85-95)	89
3.4.16.	Employment productivity trade-off: all sectors – change in capital labour substitution growth (avg 96-04 minus avg 85-95)	89
3.4.17.	Employment productivity trade-off: all sectors – change in TFP growth (avg 96-04 minus avg 85-95)	89
3.4.18.	Employment productivity trade-off: manufacturing – change in HLP growth (avg 96-04 minus avg 85-95)	90

3.4.19.	Employment productivity trade-off: manufacturing – change in capital labour substitution growth (avg 96-04 minus avg 85-95)	90
3.4.20.	Employment productivity trade-off: manufacturing – change in TFP growth (avg 96-04 minus avg 85-95)	90
3.4.21.	Employment productivity trade-off: private services – change in HLP growth (avg 96-04 minus avg 85-95)	91
3.4.22.	Employment productivity trade-off: private services – change in capital labour substitution growth (avg 96-04 minus avg 85-95)	91
3.4.23.	Employment productivity trade-off: private services – change in TFP growth (avg 96-04 minus avg 85-95)	91
4.1.1.	Technology frontier and sources of growth	110
4.2.1.	Public spending on education and R&D, EU-15	113
4.2.2.	R&D expenditure and researchers in EU Member States	113
4.2.3.	Public expenditure on research and education by Member States	114
4.2.4.	Efficiency of public spending	115
4.3.1.	Relationship between competition and innovation according to Aghion	123
4.3.2.	OECD deregulation index for network industries, EU-15 aggregate	126
4.3.3.	Simulation results: changes in mark-ups	129
4.4.1.	Birth rate of new enterprises 2003-2004	132
4.4.2.	Labour productivity by firm size	133
4.4.3.	Contribution of negative productivity sectors to aggregate productivity growth, EU-15	134
4.4.4.	Correlation between firm entry and exit	135
4.4.5.	Employment protection legislation index	139
4.4.6.	Fragmented industries	140
4.4.7.	Segmented industries	140

## Boxes

1.2.1.	Different concepts of productivity growth	16
1.5.1.	Disentangling trend and cycle	26
2.3.1.	EU KLEMS Growth Accounting Methodology.	50
3.4.1.	The effects of product and labour market reforms on the relationship between productivity and employment	93
3.4.2.	QUEST II model	96
4.2.1.	The impact social return of R&D on productivity growth: a brief review of the literature	112
4.2.2.	A description of the QUEST III R&D-model	119
4.3.1.	Recent evidence on the link between trade openness and productivity growth with firm data	125