

November 1999

IMF Staff Country Report No. 99/135

## **Portugal: Selected Issues**

This Selected Issues report on Portugal was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with this member country. As such, the views expressed in this document are those of the staff team and do not necessarily reflect the views of the Government of Portugal or the Executive Board of the IMF.

Copies of this report are available to the public from  
International Monetary Fund • Publication Services  
700 19th Street, N.W. • Washington, D.C. 20431  
Telephone: (202) 623-7430 • Telefax: (202) 623-7201  
Telex (RCA): 248331 IMF UR  
E-mail: [publications@imf.org](mailto:publications@imf.org)  
Internet: <http://www.imf.org>  
Price: \$15.00 a copy

**International Monetary Fund**  
**Washington, D.C.**

INTERNATIONAL MONETARY FUND

PORTUGAL

**Selected Issues**

Prepared by Benedict Clements and Jenny Ligthart (EUI)

Approved by the European I Department

September 23, 1999

Contents	Page
Basic Data.....	4
Introduction .....	5
I. The Portuguese Education System: Performance and Reform Agenda.....	8
A. Introduction.....	8
B. The Portuguese Education System: An Overview.....	9
Organization of the system .....	9
School enrollments and attainment indicators: a long-run view.....	10
C. Education Expenditure.....	11
D. Recent Improvements in Educational Performance: Convergence to OECD Averages? .....	15
Enrollment, attainment, and graduation rates .....	15
Performance on international examinations .....	20
E. Education and Labor Market Outcomes in Portugal .....	20
F. The Efficiency of Education Expenditure in Portugal: Insights from FDH Analysis.....	21
An overview of FDH analysis .....	21
Educational inputs and outputs for FDH analysis .....	24
Empirical results.....	25
G. Education Reform in Portugal .....	28
H. Possible Directions for Further Reform and Research .....	32
References.....	64
II. Public Capital and Output Growth in Portugal: An Empirical Analysis .....	67
A. Introduction .....	67
B. The Production Function Approach.....	69

Conceptual framework .....	69
Evidence for OECD countries .....	70
The data .....	71
Empirical results for Portugal .....	71
C. The Unrestricted Vector Autoregression Approach .....	76
Method .....	76
Granger-causality tests .....	76
Impulse response analysis .....	77
Variance decompositions .....	80
D. Summary and Concluding Remarks .....	81
References .....	96

## Figures

1. Free Disposable Hull (FDH) Production Possibility Frontier .....	23
2. Average Gross Public Capital Formation as Share of GDP for Various Countries, 1994–98 .....	68
3. Impulse Response Functions .....	78

## Tables

1. Student Enrollment at Preschool and Primary Levels, 1985/86–1995/96 .....	35
2. Student Enrollment at Secondary and Tertiary Levels, 1970/71–1997/98 .....	36
3. Percentage of the Population that has Attained a Specific Level of Education .....	37
4. Educational Expenditure from Public and Private Sources for Educational Institutions ...	38
5. Expenditure per Student (U.S. Dollars Converted Using PPPs) on Public and Private Institutions by Level of Education (Based on full-time equivalents, 1995) .....	39
6. Expenditure per Student as a Share of GDP per Capita, 1995 .....	40
7. Ratio of Students to Teaching Staff by Level of Education, 1996 .....	41
8. Annual Statutory Teachers' Salaries in Public Institutions at the Primary Level of Education, in Equivalent U.S. Dollars Converted Using PPPs (1996) .....	42
9. Educational Expenditure on Primary and Secondary Education by Resource Category for Public and Private Institutions (1995) .....	43
10. Gross Enrollment Rates, 1989/90–1995/96 .....	44
11. Percentage of Students Successfully Completing the School Year in Continental Portugal, 1994/95 and 1995/96 .....	45
12. Dropout Rates by Grade in Continental Portugal .....	46
13. Repetition Rates by Grade in Continental Portugal .....	47
14. Ratio of Upper Secondary Graduates to Population at Typical Age of Graduation (times 100), First Educational Programs, 1996 .....	48
15. Net Enrollment Rates in Continental Portugal, 1994/95 .....	49
16. Conclusion Rates in Continental Portugal, 1995/96 .....	50
17. Students Above the Normal Age in Grades 7–9, by Region, 1994/95 .....	51
18. Student/Teacher Ratios by Region, 1997/98 .....	52

19. Conclusion Rates in Continental Portugal for Private and Public Schools, 1995/96.....	53
20. Actual and Projected Educational Attainment Rates, Continental Portugal, 1990/91–2000/01.....	54
21. Net Enrollment Rate and Share of the Population Completing Tertiary Education 1990/91–1997/98.....	55
22. Performance on International Examinations .....	56
23. Relative Earnings of 25–64 Year-olds with Income from Employment .....	57
24. Efficiency Scores: Expenditure per Student in Purchasing-Power Adjusted Dollars and Secondary Graduates to Population at Typical Graduation Age .....	58
25. Efficiency Scores: Education Spending per Student as Share of GDP per Capita (Secondary Level) and Secondary Graduates to Population at Typical Graduation Age..	59
26. Efficiency Scores: Education Spending to GDP and Educational Attainment Levels.....	60
27. Efficiency Scores: Education Spending to GDP and Ratio of Secondary and Tertiary Graduates to Population at Typical Graduation Age .....	61
28. Efficiency Scores: Education Spending to GDP at Primary and Secondary Level and Achievement in Eighth-Grade International Achievement Examinations.....	62
29. Correlations Between Educational Inputs and Efficiency Measures .....	63
30. Growth Rates of Private and Public Capital Stocks in Portugal, Spain, and the United States for Selected Time Periods .....	82
31. Overview of Empirical Studies: The Production Function Approach .....	83
32. Summary of Descriptive Statistics for Studies Estimating the Production Elasticity of Public Capital .....	85
33. Composition of the Total Capital Stock, 1975 and 1995 .....	86
34. Unrestricted Estimates of the Production Function in Levels, 1965–95.....	87
35. Estimates of the Production Function in Levels, 1965–95.....	88
36. Disaggregated Estimates of the Production Function.....	89
37. Augmented Dickey-Fuller Tests for Non-Stationarity.....	90
38. Estimates of the Production Function in First Differences, 1965–95 .....	91
39. Johansen's Cointegration Analysis of Portuguese Production.....	92
40. Likelihood Ratio Tests to Determine the Lag Length .....	93
41. Granger-Causality Tests.....	94
42. Variance Decompositions .....	95
III. Sources of Data and General Information on the World-Wide Web.....	100

## Portugal: Basic Data 1/

Total area: 34,312 square miles  
Population: 10.0 million  
GDP per capita (1998): US\$10,863

	1993	1994	1995	1996	1997	1998	1999
(Changes in percent, except as otherwise indicated)							
Domestic economy							
Real GDP	-1.4	2.4	2.9	3.6	3.8	3.9	3.0
Real domestic demand	-1.6	3.1	2.4	3.5	5.2	6.5	4.1
Private consumption	1.0	2.3	1.7	2.8	3.3	5.6	4.5
Investment	-10.1	6.5	4.4	6.6	12.3	10.5	4.2
Foreign sector contribution	0.3	-0.9	0.3	-0.2	-1.8	-3.0	-1.5
Employment	-2.0	-0.1	-0.6	0.6	1.9	2.3	0.8
Unemployment rate	5.5	6.8	7.2	7.3	6.7	5.0	4.6
Compensation per worker (manufacturing)	7.7	4.8	6.0	4.9	4.6	4.1	3.8
Unit labor costs (manufacturing)	7.7	2.8	-1.9	0.9	0.7	2.4	2.4
Consumer prices (national index)	6.5	5.2	4.1	3.1	2.2	2.8	2.5
Consumer prices (harmonized index)	...	...	...	2.9	1.9	2.2	2.3
GDP deflator	7.0	6.1	5.0	2.5	3.1	4.5	3.0
External accounts							
Export volume	-2.2	13.2	12.9	12.7	10.0	7.4	6.0
Import volume	-5.8	11.3	9.7	8.4	13.2	15.2	6.8
Export unit value	6.0	6.5	4.2	-3.8	0.4	0.2	1.0
Import unit value	9.2	4.3	1.7	-0.3	0.3	-1.2	1.3
Trade balance (US\$ billions, f.o.b.)	-8.0	-8.3	-8.9	-9.4	-10.0	-12.2	-13.0
Current transfers (net, US\$ billions) 2/	6.7	5.4	7.1	4.4	3.7	4.0	4.3
Current account (US\$ billions) 3/	0.1	-2.2	-0.2	-2.3	-2.8	-4.6	-5.6
In percent of GDP 3/	0.1	-2.5	-0.2	-2.1	-2.8	-4.3	-5.1
Current account excluding capital transfers (in percent of GDP)	...	...	...	-4.2	-5.4	-6.7	-7.5
Financial account (in percent of GDP)	-3.3	0.7	3.5	3.6	6.2	5.6	...
Of which: inward foreign direct investment	1.8	1.4	0.7	1.3	2.5	1.6	...
inward portfolio investment	5.3	4.4	2.0	3.9	8.3	5.8	...
Nominal effective exchange rate 4/	-5.7	-3.4	1.7	0.2	-2.1	-1.1	-1.5
Real effective exchange rate (CPI based) 4/	-2.9	-1.2	2.9	0.9	-1.8	0.2	-0.7
Net official reserves (end of period; in US\$ billions)	21.8	21.3	21.7	21.3	18.2	18.7	...
General government finances (in percent of GDP)							
Revenues	41.1	39.5	40.6	43.2	43.4	43.4	44.5
Expenditures	47.2	45.5	46.4	46.5	46.0	45.5	46.1
Of which: capital expenditures	5.9	4.9	5.2	6.2	6.3	6.4	6.6
Overall balance	-6.1	-6.0	-5.7	-3.3	-2.5	-2.1	-1.6
Public debt (Maastricht definition)	63.1	63.8	65.9	65.0	61.4	57.0	55.4
Of which: external debt	7.4	9.4	11.6	11.8	14.1	14.9	...
Privatization receipts	0.6	1.3	2.3	2.8	4.8	4.0	1.7
Financial variables (end of period)							
Harmonized M3 5/	...	...	8.2	6.1	6.4	6.8	6.9
Liquidity of residents (L-)	6.2	9.4	8.0	8.8	6.3	7.8	...
Domestic credit 5/	8.8	13.7	11.7	12.6	11.6	17.1	18.5
Credit to the general government 5/	2.3	22.0	-5.3	-3.1	-28.1	-40.0	-65.1
Credit to the private sector 5/ 6/	11.4	11.1	17.7	17.1	20.8	25.1	28.1
Interest rates (percent) 7/							
Overnight rate	11.2	8.9	8.6	6.7	5.1	3.3	2.4
Deposit rate, 91-180 days	10.2	9.3	8.1	5.5	4.6	3.3	2.7
Lending rate, 91-180 days	15.7	14.7	12.7	11.0	8.4	6.0	5.0
Government benchmark bond	9.0	11.6	10.0	7.0	5.7	4.1	5.4
Nonperforming loans (in percent of total) 8/	6.9	6.5	5.9	5.1	4.0	2.8	...
Risk-based capital asset ratio 9/	...	11.6	8.5	8.4	9.1	9.1	...
Long-term foreign currency debt rating (S&P) 10/	AA-	AA-	AA-	AA-	AA-	AA	AA
Long-term foreign currency debt rating (Moody's) 10/	A1	A1	A1	A1	Aa3	Aa2	Aa2

Sources: Bank of Portugal; Ministry of Finance; National Statistics Office (INE); and Fund staff estimates and projections.

1/ Unless otherwise noted, 1999 data are staff estimates or projections.

2/ Statistical break in 1996. Figures exclude transfers to finance capital expenditure for 1996-1999. These transfers equaled US\$2.2 billion in 1996.

3/ Statistical break in 1996. Figures include transfers to finance capital expenditure, which equaled US\$2.2 billion in 1996.

4/ Data for 1999 correspond to year-on-year rates of change through July.

5/ Data for 1999 correspond to year-on-year rates of change through August.

6/ Includes nonfinancial public enterprises and nonmonetary financial institutions.

7/ Data for 1999 refers to September.

8/ Includes credit unions, and encompasses activity of off-shore branches and branches abroad.

9/ Capital over risk-weighted liabilities according to BIS methodology; lowest value among the six largest banking groups (which account for 90 percent of the banking system).

10/ 1999 ratings refer to those available as of July.

## INTRODUCTION

1. Since the mid-1990s, the Portuguese economy has combined one of the highest growth rates in the euro area with a successful disinflation process. This reflected, to an important extent, sound macroeconomic policies in the run-up to the third stage of European Economic and Monetary Union (EMU), as well as flexible labor markets that helped accelerate the convergence process.
2. Achieving durable convergence in living standards remains the key policy challenge facing the Portuguese economy. Since joining the European Union (EU) in 1986, per capita income growth has exceeded that in EU partner countries by about 1 percent per annum. In the past, Portugal's growth was fueled primarily by the accumulation of capital, rather than increases in total factor productivity. This brings to the fore the issue of the sustainability of the catch-up process, at a time when per capita income is still only about two-thirds of the EU average. The impending reduction in EU transfers (as a share of GDP) expected toward the end of the Agenda 2000 horizon (in 2006) draws further attention to the need to strengthen factor productivity growth.
3. In this context, the background chapters presented here focus on two key issues: **education** and **public investment**. Both areas are generally considered as critical for Portugal's prospects for sustaining or accelerating the drive toward real income convergence. Moreover, both areas absorb a substantial share of public resources and thus have important implications for fiscal balances, which are, under EMU, constrained by the Stability and Growth Pact.
4. Chapter I (by Benedict Clements) assesses the performance of the Portuguese **education system** and delineates a possible agenda for reform. The accumulation of human capital is widely recognized in the growth literature as a driving force in economic development. This issue is of particular concern to Portugal, where the small share of the population having completed secondary school (about 20 percent) constitutes a major stumbling block to higher labor productivity. The chapter finds that considerable progress has been achieved in recent years. Nevertheless, rates of educational attainment for the current school-age cohort still lag behind much of the OECD, suggesting the need for additional steps to complement recent reforms.
5. Low attainment rates reflect several factors, among them high failure rates, which exceeded 30 percent for grades 10–12 for the latest year for which data are available (1995/96). As a result, both school dropout and repetition rates are high. Scores on internationally comparable examinations in math and science also indicate significant lags in educational performance.
6. Portugal's low educational performance has coincided with the highest level of primary and secondary education expenditure relative to GDP in the OECD, suggesting a large degree of inefficiency. Portugal's relatively high spending in the public system is linked to both a low number of students per teacher and generous salaries (relative to per capita

income), and high repetition rates that boost school enrollments. Public expenditures on capital and nonwage current outlays in public schools are well below OECD norms, however, indicating some possible misallocation in the composition of spending. Comparisons with the private sector are also suggestive of the room for improving efficiency in the public sector: while student/teacher ratios in Portugal's private schools are 50 percent higher, failure rates are lower. The empirical results from the application of a nonparametric technique for production frontier estimation (Free Disposable Hull analysis) also support the view of a relatively high degree of inefficiency in the Portuguese education system.

7. The government's efforts to improve educational attainment have focused on strengthening participation in preschool education and increasing the range of vocational and technically oriented courses offered to students. While these measures will have a salutary effect over the long run, deeper and more ambitious reforms may be necessary to more rapidly close the gap with the rest of the OECD. Among the reforms that could be considered are: (i) adoption of a goal-oriented management and incentive system, with school and teacher performance assessments based on progress in meeting quantitative targets for reducing failure rates, repetition rates, and improving scores on national examinations; in this context, additional modifications to the curriculum may be required to support stronger academic achievement; (ii) establishing minimum school sizes and student/teacher ratios; and (iii) an easing of employment and work rules governing public school teachers, which would allow for a reallocation of experienced staff to areas of greatest need. There is also scope for raising user fees in publicly funded higher education.

8. Chapter II (by Jenny Ligthart) attempts to shed light on the role of **public investment** in Portugal. Public capital expenditures are among the highest in the EU; including capital transfers, these outlays have averaged some 5¾ percent of GDP in the 1990s, and were over 6 percent of GDP in 1998. In view of this sizable commitment of public resources, the question arises of how productive public investment has been, that is, how much it has contributed to Portugal's economic growth.

9. The chapter finds that public capital has been about as productive in Portugal as in other industrialized countries, with a 1 percent increase in the public capital stock increasing output, on average, by close to 0.3 percent. These estimates imply a high rate of return to public investment (about 40 percent), a result that is consistent with the findings for other industrial countries. With respect to the effects of separate components of the public capital stock, the estimates indicate that, in particular, public investment in infrastructure and in machinery and transport equipment stimulates growth. The evidence on whether public investment crowds out private sector capital formation is mixed: while there is some evidence to this effect in the short run, over the longer term no crowding out was found. There is little evidence to suggest that public investment responds to the business cycle; rather, public investment appears to be determined exogenously.

10. To assess the robustness of the results and allow for comparability with studies for other countries, the chapter employs a number of econometric techniques, using annual data over 1965–95. Results from a production function approach, estimated in levels by ordinary