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## **Germany: Selected Issues**

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GERMANY

**Selected Issues**

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Approved by European I Department

October 10, 2000

Contents	Page
Basic Data .....	4
I. Strategies for Turning Germany's Labor Market Around .....	6
A. Preliminaries .....	6
B. Germany's Growth Cycle Prospects: Alternative Scenarios .....	12
C. Policy Strategies for Underpinning a New Growth Cycle Era .....	17
References .....	21
II. Declining Labor Shares, Wage Moderation, and Employment Performance in Germany and the Netherlands.....	22
A. Introduction and Overview .....	22
B. Unemployment and Labor Share .....	23
C. Labor Market Performance in Germany and the Netherlands .....	24
Labor market shocks .....	24
Moderation across the board; why has the Dutch approach been sustainable? .....	26
D. Conclusions.....	32
Appendix. A Formal Model of a Labor Market with Homogeneous Labor.....	33
References.....	38
III. Prospects for the "New Economy" in Germany .....	39
A. Introduction.....	39
B. The Background: The U.S. Experience .....	40
C. The Effect of IT Investment on European Output Growth .....	43
D. Germany's Position in the Information Technology World .....	45
Production and trade of information technology goods.....	46
E. Germany's Readiness for the "New Economy" .....	49
F. Policy Issues for the "New Economy" in Germany.....	51
Labor markets .....	52

Product markets .....	53
Financial markets .....	54
G. Conclusion .....	54
References .....	56
IV. Tax Reform .....	57
A. Overview of the Reform .....	58
Key features of reform .....	58
Revenue effects .....	60
International comparisons .....	61
B. Effects on Investment and Finance .....	63
C. Imputation: An Idea Whose Time has Gone? .....	68
D. Exemption of Inter-Corporate Capital Gains .....	69
E. Implications for Other EU Countries and for Fiscal Federal Relations in Germany .....	71
F. Labor Market Issues .....	73
G. Conclusion .....	75
Appendix I. Derivation of Costs of Capital .....	76
Appendix II. Response of the Trading Tax to an Increase in the Federal Tax .....	78
References .....	79
V. Revamping Germany's Pension System .....	81
A. Introduction and Summary .....	81
B. Germany's Pension System: A Cross-Country Perspective .....	82
C. PAYG Financing: Mechanics and Projections .....	87
D. Reform Proposal .....	93
E. Assessment of Reform Proposal .....	95
Appendix. PAYG Algebra for Germany's Public Pension System .....	97
References .....	99
Tables	
III-1. Acceleration in Non-Form Business Labor Productivity, 1991-95 to 1996-99 .....	42
III-2. Labor Productivity Growth in the Business Sector .....	43
III-3. World Production of ICT Goods, 1997 .....	46
III-4. ICT Goods: Leading Exporting and Importing Countries, 1998 .....	47
IV-1. Changes in Personal Income Tax .....	59
IV-2. Full Revenue Effects of Reform .....	61
IV-3. German Tax Rates in an International Context .....	62
V-1. Public Pension Projections, 2000-50 .....	90
Text Boxes	
III-1. Accounting for the "New Economy" .....	41
III-2. Data and Comparability Problems in Measuring the "New Economy" .....	45
IV-1. The Cost of Capital .....	63
IV-2. Marginal and Average Effective Tax Rates on Investment .....	67

Figures

I-1.	Unemployment Rate and Real Output Growth, 1950-2000.....	6
I-2.	Unemployment Rate and Capacity Utilization, 1970-99.....	6
I-3.	Real Output per Employee, 1950-99.....	7
I-4.	Employment by Skills, 1976-97.....	10
I-5.	Unemployment Rates by Skills, 1976-97.....	10
I-6.	Cyclical Expansions of Real GDP.....	13
I-7.	Cyclical Expansions of Employment.....	13
I-8.	Capacity Utilization in the Manufacturing Sector and Ifo Business Climate Index, 1970-99.....	14
I-9.	Output Gaps in the Euro Area, 2000.....	14
I-10.	Monetary Conditions Index, 1992-2000.....	14
I-11.	Real Effective Exchange Rates, 1987-2000.....	14
I-12.	Growth Cycle Scenarios, 2000-2005.....	16
II-1.	Labor's Share, Unemployment Rate, Real Wages and Average Labor Productivity in Germany and the Netherlands, 1970-99.....	22
II-2.	Labor Market Shocks in Germany and the Netherlands, 1970-99.....	25
II-3.	The Real Product Wage in Germany and the Netherlands, 1970-97.....	27
II-4.	Growth in the Actual Wage minus Growth in the Warranted Wage in Germany and the Netherlands, 1970-99.....	27
II-5.	Average Labor Tax Wedge in Germany and the Netherlands, 1982-97.....	28
II-6.	Developments in Earnings Inequality in Germany and the Netherlands, 1982-94.....	28
II-7.	Capital-Labor and Capital-Output Ratios in Germany and the Netherlands, 1970-99.....	29
II-8.	Labor Force Composition in Germany and the Netherlands, 1973-97.....	30
II-9.	Employers' Social Contributions in Germany and the Netherlands, 1979-99.....	31
III-1.	Value Added in ICT Industries, 1997.....	47
III-2.	Exports of Software Goods, 1998.....	48
III-3.	Imports of Software Goods, 1998.....	48
IV-1.	Marginal Income Tax Rates.....	60
V-1.	Industrial Countries: Public Pension Expenditure.....	84
V-2.	Industrial Countries: Private Pension Fund Assets and Public Pension Expenditure.....	84
V-3.	Industrial Countries: Private Pension Fund Assets and Labor Force Participation Rate of 55-64 Year Old Persons.....	85
V-4.	Industrial Countries: Private Pension Fund Assets and Saving Rate.....	86
V-5.	Industrial Countries: Private Pension Fund Assets and Stock Market Capitalization.....	87
V-6.	Key Parameters of the Public Pension System, 1957-2000.....	89
V-7.	Main Industrial Countries: Elderly Dependency Ratios, 2000-2040.....	91
V-8.	Status-Quo Projections of Key Parameters of Public Pension System, 2000-2050.....	92
V-9.	Projected PAYG Replacement Rates, 2000-2030.....	94
V-10.	Projected PAYG Contribution Rates, 2000-2030.....	94

Germany: Basic Data

Total area	357,041 square kilometers
Total population (1999)	82.11 million
GNP per capita (1999)	US\$ 25,472

	1996	1997	1998	1999	2000 1/	2001 1/
(Percentage change at 1995 prices)						
Demand and supply						
Private consumption	1.0	0.7	2.0	2.6	2.2	3.2
Public consumption	1.8	-0.9	0.5	-0.1	0.8	1.3
Gross fixed investment	-0.8	0.6	3.0	3.3	2.7	4.0
Construction	-2.8	-1.5	-1.0	0.5	-2.1	0.7
Machinery and equipment	1.7	3.7	9.2	6.7	8.8	7.7
Final domestic demand	0.7	0.3	1.9	2.2	2.0	3.1
Inventory accumulation 2/	-0.5	0.2	0.4	0.2	0.2	0.2
Total domestic demand	0.3	0.6	2.4	2.4	2.2	3.3
Exports of goods and nonfactor services	5.1	11.3	7.0	5.1	11.4	7.3
Imports of goods and nonfactor services	3.1	8.4	8.6	8.1	9.1	7.4
Foreign balance 2/	0.5	0.8	-0.3	-0.8	0.8	0.1
GDP	0.8	1.4	2.1	1.6	2.9	3.3
(In millions, unless otherwise indicated)						
Employment and unemployment						
Labor force	40.7	41.0	41.2	41.3	41.5	41.7
Employment 3/	37.2	37.1	37.5	37.9	38.3	38.5
Unemployed 4/	3.5	3.9	3.7	3.4	3.3	3.2
Standardized unemployment rate	8.6	9.5	9.0	8.3	7.9	7.6
(Percentage change)						
Prices and incomes						
GDP deflator	1.0	0.8	1.1	0.9	0.4	1.5
Consumer price index (harmonized)	1.2	1.5	0.6	0.7	1.7	1.5
Average hourly earnings (industry)	4.6	1.2	2.0	2.4	...	...
Unit labor cost (total economy)	0.2	-0.8	0.0	0.6	0.2	0.3
Real disposable income 5/	0.6	0.2	1.8	2.3	1.5	3.4
Personal saving ratio (in percent)	10.8	10.4	10.2	9.9	9.3	9.5

1/ Staff projections.

2/ Change as a percent of previous year's GDP.

3/ According to place of residence.

4/ On national accounts basis (ESA95); Unemployment as defined by the international labor organization (ILO).

5/ Deflated by the national accounts deflator for private consumption.

Germany: Basic Data (concluded)

	1996	1997	1998	1999	2000 1/	2001 1/
<b>Public finances 2/ 3/</b>						
	(In billions of deutsche marks)					
<b>General government</b>						
Expenditure	1,802	1,806	1,840	1,885	1,907	1,964
(In percent of GDP)	50.3	49.2	48.6	48.6	47.6	46.8
Revenue	1,680	1,706	1,762	1,830	1,972	1,914
(In percent of GDP)	46.8	46.5	46.5	47.2	49.2	45.6
Financial balance	-123	-99	-78	-55	64	-50
(In percent of GDP)	-3.4	-2.7	-2.1	-1.4	1.6	-1.2
<b>Federal government</b>						
Financial balance	-78.5	-63.5	-56.6	-51.1	55.6	-40.2
(In percent of GDP)	-2.2	-1.7	-1.5	-1.3	1.4	-1.0
General government debt	2,144	2,233	2,298	2,366	2,389	2,396
(In percent of GDP)	59.8	60.9	60.7	61.0	59.6	57.0
<b>Balance of payments</b>						
Trade balance 4/	93.3	110.3	124.4	117.0	120.3	133.2
Services balance	-55.3	-59.9	-67.6	-79.8	-84.1	-89.8
Net private transfers	-16.0	-15.9	-16.0	-16.7	...	...
Net official transfers	-35.3	-36.8	-37.3	-33.6	...	...
Current account	-12.0	-4.8	-8.0	-36.4	-7.7	0.0
(In percent of GDP)	-0.3	-0.1	-0.2	-0.9	-0.2	0.0
Foreign exchange reserves (e. o. p.) 5/	72.4	76.7	100.4	98.4	...	...
<b>Monetary data</b>						
	(Percentage changes, end of period)					
Money and quasi-money (M3) 6/	5.8	4.7	8.3	8.4	...	...
Domestic bank lending	7.6	6.0	6.4	5.6	...	...
<b>Interest rates</b>						
	(Period averages in percent)					
Three-month interbank rate 7/	3.3	3.3	3.5	2.9	4.9	...
Yield on ten-year government bonds 7/	6.2	5.7	4.6	4.5	5.3	...
<b>Exchange rates</b>						
	(Levels)					
DM per US\$ (end of period) 8/	1.55	1.79	1.67	1.95	2.24	...
DM per US\$ (annual average) 8/	1.50	1.73	1.76	1.84	2.24	...
Euro per US\$ (annual average) 8/	0.78	0.88	0.89	0.94	1.15	...
Nominal effective rate (1990=100) 9/	108.9	103.9	104.1	102.1	97.4	...
Real effective rate (1990=100) 9/	119.3	111.4	108.4	104.4	98.1	...

1/ Staff projections.

2/ Data for federal government are on an administrative basis.

Data for the general government are on a national accounts basis. Debt data are end-of-year data for the general government in accord with Maastricht definitions.

3/ Government revenues in 2000 include the proceeds from the sales of mobile phone licenses of DM 99.4 billion (2.5 percent of GDP). The proceeds also affect the financial balances and the government debt.

4/ Including supplementary trade items.

5/ From 1999 onward data reflect Germany's position in the euro area.

6/ From 1999 onward data reflect Germany's contribution to M3 of the euro area.

7/ Data for 2000 refer to September 12, 2000.

8/ Data for 2000 refer to September 8, 2000.

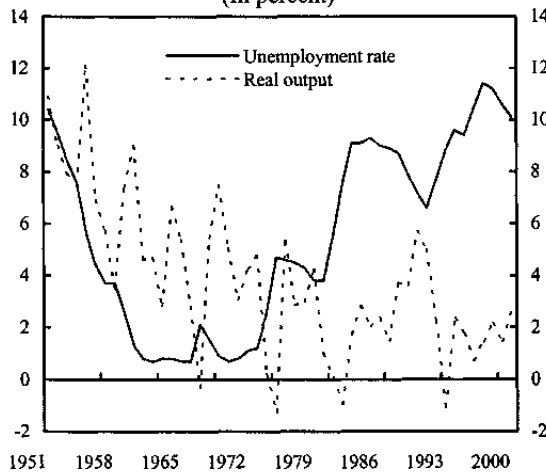
9/ Data for 2000 refer to August, 2000.

## I. STRATEGIES FOR TURNING GERMANY'S LABOR MARKET AROUND<sup>1</sup>

### A. Preliminaries

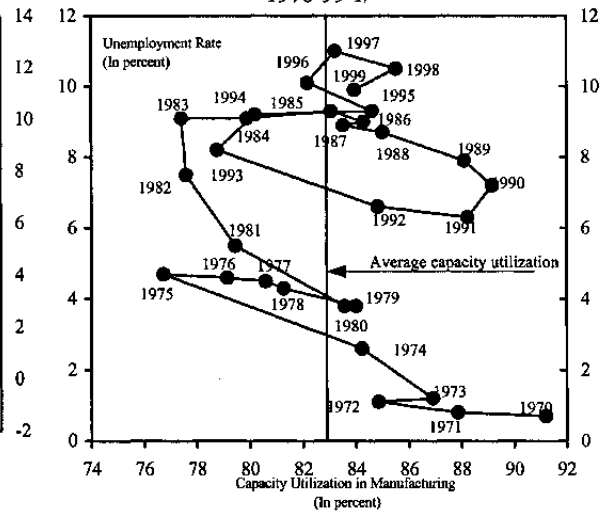
1. Since the early 1970s, Germany's performance in utilizing its labor resources has been lackluster. In particular, real output growth during the last three decades has fallen short of what was needed to prevent the unemployment rate from drifting upward—in marked contrast to the growth and labor market experience of the *Wirtschaftswunder* era in the 1950s and 1960s (Figure I-1). Each of Germany's growth cycles since the early 1970s left behind a legacy of higher structural unemployment, as can be gleaned from a scatterplot of western Germany's unemployment against capacity utilization rates during 1970-99 (Figure I-2). Thus, a large and growing number of Germany's productive workers remained inactive, preventing the economy from living up to its full potential.

Figure I-1. Germany: Unemployment Rate and Real Output Growth, 1950-2000 (In percent)



Source: IMF, World Economic Outlook.

Figure I-2. Germany: Unemployment Rate and Capacity Utilization, 1970-99 1/



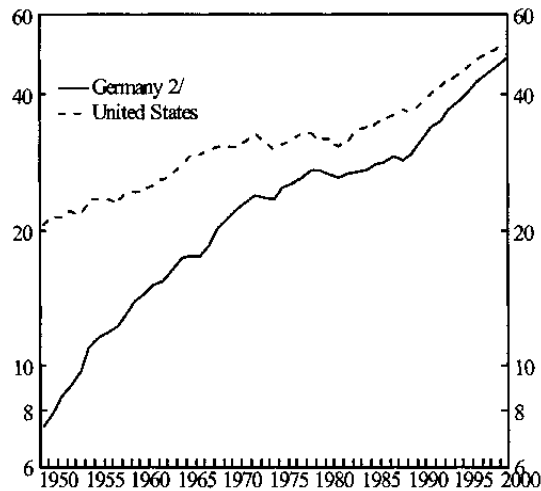
Sources: Deutsche Bundesbank; and OECD Economic Indicators.  
1/ Data refer to western Germany.

2. At the same time, Germany's performance in terms of labor productivity growth—the key determinant of increases in living standards—has remained clearly above par. Labor productivity continued to expand at a robust pace (of 2¼ percent) during 1973-99, significantly above the OECD's average rate of growth (1¾ percent) in the same period. Moreover, based on data for western Germany, the “productivity gap” vis-à-vis the

<sup>1</sup> Prepared by Albert Jaeger.

leader country—the United States—was almost closed by the end of the century (Figure I-3).<sup>2</sup> Thus, Germany’s economy continued to provide what has been dubbed the “2 percent answer” to each generation’s economic dream: labor productivity growth of 2 percent a year implies a doubling of living standards every 35 years, enabling parents to provide their children with a standard of living double the level they enjoyed themselves when they were children.

Figure I-3. Germany: Real Output per Employee, 1950-99 1/



Source: Penn World Tables.  
1/ Thousands of U.S. dollars at 1995 prices;  
logarithmic scale.  
2/ Data for 1991-99 refer to western Germany.

3. **Not surprisingly, against this background, improving the labor market’s ability to more fully use available labor resources is Germany’s number one economic policy priority.** *“The reduction of unemployment is the most important objective of the new government. Herein lies the key to resolving the economic, financial, and social problems of Germany.”*<sup>3</sup> The purpose of this chapter is to review the debate on policy strategies that could allow Germany to make a clean break with the labor market disappointments of the last three decades.

<sup>2</sup> Moreover, Germany’s labor productivity levels are likely to be underestimated (relative to the United States) owing to differences in the statistical treatment of investments in new information technologies. See Deutsche Bundesbank (2000, p. 8).

<sup>3</sup> Preamble of the government’s coalition agreement (dated October 1998; own translation).



4. What are the causes behind Germany's anemic labor utilization performance over the last three decades? **The chapter's discussion is premised on the following potted account of this portion of Germany's growth cycle history: adverse shifts in the economic environment (*shocks*) were propagated through inflexible labor market arrangements (*institutions*) and reinforced by largely endogenous fiscal and monetary policy responses (*financial policies*).**<sup>4</sup>

- **Role of shocks:** Germany's postwar *Wirtschaftswunder* economy was envied by much of the world during the 1950s and 1960s for combining rapid productivity growth and full employment without compromising on social consensus and equity objectives. Germany appeared to have found an unusually favorable mix between a market-oriented *Ordnungspolitik* (the sum of policies charged with providing a sturdy and trust-promoting legal and financial framework within which markets could operate efficiently) and an active social policy (policies charged with setting bounds within which market forces would need to operate, foremost in the labor market). However, beginning in the early 1970s, the economic environment worsened drastically, with Germany's economy battered by an array of adverse shocks including skill-biased shifts in labor demand, a quickening pace of deindustrialization, and, above all, during the 1990s, the massive economic fallout from German unification. In this much less favorable economic environment, maintaining high levels of resource utilization in the labor market would have required flexible labor market institutions.<sup>5</sup>
- **Role of institutions:** However, Germany's labor market institutions were not in sync with the more adverse economic environment. Two basic labor market coordination (or mismatch) problems obstructed the adjustment to shocks. First, the structure of labor costs was not responsive to shocks to relative labor productivities of workers (across skills, sectors, and regions).<sup>6</sup> Relative labor cost adjustments were blocked by the principle of "wage growth solidarity," enshrined in the trade unions' objective to

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<sup>4</sup> This interpretation of the interaction between shocks, labor market institutions, and financial policies in Germany draws on Chapter I (*Institutional Change and Economic Performance: A Fifty-Year Perspective*) in last year's *Selected Issues Paper* on Germany, which also provides a number of references to articles and books that adopt similar interpretations of Germany's postwar growth cycle history, specifically Paqué (2000) and van der Willigen (1995).

<sup>5</sup> Labor market institutions are defined as the formal (legal) and informal rules that underpin bargaining on wages and other work conditions, the social insurance system, the social safety net, and active labor market policies. See Williamson (2000) for a survey of the "new institutional economics."

<sup>6</sup> Prasad (1999) documents the stability of Germany's wage distribution over time.

benchmark negotiated (real) wage increases on the economy's **overall** rate of labor productivity growth. And second, social security arrangements underpinned high and inflexible reservation wages relative to take-home pay offered by the markets, where rigid reservation wages reflected unlimited durations of unemployment benefits, generous early retirement incentives, and weak re-activation requirements for the unemployed.<sup>7</sup> The social insurance system added a **vicious circle** element to the two basic mismatch problems. Rising social contribution rates—in large part an endogenous consequence of Germany's lackluster employment growth record—drove an increasing wedge between labor costs and take-home pay, crimping take-home pay and increasing labor costs, particularly of the lower-skilled, initiating a further round of employment losses.

- **Role of financial policies:** Largely endogenous fiscal and monetary policy responses added demand side strains to the supply-side consequences of an ill-functioning labor market. To begin with, the design of Germany's fiscal institutions—especially the presence of a large-scale social insurance system based on pay-as-you-go (PAYG) principles and a highly decentralized fiscal structure—lends itself to “endogenous procyclicality” in the fiscal stance. More importantly, the massive labor market shakeouts that became a defining feature of Germany's cyclical downturns implied sharp deteriorations in the underlying fiscal position, reflecting the upward ratcheting of structural unemployment. Moreover, with the anchor of a reasonably stable structural rate of unemployment missing, fiscal policy making was all at sea—orienting the fiscal stance on cyclically adjusted deficits became an exceedingly difficult exercise at best. In this situation, “putting the fiscal house back in order,” even at the cost of a procyclical bent in fiscal consolidation efforts, was widely seen as a prerequisite of sound government. Finally, two historical events—the obligation to finance the fiscal cost of unification and the drive to meet the Maastricht deficit limit in 1997—also led to a strong procyclical thrust in fiscal policy during most of the 1990s. Monetary policy (until 1998, the sole prerogative of the Bundesbank) was bound by a strictly interpreted constitutional mandate to “safeguard the currency.” Faced with a wage bargaining regime that tended to alternate between persistent phases of wage moderation (following cyclical downturns and labor shakeouts) and wage push (during cyclical upswings), as well as a fiscal policy stance that was prone to procyclicality, the Bundesbank tended to meet perceived inflationary pressures promptly, decisively, and steadfastly, while taking a more cautious and wary attitude toward relaxation of its monetary stance during periods of persistent economic slack.

**5. With the relative patterns of labor costs, take-home pay, and reservation wages largely impervious to adverse shocks, active labor market policies took on the role of**

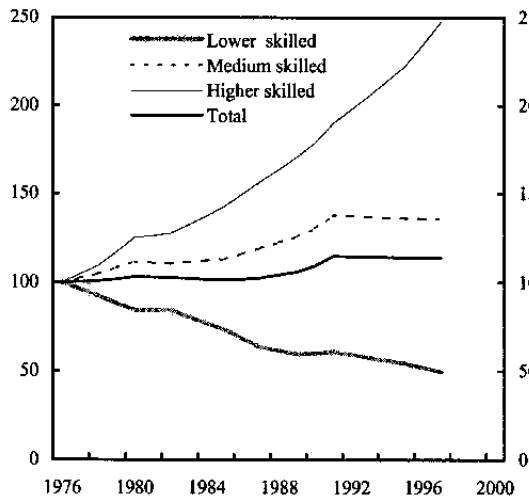
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<sup>7</sup> Prasad (2000) presents evidence on the spreads between reservation wages (based on survey data compiled within the German Socio-Economic Panel (GSOEP)) and take-home pay offered by the market.

“labor policies of last resort.” It was hoped that active labor market policies would help to raise labor productivities and re-motivate the unemployed by training or direct job creation. However, the success of active labor market policies appears to have been limited, although direct evidence on this is scarce owing to a distinct lack of evaluations of the effectiveness of Germany’s vast array of active labor market programs.<sup>8</sup>

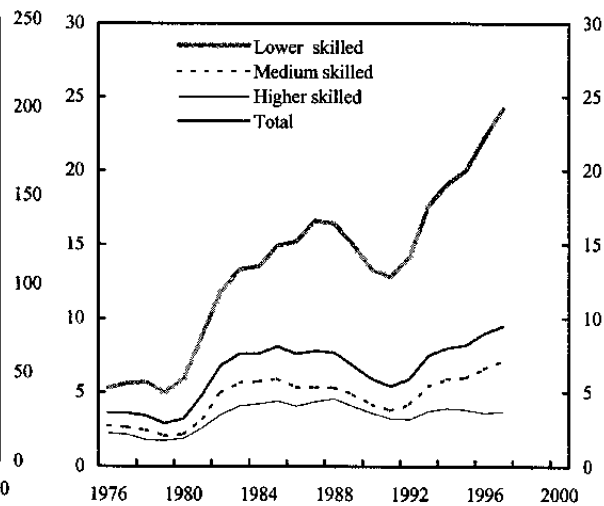
6. **The labor market fallout from the interplay of shocks, institutions, and financial policies was heavily concentrated among the lower skilled (Figures I-4 and I-5).** On the labor demand side, with the shocks biased against lower-skilled workers and the wage bargaining institutions effectively blocking relative wage adjustments that could have preserved jobs, the incidence of labor shakeouts fell heavily on the lower-skilled. On the labor supply side, a social safety net characterized by high and sticky reservation wages was unlikely to also serve as a social springboard for reabsorbing the lower-skilled during cyclical upturns.

Figure I-4. Germany: Employment by Skills, 1976-97 (1976=100) 1/



Sources: Reinberg and Rauch (1998); and staff estimates.  
1/ Data refer to western Germany.

Figure I-5. Germany: Unemployment Rates by Skills, 1976-97 (In percent) 1/



Sources: Reinberg and Rauch (1998); and staff estimates.  
1/ Data refer to western Germany.

7. **What could be done to improve the workings of Germany’s labor market while preserving an enviable record of sustained labor productivity growth and paying heed**

<sup>8</sup> Calmfors and Skedinger (1995) discuss theoretical considerations and empirical evidence (for Sweden) that suggest that the effectiveness of active labor market policies may be quite limited.

**to Germany's deeply embedded social equity objectives?** The debate on this has produced two distinct lines of argument, implying strikingly different policy strategies:

- The first line of argument is based on the premise that marked improvements in the utilization of labor resources can be achieved without abandoning the broad features of Germany's present labor market institutions. This line of argument tends to highlight the role of an unusually unfavorable economic environment (shocks) during the last three decades, not least the adverse economic effects of German unification. Moreover, it is claimed that endogenous adjustments in the functioning of labor market institutions, particularly collective bargaining on wages and work conditions, have already increased flexibility, although further piecemeal reforms may be needed. A "corporatist policy strategy" based on this line of argument would prescribe across-the-board wage moderation (a policy consistent with the "wage growth solidarity" principle) as the centerpiece of an effort to increase use of available labor resources through two channels: (i) by improving Germany's labor cost competitiveness; and (ii) by boosting labor intensity (relative to capital) of production. At the macroeconomic policy level, a key supporting role would be provided by a fiscal policy that blunts the impact of wage moderation on take-home pay, mainly by cuts in the income tax and contribution burden. Thus, a corporatist policy strategy would seek to exploit a **virtuous circle** running from wage moderation in the labor market (leading to stronger employment growth) to fiscal policy (lower social spending makes it possible to lower the contribution and tax burden) and back to the labor market (more employment growth), essentially trying to reverse the vicious labor market circle of the last three decades. In continental Europe, this type of corporatist strategy has been widely associated with the economic turnaround of the Netherlands since the early 1980s—Germany's *Alliance for Jobs* has been explicitly modeled on the Dutch experience.<sup>9</sup> Indeed, during the second half of the 1980s, Germany and the Netherlands appeared to follow similar labor market strategies—and labor market improvements in the Netherlands and Germany during the second half of the 1980s were also noticeably similar—but, in the event, Germany's wage moderation policy was derailed by the shock of German unification.<sup>10</sup>
- The second line of argument is premised on the assumption that a comprehensive overhaul of Germany's labor market institutions is needed to bolster the shock-resistance of Germany's labor market and unwind the unemployment legacy of the last three decades. An "institutional reform strategy" based on this view would focus

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<sup>9</sup> The *Alliance for Jobs* is a social partner forum initiated by the government in 1998 to coordinate a comprehensive approach to improving labor market conditions; the *Alliance* comprises the government, employers' associations, and the trade unions.

<sup>10</sup> Chapter II provides a detailed analysis of the economic effects of wage moderation and the Dutch experience.

on changing the ground rules that govern collective bargaining, social insurance, and the social safety net, while taking measures to boost take-home pay at the lower end of the labor market to uphold Germany's equity objectives. By unblocking adjustment channels in the labor market, institutional reforms would also buy insurance against future shocks and the repetition of past cyclical disappointments. Within continental Europe, Switzerland's specific set of labor market institutions provides a possible benchmark in line with the aims of an institutional reform strategy.

8. To set the stage for the remainder of the chapter, the next section lays out illustrative scenarios for Germany's medium-term cyclical growth prospects. The final section describes in more detail and evaluates the two competing lines of argument on how to improve the functioning of Germany's labor market.

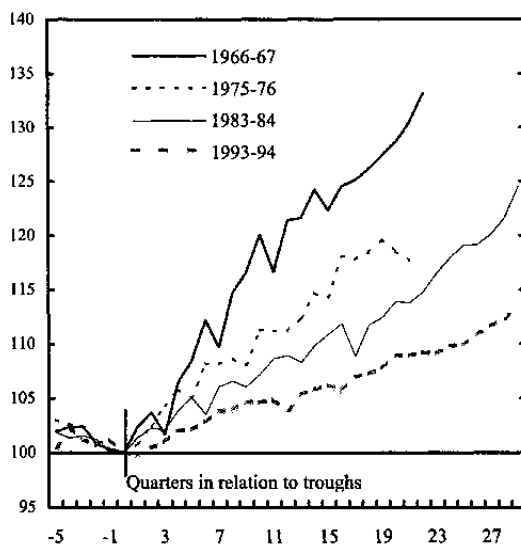
### **B. Germany's Growth Cycle Prospects: Alternative Scenarios**

9. **Germany's growth cycles since the early 1970s can be well described by a three-stage pattern: first, a cyclical downturn or labor shakeout stage (Stage 1); then, a slow stretched-out cyclical recovery stage with essentially no employment growth (Stage 2); and finally a strong cyclical upswing stage, ending invariably in another labor shakeout (Stage 3) (Figures I-6 and I-7).** The contrast between the last *Wirtschaftswunder* era cycle in the 1960s and the later cycles is noteworthy. All of Germany's growth cycle recessions since the mid-1960s have coincided with massive labor shakeouts. However, while the labor shakeout during the 1967-68 recession was followed by a quick and sustained rebound to above-average output growth, the three growth cycles since the early 1970s have been characterized by increasingly anemic growth rates during the early phase of the cyclical recovery. Output growth has tended to exceed average growth only in the final upswing phase of the growth cycle.

10. **The dynamics of these growth cycles reflected the following stylized pattern.** The cyclical downswing and labor shakeout of Stage 1 was typically followed by a phase of moderate, across-the-board wage growth to restore enterprise profitability and competitiveness; fiscal consolidation efforts including marked increases in social contribution rates to restore the soundness of public finances; and a slow and cautious relaxation of monetary policy. This setting of wage, fiscal, and monetary policies translated into slow (Stage 2) output growth and virtually flat employment (see Figure I-7). At some point, with external competitiveness restored, exports typically provided the impulse for a more pronounced cyclical pickup that was then transmitted, with some delay, to domestic demand, mainly via investment in machinery and equipment. As the cyclical upswing took hold and profits began to soar (Stage 3), across-the-board wage moderation gave way to more aggressive wage demands by higher-skilled workers—during this stage, trade unions would refer to the need to put an end to “excessive wage modesty.” While these higher wage demands were largely compatible with the rising productivity levels of the higher-skilled, labor costs for the lower-skilled were pushed out of line with their productivity. In the meantime, on the policy side, fiscal policy typically shifted to a procyclical stance—the PAYG finance principle made it possible to cut social contribution rates; lower government

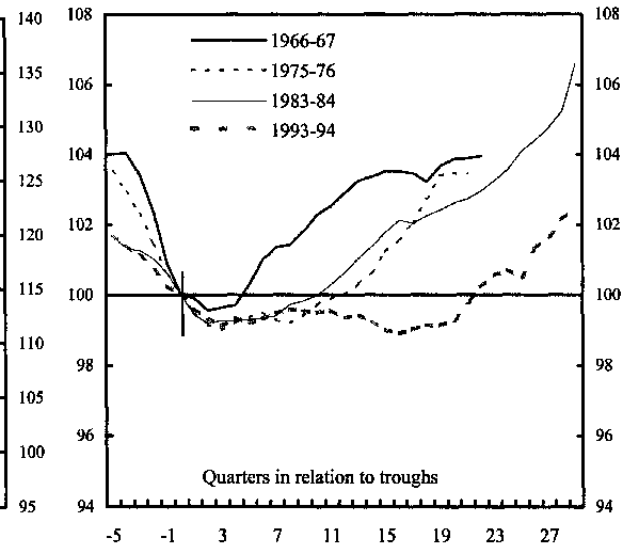
levels could use rising revenue to finance additional spending; and tax reforms were timed to coincide with a favorable budgetary situation. With the cyclical upswing gathering steam, increasingly supported by buoyant private consumption, monetary policy became more and more preoccupied by medium-term domestic cost pressures and turned restrictive at an early stage. At this point, adverse shocks, including a sharply appreciating real exchange rate or specific other shocks (oil prices, Germany unification), further aggravated cyclical strains on the economy, especially in the manufacturing sector, finally tipping the economy into the cyclical downswing stage.

Figure I-6. Germany: Cyclical Expansions of Real GDP (Index) 1/ 2/



Source: Deutsche Bundesbank; and staff estimates.

Figure I-7. Germany: Cyclical Expansions of Employment (Index) 1/ 2/



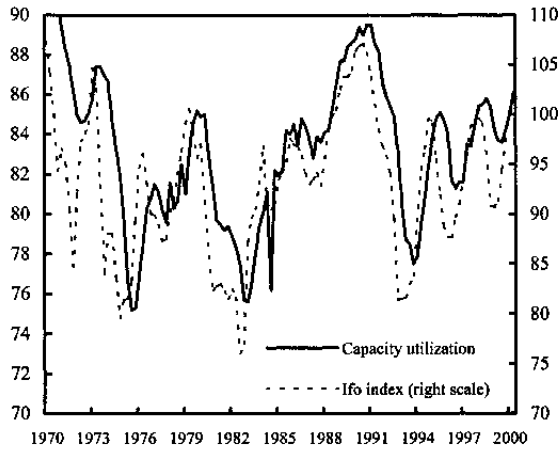
Source: Deutsche Bundesbank; and staff estimates.

1/ The troughs, calibrated at time zero, are as follows: 1967Q2 for the 1967-68 recovery; 1975Q2 for the 1975-76 recovery; 1982Q4 for the 1983-84 recovery; 1993Q1 for the 1993-94 recovery. The cyclical trough dates fulfill two criteria: (i) the annual GDP growth rate was negative; and (ii), within the year, the cyclical trough was located in the quarter with the sharpest quarterly decline in GDP.

2/ Data prior to 1991 refer to western Germany only.

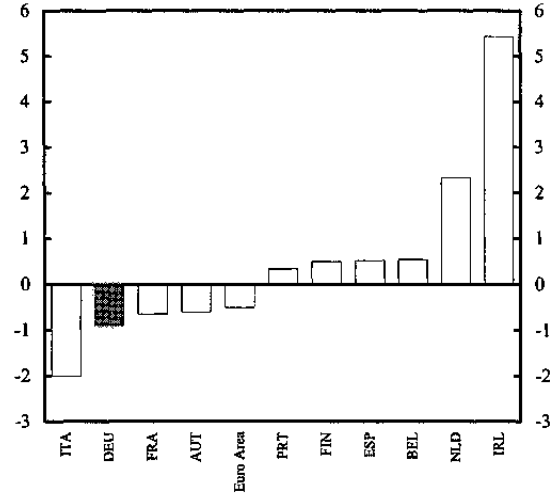
11. **Turning to Germany's present cyclical position, in mid-1999, the German economy regained the cyclical momentum lost during the Asian and Russian crises. By mid-2000, several key indicators of the cyclical state of the economy—including the rate of capacity utilization in manufacturing and the Ifo business climate index—were at or close to previous cyclical peak levels (Figure I-8). However, at the same time, activity in some sectors, particularly the construction and retail trade sectors, remained below normal levels. Staff estimates suggest that the economy's output gap in 2000—a rough, uncertain, and controversial measure of overall economic slack—was close to the euro area's average of some ½ percent of potential GDP (Figure I-9) and was likely to close in 2001.**

Figure I-8. Germany: Capacity Utilization in the Manufacturing Sector and Ifo Business Climate Index, 1970-99 1/



Source: WEFA database.  
1/ Data prior to 1991 refer to western Germany only.

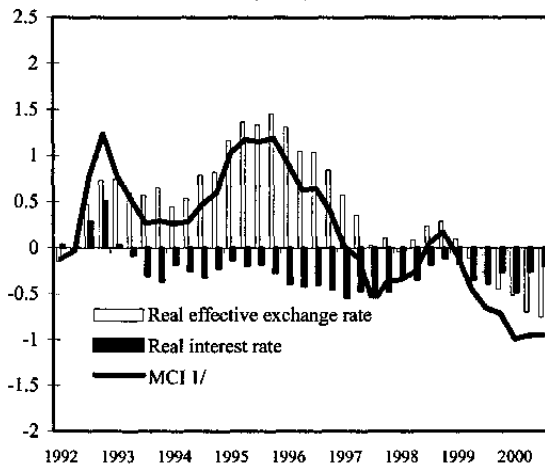
Figure I-9. Germany: Output Gaps in the Euro Area, 2000 1/



Source: IMF, World Economic Outlook.  
1/ Defined as the difference between actual and potential GDP, as a percent of potential GDP.

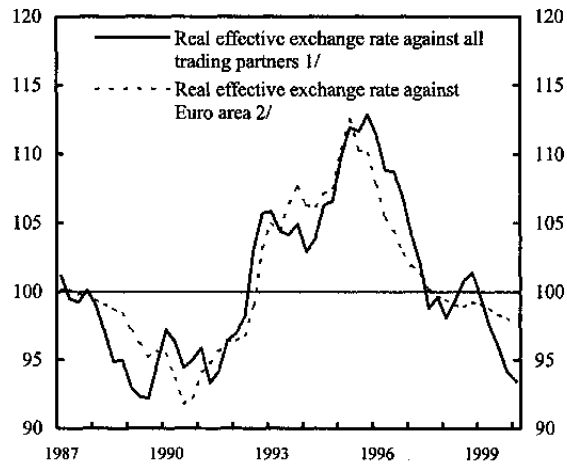
12. **In the short term, macroeconomic policies are likely to be expansionary or at least neutral.** Following an extended stretch of consolidation, fiscal policy is set to turn expansionary in 2001, owing to the income-boosting effects of the tax reform package adopted in July 2000. Monetary conditions—as measured by short-term real interest rates—are close to neutral, at least by Germany’s standard over the last 20 years (Figure I-10). Taking account of the weak euro—Germany’s real effective exchange rate against all trading partners is significantly below its longer-term average (Figure I-11)—a more broadly defined monetary conditions index (MCI) would suggest that monetary conditions are presently quite relaxed.

Figure I-10. Germany: Monetary Conditions Index (MCI), 1992-2000



Sources: Deutsche Bundesbank; and staff calculations.  
1/ Average 1981-2000=0. Calculated using as weights 2.5 for the short-term interest rate and 1 for the effective exchange rate. Upward movements denote tighter monetary conditions.

Figure I-11. Germany: Real Effective Exchange Rates, 1987-2000 (1987=100)



Sources: Deutsche Bundesbank; and staff calculations.  
1/ Based on unit labor costs in total economy.  
2/ Based on unit labor costs in the business sector.

13. **Recent wage settlements locked in wage moderation for 2000-01.** Wage settlements in early 2000 agreed on nominal wage cost increases of about 2¼ percent in both 2000 and 2001, equivalent to prospects of flat unit labor cost for the next two years. At the same time, income tax cuts are projected to boost take-home pay in 2001.

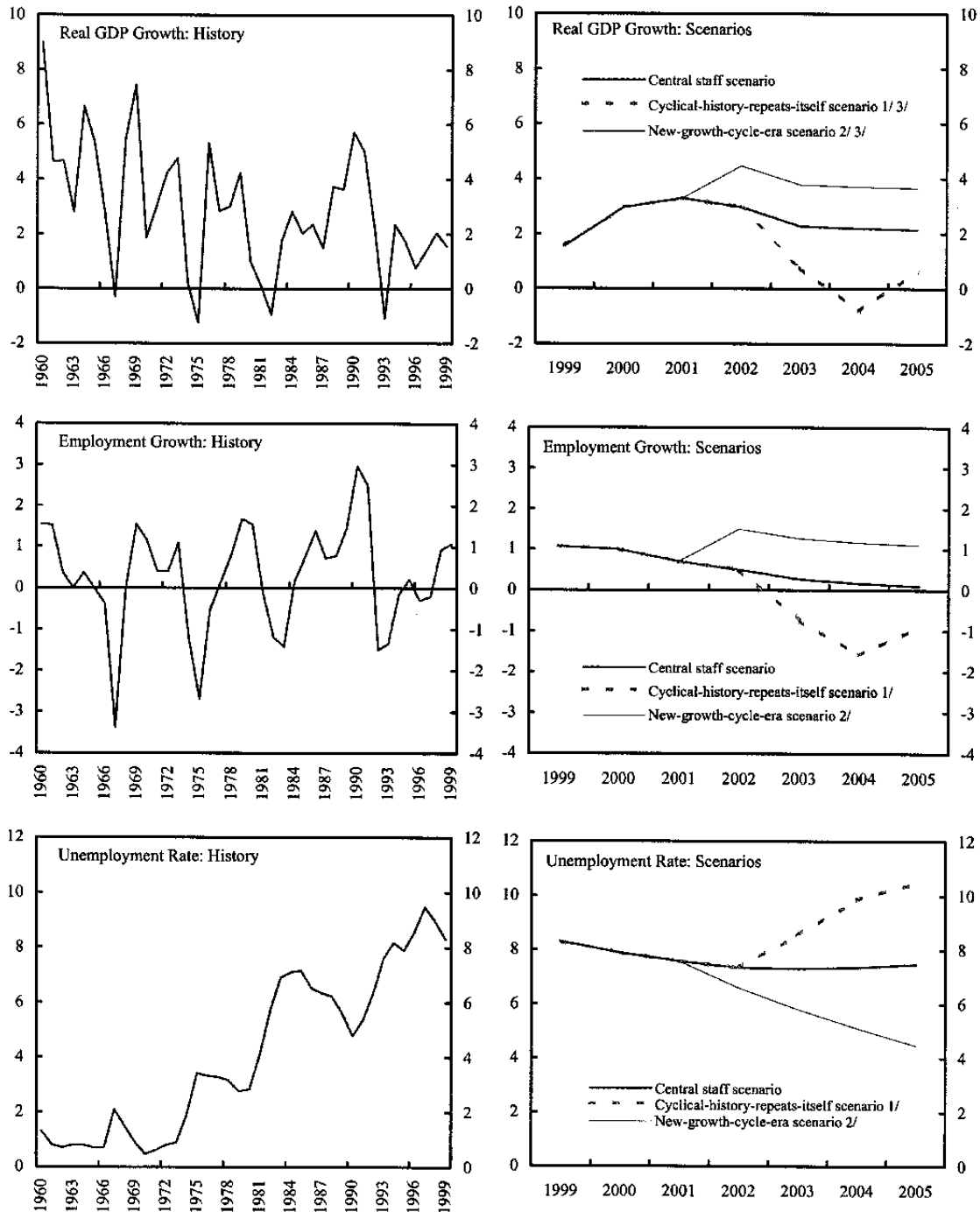
14. **In this setting, most forecasters expect the economy's cyclical expansion to continue into the short term (2000-01).** Nevertheless, significant downside risks to the short-term growth outlook include a possibly sharp appreciation of the euro, a persistently higher oil price, and a hard landing in the United States associated with a major stock market correction.

15. **Looking further ahead, medium-term prospects for growth and labor market performance are much more uncertain, with the range of uncertainty perhaps circumscribed by three illustrative scenarios for the time range 2000-05:**

- **Stable structural unemployment rate scenario** (“central staff scenario”). This scenario relies on the assumptions that the economy’s medium-term expansion path is anchored by a stable structural rate of unemployment, which is estimated by staff at 7½ percent relative to an actual rate of about 8 percent in mid-2000 (standardized national accounts definition), and by stable medium-term labor productivity growth of about 2 percent per annum. Moreover, with the actual unemployment rate converging to its stable structural rate over the medium term, in this scenario real output growth is assumed to be sufficient to close the output gap by 2005 (Figure I-12).
- **Increasing structural unemployment rate scenario** (“cyclical-history-repeats-itself scenario”). This pessimistic scenario reflects the assumption that over the next three years cyclical tensions build up to a point where a sharp cyclical downswing takes place in 2003 (Figure I-12). Broadly in line with Germany’s previous growth cycle experiences, the scenario assumes that the labor shakeout would boost the structural unemployment rate by a cumulative amount of some 3 percentage points during 2003-2005, increasing the structural rate of unemployment to about 10 percent by 2005. The marked rise in unemployment is reflected in slower real GDP and employment growth, where a 1 percentage point change in the unemployment rate is assumed to change real GDP growth by 2 percentage points in the opposite direction, roughly in line with Okun’s law estimates for Germany.
- **Declining structural unemployment rate scenario** (“new-growth-cycle-era scenario”). This optimistic scenario illustrates how the present cyclical upswing could reverse a significant portion of the accumulated unemployment legacy. The driving assumption underlying this scenario is a decline in the structural rate of unemployment totaling 3 percentage points over the period 2002-05—other continental European economies, especially Denmark and the Netherlands, saw declines of similar magnitudes from high structural rates of unemployment over four- to five-year periods during the 1980s and 1990s. As a result of the declines in the structural rate of unemployment, in this scenario real GDP growth could be kept well above previous “speed limits” for an extended period.



Figure I-12. Germany: Growth Cycle Scenarios, 2000-2005  
(In percent)



Sources: IMF, World Economic Outlook; and staff calculations.

1/ Assuming an increase in the unemployment rate by a total of 3 percentage points over the period 2003-2005, broadly in line with past cyclical recession experiences.

2/ Assuming a cumulative reduction in the structural rate of unemployment by 3 percentage points during 2002-2005.

3/ A 1 percentage point change in unemployment is assumed to change real GDP growth by 2 percentage points in the opposite direction, in line with Okun's Law estimates for Germany.

### C. Policy Strategies for Underpinning a New Growth Cycle Era

16. **The conceptual framework of this chapter assumes that macroeconomic performance depends on the interplay between the economic environment (shocks) and institutions (policies).** Within this framework, a given macroeconomic performance can in principle result from different combinations of shocks and policies. Thus, it is conceivable that a more auspicious economic environment (relative to the economic environment underlying the staff's central scenario) could combine with the unchanged policies and yield a favorable growth and labor market performance close to the new-growth-cycle-era scenario. But, conditional on a given economic environment, it is policies that matter.

17. **As regards the future economic environment, most of the adverse shocks that have shaped Germany's cyclical history since the early 1970s may have lost much of their momentum.** In particular, the number of lower-skilled workers has declined sharply since the mid-1970s (by more than 50 percent). The pace of de-industrialization in Germany is likely to slow. At the beginning of the 1970s, the share of manufacturing employment in Germany accounted for some 40 percent of employment (compared with some 30 percent in the EU); by the mid-1990s, the share of manufacturing employment in Germany had fallen to some 22 percent, close to the level in the EU (about 20 percent). Finally, most of the adverse economic effects of unification, a major and largely Germany-specific adverse shock, may have finally rippled through the system, although it left behind a difficult legacy including a hefty fiscal burden (largely reflected in higher social contribution rates) and a massive regional labor market problem in the new Länder.

18. **However, there are a number of possible new challenges (shocks) that could test the flexibility of Germany's labor market:**

- **The “new economy:”** Prima facie, the “new economy” is akin to a positive supply shock that could spur faster output growth at a stable inflation rate (see Chapter III for details). At the same time, the “new economy” phenomenon could also lead to a wider dispersion of labor productivity across skills and sectors, exacerbating the tensions associated with inadequate wage differentiation (see Chapter III for details).<sup>11</sup>
- **Regional specialization in the EU:** Integrated economic areas and monetary unions tend to produce regional clusters of specialized activities (Krugman (1992)). Regional specialization and the associated increase in the instability of regional growth rates could require a widening of wage differentials to allow locational clustering to be underpinned by labor mobility.

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<sup>11</sup> U.S. data suggest, however, that since 1995—the period most clearly associated with the “new economy” boom in the United States—wage inequality has ceased to worsen.

- **EU's eastern expansion:** This may require a higher degree of labor market flexibility to the extent that it may lead to changing patterns of migration and division of labor within the EU.
- **Population aging:** The lack of flexibility in labor market adjustments has in the past undermined the employment opportunities of older German worker cohorts—reflected in one of the lower labor force participation rates among industrial countries. The projected rapid aging of the population will considerably swell the size of older worker cohorts, cohorts with presently significantly higher unemployment rates than those for younger cohorts.

19. **Could recent policy changes or endogenous adjustments in labor market institutions have already transformed the functioning of Germany's labor market?**

There have been changes of a largely endogenous nature—in particular collective wage bargaining has become somewhat more flexible under pressure, notably in eastern Germany, as reflected in the declining share of workers and companies covered by collective bargaining agreements and the increased use of “opening and hardship clauses” (clauses that allow firm-level agreements that deviate from collective bargaining settlements). At the same time, the rules governing social insurance and the social safety net have remained broadly unchanged over the last few decades.

20. **Two stylized strategies have emerged as the main competing policy paradigms for reviving Germany's growth cycle performance:** a corporatist strategy, mainly modeled on the Dutch experience of the 1980s and 1990s; and an institutionalist strategy, which would aim at more fundamental changes of labor market institutions. The corporatist strategy would seek to exploit a virtuous circle in the labor market, essentially reversing the vicious circle that has plagued Germany's labor market during the last three decades. This virtuous circle would run from stronger employment growth (stimulated by wage moderation) to lower social spending (due to faster employment growth) to lowering the tax and contribution burden to more employment growth. Thus, fiscal policy would seek to soften the impact of wage moderation by cutting the burden of income taxes and social contributions. Income tax cuts, in particular, would most likely benefit higher-skilled/higher-income workers overproportionally, reducing the potential pressure from this side to abandon across-the-board wage moderation. Within continental Europe, a version of the corporatist policy agenda has been widely associated with the economic success of the Netherlands since the 1982 *Wassenaar Agreement*.<sup>12</sup> Indeed, the broad features of the Dutch approach have been echoed in the setup of Germany's *Alliance for Jobs*, which in turn has been widely credited for engineering the moderate wage settlements at the beginning of 2000.

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<sup>12</sup> This agreement between labor unions and employers formalized an understanding to aim at wage moderation to stimulate employment. For more details on the overall Dutch experience, see Watson and others (1999).

21. **By contrast, an institutionalist reform strategy would focus on fundamental changes in the rules governing collective bargaining, social insurance, and the social safety net.** The aim of these changes would be to unblock the adjustment channels in the labor market and to buy insurance against future adverse shocks. As its main planks, the institutionalist agenda would address:

- **Collective bargaining:** by modifying the rules that insulate the present collective bargaining system against outsider competition. In this context, the *Council of Economic Advisors* in its 1999/2000 Report urged the authorities to modify three key legal rules that underpin collective bargaining: (i) the rule in the *Works Constitution Act* stipulating that in case of a collective agreement, wages and nonwage bargaining cannot be subject to firm-level bargaining unless the collective agreement expressly allows for this; (ii) the rule in the *Wage Contract Law* stipulating that firms bound by collective bargaining agreements can only conclude agreements that deviate from collective bargaining agreements in favor of workers (“favorability principle”); and (iii) the rule in the *Wage Contract Law* that allows the parties to a collective bargaining agreement to extend it to employers that were not covered by the collective agreements (“declaration of general validity”).
- **Social insurance system:** by moving to a multipillar social insurance system. A downsized public social insurance pillar would mitigate the *vicious circle* mechanism described before and allow lower mandatory social contributions, particularly at the lower end of the wage distribution. The government’s recent proposal for pension reform are (conceptually) in line with this objective (see Chapter V for details).
- **Social safety net:** by putting limits on the duration of unemployment benefits and tightening of rules on the acceptability of jobs to bring reservation wages more closely in line with available market opportunities. At the same time, complementary reforms would likely be needed to boost take-home pay at the lower end of the market to respect Germany’s embedded equity objectives.

22. **As a possible benchmark for an institutional reform agenda, the example of Switzerland’s labor market institutions is of specific interest.** Apart from an obvious difference in size, the Swiss and German economies share a number of important characteristics: an export-oriented, high-wage manufacturing sector; high saving rates; similar education and training systems; similar exposure to demand and technology shocks; and highly decentralized political systems that require broad social consensus on far-reaching reforms. Moreover, Switzerland’s policies and institutions are held to standards of social equity that are broadly similar to Germany’s own. At the same time, Switzerland’s relatively favorable labor market record is underpinned by labor market institutions that allow flexible responses to adverse shocks: (i) a largely decentralized wage bargaining system that relies more on firm-level bargaining; (ii) a multipillar social insurance system with significantly lower social contribution rates; (iii) time limits on the duration of unemployment benefits, coupled with requirements to participate in active labor market programs; and (iv) lower employment protection and less generous nonwage benefits.

23. **In terms of timing and political feasibility, a corporatist policy strategy would have some advantages, but its longer-term sustainability is questionable.** A corporatist strategy is consistent with Germany's existing labor market institutions and can therefore be implemented more quickly than institutional reforms that call for changes of embedded formal and informal rules of a society. Moreover, once implemented, a corporatist agenda might yield quicker results in terms of employment growth. However, at the same time, a corporatist strategy is largely based on time-limited agreements among the social partners that can be revoked—raising a time inconsistency issue. But more importantly, the longer-term sustainability of a corporatist agenda is open to question, especially as regards the sustainability of wage moderation. Moreover, this policy strategy would not address the need to improve the economy's resistance to future shocks that could test the labor market.<sup>13</sup>

24. **Implementing an institutional reform strategy holds considerable longer-term promises but may also have some short-term cost.** Institutional reforms would add built-in error correction mechanisms that could help reducing the existing stock of unemployment as well as provide insurance against future shocks. At the same time, a rapidly growing literature on institutional change in labor markets suggests that changing inefficient institutions is costly in the short term, in part because of the loss of knowledge and political power that relates to organizations and individuals operating in the context of the existing institutions.<sup>14</sup> Institutional reforms tend to be time-consuming as they involve difficult political trade-offs.

25. **These considerations suggest that a two-track approach in terms of sequencing labor market reforms could be promising.** Elements of a corporatist policy strategy, especially wage moderation, could help the economy to prolong the present cyclical upswing and—with some luck regarding adverse future shocks—could deliver the first installment of a “new-growth-cycle-era” scenario. In the medium to longer term, however, elements of the institutional reform strategy would need to be put in place to lock in gains and increase the labor market's shockresistance. A key difficulty with this two-track approach, though, would be to ensure the incentives that the institutionalist reform steps are indeed undertaken. This would be an issue if the initial benefits of a corporatist agenda created the misleading impression that meaningful but difficult institutional reforms were not essential for durable improvements in the functioning of Germany's labor market.

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<sup>13</sup> In this context, however, a recent report by the *Advisory Council to the Ministry of Economics and Technology* (2000) argued that corporatist policy strategies entail significant costs in terms of conserving statusquo structures.

<sup>14</sup> See, for example, Flanagan, Hartog, and Theeuwes (1993).

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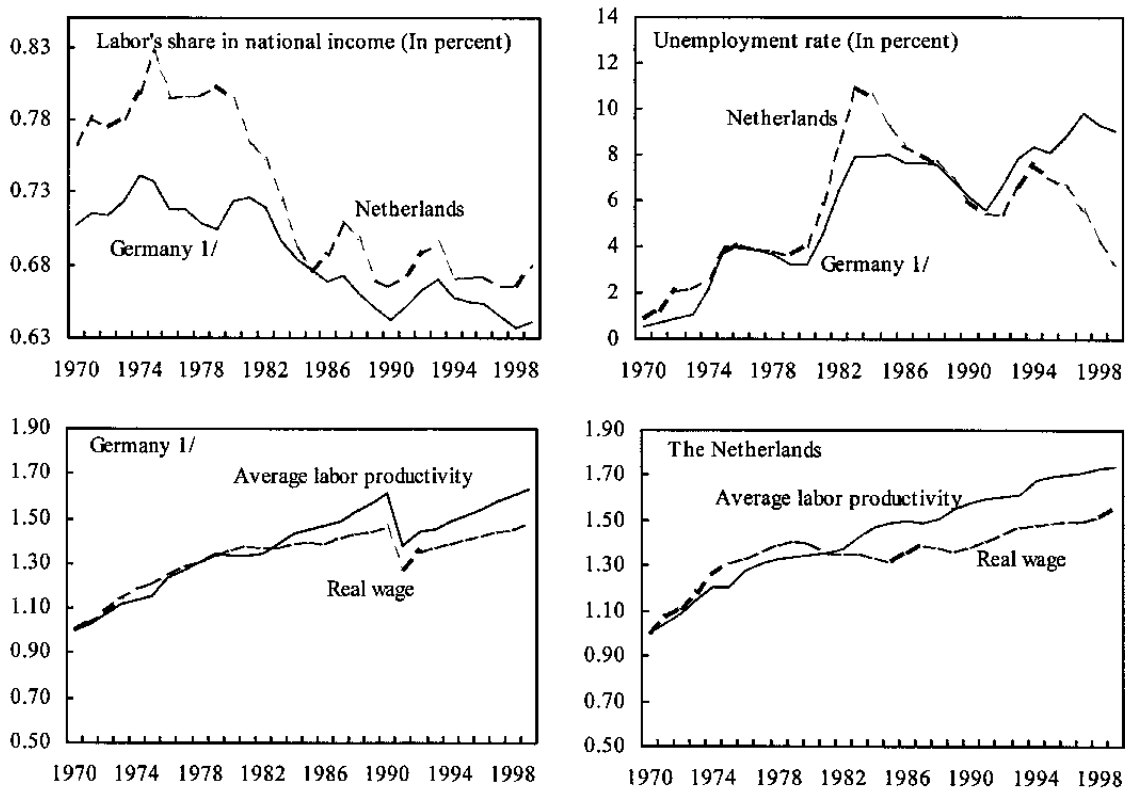
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## II. DECLINING LABOR SHARES, WAGE MODERATION, AND EMPLOYMENT PERFORMANCE IN GERMANY AND THE NETHERLANDS<sup>15</sup>

### A. Introduction and Overview

26. Since the early 1980s the share of labor in national income has trended significantly downward in both Germany and the Netherlands, owing to prolonged periods of moderate wage increases. In Germany, the downward trend in the labor share was accompanied by an upward ratcheting of the unemployment rate, while in the Netherlands the unemployment rate declined (Figure II-1).

Figure II-1. Labor's Share, Unemployment Rate, Real Wages and Average Labor Productivity in Germany and the Netherlands, 1970-99 1/



Sources: OECD analytical database; and staff calculations.

1/ Prior to 1991, west Germany only. The discontinuity in both the real wage and the average labor productivity is due to unification.

<sup>15</sup> Prepared by Caroline Kollau.

27. This chapter analyzes what has been driving the decline in labor share in both countries and offers an explanation for the rather different unemployment performance. Labor's share is defined as the ratio of aggregate labor income to national income, which can also be expressed as the ratio of the average real wage per worker to average labor productivity. Because a reduction in the labor share implies that real wages grow by less than average labor productivity, it is often concluded that a decline in the labor share must go hand-in-hand with falling unemployment. However, models described in Section B and the Appendix show that a decline in the labor share is often the result of adverse labor market shocks that, when they interact with labor market institutions, may well be associated with rising unemployment. Section C thus takes a detailed look at the type of labor market shocks that have affected Germany and the Netherlands and examines how policies and labor market institutions have dealt with them. In doing so, it sheds light on why across-the-board wage moderation has apparently been less successful in lowering unemployment in Germany than in the Netherlands. Conclusions are presented in Section D.

### **B. Unemployment and Labor Share**

28. Theoretical models point to the importance of distinguishing between shocks to labor supply and demand in explaining the relationship between labor share and unemployment. The adjustment of wages and employment to such shocks depends on the institutional structure of the labor market and may take many years to complete.

29. The basic insight of such models is relatively straightforward.<sup>16</sup> Wage moderation might be expected to follow an adverse shock to supply or demand, and thereby reduce labor share. But, at least in the adjustment period, substitution of capital for labor may raise unemployment. In the case of an adverse shock to labor demand—for example, because of a labor-saving change in production technology—the initial impact will be a decline in the labor share as both the real product wage and employment fall. Over time, firms respond to lower wages and higher profits by increasing capital and rehiring workers. Eventually, the economy will return to the employment level and the real product wage that prevailed before the shock but with more capital and a higher level of economic activity. The fact that activity is higher implies a lower labor share.

30. By contrast, a labor supply shock—for example, a failure of wages to adjust to a slowdown in the rate of growth total factor productivity, or an increase in unemployment benefits—will lead initially to an increase in labor share. In response to the resulting lower profits, firms will scale down labor, capital, and output leading to a gradual reversal of the increase in labor share. The new long-run equilibrium will be characterized by a return to the original capital-labor ratio and labor share, but at a lower level of employment (and hence higher level of unemployment). In both the cases of adverse supply or demand shocks,

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<sup>16</sup> The models are based on Blanchard (1997, 1998) and are set out in detail in the Appendix.



adjustment to the new equilibrium will be slow if the elasticity of substitution between labor and capital is low or there is considerable rigidity in wage setting.

31. The basic model can be extended to incorporate a pertinent feature of the German labor market—namely that labor is not a homogeneous factor of production. In the simple case where the labor market is split into high- and low-skilled sectors, shocks need not hit each sector symmetrically. As a result, there are additional channels of adjustment through the relative wages between skilled and unskilled workers (the skill premium). Attempts to resist a change in the skill premium because, for example, wage increases are coordinated between sectors or because minimum wage levels cannot be lowered, will perpetuate the impact of shocks and, at best, make higher unemployment more persistent.

### **C. Labor Market Performance in Germany and the Netherlands**

32. Using business sector data, this section attempts to identify the labor market shocks in Germany and the Netherlands over the last three decades, and to shed light on why the countries' employment performance has differed despite similarities in wage setting institutions. The sustainability of across-the-board wage moderation as a strategy for lowering unemployment is also analyzed.

#### **Labor market shocks**

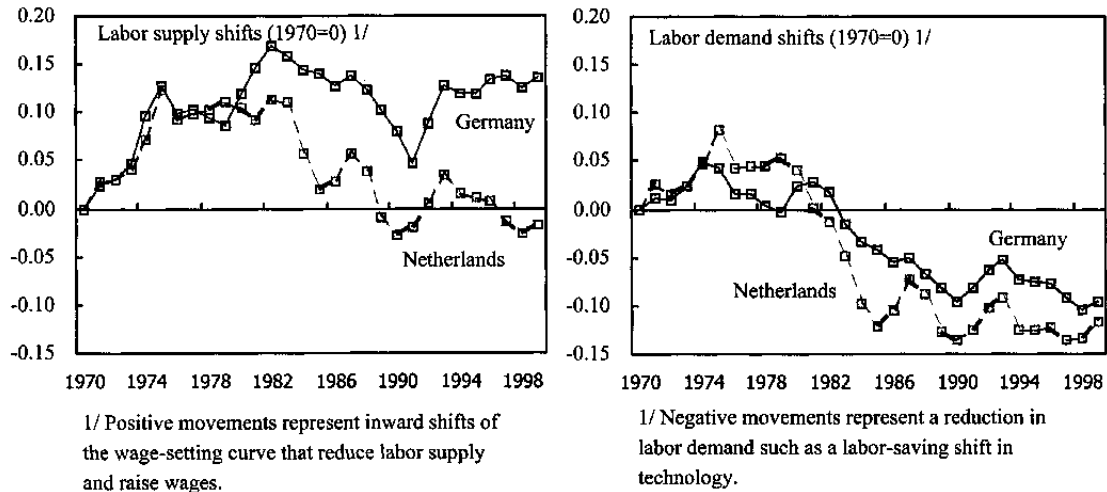
33. Using the model detailed in the Appendix, shifts in labor supply and demand can be derived. The results suggest that, with respect to labor supply, Germany has been slower than the Netherlands in reversing early adverse shocks to wage setting, particularly at the beginning of the 1990s when its strategy of moderate wage growth was derailed by unification. With respect to labor demand, both countries suffered sizable adverse shocks, although the initial shock was larger in the Netherlands.

34. For the 1970s, labor market developments in Germany and the Netherlands are well captured by adverse labor supply shocks, triggered by a failure of wages to adjust to a slowdown in productivity growth, and to the impact of the oil price hikes (Figure II-2, panel 1).<sup>17</sup> The first panel of Figure II-2 shows that the real product wage in both countries moved away from a level that would allow the economies to return to their 1970 unemployment rates without exerting inflationary pressure. By 1980 the real product wage in both Germany and the Netherlands was too high by about the same amount (assuming, that is, that the real product wage in both countries is equally sensitive to changes in unemployment). The increase in the real product wage also pushed up the labor shares but, as the models would have predicted, a prolonged decline in both variables subsequently set in.

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<sup>17</sup> In the Netherlands, the positive impact of the rise in energy prices on the revenues from natural gas accrued to the government. Similar to other oil-importing countries, the private sector suffered a severe decline in profits.

Figure II-2. Labor Market Shocks in Germany and the Netherlands, 1970-99



Sources: OECD analytical database; and staff calculations.

35. In the 1980s the lagged labor demand adjustments to the labor supply shocks of the 1970s coincided with new shocks to labor demand (Figure II-2, panel 2). The demand shocks were similar in profile in both countries, although the initial drop in labor demand was somewhat larger in the Netherlands. This was probably triggered by a slightly deeper recession than in Germany.<sup>18</sup> As a result of the labor demand shocks, there was a sharp decline in the labor share in the first half of the 1980s and a large increase in the unemployment rate in both countries.<sup>19</sup> Although it is difficult to determine exactly what caused the shifts away from labor, the framework discussed in Section B suggests the following explanations:

- adverse labor demand shifts in response to the earlier shifts in the labor supply curve;
- a sharp rise in the real interest rate in the beginning of the 1980s that lowered the long-run labor demand curve, leading to a lower real product wage and higher unemployment; and

<sup>18</sup> See Watson et al. (1999) for details on the Dutch crisis of 1981-82. From the mid-1970s, per capita GDP growth in the Netherlands stayed well below that of its neighboring countries and underperformance was particularly pronounced from 1979 onward.

<sup>19</sup> The unemployment rate in the German business sector doubled from below 4 percent in the 1970s to 8 percent in 1983. The rate in the Netherlands rose from 4 percent to 11 percent.

- technological bias away from unskilled labor, which—under the assumption that unskilled labor and capital are better substitutes than skilled and unskilled labor—would lead to a genuine shift away from labor.<sup>20</sup>

36. The steady reversal of the labor supply shock since the mid-1980s (i.e., the downward movements in Figure II-2, panel 1) can be viewed as the supply-side reaction to the adverse labor demand shocks of the early 1980s, as both countries tried to halt the surge in unemployment through wage moderation. In the Netherlands, the Wassenaar Agreement of 1982 marked the introduction of a widely-supported strategy of wage moderation that was implemented to turn around the dismal performance of the Dutch economy and to stop excessive wage growth. The government played a prominent role in this process by strongly encouraging wage moderation and by threatening to interfere if wage growth were to get out of hand. In Germany, wage moderation followed a more haphazard pattern but invariably occurred after large labor shakeouts. Contrary to the Netherlands, the German government had no role in the bargaining process.<sup>21</sup> In both countries the wage bargaining mechanism was wed to the principle of wage solidarity so that wage moderation applied across the board.

37. In the early 1990s, the shock that featured most prominently was the adverse shock to wage-setting that arose in Germany when, after unification, wages in east Germany embarked on a process of catch-up to western levels. The catch-up was not justified by productivity levels, which were much lower in the east due to an outdated and non-market oriented capital stock. Moreover, to the extent that the supply of unskilled labor increased most, wage rigidities exacerbated the shock's negative impact on total employment.

#### **Moderation across the board; why has the Dutch approach been sustainable?**

38. With the exception of German unification, the reasons behind the decline in the labor shares in Germany and the Netherlands appear to be very similar. The same is true for the approach that both countries have taken to wage moderation. Why then did unemployment steadily decline in the Netherlands but not in Germany?

39. Wage moderation in the Netherlands was perhaps successful in lowering unemployment because it was more aggressive, particularly at the outset. Not only did wage

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<sup>20</sup> This would also arise if the substitution of skilled for unskilled labor were limited by the amount of skilled labor, or if the share of unskilled labor were larger than the share of skilled labor. Apart from technological change, the bias against unskilled labor could also come from increased international trade and specialization toward non-labor-intensive products.

<sup>21</sup> More recently, however, the government became more involved with the initiation (in 1998) of the *Alliance for Jobs*. The *Alliance* is a social partner forum (of employers, trade unions and government) established to coordinate a comprehensive approach to improving labor market conditions.

growth slow relative to average labor productivity growth, but real wage increases were often below what was warranted by the rise in labor-augmenting technology leading to a sharp decline in the real product wage (Figure II-3). German wage moderation was less aggressive, so that the negative differences between actual and warranted wage growth were usually smaller than in the Netherlands (Figure II-4). While the German process of moderate wage growth was derailed by unification, the Dutch strategy was helped by a reduction in the income tax wedge (which softened the impact on net wages of the limited increases in gross wages, Figure II-5),<sup>22</sup> and by an increase in the participation rate, exercising downward pressure on wages.

Figure II-3. The Real Product Wage in and the Netherlands,

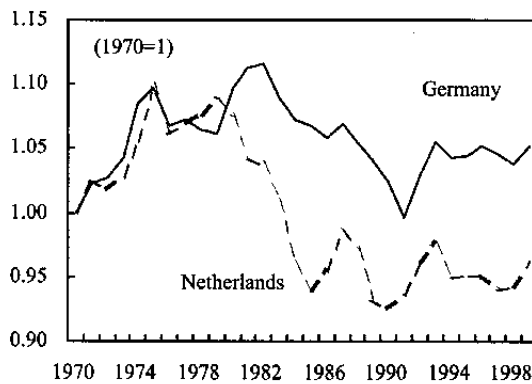
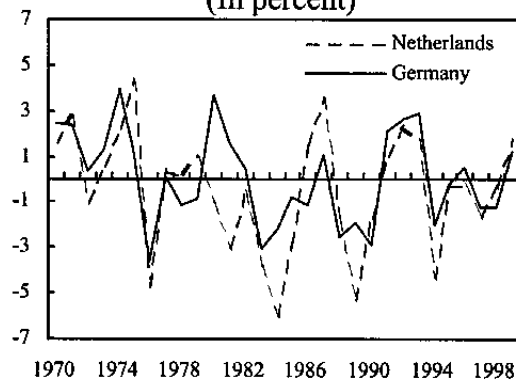


Figure II-4. Growth in the Actual Growth in the Warranted Germany and the Netherlands, (In percent)



Sources: OECD analytical database; and staff calculations.

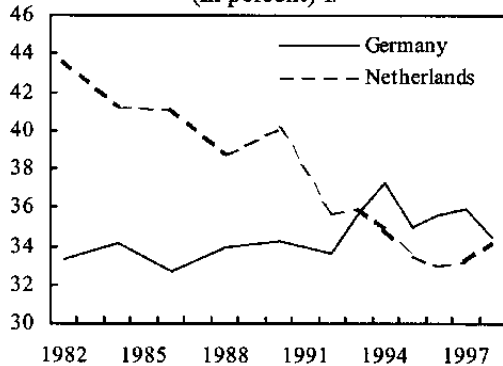
1/ The growth rate of the warranted real wage is determined by the growth rate of the labor-augmenting technology parameter,  $\alpha$ .

<sup>22</sup> Relevant for the impact on wages is the *decline* in the tax burden rather than the fact that income taxes were initially higher than in Germany.

40. The large degree of wage moderation in the Netherlands, plus the fact that it was achieved mostly through across-the-board limits on wage growth, suggests that the Netherlands did not suffer much from the disequilibrium that is typically created by across-the-board wage moderation in the face of non-neutral shocks. How can this be explained?

41. First, the Netherlands did experience *some* increase in the wage differential between high- and low-paid workers, while in Germany the differential narrowed (Figure II-6). The increase was due primarily to a nominal freeze of the Dutch minimum wage during most of the 1980s and 1990s, an increase in the differentiation of the minimum wage according to age, and the establishment of wage scales below the sectoral (bargained) minimum pay.

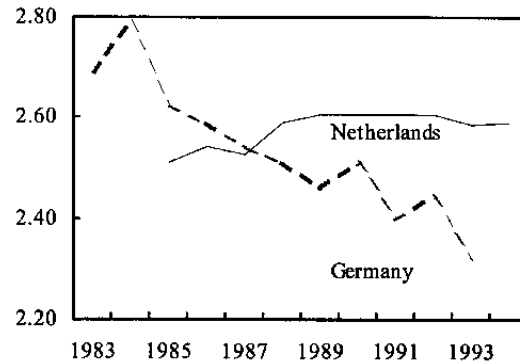
Figure II-5. Average Labor Tax Wedge in Germany and the Netherlands, 1982-97  
(In percent) 1/



Source: OECD.

1/ Average tax wedge for a married couple, single earner (average income) with two children taking account of social insurance contributions, personal income taxes, and family allowances; as a percentage of gross labor costs.

Figure II-6. Developments in Earnings Inequality in Germany and the Netherlands, 1982-94 1/



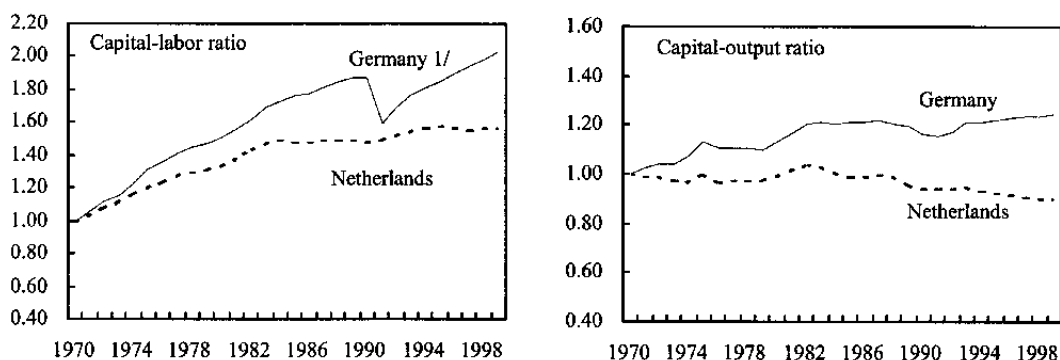
Source: OECD Employment Outlook, 1996.

1/ Defined as the ninth over the first decile in gross earnings.

42. Putting aside the slight increase in the differentiation in gross earnings, there are a few reasons why wage differentiation may have been less urgent in the Netherlands:

- The policy measures of the early 1980s induced a rebound of the Dutch economy and a recovery of firms' profits. By the end of the 1980s, per capita GDP growth in the Netherlands had surpassed that in many other European countries and during most of the 1990s also exceeded that in Germany. Higher growth reduced the bias against the unskilled that is typical of large cyclical downturns.

Figure II-7. Capital-Labor and Capital-Output Ratios in Germany and the Netherlands, 1970-99



Sources: OECD analytical database; and staff calculations.

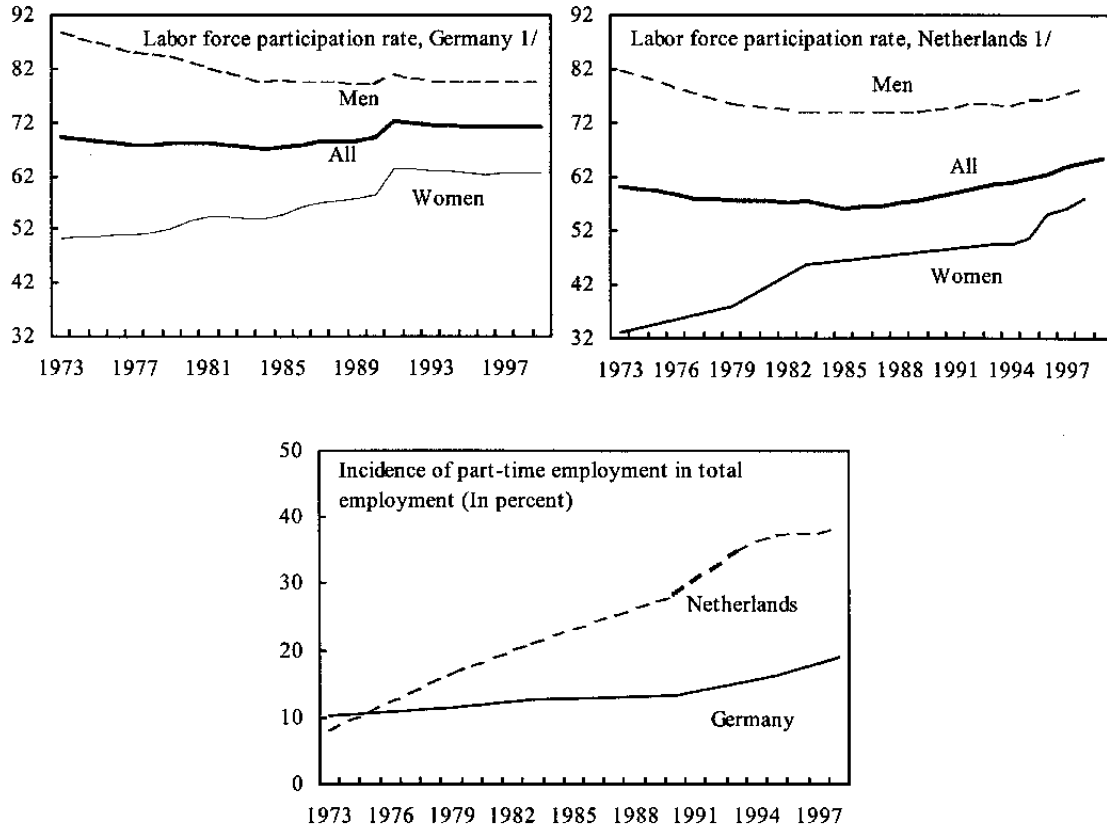
1/ The discontinuity is the direct result of unification.

- The lower capital-intensity in the Netherlands relative to Germany also reduced its demand bias away from unskilled labor. Economic growth after the mid-1980s was very labor intensive. This shift to a more labor-intensive growth pattern was largely endogenous to the policy of wage moderation, which (as employers became convinced that wage moderation was a long-term strategy) made labor more attractive. It was also aided, however, by a large and expanding service sector which, in the early 1980s, already occupied two-thirds of all workers.<sup>23</sup> Indeed, both the capital-output and the capital-labor ratio show that capital-for-labor substitution was less pronounced in the Netherlands (Figure II-7).
- From the early 1980s onward, a sharp increase in the labor force participation rate took place in the Netherlands (Figure II-8). As in many other countries, the composition of the labor force also moved to a greater share of skilled labor, thus putting downward pressure on the wages of the skilled. The fact that much of the increase came through part-time workers and women who had been out of work for a while perhaps also implied that these entrants had a lower reservation wage than existing labor market participants. This development contrasts sharply with the labor

<sup>23</sup> In Germany, the service sector also expanded. But, while in the Netherlands this development led to an increase in total employment, the German service sector had to absorb excess employment from the manufacturing sector—a sector that had proven extremely sensitive to the shock of unification.

supply shock in Germany: unification raised the relative supply of low-skilled labor<sup>24</sup> and was accompanied by a policy of wage catch-up for the east.

Figure II-8. Labor Force Composition in Germany and the Netherlands, 1973-97

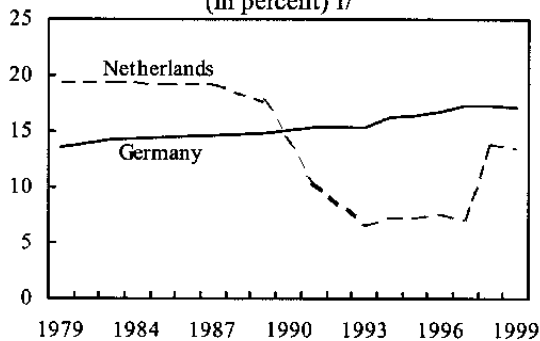


Sources: OECD Employment Outlook 1996 and 1999; Sociale Nota 1999; and staff calculations.  
1/ Defined as a share of total working age population.

<sup>24</sup> Although the average level of schooling in eastern Germany was at least as high as in western Germany, most east German workers had to be retrained after unification as they were ill-adapted to a western-style economy.

- The Netherlands achieved an increase in the cost differential of skilled and unskilled labor through a differentiation in non-wage labor costs that largely left intact the relative gross wage. Starting in 1983, taxes and social contributions of employees were cut substantially.<sup>25</sup> In the beginning of the 1990s several measures were taken to cut the employers' costs of hiring unskilled workers, mainly through cuts in the employers' social contributions (Figure II-9). The Dutch social insurance system

Figure II-9. Employers' Social Contributions in Germany and the Netherlands, 1979-99 (In percent) 1/



Source: OECD, *The Tax/Benefit Position of Employees*, several issues.

1/ Employers' social insurance contributions for a married couple, single earner (average income) with two children; as a percentage of gross labor costs.

differs from the German system in that it does not strictly adhere to the contribution-benefit parity and thus enjoys a larger degree of freedom in restructuring contributions. An example of these measures is the social contribution concession (the *SPAK*) for employers hiring workers at an hourly wage of up to 115 percent of the minimum wage. The scheme operates together with large subsidies for hiring long-term unemployed; if workers meet both criteria, the employers' contributions fall to zero.<sup>26</sup>

- Finally, the Netherlands addressed the high reservation wages at the low end of the market by a cut in the unemployment and disability replacement rate from 80 percent to 70 percent of the last earned wage.

43. **To sum up:** The effectiveness and sustainability of across-the-board wage moderation in the Netherlands depended greatly on timing and the right combination of additional policy measures. Wage moderation was effective because it was introduced as the economy was in a severe recession, which led to broad agreement on the necessity of wage moderation and allowed for an aggressive approach. The across-the-board aspect of the approach was feasible because additional measures (including tax cuts, and reforms at the

<sup>25</sup> To the extent that income tax cuts gravitated toward the skilled (e.g., because of cuts in the top rates), this relaxed the gross wage demands from the skilled, which—with fixed differentials—could trigger lower wage demands from the unskilled.

<sup>26</sup> See Watson et al. (1999) and CPB report 98/2 for further details on the cuts in employers' social contributions.



low end of the market) either put downward pressure on wages at the high end of the labor market, or ensured differentiation through non-wage labor costs. The result of the Dutch strategy has been a large decline in total unemployment over the last two decades, a development that has also put the unskilled in a somewhat better position. Whether the Dutch strategy has promise for the future is less clear; the current unemployment rate is low and shortages of skilled labor have arisen. This could put upward pressure on the wages of the skilled and, if wage solidarity is maintained, on those of the unskilled.

#### **D. Conclusions**

44. The evolution of the labor share and a country's employment performance depend on the type of shocks that affect the labor market, as well as on the institutional structure of this market. Some form of wage moderation is essential to prevent rising unemployment in the face of an adverse shock. In a market with heterogeneous labor, moreover, moderation would need to be aggressive, given that it must aim to bring wage increases more in line with labor productivity growth, *particularly* at the low end of the labor market. Data suggest that in the Netherlands wage growth has, in the past, substantially undercut warranted wage growth, while in Germany wage moderation has been more modest and, in recent years, hampered by the lingering wage effects of unification.

45. If labor markets are heterogeneous, across-the-board wage moderation can, in effect, establish equilibrium in only one market. In the long run, therefore, the across-the-board aspect of wage moderation will become problematic as labor shortages at the high end of the market will put upward pressure on wages. Ideally, the skill premium should be allowed to change with relative changes in the demand for different types of labor. In the Netherlands, the problem of little differentiation in gross wages has in the past been alleviated by a differentiation in overall labor costs (through employer subsidies), while a somewhat smaller bias away from unskilled labor, a growing workforce, and a changing skill-composition of this workforce may have rendered wage differentiation less urgent than in Germany.

### A Formal Model of a Labor Market with Homogeneous Labor

46. This Appendix summarizes the formal model underlying the homogeneous labor market framework of Section B and the method used for deriving the labor market shocks in Germany and the Netherlands that are analyzed in Section C.

#### A simple model of the labor market

The model comprises the following equations:

47. The **wage-setting equation** relates the effective or real product wage ( $w/a$ ) to the unemployment rate and a shift-parameter,  $z$ , that captures other relevant labor market conditions:

$$w/a = f(u, z). \quad (1)$$

Ceteris paribus, real wages will grow at the rate of  $a$  (the level of labor-augmenting technology), so that  $w/a$  remains constant.

48. The **short-run labor demand** relation is determined by the first derivative of the production function with respect to labor. Using a CES production function,

$$Y = A(b(aL)^\rho + (1-b)K^\rho)^{1/\rho} \quad (2)$$

—in which  $A$  is a multiplicative constant,  $K$  is capital,  $aL$  is labor in effective terms,  $b$  is the share parameter on labor, and  $\rho$  is a function of the elasticity of substitution between capital and labor ( $\rho = (\sigma - 1)/\sigma$ )—the first-order condition (including the mark-up,  $\mu$ , over the wage) is:

$$w/a = (Ab/(1 + \mu)) (b + (1-b)(K/aL)^\rho)^{(1-\rho)/\rho}. \quad (3)$$

49. The **long-run labor demand** relation is determined by the zero-net-profit condition that a firm's revenues from output just cover the cost of production:

$$Y = w/a aL + K (r + \delta), \quad (4)$$

with the real interest rate ( $r$ ) and the rate of depreciation ( $\delta$ ) reflecting the user cost of capital. After substituting (2) and (3) into (4), the condition can be rearranged to yield:

$$(r + \delta) = [(1-b) + (b - b/(1 + \mu)) (aL/K)^\rho] [b(aL/K)^\rho + (1-b)]^{(1-\rho)/\rho}. \quad (5)$$

For a given user cost of capital, this condition pins down the capital-labor ratio and, by implication, the real product wage.

50. The labor share ( $S_L$ ) that is compatible with this framework is defined as:

$$S_L = (w/a aL)/Y. \quad (6)$$

In equilibrium, labor is paid its marginal product and employment equals equilibrium employment, so that the labor share becomes:

$$S_L = [(Ab/(1 + \mu))(b + (1-b)(K/a \bar{L})^\rho)^{(1-\rho)/\rho}] a \bar{L} / \bar{Y}, \quad (7)$$

which, after substituting (2) for  $\bar{Y}$ , yields:

$$S_L = (b/(1+\mu))(b + (1-b)(K/a \bar{L})^\rho)^{-1}. \quad (8)$$

51. The equilibrium labor share is a positive function of the share parameter,  $b$ ; a negative function of the mark-up,  $\mu$ ; and a positive *or* negative function of the capital-labor ratio, depending on the sign of  $\rho$ . In the short run (when the elasticity of substitution is probably low)  $\rho$  will be negative. In the medium and long run,  $\rho$  is probably positive.

52. In the steady state, the economy satisfies the labor supply relation, as well as both labor demand relations. Capital, labor, and output grow at the same pace, as do real wages and technology (thus maintaining a constant real product wage). The labor share that is compatible with the steady state is one in which labor earns its marginal product (adjusted for the mark-up) and employment equals equilibrium employment. Given that in the steady state the ratio of capital to effective labor is constant, the labor share will be constant as well.

53. Out of steady state, the labor share can change:

- The immediate effect of an adverse *labor supply* shock will be an increase in the labor share but, as quantities adjust, the labor share will move back to its original level (Figure A-1, panels 1 and 2). Suppose that the wage-setting curve shifts inward because wages fail to adjust to a slowdown in technological progress ( $a$ ).<sup>27</sup> The adverse shock will initially raise both the real product wage and the labor share, but in response to high wages and low profits, firms will scale down labor, capital, and economic activity. This causes a leftward shift of the short-run labor demand curve and a gradual reversal of the initial increase in the wage and the labor share. The new long-run equilibrium will again be on the long-run labor demand curve and, as the parameters of this curve were not affected, both the capital-labor ratio and the labor share are unchanged from their original values.<sup>28</sup> In the long run, an unfavorable shift to the wage-setting curve thus comes entirely at the cost of higher unemployment.
- The immediate effect of an adverse shock to *short-run labor demand* will be a decline in the labor share that persists even after the economy has reached a new steady state (Figure A-1, panels 3 and 4). Suppose that the short-run labor demand curve shifts because of an increase in the mark-up.<sup>29</sup> The shock will initially reduce both the real

<sup>27</sup> Similar shifts would result from an increase in the level or duration of unemployment benefits; an increase in the tax wedge between gross and net pay (assuming that some of the tax burden is shifted to the employer); a higher incidence of long-term unemployment; or a failure of wages to adjust to an increase in labor supply.

<sup>28</sup> Adjustment to the new equilibrium may take years and is affected by the elasticity of substitution between labor and capital—a low elasticity will slow the adjustment process.

<sup>29</sup> Similar shifts would come from a decline in the share parameter on labor (i.e., a change in production technology biased against labor).

product wage and employment. Over time, firms respond to lower wages and higher profits by increasing capital and rehiring workers. Eventually, the economy will return to the employment level and the real product wage that prevailed before the shock but with more capital and a higher level of economic activity. Although the equilibrium is on the same long-run labor demand curve as before, the fact that activity is higher implies a lower labor share.

54. The effect of an adverse shock to the *long-run labor demand* condition will be a permanent decline in the real product wage and the level of employment, while the labor share can rise or fall depending on the elasticity of substitution between labor and capital (Figure A-1, panels 5 and 6). An increase in the user cost of capital will lower the long-run labor demand curve and trigger substitution toward a smaller capital-labor ratio and a lower real product wage. Despite the labor-for-capital substitution, it is the reduction in capital that dominates the impact on labor demand and reduces employment. If the elasticity of substitution between capital and labor is less than unity, the declining capital-labor ratio will compress the labor share, while with an elasticity of substitution greater than unity, the labor share will rise.

#### Calculating Labor Market Shocks<sup>30</sup>

55. *Labor supply* is determined by the wage-setting relation, which can be estimated using

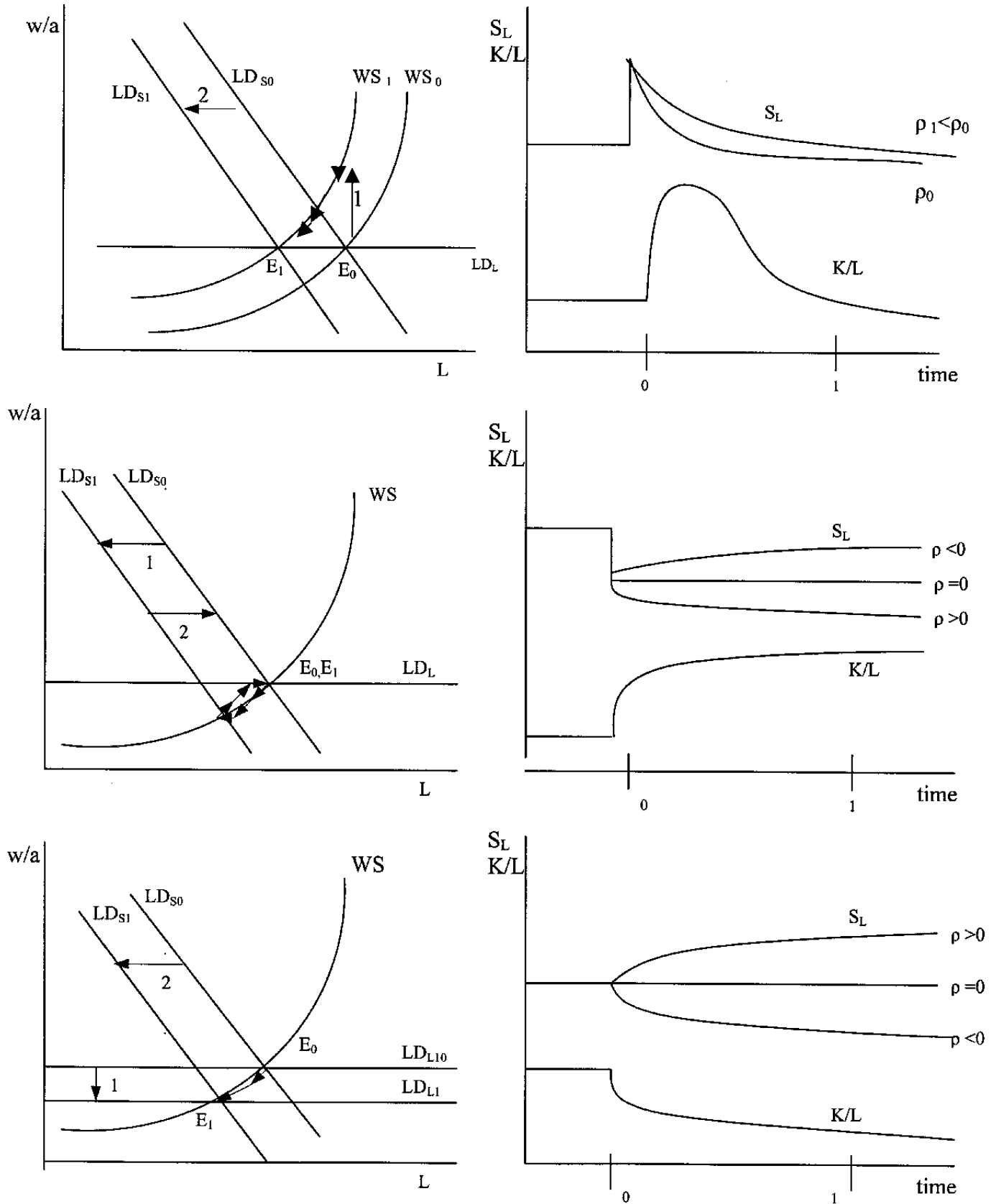
$$\log(w/a) = -\beta u + z,$$

where  $\beta$  measures the sensitivity of the real product wage ( $w/a$ ) to changes in the unemployment rate ( $u$ ). Changes in  $z$  reflect labor supply shocks, so that the evolution of the wage-setting curve can be represented by the evolution of  $z$  (given by  $\log(w/a) + \beta u$ ). The technology parameter,  $a$ , is estimated by the Solow residual scaled by the labor share, while the real wage is the nominal wage of the business sector deflated by the GDP-deflator of the business sector. The sensitivity parameter  $\beta$  is taken to be 1 for both countries (a value consistent with findings by Blanchflower and Oswald, 1995). At any point in time, figure II-2 (panel 1) shows the difference between the actual real product wage and the wage that would allow the economy to return to its 1970 unemployment rate without any inflationary pressure. The size of the gap increases with  $\beta$  because, if wages are more sensitive to changes in the unemployment rate, a reduction in this rate will put more upward pressure on wages.

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<sup>30</sup> Blanchard (1997, 1998).

Figure A-1. Shocks to Labor Supply and Labor Demand



56. *Labor demand* is determined by the first-order condition that labor is paid its marginal product, which can be rearranged and estimated as:

$$\log (w/a) = \log (b) - \log (1+\mu) - (1-\rho) \log (aL/Y).$$

Shifts in labor demand come from changes in the share parameter or the mark-up, so that the evolution of labor demand can be represented by the evolution of  $b$  or  $\mu$  (changes in  $b$  or  $\mu$  are observationally equivalent and given by  $\log (w/a) + (1-\rho) \log (aL/Y)$ ). The elasticity of substitution is taken to be 1, but other values generate similar results. Incidentally, with an elasticity of 1 ( $\rho=0$ ), labor demand shocks mirror changes in the labor share because  $b$  and  $\mu$  are the only source of change in the labor share in this case.

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### III. PROSPECTS FOR THE “NEW ECONOMY” IN GERMANY<sup>31</sup>

#### A. Introduction

57. The recent economic recovery in Germany has led many observers to ask whether this upturn will mirror the “new economy” experience over the last five years in the United States, which has been characterized by sustained robust growth and low inflation. The concept of the “new economy” is of an acceleration in technical change in which rapid investment and use of information technology transforms business practices leading to new breakthroughs and wider adoption and use of technology. The practical macroeconomic consequence is typically seen as higher productivity growth that some have suggested could be quite persistent. Thus, while the “new economy” has several connotations, most studies of the phenomenon attempt to discern a link between the higher productivity growth and investment in new technology. Some of these studies suggest that the increase in productivity growth is not just cyclical but is more enduring.

58. **To date, there is little evidence of the “new economy” in Europe—at least when examined using the traditional macroeconomic data and methods.** It is difficult to draw firm conclusions, however, as the national accounts data produced in most European countries are not comparable to the United States and not well-suited to accounting for the potential role that information technology may have played in productivity growth. These data limitations are also evident for Germany.

59. **More circumstantial evidence, however, suggests that Europe may be on the cusp of the “new economy” and Germany is in the forefront on a number of dimensions.** For instance, the underlying infrastructure supporting the use of information technologies is considered state-of-the-art and geographically dispersed. Deregulation of the telecommunications and electricity industry has also aided adoption of new technologies by cheapening some main inputs. However, while Germany is farther along than many of its peers in continental Europe in some dimensions, it ranks behind the Nordic countries, the U.K. and some Asian countries on other dimensions. Thus, the evidence is mixed as to its readiness to take advantage of all the “new economy” has to offer.

60. **Moreover, there are a number of structural characteristics of the German economy that may stand in the way of a full absorption of the traits that typify the “new economy.”** The German labor market has yet to allow the wage differentiation necessary to best utilize the diverse skills of its labor force most efficiently. The flexibility of U.S. labor markets is cited as an important element in the rapid adoption of technology, even appearing to spur the demand for lower-skilled workers despite the emphasis on a highly skilled

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<sup>31</sup> Prepared by Laura Kodres with contributions from Marcello Estevão and Joaquim Levy.



workforce for the “new economy.”<sup>32</sup> The administration burden placed on new companies may discourage the formation of corporate structures that reward entrepreneurs and quickly adapt to the changing business practices inherent in the use of new information technologies. Lastly, in the U.S., the financing of “new economy” firms frequently takes the form of venture capital and private equity—both of which are relatively underdeveloped in Germany where bank financing (loans) is usually the first infusion of capital for most small- and medium-sized enterprises.

61. This chapter is organized as follows. First, the evidence for the U.S. “new economy” is briefly presented. It is worth emphasizing that there is a debate on the interpretation of the increased productivity growth in the United States during the 1990s—focusing on the relation of productivity growth to the use of computers and its sustainability.<sup>33</sup> Second, the evidence regarding labor productivity growth is presented for some European countries, and specifically for Germany and France, to see whether there are any hints in the macro data of a “new economy” in European economies.<sup>34</sup> Third, the chapter examines Germany relative to other countries, attempting to discern the degree to which some of the preconditions for the development of the “new economy” are present. And lastly, the chapter takes a more prospective angle and points to potential impediments or blockages to the positive impact of new technologies in Germany.

### **B. The Background: The U.S. Experience**

62. **While the term “new economy” has several meanings, this chapter uses it to designate the buoyant performance of the American economy in the latter half of the 1990s—high output growth with no significant signs of inflationary pressure.** The “new economists” suggest that the rapid growth in investment in information technology (IT) equipment in the 1980s and 1990s has altered the nature of business, leading to higher productivity growth throughout the economy. Such rapid productivity increases has produced steeper rates of growth for potential output. The higher potential output, in turn, permitted higher actual output growth without putting pressure on the economy’s resources, alleviating the short-run trade off between output growth and inflation rate. Most of the emphasis, therefore, has been on the measurement of the higher productivity growth in the United States and whether it can be linked to high-technology equipment, either through the

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<sup>32</sup> Skill-based wage differentials have ceased widening and employment gains have been relatively broad-based.

<sup>33</sup> See SM/00/146, United States—Selected Issues and Statistical Appendix, Chapter I, for several definitions of the “new economy” and a discussion of this debate and EBS/00/156, the World Economic Outlook, Chapter II, for additional cross-country information.

<sup>34</sup> See the Selected Issues for the French 2000 Article IV consultation, Chapter III, for a more detailed discussion of France.

production of such equipment or through its use throughout the economy. Some enthusiasts have viewed the acceleration in productivity as permanent, placing the economy on a sustainable higher growth path akin to that attained during the industrial revolution.

63. **Economists agree that the U.S. economy witnessed an acceleration in labor productivity in the latter half of the 1990s of around one percent per annum, but they view the source of the acceleration differently.** While the linkage between productivity and IT investment can be accounted for in several ways, most believe that at least some of the increase can be traced to the *production* of IT (Box III-1). Evidence of this effect is present in estimates of the growth in total factor productivity (TFP) which, according to Oliner and Sichel (2000), have picked up from about ½ percent in the 1991-95 period to 1¼ percent in the 1996-99 period. According to the same study, about one-third of the increase in TFP can be attributed to the computer sector plus the computer-related semiconductor sector. Even the skeptics give credence to this evidence. After estimating the structural acceleration in labor productivity which eliminates increases associated with cyclical effects, Gordon (2000) estimates that about half of the acceleration in output per hour is due to TFP growth, most of which is captured by the computer and computer-related semiconductor manufacturing sector. When Gordon (2000) examines output per hour excluding durable manufacturing, he finds no evidence of accelerated TFP growth and concludes that its absence is evidence that the “new economy,” at least in the sense of spillovers to sectors outside durable manufacturing, is not present.<sup>35</sup>

### Box III-1. Accounting for the “New Economy”

Most analyses of growth accounting and productivity start with an economy’s aggregate production function in logarithmic form, whereby growth rate in output,  $y$ , is attributed to contributions from the growth of capital,  $k$ , labor,  $l$ , and total factor productivity,  $a$ .

$$y = \alpha_k k + \alpha_l (l + q) + a \quad (1)$$

In equation 1, the  $\alpha$  terms are income shares; under neoclassical assumptions these income shares equal the output elasticities for each input and they sum to one due to constant returns to scale. The  $q$  represents changes in worker quality and  $a$  is the growth rate in total factor productivity (TFP). TFP identifies the portion of output growth left after accounting for growth in capital and labor.

Oliner and Sichel (2000) and others then subtract labor growth (worker-hours) from output growth to obtain labor productivity growth and split up the components of capital into the contribution from the high tech equipment (information and communication technology) sector,  $ICT$ , and other sectors,  $o$ , as described in the equation below:

$$y - l = [\alpha_{ICT} (k_{ICT} - l) + \alpha_o (k_o - l)] + \alpha_l q + a \quad (2)$$

First, labor productivity may have increased in the 1990s because of “capital deepening”, the bracketed term. The contribution of changes in the high-tech capital/labor ratio,  $\alpha_{ICT}(k_{ICT}-l)$  and be interpreted as the contribution of changes in the *use* of high-tech equipment. The contribution of productivity gains in the *production* of computers and semiconductors to aggregate labor productivity growth shows up in TFP changes,  $a$ .

<sup>35</sup> It is important to recognize that Gordon’s results depend crucially on his technique to split trend and cyclical labor productivity growth.

64. **Oliner and Sichel (2000), among others, further claim that the use of information technology by U.S. firms has played a significant role in the acceleration of labor productivity in the second half of the 1990s.** The use of information technology is captured by an examination of “capital deepening,” that is, primarily the contribution of changes in the high-tech capital/labor ratio. Oliner and Sichel (2000) show labor productivity growth went from 1.6 percent in the first half of the 1990s to 2.7 percent in the second half (Table III-1). Of this acceleration, about one-half can be accounted for by the increased use of high-tech goods—capital deepening. Oliner and Sichel (2000), who use a broader definition for the stock of high-tech goods than most other authors, show that capital deepening outside the high-tech sector had no effect on the acceleration of labor productivity. Despite the difference in the definition of the high-tech capital and the use of different approaches, Whelan (2000) and Jorgenson and Stiroh (2000) also find that the use and the production of computers boosted labor productivity growth in the second half of the 1990s.

Table III-1. Acceleration in Non-Farm Business Labor Productivity, 1991-95 to 1996-99

(Percentage points per year)

	1991-95	1996-99	Increase
Actual productivity growth	1.61	2.67	1.06
<i>Of which due to:</i>			
<b>Capital deepening</b>	0.61	1.10	0.49
IT capital	<b>0.50</b>	<b>0.96</b>	<b>0.46</b>
Hardware	0.23	0.59	0.36
Software	0.22	0.26	0.04
Communication	0.05	0.10	0.05
Other Capital	0.11	0.14	0.03
<b>Labor quality</b>	0.44	0.31	-0.13
<b>TFP</b>	0.56	1.26	0.70
Computers	<b>0.13</b>	<b>0.21</b>	<b>0.08</b>
Semiconductors (SC)	<b>0.12</b>	<b>0.39</b>	<b>0.27</b>
Other sectors	0.31	0.65	0.34

Source: Oliner and Sichel (2000)

65. **Estimates of TFP are, by construction, residuals and as such also contain the errors in measuring output. The TFP estimates in the United States and other countries are likely to be biased down because of inadequate measures of output growth in service sector industries.** As in the computer industry, many service industries have undergone substantial changes in their business practices (e.g., the finance, insurance and real estate industry). However, unlike data for computer production, the official statistics in the United States do not control for quality changes when measuring the price of these services and it is likely that they overestimate service price increases since the quality of such services is thought to be improving, in part owing to the use of computer technology. Therefore, real output measures obtained by using these prices to deflate nominal expenditures grow at a

slower rate than “actual” production and total factor productivity growth in service sector industries will be underestimated. If one believes that the greater proliferation of high-tech equipment in the second half of the 1990s has a positive impact on TFP growth in the service sector, the above-mentioned measures of TFP acceleration in non high-tech sectors will be “too small.”

66. **In conclusion, while there continues to be differences among scholars about the exact attribution of the increased productivity growth in the United States, most agree that information technology has played a decisive role.** Most of the recent studies point to the increase in capital deepening as one of the avenues through which IT increases labor productivity. The actual production of information technology, in the form of mostly computers and semiconductors, has also made a contribution though there is more debate about the actual amount. How sustainable the acceleration in labor productivity is, is still largely opinion and will await observation over a longer time period.

### C. The Effect of IT Investment on European Output Growth

67. **In contrast with the United States the “new economy” is at best only slowly making an appearance in most of Europe.** The growth in labor productivity in the business sector, which was higher in the euro area than in the United States in the 1970s and 80s, has declined in recent years, rather than increased (Table III-2). This decline in part reflects policy choices, most notably the desire to reintegrate low-skilled labor into the labor force that has in recent years been particularly successful in France. By contrast, the rise in productivity in the 1991-1995 period for Germany also reflects a labor shakeout in which the employment of lower skilled workers fell and eastern German productivity grew following unification.

Table III-2: Labor Productivity Growth in the Business Sector

(Average annual log differences within the period shown multiplied by 100)

	1974-90	1991-99	1991-95	1996-99
Germany 1/	2.34	2.04	2.37	1.72
France 2/	3.06	1.90	1.99	1.79
Euro area 1/	2.34	1.82	2.45	1.19
United States 3/	1.43	2.06	1.61	2.67

Source: Fund staff computations.

1/ Germany and Euro area: OECD Analytical Database; output includes agricultural sector; averages of 1992-99 and 1992-95 were used to control for German unification.

2/ France: OECD Analytical Database for output and employment, hours worked from DARES (Direction de l’animation de la recherche, des études et des statistiques).

3/ USA: Oliner and Sichel (2000); output is for the non-farm business sector.

68. **Statistical problems make an assessment of the impact of IT on productivity growth difficult and few countries outside the United States have completed analytical studies (Box III-2).**<sup>36</sup> Circumstantial evidence is typically obtained by observing the share of investment in IT capital. Recent data on the share of investment in information technology is already somewhat dated, but generally shows that the share of investment in information and communication technology equipment (ICT) in European countries—with the notable exception of the United Kingdom—to be significantly smaller than in the United States at least until 1997. Overall, from 1985 through 1996, all of the G7 countries have been adding to their information technology capital stock at double-digit rates. However, with the exception of the United States and Canada, the rate of ICT capital-build up decelerated in the first half of the 1990s.<sup>37</sup>

69. **In conclusion, statistical difficulties prevent a breakdown of labor productivity growth in terms of the contribution of IT investment and make cross-country comparisons suspect.** Differences across countries in the national accounts capital series and price deflators, in particular, frustrate attempts to estimate TFP.<sup>38</sup> With respect to Germany, the use of different price deflators imply measures of “capital deepening” and TFP gains are likely to be underestimated relative to the United States. In this case, the “new economy” gains in productivity may well be present in Germany, but data quality may prevent their detection.

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<sup>36</sup> Sweden is an exception. See also above referenced Selected Issues chapter for the French Article IV consultation for an initial attempt at a decomposition of labor productivity along the lines of Sichel and Oliner (2000).

<sup>37</sup> See Table 1 of Schreyer (2000).

<sup>38</sup> The OECD, for instance, recommends that no productivity calculations using business sectors be made due to the rebasing and redefinitions of SNA93 accounts. Thus the numbers in Table III-2 should be viewed cautiously.

### Box III-2. Data and Comparability Problems in Measuring the “New Economy”

Several statistical issues are encountered when attempting to link productivity growth with the increased production and usage of computers. One of the largest pitfalls is the appropriate measure of prices of technology goods to be used to deflate nominal values to obtain the real output and investment in the technology sector. Because the quality of computers and related peripherals has improved so rapidly a computer purchased today has much more computing power than one purchased even a year ago. Thus, using actual prices distorts the value of the computer output and other methods must be utilized to estimate computer prices. In the United States, unlike Germany, “hedonic” prices are used which attempt to value computer characteristics rather than the computer unit itself.<sup>1</sup> Recently, the Bundesbank estimated that computer equipment prices fell by four-fifths in the United States from 1991 to 1999 whereas the official statistics for Germany show a fall of only one-fifth. By their calculations, if one used the U.S. price deflators for computer equipment in 1998, German IT investment would have been double the official estimates. In 1999 the discrepancy was well over 170 percent. Growth rates of real expenditure on IT equipment are similarly biased—annual growth rates in the years since 1991 would be 27½ percent with the U.S. price deflators as opposed to 6 percent using the conventional approach. For comparison, the United States’ private sector experienced growth rates of around 40 percent per year from 1992 to 1999.

Other problems arise with the definition of the high-tech sector and the measurement of output. For instance, Schreyer (2000) limits his definition of high-tech investment to hardware, whereas Oliner and Sichel (2000) include software in their estimates. Other authors define the IT sector in other ways depending on the sectoral accounts of the country. It has been further observed in the United States that the difference between GDP calculations based on the expenditure-side measures of output, which reflects spending on goods and services, and those based on the income-side have widened since the mid-1990s, with the income-side showing higher growth. Though the current studies use expenditure-side measures, the income-side data raises the possibility that the growth increase is even greater than previously thought.

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<sup>1</sup> Other users of hedonic prices include France, Sweden, and Denmark. The hedonic approach estimates a function relating prices of computer “boxes” to their respective characteristics (e.g., speed, memory size, and so on). An evaluation can then be made as how much a new computer model would have cost in a previous period.

### D. Germany’s Position in the Information Technology World

70. This section attempts to put Germany in perspective relative to other developed countries in terms of its production and use of information and communications technology (ICT) goods using a variety of information. It then attempts to examine how Germany stands, again compared to other developed countries, in its readiness to use ICT goods in the “new economy.” **The information below suggests that Germany is not a large producer of most ICT equipment, with the notable exceptions of telecommunications goods and components. It is also a net importer of software and computer related services.** Thus, if one is to detect productivity gains related to the “new economy” in Germany it would appear best to examine the *use* of computers through capital deepening rather than the actual production, though a sectoral analysis of the telecommunications industry would be warranted.

## Production and trade of information technology goods

71. **While Germany is one of the larger producers of ICT goods in dollar terms—producing about \$34.5 billion worth in 1997—it amounted to only 1.6 percent of GDP.** Both the United States and Japan overwhelm it, by producing about seven and six times more in dollar terms, respectively (Table III-3). Within Europe, Germany produces more than France and less than the United Kingdom. When measured as value added by the ICT industries as a percentage of GDP, as of 1996 Germany was third among fifteen OECD countries (Figure III-1). Ahead of Germany were the United States and Finland (Japan was excluded from this sample).<sup>39</sup> Germany fares much worse in cross country comparisons when one looks at 1997 expenditures on ICT. It ranks 15 out of 19 OECD countries.

Table III-3. World Production of ICT Goods, 1997

(US\$ billions)

	Electronic Data processing	Office Equipment	Radio comm (including mobiles) and radar	Telecom- munications	Consumer audio and video	Components	Total	% of GDP
United States	82.9	5.1	57.6	36.1	6.4	79.2	266.8	3.2
Japan	67.7	6.2	19.2	21.7	18.7	84.4	218	5.2
France	7.2	0.5	9.8	1.7	1.9	6.9	31.1	2.2
Germany	8.4	0.9	5.0	6.6	2.3	11.2	34.5	1.6
Italy	5.6	0.3	2	3.6	0.6	3.9	16.1	1.4
Spain	1.536	0.1	0.3	2.6	1.2	1	6.88	1.2
United Kingdom	15.2	0.7	7.6	2.8	3	7.7	37.1	2.8
Nordic	1.4	0	8	4.9	0.3	2.9	17.8	2.6

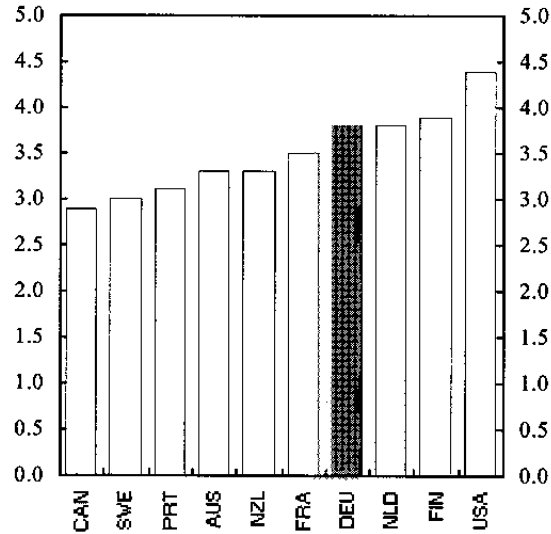
Source: OECD Information Technology Outlook, 2000, Chapter 1, Table 2.

72. **Germany appears to be relatively stronger in the mobile telecommunications and the electronic components area than in the computer sector, strictly defined.**

Germany was the third largest importer and exporter of communications equipment in 1998 and ranks third also as an importer of components (Table III-4) though, in terms of hardware—computers, communications equipment, and electronic components—the United States remains dominant. Germany is the fourth largest exporter of components, in line with its role as a producer of these goods. In the trade of computers, however, it ranks only sixth as an exporter, behind the large export countries of United States, United Kingdom, and Japan, but also behind the Netherlands and Ireland (not shown). It is the third biggest importer, however, of computers.

<sup>39</sup> The industries utilized in these data include (1) office and computing equipment, (2) radio, TV and communications equipment and (3) communications services.

Figure III-1. Germany: Value Added in ICT Industries, 1997  
(In percent of GDP)



Source: OECD Information Technology Outlook, 2000, Chapter 1, Table 1.

Table III-4. ICT Goods: Leading Exporting and Importing Countries, 1998  
(US\$ billions)

	Exports by				Imports by			
	Computers	Comm Equip	Components	Total	Computers	Comm Equip	Components	Total
United States	44.6	15	44.2	103.8	71.5	15.4	38.7	125.6
Japan	26.8	6	31.7	64.5	15.9	3.4	11.3	30.6
France	9.9	6	9.8	25.7	22.2	3.4	7.6	33.2
Germany	11.9	8	7.8	27.7	14	4.7	11.6	30.3
United Kingdom	18.9	10.4	7.5	36.8	24	7.7	8.9	40.6

Source: OECD Information Technology Outlook 2000, Chapter 1, Table 9.

73. **Germany is a net importer of software goods, as well as IT related services (Figures III-2 and III-3).** It imports \$0.97 billion of software and exports \$0.51 billion. Ireland is the largest—exporting \$3.29 billion worth in 1998—surpassing the United States. Trade in communications services and computer and information services tells a similar story, with Germany a net importer of both types of services. The flows of both imports and exports are, however, relatively great. Germany is the second largest importer in both categories and the third largest exporter.



Figure III-2. Germany: Exports of Software Goods, 1998  
(In billions of US dollars)

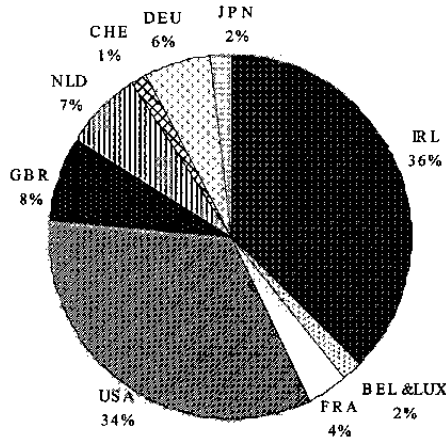
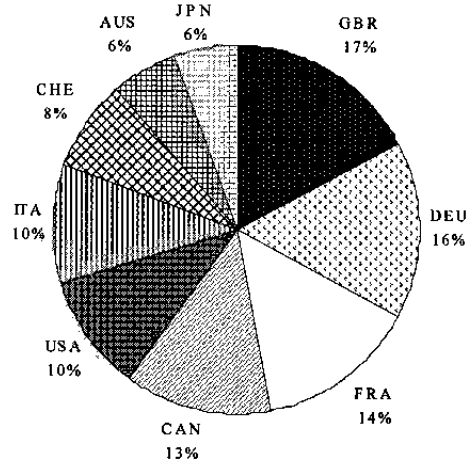


Figure III-3. Germany: Imports of Software Goods, 1998  
(In billions of US dollars)



Source: OECD Information Technology Outlook, 2000, Chapter 1, Table 7.

74. **Employment in Germany's ICT sector has grown noticeably since 1997.** Persons employed in the hardware, software, and services sector increased 6.6 percent from 1997 to 1999, compared with employment growth of 0.7 percent in the economy as a whole over the same period.<sup>40</sup> This is more striking given that it has occurred within an environment in which manufacturing employment has steadily declined. For example, in 1998 the information industry represented 2.8 percent of all employed persons, but 21.8 percent of Germany's total employment growth. This sector offers potential for continued dynamism and employment growth. For instance, a recent study suggested that the gains in employment could be quite large—estimates ranging from 100,000 jobs to 400,000 jobs—if flat-rate pricing was adopted for Internet service.<sup>41</sup> Despite the employment growth, the government calculates a shortage of 75,000 specialists in the high-tech fields and, most recently, an outright call for computer-trained professionals was made and the issuance of a special working visa for Russian and Indian computer experts was approved.

<sup>40</sup> See the "Innovation and Jobs in the Information Society of the 21<sup>st</sup> Century: Action Programme by the German Government," Federal Ministry of Economics and Technology.

<sup>41</sup> See P. Welfens and A. Junmittag, "Effects of an Internet Flat Rate on Growth and Employment in Germany," European Institute for International Economic Relations (EIIW), February 2000.

### E. Germany's Readiness for the "New Economy"

75. **Although Germany is not at the forefront of IT production, it has a large potential to absorb IT and already has in place the basic infrastructure necessary for doing so.** The information below documents some of the areas in which Germany is especially strong, as well as some areas in which it falls behind other developed countries.

76. **The gradual shift to a more service-based economy among the developed countries has been associated with an increased use of ICT in this sector, serving to reinforce this trend.** Services account for about two-thirds of GDP in OECD countries and about 68 percent in Germany. Foremost among the service sector in absorbing ICT is the financial services industry. In the United States, for instance, financial markets have the highest relative IT intensity index. This index measures the industry's percentage share of information technology expenditures relative to industry's share of GDP. Other high users of ICT in the United States, in decreasing order, are banking, education, insurance, manufacturing, utilities, and communications and media. These sectors are well-represented in Germany as well.

77. **In comparison to other EU countries, Germany was above the average level of R&D expenditures as a percent of GDP in 1998, though ranked well below the leaders, Sweden and Finland.**<sup>42</sup> Another measure of potential future growth in output from ICT is to examine how much of the total business expenditures devoted to research and development (R&D) is going into the ICT sector. Data from 1997 show the share of total business R&D expenditures going into the ICT industries—office machinery and computers, radio, TV and communications equipment, and communications services—was only 13.7 percent while in Finland this measure was 40.9 percent. Germany follows ten OECD countries in this measure—in most countries about one-fifth to one-quarter of all R&D spending goes into the ITC sector.<sup>43</sup>

78. **Germany is well placed in terms of its underlying infrastructure for the "new economy."** The proportion of digital telephone connections per 100 inhabitants is relatively high (57 per 100), ranking only slightly less than the United States (62) and France (59) in 1998. The jump to wireless technologies has also been enhanced by the recent auction of UMTS (universal mobile telecommunications systems) by the government. UMTS is a third generation mobile phone system that will give access to new wireless multi-media services, including Internet access via mobile phones. Its introduction will also increase the competitive pressure on line-based systems, permitting further declines in the costs of fixed-line phone calls, which have already fallen 90 percent for long-distance calls in the last two

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<sup>42</sup> See the "Economic Report 2000," German Federal Ministry of Economics and Technology, p. 38.

<sup>43</sup> See the "OECD Information Technology Outlook, 2000," Chapter 1, Table 14.

years with the partial privatization of Deutsche Telekom.<sup>44</sup> The knock-on effects of the new UMTS licenses will also include a boost to the production of telecommunications goods and electronic components, the strongest of the Germany's ICT industries. The continuing deregulation of the electricity industry is also reducing electricity prices thus lowering the underlying costs associated with Internet and other operations. Costs per kilowatt hour have fallen from 15 pfennigs in March 1998 to 11 pfennigs in May 2000 for industrial users.<sup>45</sup>

79. **While the infrastructure is present, usage is relatively low in Germany—though the Internet is taking hold very quickly.** Internet hosts per 1000 inhabitants as of July 1999 showed Germany low on the list—below the EU average of around 30 hosts per 1,000 inhabitants.<sup>46</sup> On this dimension, both France and Japan ranked just below Germany. The highest number of Internet hosts per capita reside in Finland, the United States, Iceland, and Sweden. As of 1998, on-line subscribers and Internet usage are also relatively low, in part due to the low computer ownership among the general population. More recent data, however, shows the number in Internet users in Germany doubled within the six months ending in January 2000 along with the increasing use of mobile telephones and televisions, instead of computers, as the connection devices to the Internet. Small and medium-sized businesses (consisting of nearly 80 percent of Germany's business sector) are already avid users—Internet access is present in 94 percent of all companies with between 10 and 500 employees and one in every six of these firms is engaged in e-business.

80. **Until very recently, European firm's use of equity finance, one of the main methods of financing the "new economy," has been relatively limited as compared to the United States and the United Kingdom.** Equity issues—both publicly-issued equity and privately-issued equity (venture capital) represent the primary means of financing for IT companies.<sup>47</sup> One reason equity is a "natural" vehicle for financing these types of startups is that they typically have no ongoing cash flows. Thus, bank financing, which requires evidence of cash flows for interest payments is unsuited to these enterprises. Equity

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<sup>44</sup> See the "Economic Report 2000," German Federal Ministry of Economics and Technology, p. 44.

<sup>45</sup> See the "Economic Report 2000," German Federal Ministry of Economics and Technology, p. 48.

<sup>46</sup> Hosts represent websites established with a domain address within a specific country (e.g. for Germany, the domain address is ".de") rather than the number of subscribers to Internet services.

<sup>47</sup> In the accompanying data, private equity included venture capital, replacement capital and buy-outs. Venture capital includes seed, start-up, other early stage, expansion, bridge finance, and rescue/turnaround. "Money for Growth: The European Technology Investment Report, 1998," PriceWaterhouseCoopers.

capitalization as a percent of GDP is much lower in the euro area than in the United States—71 percent for the euro area and 163.3 percent for the United States. In terms of the high-tech firms as characterized by the NASDAQ index in the United States versus the Neuer Markt index in Germany the numbers are even more striking. The market capitalization of the NASDAQ is about 22 times greater than the Neuer Markt and about 17 times as many firms are listed on the NASDAQ as on the Neuer Markt. The strict rules governing new listings on the Neuer Markt may, however, be a blessing since the most recent set of initial public offerings (IPOs) in the United States, particularly those associated with the dot.coms have met significant difficulties.

81. **Despite the overall reticence to use equity, technology investments made through venture capital in Europe have exploded, albeit from a low base.**<sup>48</sup> Using the most recent data available, growth between 1997 and 1998 amounted to a whopping 75 percent, reaching ECU 4 billion. By comparison, similar investments in the United States in 1998 reached ECU 9.4 billion—more than double. Of the seventeen countries included in the PriceWaterhouse-Coopers 1998 survey, the United Kingdom led technology investments with 44 percent of the total amount invested; followed by, in order, Germany, France, and the Netherlands. Germany, however, led in terms of number of investments at 711, with the United Kingdom and France following.

#### F. Policy Issues for the “New Economy” in Germany

82. **The picture of the “new economy” obtained from the evidence presented above suggests that Germany is not at the head of the pack in terms of production of IT goods and services, but is well placed to be a significant user.** Germany’s use of technology in its manufacturing sector is almost legendary. It’s “consensus model” for technological adoption—the introduction of industry standards before widespread use—and its incremental approach mean that there may be a time lag before new technologies are fully operational. Once standards are in place, however, adoption tends to be very rapid. The Federal Ministry of Economics and Technology have a number of initiatives under way to quicken the pace of IT adoption, including the formulation of standards in some areas (e.g. electronic signatures). In other areas, the Ministry is attempted to dispense with standards or rules that may no longer be applicable (e.g. abolition of controls on cryptographic production).

83. **While the formal connection between the productivity gains from IT investment and labor and product market structures is not yet well developed, many commentators and economists believe labor and product market flexibility to be key.** Recent research shows that countries with the lightest degree of regulation in the economy (as measured by administrative regulation, product market regulation, and employment protection regulation)

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<sup>48</sup> Technology based companies were defined in these data as communications, computer related, other electronics related, biotechnology, and medical/health related.

were able to generate the fastest growth rates of total factor productivity.<sup>49</sup> Moreover, the free flow of financial capital to new entrepreneurs also appears to be important. The discussion below highlights some areas that may require special attention in light of the features of the German economy.

### **Labor markets**

84. **Though formal evidence is slim, a flexible labor market is put forth as a key element that permits the rapid accommodation of information technology into the economy and aids productivity growth.** Flexibility encompasses a number of features: high levels of job turnover (the ability to hire and fire with a minimum number of constraints), flexible hours, retraining opportunities, wage differentiation, and non-wage compensation that is transferable or fungible (e.g. transferable private pensions, stock options).<sup>50</sup> Germany is viewed as having higher costs of displacing workers than many other countries and this type of feature may delay some of the benefits of the “new economy.”

85. **Encouraging part-time employment and flexible working hours, perhaps by permitting more flexible shop opening hours may be helpful.** Features found attractive by the IT workforce appear to include the ability to work part-time, particularly for women, and the ability to work at home or in other locations. Flexible work arrangements are probably most likely to arise in sectors that use computer and communications equipment, rather than in the production of the equipment. Many of these jobs are already outside the more highly regulated sectors (the “crafts”) aiding their development further. Specifically, an examination of social insurance contributions with a view to lower non-wage costs that discourage flexible work arrangements may increase the number of IT workers.

86. **The German apprenticeship program could be better utilized to target information and communications technological jobs through a variety of methods.** The application of the same structures and principles underlying the apprenticeship program to re-training older workers through a “lifelong learning” project, rather than those just graduating from secondary schools, could help make a dent in the structurally unemployed. Early attempts at increasing the flexibility of “lifelong learning” programs are already underway. Educational practices at the university level could be enhanced with collaborative industry-university programs to increase the supply of “IT-enabled” workers. In fact, even among the “IT-enabled” workforce maintaining up-to-date skills is already a necessity, not a luxury.

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<sup>49</sup> See Bassanini, Scarpetta, and Visco (2000).

<sup>50</sup> Flexibility can also have negatives. High turnover increases frictional unemployment. Those with low education levels and low innate ability may have difficulty retraining, leading them to remain either unemployed or to take unskilled jobs at the bottom of the pay scale. In fact, the increase in income inequality in the United States is cited as the outcome of these negative attributes to flexibility.

Though, it will be important to assure that a “digital divide” between IT-enabled individuals and others does not alienate any given socio-economic group.

### **Product markets**

**87. Deregulation of the telecommunications markets in Germany has contributed to the development of ICT sectors and the diffusion of the Internet, which depends critically on cost of telephone usage.** Costs of long distance calls have fallen dramatically and costs of mobile phone service saw a decline of 20.5 percent last year. Despite the dramatic fall in telephone costs, the relative cost of Internet access remains higher in Germany than the OECD average though it is lower than half of the other European countries.<sup>51</sup> Given the increased demand for a range of communications services (e.g. longer calls, second residential lines, higher-speed, high-quality services, and leased lines) associated with use of the Internet, continued deregulation and the ability for industrial restructuring will remain top priorities.

**88. In some of the ICT sectors, economies of scale are present and therefore mergers and acquisitions in these sectors may be efficiency enhancing, but careful attention to possible market abuses is still necessary.**<sup>52</sup> It is perhaps telling that telecommunications sector experienced the largest value (over \$250 billion) of mergers and acquisitions (M&A) in Europe and North American in 1998 in comparison to the software, hardware, and support services sectors (all less than \$100 billion)—the largest gains from economies of scale are arguably most obvious in this sector. Germany, however, did not share proportionately in this M&A activity, considering the size of its telecommunications firms. While it is impossible to attribute the lower number of M&As in Germany to any specific cause, it is well-known that German industrial restructuring (e.g., through the ability for hostile takeovers) has been somewhat inhibited. The authorities plan to establish a clearer legal framework for corporate takeovers to help alleviate these concerns. However, competition authorities should remain cognizant that even firms in industries that are not obviously “natural” monopolies now (or used to be), may be able to constrain the entry of competitors so as to obtain monopoly-like advantages as a recent legal case in the United States illustrates. Thus, more leeway for M&A activity will probably allow Germany to reap more of the benefits of the “new economy” as long as such side-effects are limited.

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<sup>51</sup> This fact, though, is not entirely dependent on the on-line cost of a telephone call but, as well, the fees levied by Internet service providers.

<sup>52</sup> In fact, the “natural monopoly” formed by declining marginal and average cost over a large range of output is what led to regulation of the telecommunications industry initially. With the advent of wire-less technologies, the ownership of lines (and who uses them) has made this industry “contestable” and thus the rationale for regulatory intervention has lessened.

89. **The administration burden placed on young companies also discourages startups.** There are already plans to reduce and simplify regulations—the Federal Ministry of Economics and Technology’s “initiative to cut red tape.” While most high-tech workers are not covered by the Craft Code, which puts restrictions on the training and expertise within various master-crafts professions, there are still requirements in the area of “liberal” professions that could usefully be re-evaluated.

### **Financial markets**

90. **The current bias toward retained profits may have the inadvertent side-effect of restricting the amount of venture capital that would otherwise be available to finance “new economy” start-up enterprises.** In addition to the different effective tax rates levied on the distributed profits obtained within different corporate forms, there is a general view in Germany that the tax system should help to avoid “short-termism” in investment decisions and limit the possible role of stock speculators. However, the tax bias toward retained earnings (a “lock-in” effect) restricts the use of capital and makes outside equity financing relatively more expensive by lowering the “internal cost of capital,” the reinvestment rate from retaining earnings.<sup>53</sup> Part of the motivation of “new economy” venture capitalists is to provide the seed money for an investment project and then realize the gains within the project horizon. The cash payouts from one project, in turn, provide the financing for other projects in other firms. Although not all venture capital-financed projects have positive outcomes, the venture capitalist typically diversifies across firms with different products and time horizons—a feature made possible by the free flow of distributed profits.

91. **Removing any impediments to the use of private equity and venture capital and encouraging its use in technology investments would probably make Germany a more attractive location for “new economy” startup enterprises.** While the total amount of private equity and venture capital raised in Europe in 1998 was a record ECU 20.3 billion, comparatively less of this money was planned for technology investments than in the United States. While directly comparable data are not available in the survey, in the United States, about three-quarters of total venture capital investment was invested in the technology sectors. In Germany, the planned investment in the technology sector was 35 percent. Several plans are underway in Germany to enhance its reputation in this area—Deutsche Ausgleichsbank’s new “Startgeld” (start-up money) is an example.

### **G. Conclusion**

92. **Macroeconomic evidence that the “new economy” has arrived in Germany is not yet forthcoming; however, other microeconomic-based information suggests Germany may be on the brink of its arrival.** For example, recent recalculations by the Bundesbank

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<sup>53</sup> See Selected Issues, Chapter IV, “Tax Reform in Germany” for a further discussion of new equity financing versus retained earnings.

regarding the real level of IT investment put Germany much closer to the experience in the United States. Much of the uncertainty regarding the presence of the “new economy” may therefore be the result of differing methodologies for computing the statistics typically used in macroeconomic growth accounting frameworks. However to maximize the potential windfall to productivity and output growth some improvements to the functioning of labor, product, and financial markets could be considered. A number of policy changes are already underway, but additional reforms may be needed to fully reap the benefits of the “new economy.”



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#### IV. TAX REFORM<sup>54</sup>

93. Tax reform has been a long time coming to Germany. While others have embarked on rate-cutting and base-broadening reforms along the lines of the 1986 US reform, Germany has come to look increasingly an outlier in international tax comparisons, characterized by high statutory tax rates on both business and personal income levied on relatively narrow bases. Now, however, Germany has embarked on fundamental reform. This process began last year with the Tax Relief Act of 1999/2000/2002, focused on the rate and allowance structure of the personal income tax (PIT), and culminated in a reform of business taxation that was approved by the Bundesrat on July 14, 2000.<sup>55</sup>

94. The reform package is a bold and sweeping attempt to deal with weaknesses of the pre-existing system that were being increasingly exposed by tax reforms both elsewhere in Europe and more generally. At about 47 percent of GDP, the ratio of general government revenue to GDP in Germany is around the EU average. Much of that revenue has been raised, however, by applying relatively high statutory tax rates to relatively narrow bases. Most strikingly, corporation tax raised less than 2 percent of GDP throughout the 1990s despite a statutory rate on retained earnings of 45 percent for much of the period.<sup>56</sup> The personal tax too was marked by high rates and an eroded base. Moreover, the system was rendered complicated and opaque by the number and complexity of, and interaction between, distinct charges. The package emerged from a consensus on the need for fundamental reform.

95. This chapter reviews key elements of the package of income tax reforms.<sup>57</sup> It starts with an overview of the reform (Section A), then focuses on key aspects of the changes to business taxation: effects on finance and investment (Section B), the change in the tax treatment of dividends, which has a wider significance to the development of corporate tax structures in the EU (Section C), and—one of the most widely noted aspects—the exemption of inter-corporate capital gains (Section D). Tax reform in so significant a country as Germany may well generate responses from other countries, and domestically too may also induce changes in the local trading tax: these issues are explored in Section E. Section F turns to labor market aspects, and Section G concludes.

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<sup>54</sup> Prepared by Michael Keen.

<sup>55</sup> Formally, agreement was on a package that the Bundesrat will approve when presented as a revised bill.

<sup>56</sup> This partly reflects the relatively small corporate sector in Germany.

<sup>57</sup> It does not address the series of “eco-tax” measures, raising taxes on petroleum products and using the proceeds to reduce social contributions.

## A. Overview of the Reform

### Key features of reform

96. The deepest structural reforms are to the corporate tax. At present—the reform takes effect on January 1, 2001—retained profits are taxed at 40 percent and distributed at 30 percent. There is currently “full imputation,” the corporate tax paid on distributed profits being treated as a prepayment of the shareholder’s liability to personal income tax on those dividends<sup>58</sup> (the rationale of this being to avoid double taxation of dividends, at both personal and corporate levels): in effect, distributed profits are untaxed at corporate level but subject to a 30 percent withholding tax that is fully creditable against personal tax. Under the new system, all profits will be taxed at 25 percent and imputation replaced by including in the base of the PIT only half of the dividend received.

97. The situation is complicated—both before and after-reform—by the presence of two other taxes. First, a “solidarity surcharge” of 5.5 percent is levied on corporate tax payments (and on many other taxes), so that the post-reform rate of taxation is effectively 26.375 percent. Second, businesses are liable to local trading taxes (*Gewerbesteuer*)<sup>59</sup> that bring the combined marginal rate under the new system to an average of around 39 percent,<sup>60</sup> varying between about 36 and 42 percent. This compares to a combined rate on retained earnings under the current system of about 52 percent.

98. The principal base-broadening measure is a substantial reduction in depreciation allowances. For movable assets, the maximum permissible rate of declining balance depreciation<sup>61</sup> is reduced from 30 to 20 percent; for buildings, the allowable (straight line)

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<sup>58</sup> For example, if a shareholder receives a check for dividends of DM 700 this is regarded as reflecting an underlying dividend of DM 1000 from which DM 300 of PIT has been withheld. If the shareholder’s marginal rate of PIT is 40 percent, for instance, additional personal tax of DM 100 is payable.

<sup>59</sup> The base is common to all municipalities, and while similar to that for the federal corporation tax has some important differences (most notably the non-deductibility of interest on long-term debt obligations). Each municipality then applies its own “multiplier” to the basic amount, the latter being 5 percent of the common base. Multipliers vary from about 300 to over 515 percent, averaging around 400. Trading tax payments are deductible from the base of the corporate tax.

<sup>60</sup> The trading tax rate calculated by applying the multiplier to the basic federal tax is a tax-exclusive rate (that is, is charged on a base that excludes the tax itself). At a multiplier of 400 percent, the combined tax rate is thus  $(0.25)(1.055 - (0.2/1.2)) + (0.2/1.2) = 0.38875$ .

<sup>61</sup> Regulations specify maximum allowable rates of straight-line depreciation for a large number of distinct asset types, and allow declining balance depreciation at three times those

(continued...)

rate is reduced from 4 to 3 percent. Small and medium sized enterprises (net worth below DM 400,000), however, will continue to be able to create tax-free reserves equal to 50 percent of the cost of assets they intend to acquire. This has been identified by the Code of Conduct group of the EU as an instance of harmful tax competition, and in initial versions of the reform package was slated for removal.

99. One of the most widely discussed of the reform measures is the exemption from corporation tax of capital gains on shares in other corporations that have been held for more than one year (with effect from 2002).<sup>62</sup> This seemingly technical issue has particular importance in Germany because of the extent of such corporate cross-holdings, stemming especially from acquisitions by banks. To the extent that the prospect of taxation on the realization of gains on such holdings has discouraged their disposal, exemption is seen as having a powerful effect in unfreezing equity markets: the Dax rose nearly 7 percent on announcement of this measure; and the unanticipated success of the July negotiations led to a 6.9 percent increase in the value of Allianz, one of the largest cross-holders.

Table IV-1. Changes in Personal Income Tax

	1998	2000 (current)	2005
Entry rate 1/	25.9	22.9	15.0
Top marginal rate 1/	53	51.0	42.0
Basic allowance 2/	12,400	13,499	15,011
Starting point of top rate 2/	120,000	114,695	102,000

1/ Excluding solidarity surcharge.

2/ DM, for a single taxpayer.

100. The main changes in the PIT, summarized in Table IV-1, are the sequenced cut in marginal tax rates, increase in the basic allowance and reduction in the level at which the highest marginal rate applies.<sup>63</sup> In some respects the changes are somewhat less dramatic than may at first appear. The increase in the basic allowance barely keeps up with inflation: assuming inflation of 2 percent per annum, the real increase between 2000 and 2005 is less than 1 percent. And the unusual way in which the tax schedule is specified in Germany—the marginal tax rate varying continuously rather than being constant within wide bands—means that the “headline” entry marginal rates apply only over rather restricted ranges of income:

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rates up to a maximum (after reform) of 30 percent. Companies may take faster depreciation if they are able to show that the asset is actually used more rapidly.

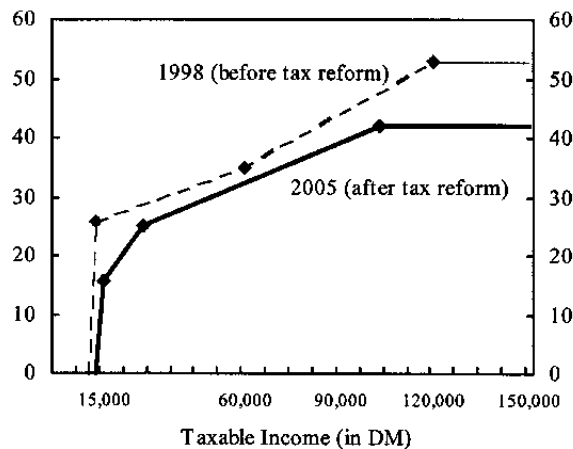
<sup>62</sup> Gains on holdings of foreign corporations were already exempt prior to reform.

<sup>63</sup> The changes were initially set out in the Tax Relief Act of 1999/2000/2002; the 2000 tax reform brought forward to 2001 changes initially scheduled for 2002; and the July Bundesrat agreement cut the final top rate from 45 percent.

whereas a household earning DM 1 over the basic allowance will (in 2005) pay tax at a marginal rate of 15 percent, for instance, one earning DM 1,000 more will have a marginal rate of 15.9 percent. Nevertheless, the sequence of reforms clearly produces a substantial restructuring of the tax schedule.

101. Average rates of tax fall significantly throughout the income range: hence the large revenue cost of these changes reported below. Figure IV-1 shows the change in marginal tax rates between 1998, prior to the start of the process, and 2005, at its conclusion. At the two extremes of the distribution, the cut in the marginal rate is large. At intermediate income levels—in which many taxpayers are likely to be located—the cut is less significant.

Figure IV-1. Germany: Marginal Income Tax Rates  
(In percent)



Source: Ministry of Finance.

102. A major concern in putting together the package was to make it reasonably attractive to unincorporated small and medium enterprises (SMEs), which form a large part of the business sector in Germany. The reduction in PIT is in itself a benefit to these groups, though this was to some degree offset by the removal of an upper limit on the marginal tax rate on business income. But although the basic reform did no great harm to SMEs it gave them no benefit as striking as the capital gains exemption offered to corporations. Three concessions to this group ultimately emerged: dropping of the proposals to remove allowances on provision for planned investments referred to above, roll-over relief (not exemption) for capital gains that SMEs realize on shares in other companies and then reinvest in corporate shares; and taxation of only half the capital gains on sales of own-businesses.

### Revenue effects

103. The package is sizeable. When fully implemented,<sup>64</sup> the net effect is estimated to be a revenue loss—consolidated across all levels of government—of DM 62.5 billion, equivalent

<sup>64</sup> The transitional effects are complex, in large part because the effects of the corporate rate cuts are felt immediately whereas the revenue gain from less generous depreciation

(continued...)

to around 1.5 percent of current GDP. The bulk of this cost is through the changes to the personal income tax. The net cost of the business tax measures reflects the offsetting effects of large gross changes from the cut in rates and broadening of the base.

Table IV-2: Full Revenue Effects of Reform

(DM billion)

Overall revenue effect		-62.5
<i>Of which:</i>		
Business taxes		-10.6
<i>Comprising:</i>		
Cuts in corporate tax rates	-20.4	
Cuts in rates on non-corporate tax rates	-6.1	
Tighter depreciation rules	+ 17.0	
Other measures	-1.0	
Personal taxes		-51.9

Source: Federal Ministry of Finance

### International comparisons

104. A key purpose of the reform is to increase the attractiveness of the German tax system relative to those of other countries. Assessing this is a complex matter (taken up in Section B below), but a simple comparison of two key tax rates—those on corporations and on the highest personal incomes—is suggestive. The first column of Table IV-3 shows that Germany will indeed have a headline rate of corporation tax that is low by international standards, and, in particular, well below the current EU average. Taking account of local taxes and surcharges, however—in the second column—the picture is less striking: these additional taxes are higher in Germany than elsewhere, so that on this more inclusive measure reform essentially takes Germany to around the EU average. The top marginal rate on personal income reached in 2005, however, is low relative to current rates elsewhere both with and without adjustment for add-ons.

105. These comparisons implicitly assume, however, that rates elsewhere will remain unchanged. Insofar as the reform does strengthen Germany's position in the competition for mobile income, however, so others may also feel compelled to lower their rates further, a point pursued further in Section H.

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allowances accrues gradually (because assets acquired pre-reform continue to be depreciated at pre-reform rates).

Table IV-3: German Tax Rates in an International Context

	Corporation Tax 1/		Top Personal Marginal Rate 1/	
	Headline rate 2/	Including surcharges and local taxes 3/	Headline rate 4/	Including surcharges and local taxes 4/
Austria	34	34	50	50
Belgium	39	40.2	55	56.65-62.15
Denmark	32	32	59	59
Finland	28	28	38 [28]	53-57.75 [28]
France	33.33	39.9 5/	54	54
Germany	25 6/	(38.875) 6/	42 7/	44.31 7/
Greece	35 8/	35 8/	45	45
Ireland	28 9/	28 9/	46	46
Italy	37 10/	41.25 11/	46	46.23-46.46
Luxembourg	30	36.42-39.8	46	46
Netherlands	35	35	60	60
Portugal	34	37.4	40	40
Spain	35	35	39.6	40.79-42.93
Sweden	28	28	25 [30]	51-58 [30]
United Kingdom	30	30	40	40
<i>Non-Germany EU average 12/</i>	32.7	39.65	45.97	49.82
Canada	28 13/	34.1-46.1 (44.6)	29	44.4-54.2
Japan	34.5	(47.8) 14/	50	65
Norway	28	28	10.35	28
United States	35	35.65-42.8	39.6	(46.05) 15/

Sources: Staff calculations from: International Bureau of Fiscal Documentation, *European Tax Handbook 2000*; Price Waterhouse Coopers *Corporate Taxes 1999-2000* and *Individual Taxes 1999-2000*.

1/ For fiscal year starting in 1999, unless otherwise indicated.

2/ Central government basic rate on retained earnings.

3/ Figure in (parentheses) indicates a representative figure.

4/ Figure in [brackets] is flat rate on capital income.

5/ With the elimination of two surcharges, falls to 33.33 percent from 2001.

6/ From 2001.

7/ From 2005.

8/ For banks and corporations not listed on the Athens stock exchange, 45 percent.

9/ From 2003, 12.5 percent.

10/ This rate applies to income in excess of an imputed return to equity capital, the latter being taxed at 19 percent.

11/ Includes IRAP.

12/ Unweighted, taking mid-points of ranges.

13/ Includes 10 point abatement to create room for provincial taxes.

14/ Assumes Tokyo inhabitants tax and enterprise tax at mid-points of permissible range for large enterprise.

15/ New York City.

## B. Effects on Investment and Finance

106. The effects of the reform on incentives to invest are complex: they potentially vary, for instance, with the identity of the final investor (whether located at home or abroad, and how they are taxed at personal level), the physical nature of the investment (whether in plant and machinery, say, or in buildings) and on the means by which the investment is financed. Moreover, the reform involves changes in both the rates of tax and the basic structure of the tax rules (particularly the change in the tax treatment of dividends), making analysis far from straightforward.

107. For domestic investors—meaning a hypothetical group that will either invest in Germany or not at all—the key issue is how reform affects the cost of capital: that is, the pre-tax return needed to meet the minimum post-tax return required by investors. This, in turn, depends on the way in which the firm chooses to finance itself, as shown in Box IV-1. The expressions there—derived in Appendix 1, where the underlying model is spelt out—point to the central effects of the four main components of reform.

### Box IV-1. The Cost of Capital

By the cost of capital is meant here the quantity to which a firm that acts to maximize the wealth of its representative shareholder will seek, by adjusting its level of investment, to equate the marginal product of capital. In the absence of taxation (and assuming, for simplicity, a world with no uncertainty) this would be simply the market interest rate. It is through its effects on the costs of capital that the effects of taxation on incentives to invest are traditionally examined.

These effects depend, in general, on corporate tax parameters—the rates on distributed and retained profits (denoted  $\tau_d$  and  $\tau_u$  respectively), the rate of imputation  $c$ , and the price of investment goods net of the present value of depreciation allowances ( $p^*$ )—the marginal rate of PIT of the marginal shareholder,  $m$ , and the proportion of dividends taxable at personal level,  $\mu$ . The nature of that dependence in turn depends on the marginal source of finance both when an investment is made and when the returns are realized. Under circumstances spelled out in the appendix, denoting by  $R$  the pre-tax interest rate—assuming (a reasonable approximation in Germany) that capital gains are untaxed at personal level, and for simplicity abstracting from the costs of true depreciation—the financial costs of capital under the main financial regimes are:

$$\begin{aligned} \text{Retention finance:} & \quad \frac{(1-m)}{(1-\tau_u)} Rp^* \\ \text{Debt:} & \quad Rp^* \\ \text{New equity:} & \quad \frac{(1-c)(1+\tau_d-\tau_u)(1-m)}{(1-\mu m)(1-\tau_d)} Rp^* \end{aligned}$$

Under the present system,  $c = \tau_d$  and  $\mu = 1$ ; after reform,  $c = 0$ ,  $\tau_d = \tau_u$ , and  $\mu = 1/2$ .

108. First, the **reduction in depreciation allowances** raises the effective cost of acquiring productive assets, and so unambiguously discourages investment (at least, once the reform is



in place: there is an incentive to bring investment forward before the reform, so some temporary investment boom in 2000 is likely).

109. Second, the **cut in the rate of corporation tax** reduces the pre-tax earnings needed to finance any given stream of gross dividends to shareholders, and so reduces the cost of equity finance. It has no effect on the cost of debt finance: since interest is deductible against corporation tax, the earnings needed to meet interest costs are unaffected by the tax rate.

110. Acting in the opposite direction, however, the lower rate of corporation tax reinforces the increase in tax-inclusive price of investment goods brought about by the cut in depreciation allowances: at a nominal interest rate of 5 percent, for example, the present value of depreciation allowances on a movable asset falls from 33 percent of the asset price to 19 percent.

111. Third, the **reduction in personal tax rates** on interest income raises the cost of equity finance. Instead of investing in the company, the shareholder could simply invest her funds at the going interest rate; since such interest income is now more lightly taxed than before, equity investments—both retentions and, under the half-dividend scheme, new equity—must earn a higher return in order to persuade the shareholder to put money in the company. (There is no effect through this channel on the cost of debt finance, which, as noted, is driven by deductibility against the corporate tax.)

112. The fourth component, more subtle, is the effect of **moving from full imputation to the half-dividend scheme**. It has been widely claimed that the reformed system will encourage retention finance. The reasoning is that whereas under the imputation system distributed profits ultimately bear only personal tax, under the reformed system they will bear both corporate tax and personal taxation at half the usual rate, with the latter being a heavier burden for those with a low enough marginal tax rate.<sup>65</sup> For such shareholders the change in the tax treatment of dividends makes distributing profits more costly in terms of the taxes paid today.

113. But this argument is incomplete, since a decision to retain profits also has implications for taxes paid in the future. The choice in deciding whether or not to retain profits is that between taking dividends today or dividends some time in the future.<sup>66</sup> So long as the tax rate applied to those dividends does not change, the dividend tax simply cancels

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<sup>65</sup> At the present corporate rate on distributions of 30 percent, the critical marginal rate of personal tax is about 46 percent.

<sup>66</sup> Even if the present shareholder does not expect to receive an increased dividend but rather an increased share price, that price increase will ultimately stem from the expectation of higher future dividends

out of the calculation. In effect, shareholders' funds within the corporation are "trapped:"<sup>67</sup> an increase in the dividend tax rate will make shareholders worse off, but since they cannot get their money out of the company without paying that tax it becomes effectively lump sum, and so is irrelevant to their decisions.

114. Thus the change in the tax treatment of dividends does not in itself affect the cost of retention finance.<sup>68</sup> It does, however, affect the cost of finance by means of issuing new equity: for whereas retention finance is from money already inside the company and so subject to the trap of dividend taxes, subscribing new equity is to put money into the trap, with no way of earning a return—either directly or through selling at a capital gain—that is not ultimately subject to dividend tax. While the reform does not encourage retention finance by making it cheaper in an absolute sense, it does favor it by making it cheaper relative to new equity.<sup>69</sup>

115. Combining these effects, there are few clear-cut conclusions except that (at any given world interest rate) debt-financed investment becomes more expensive. The impact on the cost of capital becomes an empirical question; or, more precisely, one of the assumptions made on the identity of the marginal shareholder and the underlying pattern of true depreciation. Taking the special case of a top-rate shareholder investing in movable assets attracting depreciation at the maximum rates, the results in Box IV-1 point to an increase in the cost of capital for all three sources of finance, and particularly for debt and new equity finance.<sup>70</sup>

116. More detailed studies tend to reach broadly the same conclusion. Bond and Chennells (2000)—who ignore personal tax effects—find significant increases in the costs of both debt-

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<sup>67</sup> On this "new" or "trapped equity" view of dividend taxes, see, for instance, Auerbach (1983).

<sup>68</sup> This can be seen from Box IV-1, the cost of capital for retention finance being independent of  $c$  and  $\mu$ .

<sup>69</sup> This discouragement of new equity finance is essentially the "lock-in" effect that has been widely discussed in Germany. Wagner and Wader (2000), for example, show how the post-tax return from investing in a company increases with the length of the holding period, an effect reflecting precisely the benefits of delaying tax on dividend payments. Implicitly, their argument relates to the subscription to new equity, since otherwise the dividend tax avoided now by retaining profits would offset the tax on future dividend. The point is thus that the new scheme not only discourages new equity finance but encourages delaying the payment of dividends financed by the subscription to such new issues.

<sup>70</sup> At an 8 percent interest rate, the costs of capital in Box V-1 (which, recall, do not include the costs of true depreciation) rise from 4 to 4.9 percent (retentions), 5.2 to 6.3 percent (debt), and 4.6 to 6.2 percent (new equity).

and new-equity financed investments: from<sup>71</sup> 3.8 to 7.5 percent and from 11.2 to 14.0 percent respectively, leaving these amongst the highest for the set of industrialized countries they study.<sup>72</sup> Retention finance, they find, becomes slightly cheaper: the cost of capital falls from 14.8 percent to 14.0 percent. (This ignores, however, the effects of personal taxes: while that is appropriate for tax-exempt institutional investor, the lowering of personal tax rates tends to raise the cost of retention finance for reasons described above.) Overall, they find a slight increase in the weighted average cost of capital for plant and machinery, from 10.6 to 11.7 percent: a level exceeded only by Japan. Making somewhat different assumptions—and now including personal tax changes (though not the full cut in the top rate agreed in the final package)—Sinn and Scholten (1999) find that for “normal investment”—financed half by retentions and half by debt—the cost of capital increases.

117. The overall impression is thus that the reform is unlikely to generate a significant increase in the aggregate level of investment by domestic investors. This does not imply, however, that the impact on investment incentives is adverse. Indeed that impact is almost certainly beneficial. To see why, it is helpful to think in terms of the marginal effective tax rate (METR) on investment: this is a summary indicator of the impact of the tax system on marginal investment incentives, and can be defined for present purposes as the difference between the cost of capital with and without taxes. The reform is likely to change the pattern of METRs in two beneficial ways. First, it appears to reduce the dispersion in the METRs across different types of investment and so assures a more efficient allocation of the capital stock. Second, and more strikingly still, it is likely that the initial METR is many cases negative—the generosity of depreciation allowances outweighing other aspects of the tax system to turn the net effect of the system into a subsidy—so that raising the METR actually mitigates a bias towards too high a capital stock. The effects of the reform on the incentive to invest faced by domestic investors thus appear to be beneficial, though they tend, if anything to make investment less attractive.

118. The decisions of foreign direct investors—choosing between locating real investments in Germany and elsewhere—depend not only on the marginal effective tax rate just described but on the *average* effective tax rate (AETR): that is, on the proportion of the profit earned on a project that is taken in tax.<sup>73</sup> Even if the METR were zero in all countries (meaning that no tax was collected on projects that just break even), there would be a distinct incentive, all else equal, to locate projects that do better than break even (and so do pay tax) in the country with the lowest AETR. (The difference between marginal and average effective tax rates, and the ways in which they affect investment decisions, is illustrated by

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<sup>71</sup> The figures in this paragraph are for investments in plant and machinery. The conclusions for buildings are broadly similar.

<sup>72</sup> Denmark, France, Japan, the Netherlands, the UK, and the US.

<sup>73</sup> See Devereux and Griffiths (1998) for an account of the average effective tax rate.

### Box IV-2. Marginal and Average Effective Tax Rates on Investment

Consider a tax system that allows investment spending as an immediate deduction against tax. (This is a 'cash-flow' tax, but other arrangements—allowing interest to be deducted and giving allowance for true depreciation, for example—have the same effect). The examples below shows the treatment of two hypothetical investment projects under such a system. Both involve an investment of DM 100, and in each case the rate of return required by the investor—the return that could be earned by simply investing in the world capital market—is 5 percent. Both projects last only one period, in the sense that the investment goods acquired in period 1 are sold, after they have yielded their profit, in period 2. These sales proceeds are taxed, just as the initial investment was deductible (which again approximates real-world rules) Project A earns, before tax, a return of exactly 5 percent, the minimum required. Project B, in contrast, earns 20 percent. The tax rate is 25 percent.

	Project A (5 percent return)	Project B (20 percent return)
<i>Period 0:</i>		
Investment	100	100
Tax payment	-25	-25
<i>Period 1:</i>		
Receipts	105	120
Tax payment	26.25	30
<i>In present value:</i>		
Pre-tax profit	0	14.3
Tax payment	0	3.6
After-tax profit	0	10.7

The two projects are identical in period 1, when the investment is made. They cost DM 100, but the firm reduces its tax base by that amount and so reduces its tax bill by DM 25. In period 2, however, both firms must pay tax on the sales proceeds of DM 100, but there the similarity ends:

- Project A earns profit of DM 5, and so pays tax of DM 26.25 (25 percent of DM 5 profit plus DM 100 receipts from disinvestment). Discounted at the investor's rate of 5 percent, this is worth DM 25 in period 1 terms; and so exactly offsets the tax reduction of 25 DM in period 1: the present value of taxes paid is zero. So too are both pre- and post tax profits. Thus the METR under this tax system is zero: the pre- and post-tax returns are identical, with the investor earning exactly the minimum required. This is because this tax system because it gives full allowance for the costs of investment. (Clearly too the AETR on this particular project is zero).
- Project B earns profit of 20 and so pays tax of DM 30 (25 percent of DM 20 profit plus DM 100 disinvestment). In present value terms, this is greater than the break of DM 25 in period. Thus the AETR is positive. Present value profits are also positive: the project remains worth undertaking even though some of the return goes in tax.

If all countries offer tax systems of this kind, but at different rates, an investor will be indifferent as to where to locate the marginal project A, but will locate B wherever the tax rate is lowest.<sup>1</sup>

<sup>1</sup> To see more generally and precisely the respective roles of marginal and average effective tax rates, consider the investment problem of a multinational firm. This has two stages: in which country to invest and how much to invest there. For the second stage of this problem, the multinational decides how much it would wish to invest were it to choose each of the possible countries. These choices will be affected by the METRs in each country. At the first stage, it then chooses between countries by selecting the one in which the after-tax profit implied by the hypothetical investment decisions determined at the second stage is greatest; this will depend on the AETRs levied in the various countries. Allowing for the further complication that investments may be made simultaneously in several countries, a further role emerges for the statutory tax rate, since location then becomes an extreme form of transfer pricing (since it affects the cross-country split of profits). See Keen (1991) for a fairly general treatment of tax effects on multinational's investment decisions.

numerical example in Box IV-2). It should be emphasized that there is in general no simple relationship between METRs and AETRs. In particular, it is quite possible for a reform to increase one and reduce the other.<sup>74</sup>

119. Bond and Chennells report average effective tax rates for Japanese and US subsidiaries operating in Germany (the home country of the multinational mattering in this context because of differing home country tax rules on the treatment of earnings repatriated by subsidiaries). While the results are mixed, the most striking finding is a fall in the AETR on retention-financed investment (retentions being a particularly important source of finance for subsidiaries): from 45.1 to 41.5 percent for a Japanese subsidiary, and from 41.9 percent to 37.3 percent for a US subsidiary.<sup>75</sup> While these results in part reflect a relatively high assumed pre-tax return of 30 percent, they suggest that the cut in the statutory tax rates may have a marked effect on this aspect of incentives to invest. Even so, the AETRs achieved after reform are in many cases higher than multinationals could achieve elsewhere.<sup>76</sup> Nevertheless, the reform does appear to make Germany a significantly more attractive country in which to locate footloose investments.

### C. Imputation: An Idea Whose Time has Gone?

120. One of the most controversial aspects of the reform was the ending of full imputation. What makes the issue of special and wider interest is that imputation was at one point clearly identified<sup>77</sup> (though not formally adopted) as a target for harmonization within the European Union. Imputation indeed spread from France to Germany, Ireland, and the UK. Classical corporate systems of the kind operated in the US—with separate taxation at personal and corporate levels—began to look a thing of the past. Now the tide has turned: the UK and Ireland have already moved back to a classical system. Thus the wider question raised by the German reform is whether this route towards integration has proved to be fundamentally

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<sup>74</sup> To see this, note that the METR depends only on parameters of the tax system, the true rate of depreciation and the rate of interest. Calculating the AETR, in contrast, requires some assumption on the pre-tax return earned by the particular project. (Crudely put, the METR is a property of a tax system, the AETR a property of a particular project). Thus a reform which cuts both depreciation allowances and the statutory tax rate, for example, could on balance raise the METR (the depreciation effect dominating) yet lower the AETR (because intra-marginal returns are so large that the cut in the tax rate dominates the increase in the tax base from lower depreciation).

<sup>75</sup> These figures are again for investment in plant and machinery: the fall in average effective tax rates for buildings is somewhat more marked.

<sup>76</sup> For example, the average effective tax rate for the same investment by a US subsidiary is estimated to be 33.7 percent in the UK and 34.3 in the Netherlands.

<sup>77</sup> In a 1975 draft directive.

flawed; or whether, on the other hand, a potentially useful development has been terminated prematurely.

121. Two main arguments were used in favor of full imputation in the German reform debate. The first is based on equity considerations: relative to a full imputation system under which distributions are taxed as personal income, those with sufficiently low marginal tax rates will lose from adoption of the half-dividend system (the advantage of paying only half their marginal tax rate being outweighed by the loss from paying tax at the corporate rate before receiving the dividend). But it is not clear that this is a significant issue in practice, and the liability of many less well-off shareholders to pay tax on their dividends will in any event be limited by the availability of a DM 3,000 allowance to set against capital income, which implies (because of the halving) that tax is payable only if dividends received exceed DM 6,000.

122. The second argument is that the merits of imputation in terms of leveling the playing field between retention and new equity finance should not be discarded lightly.<sup>78</sup> Conversely, removing imputation biases firms against financing themselves by selling new equity, and so hampers the development of equity markets. Note though that imputation does not level the playing field between all sources of finance: as can be seen from Box IV-1, debt finance will be more attractive than equity finance to a shareholder whose marginal personal rate is below the corporate tax rate (the intuition being that the value of interest deductibility at personal level more than offsets the tax paid on interest income at personal level). The general lowering of tax rates at corporate and personal levels may reduce this distortion: but it does not eliminate it.

123. The main argument levied against imputation, however, is the potential legal objection to the denial of imputation credit to non-residents (except as provided for by bilateral treaty, as for instance between Germany and France). These were also a factor in the UK's decision to move away from imputation, though in that case there were also keenly felt difficulties associated with the denial of credit for dividends paid to domestic residents from income that had borne corporate tax outside the UK. One way of resolving any such problems would be to unilaterally extend credits to residents of other member states, though the revenue cost could be considerable. Thus it may be that legal difficulties are taking the EU further away from achieving a desirable integration of personal and corporate taxes, a point returned to in Section E below.

#### **D. Exemption of Inter-Corporate Capital Gains**

124. The exemption of inter-corporate gains had a particular rationale, and popularity, in Germany because of its effect in unwinding substantial holdings built up by the financial

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<sup>78</sup> In Box IV-1, the costs of retention and new equity finance are identical if  $c = \tau_d = \tau_u = m$  and  $\mu = 1$ .

sector. As a tax policy measure, however, its merits are not immediately obvious. If the purpose is to discourage inter-corporate holdings, for example, making gains on such holdings tax-free is unlikely to be the best instrument; if particular problems attach to pre-existing holdings, specific measures could have been adopted targeted to those holdings (granting a one-time exemption, for example, for assets held more than some number of years). More generally, the measure marks an important departure from the normal practice—while some countries reduce the tax burden on inter-corporate gains, many tax them fully—and one which might so easily be imitated by others that its deeper rationale merits close consideration.

125. The key tax policy argument for exempting inter-corporate gains is that changes in fundamental share prices reflect changes in anticipated earnings, so that if those earnings are subject to corporation tax it would be inappropriate double taxation to tax the gain as well. Just as inter-corporate dividends are usually exempted from tax, so, the argument goes, should be inter-corporate capital gains. Advocates of the reform link this point with the move towards a classical system, which indeed changes the corporation tax into a distinct tax on corporate earnings as such.

126. The logic of the basic argument, however, can be pursued further. It can be applied at personal level to conclude that, as a matter of principle, there also should be no capital gains tax on shares in corporations. This is so, moreover, under both classical and imputation systems. Under a classical system, taxing at the personal level changes in share prices that reflect anticipated distributions on which both corporate and dividend taxes are charged would be triple taxation; and taxing gains on corporations' shares in other corporations would imply quadruple taxation. Under full imputation, at the other extreme, the object is to ultimately tax earnings received through corporations at the personal rate. This is properly achieved by giving the shareholder full credit in respect of dividends received for underlying corporation tax paid: taxing capital gains which reflect the personal tax paid on future dividends subjects corporate earnings to two layers of personal tax. Thus one arrives at the conclusion that capital gains on shares in corporations should not be taxed at either personal or corporate level.

127. Clearly any such exemption from capital gains tax needs to be carefully structured so as to prevent avoidance by turning untaxed income into untaxed capital gains, the key being to ensure that exemption is available only when there is assurance that tax has or—more difficult, since capital gains can arise from anticipated earnings far in the future—will be paid. Two more fundamental objections to the argument for exemption are sometimes made.

128. One is to doubt whether retained earnings are necessarily fully reflected in share prices, and similarly whether share prices reflect only expected future dividends: cannot the dividend tax be avoided by never distributing profits? The essential requirement for the argument above, however, is merely that fundamental share prices ultimately be rooted in earnings, and that those earnings must ultimately be distributable if the firm is to be more than a bubble.

129. The second argument, more subtle, asserts that while it is indeed double taxation to tax gains on corporate shares that arise from the expectation of future dividends, this is exactly offset by the taxable loss—and hence reduction in capital gains tax—that arises when the dividend is subsequently paid.<sup>79</sup> But this is not right: the subsequent reduction in capital gains tax liability when the share goes ex-dividend will be reflected in its share price prior to the dividend being paid. This effect thus washes out, leaving only that of the underlying change in earnings.

130. While opinions will continue to differ, the tax policy grounds for this measure appear to be strong; so strong, indeed, that they may well call what has previously been standard practice into increased doubt.

### **E. Implications for Other EU Countries and for Fiscal Federal Relations in Germany**

131. The reform fundamentally alters the context in which other jurisdictions set their taxes, so that the final equilibrium to which it leads may also reflect changes in the behavior of those other jurisdictions. Responses are likely both externally, most obviously by other countries in the EU, and internally, at lower levels of government within Germany.

132. It is not surprising that Germany has had a higher rate of corporation tax than many other countries. Theory predicts<sup>80</sup> that, all else equal (including tastes for publicly-provided goods), large countries will maintain higher tax rates than small: they have less to gain by setting a low tax rate in order to attract tax base from abroad and more to lose in terms of revenue forgone on the domestic tax base. This is especially so if that large country acts as a leader in the setting of tax rates, anticipating how others will respond when setting its own tax rate. Thus the dramatic cut in German tax rates could have a significant effect on the overall equilibrium that emerges from international tax competition.

133. Most obviously, the reduction in the statutory rate of corporation tax will put pressure on those high tax countries that now become more exposed. Since the German tax reform, France has announced the removal of a surcharge on corporation tax that will take its rate down to 33.3 percent.<sup>81</sup> But even countries that set lower taxes than Germany may now have an incentive to cut further in order to maintain their competitiveness. To some extent the impact of the German tax cut is mitigated by the fact that Germany's treaties generally exempt dividends received from foreign subsidiaries rather than giving a credit for taxes paid abroad: for this means that the tax cuts have no effect on the overall tax position of German subsidiaries operating abroad and so do not place pressure on other jurisdictions to cut their tax rates so as to retain their attractiveness to those subsidiaries. Nevertheless, it seems likely

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<sup>79</sup> This argument is used, for instance, by US Treasury (1992).

<sup>80</sup> See, for example, Kanbur and Keen (1993).

<sup>81</sup> See the chapter on recent tax developments in the selected issues paper for France.



that the German reform will give a further twist to tax competition in the EU and perhaps also more widely.

134. The reform now leaves Finland and France as the only EU countries operating an imputation system. It remains to be seen whether it will prove advantageous for them to continue doing so, especially if the legal problems invoked in justifying the change in Germany prove warranted. It clearly seems that imputation—once the preferred form of corporate tax in the EU—has failed to resolve the problems associated with the double taxation of dividends. The wider question is whether the uncoordinated solution to which the EU is headed—some degree of double taxation of dividends—is better than that which would have been achieved with coordination, whether on full imputation with credits payable to residents of all EU states or to some other system.

135. It may be, however, that corporation tax in the EU has reached a point at which reform even more fundamental than convergence on imputation with full crediting across member states' borders will suffice. More radical approaches to the tax competition problem—some commentators have suggested moving to a system of EU-wide of formula apportionment,<sup>82</sup> or to an optional “European” corporation tax—may need to be entertained.

136. Within Germany, the similarity between the base of the corporation tax and that of the local trading tax suggest that the change in the former may induce a change in the equilibrium level of the latter. These trading taxes are set in an environment shaped largely by horizontal tax competition between the municipalities, tempted to attract capital by setting lower taxes than their neighbors.<sup>83</sup> But that environment is also shaped by the vertical interaction with the corporation tax. The implications of this for the equilibrium tax structure are complex.

137. First, since the trading tax is deductible against the corporation tax, part of the cost of the increased trading tax that firms would pay if a municipality were to raise the rate at which it charges its trading tax would actually be borne not by the firm itself but by the federal government (in the form of a reduction in corporation tax receipts). This gives the municipalities an incentive to set the trading tax higher than they otherwise would. With the cut in the corporate tax rate, the federal government now bears less of the cost of an increase in the trading tax. This makes it more costly for the municipalities to raise their tax rates, and so should lead to a lower equilibrium level of the trading taxes.

138. Second, to the extent that the reform increases the base of the trading tax, so the revenue that a municipality gains by increasing its tax rate increases, making such an increase more attractive. This points towards higher trading taxes in equilibrium.

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<sup>82</sup> That is, allocating the profits of multinationals across EU member states by summary measures of their economic presence in each.

<sup>83</sup> Horizontal tax competition of this sort is documented by Büttner (2000).

139. These effects point in opposite directions, and the overall effect is theoretically uncertain. In the simplest case in which municipalities seek to maximize revenue and the base is a linear function of the tax rate, it is shown in Appendix 2—in a very stylized model—that a cut in the rate of corporation tax will lead to higher rates of trading tax if and only if the latter is initially less than 50 percent. More generally, there are even more effects at work.<sup>84</sup> Whether a reduction in the federal tax rate will lead to higher or lower municipal tax rates is thus an essentially empirical question, for which—in the absence of home-grown evidence—one must look outside Germany. For Canada, Hayashi and Boadway (1999) find that a cut in the federal corporate tax is associated with an increase in provincial taxes. If this pattern were to be repeated in Germany,<sup>85</sup> the cut in the federal tax rate brought about by reform would be partly offset by increased trading taxes: the average effective rate will end up even higher than the 39 percent cited earlier.

#### F. Labor Market Issues

140. The general decline in average tax rates will tend to reduce the work effort of those currently employed, since the income effect of the increase in net income at initial levels of effort means that more leisure can now be afforded. Two further effects of the average tax rate reductions, however, are likely to have a more positive effect on employment: the increase in in-work income relative to that when out of the labor market is likely to increase participation rates; and by reducing the pre-tax wage increase needed to achieve any increase in net income, the average rate cuts may also tilt collective agreements towards outcomes more favorable to employment.

141. The reduction in marginal rates in itself generates substitution effects that point to an increased labor supply. The most significant cuts are at the lowest income levels—though this is somewhat over-stated by the comparison in Figure IV-1 above, since wage inflation will move taxpayers into higher incomes by 2005—and, especially, at the highest. The latter is certainly substantial—11 points relative to 1998—though how significant the work responses will be is a matter for conjecture: recent evidence suggests some caution in

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<sup>84</sup> For instance, the change in the federal tax will typically affect not only the level of the tax base but also its sensitivity to the trading tax, which will further affect the municipalities' decisions in setting trading taxes. Keen and Kotsogiannis (2000) analyze the response of provincial taxes to federal in fairly general circumstances.

<sup>85</sup> It should though be noted that provincial taxes are not deductible against federal in Canada, so that the effect in paragraph 137 is not at work there: the presence of this effect in Germany makes it more likely that the trading tax would fall in response to the cut in federal taxation.

anticipating very sizeable effects.<sup>86</sup> Clearly though the overall effect of reform is to change the rate structure in a way that is significantly less distortive of work decisions.

142. A notable feature of the reform package in relation to labor market performance—a contrast to recent policy developments in many other countries—is the relative modesty of targeted measures intended to improve the employment prospects of the lower-skilled. Others have sought to address very directly the concern that high taxes and social contributions may induce unemployment, although the question of whether high taxes do indeed contribute to unemployment remains contentious (it being clear that labor market institutions also matter in this context).<sup>87</sup> Crucial in this context is the relationship between net incomes in and out of work, and the question arises as to whether more direct action on this margin is appropriate in Germany.

143. One obvious way to tilt the balance in favor of work is by restricting the duration of entitlements to unemployment benefit, which is currently unlimited. Several measures are available to increase in-work net pay at low income levels:<sup>88</sup> reducing PIT and social contributions (as in the present reform package); subsidizing wages paid by employers (perhaps only on new hires, and perhaps only for a limited period); or making earnings-related payments direct to workers. There are potentially important differences in their administration, but conceptually they are essentially equivalent: all change the relationship between gross labor costs of employers and net incomes to workers so as to increase the latter for any given level of the former. The principal measure of this kind adopted in Germany is the exemption from PIT<sup>89</sup> and employee's social contributions for jobs paying less than DM 630 for less than 15 hours work per week. France has a more extensive scheme for rebating employer's contributions on wages up to 1.8 times the minimum wage. The US and UK have focussed instead on boosting take-home pay through the tax system, through earned income tax credit schemes.

144. While schemes of this type can in principle be self-financing, with the direct cost more than offset by unemployment benefit saved and additional taxes paid, in practice their cost-effectiveness is unclear. Thus Katz (1996) reaches a skeptical conclusion as to the effectiveness of wage subsidies unaccompanied by well-designed training measures, as for the UK do Bell, Blundell and van Reenen (1999). German policy in this area seems to betoken a similar skepticism of these non-traditional measures: experiments on the

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<sup>86</sup> Goolsbee (1999).

<sup>87</sup> If labor markets are competitive, for instance, then taxes may impact the level of employment but not induce unemployment; and in fully centralized labor markets employment effect should be internalized in the bargain. See Daveri and Tabellini (2000).

<sup>88</sup> These are analyzed in Chapter IV of the 1999 Selected Issues.

<sup>89</sup> For taxpayers with no other income.

employment effects of restructuring social contributions are underway, for example, but will not yield conclusions for several years. While this skepticism may prove well-placed, it is striking how much less attention to these issues has been paid in Germany than elsewhere.

### G. Conclusion

145. The reform package marks a radical and constructive shift in German tax policy. The direct impact on those aspects of behavior that are most readily quantified—and hence most widely studied—may prove modest: there may be little effect on levels of real investment (especially by domestic corporations) and on labor supply at all but the highest incomes. Clearly too there remains scope for further base-broadening,<sup>90</sup> and the system is still complex.<sup>91</sup> Tax reform is evidently work in progress: the weaknesses of the current trading tax, for example, are likely to become more pressing.

146. But there will clearly be very significant gains from the current package, albeit ones hard to quantify. Germany will be a more attractive place for international investors, the allocation of investment will be improved, the cut in the top rate will help retain and motivate skilled workers and entrepreneurs, and the reduction in average rates of personal taxation is likely to feed helpfully into participation decisions and employment bargaining. Above all, the reform signifies a willingness to remold tax policy, to match—and in important respects better—developments elsewhere.

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<sup>90</sup> Prime candidates for removal include exemptions for Sunday work, night work and commuting expenses, and the allowance for second homes bought for work purposes.

<sup>91</sup> In the concessions introduced for SMEs, for example, the PIT rate structure, the transition rules for movement to the half-dividend system and in the operation of the solidarity surcharge

### Derivation of Costs of Capital

147. The model underlying Box IV-1 and the arguments in the text is an essentially standard one of shareholder wealth-maximization under perfect certainty (developed by King (1974)). Arbitrage requires that the marginal shareholder be indifferent between: (a) selling the share at its current price  $V_t$  and investing the proceeds at the market interest rate  $R$  and (b) holding it, subscribing an amount  $V_t^N$  in new share issues, receiving dividend  $D$  and capital gain.<sup>92</sup> Allowing for a tax on interest income at the rate  $m$  and taxation of dividends in the hands of the shareholder at rate  $\theta$ , this requires that:

$$(1-m)RV_t = (1-\theta)D_t + \{V_{t+1} - V_t - V_t^N\} \quad (1)$$

148. The dividend tax parameter  $\theta$  reflects both the personal tax rate applied to dividends and any credit for underlying corporation tax, so that in general, in the notation of Box IV-1,  $1-\theta = (1-\mu m)/(1-c)$ . Solving equation (1) subject to the terminal condition  $(1+\rho)^{-T}V_T = 0$  gives the valuation:

$$V_t = \sum_{s=1}^{\infty} \{(1-\theta)D_{t+s} - V_{t+s}^N\} (1+\rho)^{-(1+s)} \quad (2)$$

where  $\rho = (1-m)R$  denotes the shareholder's discount rate. The final ingredient is the sources and uses condition, which implies that dividends are:

$$D_t = F(K_t) + B_{t+1} + V_t^N - (1+i)B_t - I_t - \tau_u \{F(K_t) - iB_t - J_t - D_t\} - \tau_d D_t \quad (3)$$

where  $F(K_s)$  denotes profit as a function of the real capital stock at time  $s$ ,  $K_s$ , while  $B_s$  denotes (one-period) debt issued at time  $s$  (interest being deductible),  $I_t$  denotes real investment, and  $J_s$  depreciation allowable at time  $s$ . The firm's objective is to maximize the share price in (2) subject to (3) and the equations of motion on the real capital stock and tax-written capital.

149. Suppose that depreciation for tax purposes is at declining balance at rate  $\delta^T$ , so that  $J_s = I_s - \delta^T J_s$ . It is then straightforward to show that the present value of depreciation allowances on a unit investment is  $\tau_u \delta^T / (\rho + \delta^T)$ , reducing the effective cost of acquiring an investment good from unity to  $p^* = (1 - (\tau_u \delta^T / (\rho + \delta^T)))$ . The firms' problem is then equivalent to one in which  $D_t$  in (2) is replaced by<sup>93</sup>

<sup>92</sup> Capital gains are assumed untaxed at personal level, as seems a reasonable simplification for Germany.

<sup>93</sup> And a further term added to the valuation expression that reflects investment decisions prior to the current period, and so is irrelevant to the optimization.

$$D_t^* = \left( \frac{1}{1 + \tau_d - \tau_u} \right) \{ (1 - \tau_u)F(K_t) + B_{t+1} + V_t^N - (1 + R(1 - \tau_u)B_t - p^*I_t) \} \quad (4)$$

and it is this form of the problem that is pursued here.

150. The costs of capital are derived by considering a one-period perturbation of the capital stock ( $\Delta I_t = -\Delta I_{t+1} = 1$ ) under various financing assumptions, leaving—under the simplifying assumption that capital does not depreciate—the situation of the firm at all other dates unaffected. At an optimum, the net effect of this perturbation on the share price must be zero, and from this the cost of capital can be inferred.

151. *Retention finance.* In this case the net impact on share prices reflects a cut in the current dividend sufficient to finance investment of  $p^*$  and an increase next period that reflects both the additional earnings and the reduction in next-period investment:

$$-\left( \frac{\theta}{1 + \tau_d + \tau_u} \right) p^* + \left( \frac{\theta}{1 + \tau_d + \tau_u} \right) \left( \frac{1}{1 + \rho} \right) \{ (1 - \tau_u)F'(K_{t+1}) + p^* \} = 0 \quad (5)$$

which, recalling the definition of  $\rho$ , reduces to

$$F'(K_{t+1}) = \frac{(1 - m)R}{(1 - \tau_u)} p^* \quad (6)$$

152. *Debt finance.* Financing the perturbation by adjusting only borrowing ( $\Delta B_t = -\Delta B_{t+1} = p^*$ ) gives a share price effect of

$$-\left( \frac{\theta}{1 + \tau_d + \tau_u} \right) \left( \frac{1}{1 + \rho} \right) \{ (1 - \tau_u)F'(K_{t+1}) - (1 + (1 - \tau_u)R)p^* + p^* \} = 0 \quad (7)$$

which reduces to the expression in Box IV-1.

153. *New equity.* With new equity finance ( $\Delta V_t^N = -\Delta V_{t+1}^N = p^*$ ), setting the net effect to zero means

$$-p^* + \left( \frac{\theta}{1 + \tau_d + \tau_u} \right) \left( \frac{1}{1 + \rho} \right) \{ (1 - \tau_u)F'(K_{t+1}) \} + \left( \frac{1}{1 + \rho} \right) p^* = 0 \quad (8)$$

which, from the definition of  $\theta$ , gives the result in Box IV-1.

**Response of the Trading Tax to an Increase in the Federal Tax**

154. Writing the base of the tax as a (decreasing) function  $B(\cdot)$  of the combined tax rate  $T + t(1-\bar{i}T)$ , where  $t$  and  $T$  denote respectively the local and federal tax, and  $\bar{i}$  the proportion of local taxes deductible against federal, suppose, by way of illustration, that the objective of the lower-level government is simply to maximize its revenue  $tB(T + t(1-\bar{i}T))$ . The necessary condition for this,

$$B + tB'(1 - \lambda T) = 0, \tag{9}$$

defines  $t$  as a function of  $T$ . By the implicit function theorem,  $dt/dT$  has the same sign as  $-\lambda B't + B'(1-\lambda t) + B''(1-\lambda T)(1-\lambda t)$  (the first and second terms corresponding to those discussed in paragraphs 137 and 138), which is in general ambiguous. In the special case in which  $B''=0$ , however, and with full deductibility, it is necessary and sufficient for  $dt/dT < 0$  that  $t$  be less than 0.5.

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## V. REVAMPING GERMANY'S PENSION SYSTEM<sup>94</sup>

### A. Introduction and Summary

155. **The government's pension reform proposal amounts to a sea change in public policy thinking.** The proposal tackles one of Germany's long-standing public policy taboos—it recognizes the need for systemic pension reform as opposed to piecemeal adjustments of the pay-as-you-go (PAYG) public pension pillar. As its main objective, the proposal seeks to diversify retirement income provision by building up a new private funded pillar and by downsizing the present large-scale PAYG pillar. Since Germany's present public pension system was set up in 1957,<sup>95</sup> previous (official) reform proposals had argued that moving to a pension system with a significant role for a private funded pillar would be neither appropriate nor feasible.

156. **The reform proposal also contains new thinking on the issue of linking pension contributions and benefits.** Pension contributions for the PAYG pillar are presently levied proportionally across the wage distribution (subject to an upper contribution ceiling) and benefits are linked tightly to previous contributions.<sup>96</sup> With Germany's unemployment largely concentrated among lower-skilled workers, the principle of charging proportional contributions across the wage distribution has come under increasing scrutiny.<sup>97</sup> The reform proposal suggests subsidizing contributions to the new private funded pillar by providing significant targeted fiscal incentives for lower-paid workers.

157. **This chapter reviews and evaluates the pension reform proposal.** Section B provides a cross-country perspective on the link between diversification of the pension system and key macroeconomic variables. Section C uses a stylized model to describe the evolution of the key parameters of the public pension system since 1957 and to develop long-term status quo projections (2000-50). Section D describes how the reform proposal affects the long-term status quo projections. The final Section E evaluates the reform proposal.

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<sup>94</sup> Prepared by Albert Jaeger.

<sup>95</sup> The historical roots of Germany's public pension system reach back to Bismarck's invalidity and old-age insurance law of 1889, which set up the first modern public pension scheme.

<sup>96</sup> A reduced pension contribution rate of 12 percent (compared to a statutory rate of 19.3 percent in 2000) applies to workers holding small-time jobs (less than 15 work hours per week) that earn less than DM 630 per month.

<sup>97</sup> Pilot projects are under way in four regions of Germany to study the labor market effects of fiscal subsidies at the lower end of the labor market.

158. **The chapter draws four main conclusions:**

- **The reform proposal is a major step in the right direction, namely toward a more diversified pension system.** More diversification will enhance the security and credibility of retirement income provision, particularly with population aging looming as a major stress test of the pension system's capacity to transfer resources from active to retired generations, without disruptive effects on social consensus or macroeconomic stability.
- **A more diversified pension system should improve Germany's macroeconomic performance** by enhancing incentives to work (relative to taking early retirement), allowing the authorities to keep across-the-board pension contribution rates at lower levels than under a no-reform scenario, and spurring more capital market driven financial intermediation. The reform's impact on Germany's saving rate is less clear-cut but is likely to be positive.
- **The proposed changes in the size of the public pension pillar are modest and would leave its dominance largely intact.** According to the authorities' relatively optimistic projections of longer-term pension finances, pension contribution rates would still have to rise from 19.3 percent at present to some 22 percent by 2030, only 1¾ percentage points lower than under a status quo baseline. This said, the reform would be vital for opening the door to a more balanced pension system in the future.
- **The projection horizon underlying Germany's public debate on pension reform is relatively short.** The reform proposal's planning horizon stops in 2030, covering less than one half of an average individual's average life expectancy.<sup>98</sup> The relatively short projection horizon may partly explain the reform's lack of "parametric ambition" as the full stress of population aging will likely be felt beyond 2030.

### **B. Germany's Pension System: A Cross-Country Perspective**

159. **The main objective of a pension system is to enable individuals to distribute consumption over their lifetimes, an objective that requires a transfer of real resources from active to retired generations.** There are two basic vehicles for organizing the real resource transfer from active to retired generations: government promises (PAYG schemes) and financial claims (funded schemes). These two alternative vehicles have different characteristics as regards rates of return, risks (relating to events that are insurable), uncertainties (relating to events that are not insurable), and scope for redistribution within

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<sup>98</sup> One possible rule of thumb for projecting the longer-term trends of pension finances—used for example by the *Social Security and Medicare Boards of Trustees* in the United States—is to base the projection horizon on average life expectancies (75 years in the case of the U.S.).

and across generations. Thus, as a general design principle, the objective of providing a robust retirement income system that also takes account of a population's preferences for redistribution would almost certainly call for a diversified (multipillar) pension system. At the same time, the choice of mix between PAYG and funded pillars has feedback effects on the macroeconomy, with the main channels reflecting labor market incentives, the rate of saving, and the structure of financial intermediation.

160. **Although the specific design of public pension pillars varies substantially across industrial countries, it is useful to group PAYG pillars under the three broad conceptual headings "large," "medium," and "small."** Large-sized public pension pillars are mandatory schemes with broad coverage and relatively high standard pension replacement rates in the range of 60-80 percent. They usually dominate a country's retirement income provision, leaving a relatively small role to a private funded pillar. The PAYG systems in many continental European countries would fall under this heading. Medium-sized PAYG schemes are usually also mandatory with wide coverage, but pension benefits provide the average wage earner a pension of only around 40 percent of average wages. Such schemes provide much more scope for diversification. The PAYG schemes in most Anglo-Saxon countries, but also in some continental European countries such as the Netherlands and Switzerland, would fall under this heading. Small-sized PAYG schemes are designed to provide mainly poverty relief to persons not adequately covered by private pension schemes. These schemes are often financed exclusively through budget transfers. Among industrial countries, Australia's pension scheme exemplifies this type of system.

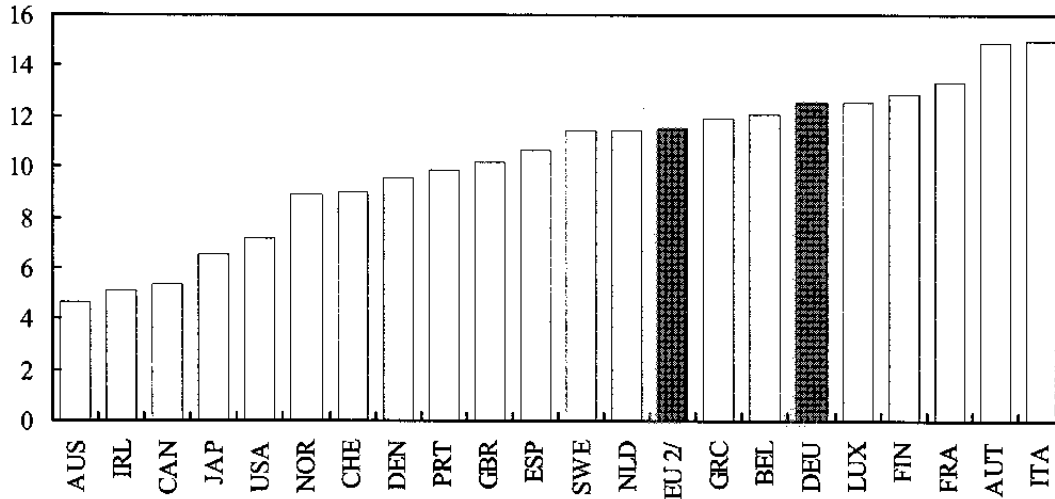
161. **Germany's system of retirement income provision is one of the least diversified among industrial countries.** Its PAYG pillar clearly fits into the "large" category: public pensions account for some 85 percent of total retirement incomes; a standard pension (*Eckrente*) replaces about 70 percent of average net earnings in the economy; and public pension schemes transfer close to 13 percent of GDP to retired persons, one of the highest public pension-GDP ratios among industrial countries (Figure V-1).

162. **Germany's small funded pension pillar comprises voluntary company pension plans.** Total assets of company pension plans amount to about 15 percent of GDP, of which about half are kept as book reserves on companies' balance sheets.<sup>99</sup> Consistent with Germany's large public pension scheme, the size of Germany's second pillar system is relatively modest by industrial country standards (Figure V-2).

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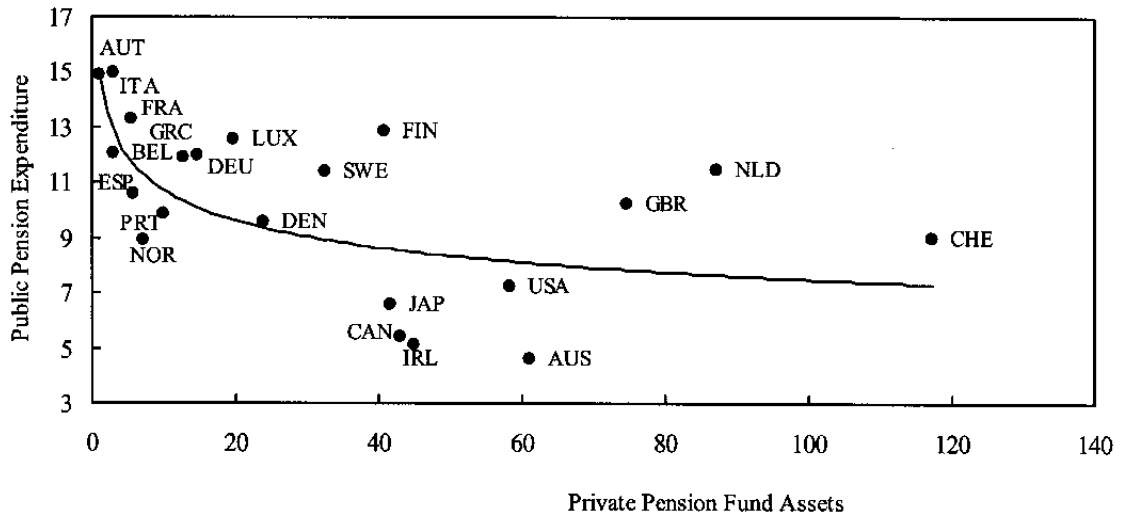
<sup>99</sup> Deutsche Bank (1996).

Figure V-1. Industrial Countries: Public Pension Expenditure  
(In percent of GDP) 1/



Source: World Bank.  
1/ Data refer to 1995.  
2/ Unweighted average.

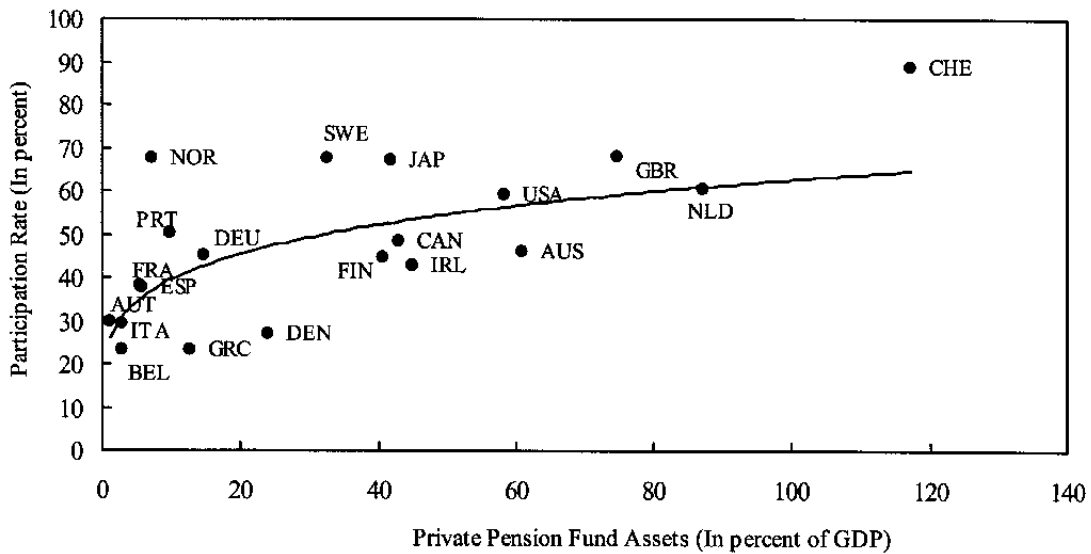
Figure V-2. Industrial Countries: Private Pension Fund Assets and Public Pension Expenditure (In percent of GDP) 1/



Source: World Bank.  
1/ Data for private pension fund assets refer to 1996.

163. In tandem with other labor market institutions including wage setting and the social safety net, Germany's public pension pillar—as part of the overall social insurance system—has been a key propagation mechanism for adverse labor market shocks. On the labor demand side, sharply rising social (pension) contributions add a further strain to an already badly functioning labor market. In particular, at the labor market's lower end, high social contribution rates effectively screen out lower-paid jobs above the DM 630 exemption limit for full contributions. On the labor supply side, early retirement serves as one of the escape valves for labor market stress. Indeed, Germany has one of the lower labor force participation rates for older workers among industrial countries. There is a markedly positive correlation between the size of a country's funded pension pillar and labor force participation of older workers (Figure V-3).

Figure V-3. Industrial Countries: Private Pension Fund Assets and Labor Force Participation Rate of 55-64 Year Old Persons

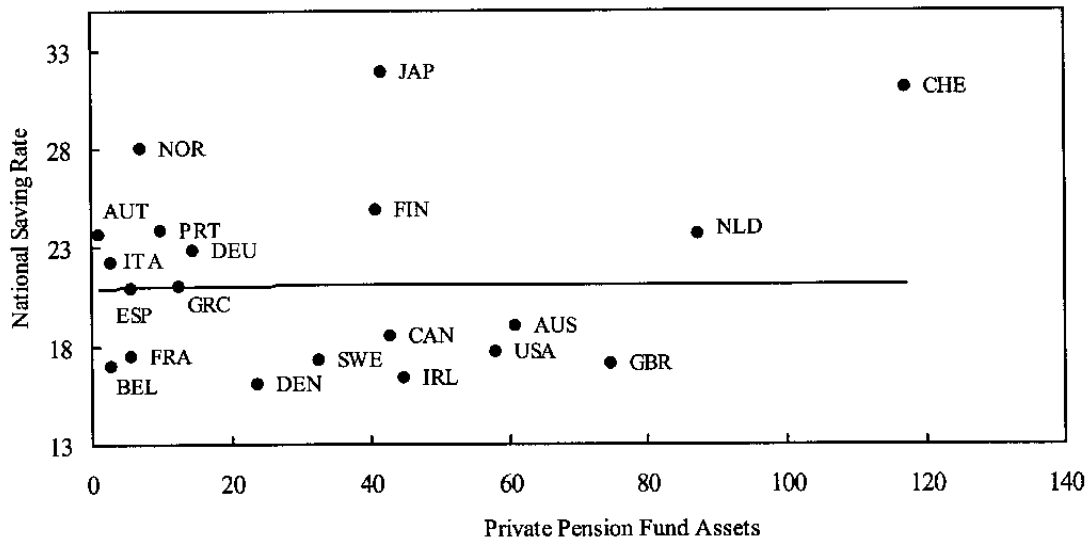


Sources: World Bank; and International Labor Office.

1/ Data for labor force participation rate refer to 1997.

164. **Across industrial countries, there is no clear positive or negative relationship between national saving rates and the size of second pillar systems (Figure V-4).** This confirms the largely agnostic stance in the literature on the link between saving and pension regimes (Mackenzie et.al. (1997)).

Figure V-4. Industrial Countries: Private Pension Fund Assets and Saving Rate (In percent of GDP) 1/



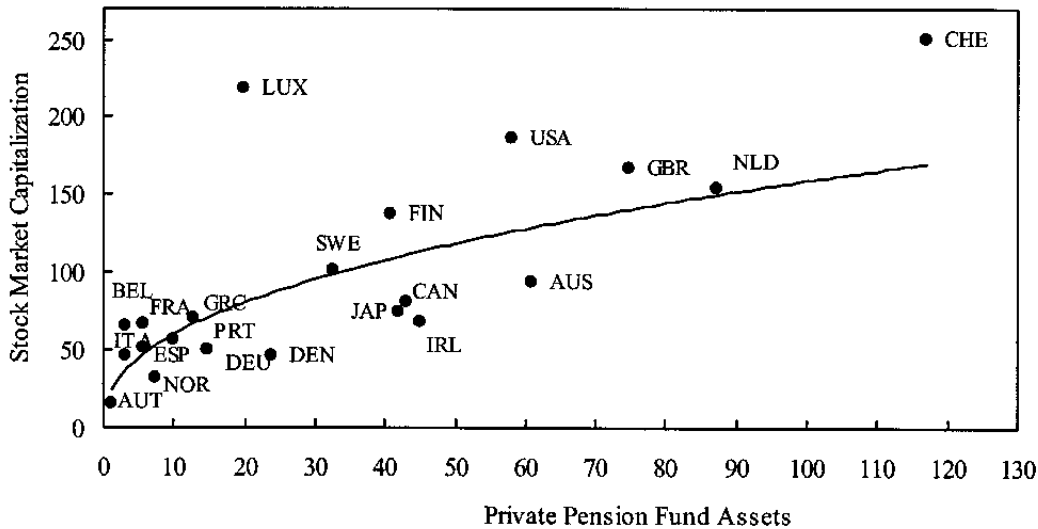
Source: World Bank; and OECD.

1/ Data for National saving rate refer to average during 1980-90.

165. **Building up a significant funded pension pillar could nudge Germany toward a more capital-market driven financial intermediation structure.** Lack of deep equity and venture capital markets has often been cited as a bottleneck for growth of businesses in Germany, including by the government's annual reports on the economy. The relatively small size of Germany's equity market reflects a number of factors, including the dominant role of sole proprietorships and private limited companies, the competitive climate for loan financing in the banking sector, and the somewhat conservative portfolio behavior of households.<sup>100</sup> At the same time, cross-country data on the size of private pension fund assets and stock market capitalization indicate that large funded second pillars are usually associated with relatively large equity markets (Figure V-5).

<sup>100</sup> See Bundesbank (1997).

Figure V-5. Industrial Countries: Private Pension Fund Assets and Stock Market Capitalization (In percent of GDP) 1/



Sources: World Bank; and DataStream.  
 1/ Data for stockmarket capitalization refer to 1999.

### C. PAYG Financing: Mechanics and Projections

166. The key parameters of Germany's public pension finances can be brought out by using an extended version of the PAYG financing constraint:<sup>101</sup>

$$\alpha = \beta(1-\alpha)(1-\tau)\psi(M/N), \quad (1)$$

where:

- $\alpha$ : is the equilibrium contribution rate based on the PAYG principle;
- $\beta$ : is the standard pension replacement rate, defined as the ratio between a pension based on 45 years of average contributions and the average net wage in the economy; the average net wage is defined as average gross wage in the economy minus employees' social insurance contributions and minus wage income taxes;

<sup>101</sup> The derivation of equation (1) is described in the appendix. This PAYG equation is strict in the sense that it ignores that Germany's main public pension fund—the wage and salary earners' fund—is required by law to maintain a small fluctuation reserve (equivalent to at least one month of pension expenditure).



$\tau$ : is budget transfer rate, defined as the share of total pension spending financed by budget transfers;

$\psi$ : is the pension system coverage ratio, defined as the ratio between two shares: the share of elderly persons eligible for a pension (as a percent of all elderly persons); and the share of contributors (as a percent of all persons of working age);

(M/N): is the elderly dependency ratio, i.e. the ratio between all elderly persons and all persons of working age.

167. **In this stylized set up, there are three basic PAYG policy levers.** The policy parameters that can be directly set are the two financing PAYG parameters—the level of the required contribution rate ( $\alpha$ ) and the budget transfer rate ( $\tau$ )—and the standard pension replacement rate ( $\beta$ ). The pension system coverage ratio ( $\psi$ ) can also be influenced by policy decisions, such as labor market policies that affect labor force participation and unemployment rates, pension regulations concerning retirement age, and immigration policies. At the same time, the pension system coverage ratio is also importantly influenced by private households' preferences, reflected for example in the trend of labor force participation. Finally, the evolution of the PAYG system can be affected by largely exogenous demographic trends, proxied by the elderly dependency ratio (M/N).

168. **The trends in PAYG parameters since 1957 indicate significant changes in policy parameters, but the contribution rate has risen inexorably (Figure V-6).** In the 1960s and 1970s, a rising dependency rate and reduced budget transfers offset some reduction in the coverage ratio, putting upward pressure on the contribution rate.<sup>102</sup> By 1999, the contribution rate had risen to 19.5 percent, compared to 14 percent in 1957.

169. **Two measures—which were part of the government's fiscal package that was adopted in 1999—will affect the basic PAYG parameters during 2000-03.** First, temporary indexation of pensions to CPI inflation instead of net wages during 2000-01. This measure is reflected in a decline of the standard replacement ratio to 68.5 percent by 2001 (Table V-1).<sup>103</sup> Second, the use of additional ecotax revenue, based on stepwise ecotax increases phased in during 2000-03, to finance the pension system, leading to an increase in the budget transfer rate by some 5 percentage points by 2003 (Table V-1).<sup>104</sup>

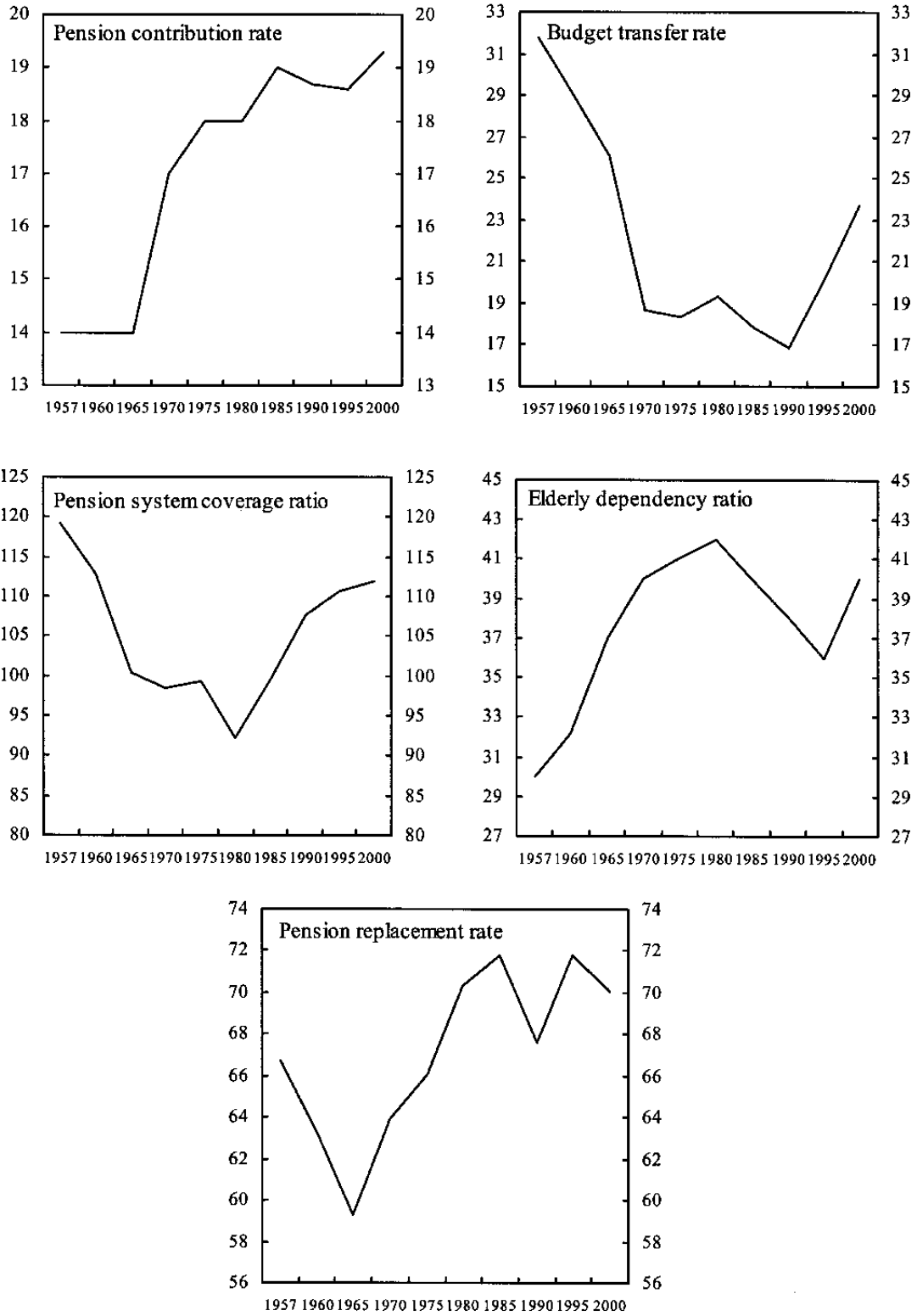
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<sup>102</sup> These calculations were based on available time series for contribution rate, budget transfer rate, standard pension replacement rate, and the elderly dependency ratio. The time series for the pension system coverage ratio was calculated using equation (1).

<sup>103</sup> The reform proposal would, however, suspend CPI indexation in 2001 and redefine the net wage concept; see next section for details.

<sup>104</sup> This baseline projection assumes that the demographic factor that would have reduced pensions in relation to increases in life expectancies—and which was suspended by the present government—will not be reinserted in the pension benefit formula beginning in 2002.

Figure V-6. Germany: Key Parameters of the Public Pension System, 1957-2000  
(In percent) 1/



Sources: Verband Deutscher Rentenversicherungstraeger; and Fund staff estimates.  
1/ For definition of parameters, see equation (1).

Table V-1. Germany: Public Pension Projections, 2000-50 1/

	1999	2000	2001	2003	2005	2010	2020	2030	2040	2050
	Est.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.	Proj.
<b>Benchmark status-quo projection</b>										
Contribution rate	19.5	19.3	19.0	19.4	19.6	20.3	23.1	28.9	29.8	30.8
Budget transfer rate	23.9	23.7	25.3	28.1	28.1	28.1	28.1	28.1	28.1	28.1
Pension replacement rate	70.1	70.0	68.5	69.5	67.7	69.1	69.1	69.1	69.1	69.1
Pension system coverage ratio	1.15	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12
<b>Reform proposal status-quo projection</b>										
Contribution rate	19.5	19.3	19.2	19.1	20.4	19.6	20.5	23.6	n.a.	n.a.
Budget transfer rate	23.9	23.7	25.3	28.1	28.1	28.1	28.1	28.1	n.a.	n.a.
Pension replacement rate	70.1	70.0	68.5	69.5	67.7	69.1	69.1	69.1	n.a.	n.a.
Pension system coverage ratio	1.15	1.12	1.13	1.10	1.17	1.07	0.96	0.85	n.a.	n.a.
<b>Effects of reform proposal 2/</b>										
Contribution rate		--	--	-0.3	-0.3	-0.4	-0.8	-1.7	n.a.	n.a.
Pension replacement rate 3/		--	--	--	--	--	-1.5	-4.0	n.a.	n.a.
<b>Memorandum item:</b>										
Elderly dependency ratio 4/	39.6	40.0	41.0	42.9	44.8	45.8	54.1	73.0	76.2	80.0

Sources: Ministry of Labor; and staff estimates and projections.

1/ Covering wage and salary earners' insurance fund.

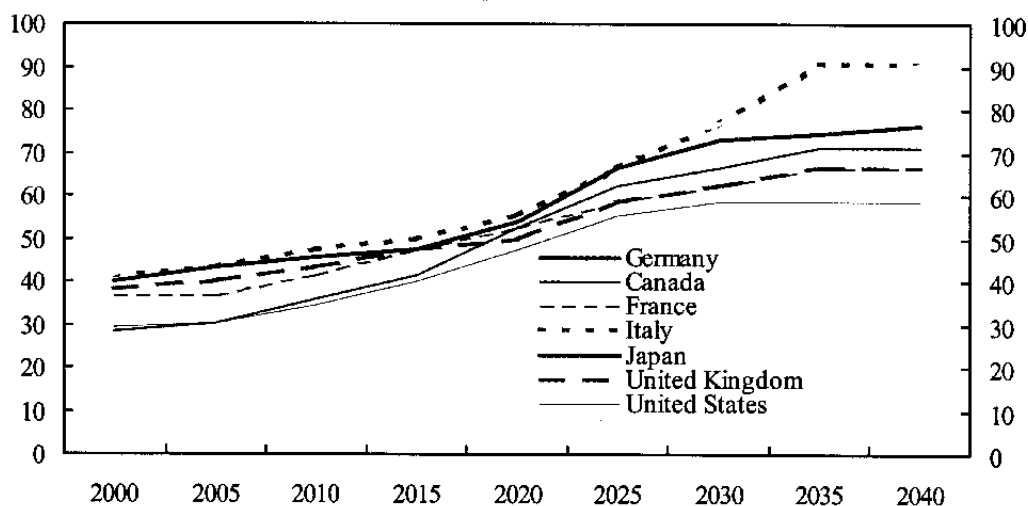
2/ Relative to reform proposal status-quo projection.

3/ Beginning in 2011, pension replacement rate of new pensioners (rounded figures).

4/ Defined as population aged 60 and over as a percent of population aged 20-59.

170. **Looking further ahead, rapid population aging looms as the main challenge for Germany's pension system.** Based on the Federal Statistical Office's latest population forecast (lower immigration variant), the elderly dependency ratio—population aged 60 and over as a percent of population aged 20-59—is projected to double over the next fifty years from about 40 percent to 80 percent (Table V-1). Moreover, compared to other main industrial countries, Germany's projected aging trend is one of the less favorable ones (Figure V-7).

Figure V-7. Main Industrial Countries: Elderly Dependency Ratios, 2000-2040  
(In percent) 1/



Sources: World Bank; and Federal Statistical Office.

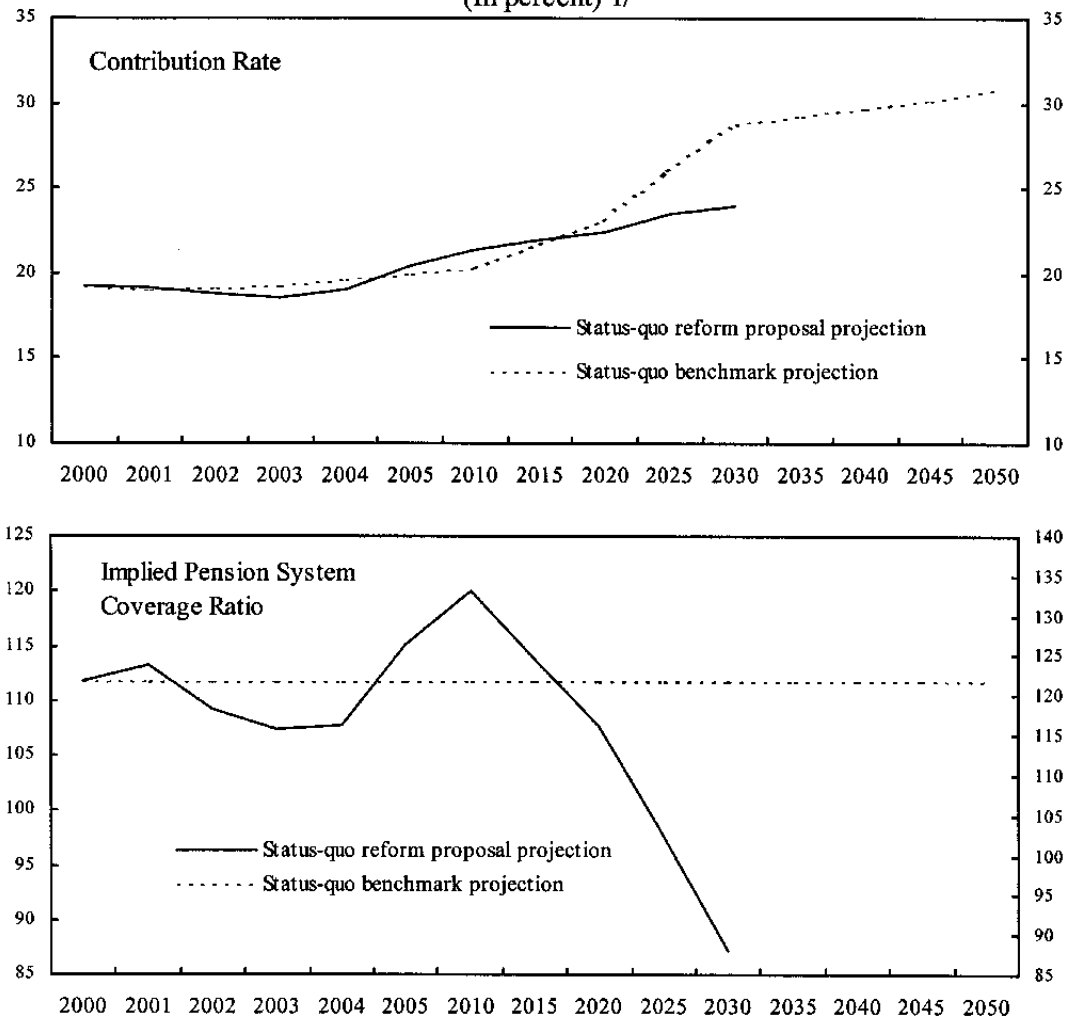
1/Elderly dependency ratio is a ratio of population over 60 years old to population aged 20-59.

171. **The impact of population aging on Germany's PAYG finances is illustrated by a staff benchmark projection that assumes a constant pension coverage ratio (Table V-1, Figure V-8).** The assumption of a constant pension coverage ratio is roughly equivalent to assuming constant labor force participation, unemployment, and pension eligibility rates. Given the considerable uncertainties attached to projections of some of these variables, the assumption of a constant pension system coverage ratio is often employed as a natural benchmark for comparing long-run pension projections across countries (see Chand and Jaeger (1996)). In this setup, and with budget transfer and pension replacement rates also kept roughly constant, population aging feeds through to the contribution rate, reflected in the benchmark projection by a sharp rise of the contribution rate to some 30 percent by 2030.

172. **Over the next 20 years, the reform proposal's status quo projection is similar to the benchmark projection, but afterwards it shows a markedly more favorable trend for the pension coverage ratio (Figure V-8).** The reform proposal projection assumes that during the 2020s the contribution rate is kept in check by a marked decline in the pension coverage ratio. Longer-term pension projections of this type are surrounded by large margins

of uncertainty, but these uncertainties are likely to be symmetric around the benchmark scenario. Germany's labor market performance could conceivably improve markedly in the longer term, particularly under a reform-driven labor market strategy. At the same time, labor market developments could also be less favorable than assumed in the benchmark scenario, particularly if Germany's growth cycle history during the last three decades would be extrapolated to the future (see Chapter I).

Figure V-8. Germany: Status-Quo Projections of Key Parameters of Public Pension System, 2000-2050  
(In percent) 1/



Sources: Ministry of Labor (2000); and staff estimates.

1/ For definition of parameters, see equation (1).

#### D. Reform Proposal

173. **The reform, which envisages a complex set of changes, includes five particularly important measures:**

- **Beginning in 2001, a private voluntary pension pillar is set up.** The contribution rate to this pillar is assumed to increase linearly from initially 0.5 percent of gross wages to a final level of 4 percent in 2008. Assuming full coverage of all PAYG contributors and following an introductory phase (until 2008), the dynamics of a stylized reserve fund  $A(t)$  would follow:

$$A(t) = [1 + r(t)]A(t-1) + \lambda(WN^*) - \mu(t)(WM^{**}), \quad (2)$$

where  $r(t)$  is the nominal rate of return on assets,  $\lambda$  is the contribution rate (4 percent from 2008 onward),  $W$  is the gross wage per worker,  $N^*$  the number of workers,  $M^{**}$  is the number of persons eligible for a funded pension (assuming full coverage,  $M^{**}$  should eventually converge to the total number of pensioners  $M^*$ ), and  $\mu(t)$  is the average pension replacement rate eligible persons receive from the fund, which will vary over time, across persons.

- **Private pension savings will be encouraged through fiscal incentives.** First, contributions to the private pillar will be deductible from income tax. However, if pension payouts are subject to income tax, this would only amount to deferring payment of tax until retirement. Second, there will be significant direct fiscal subsidies for low- to medium-income earners. For example, a single-earner income household with two children would, by 2008, receive an annual subsidy of DM 1,320 (unrelated to actual earnings), subject, however, to the condition that at least 1 percent of gross wage earnings is contributed to the private pension fund.
- **The definition of net wages used for indexing public pensions will be adjusted.** The contributions to the new pillar will be taken into account in the calculation of net wages for the first pillar. This will reduce the amount of pensions paid out in the first pillar system. In effect,  $(1-\alpha)$  on the right hand side of equation (1) would be replaced by  $(1-\alpha-\lambda)$ .
- **The standard pension replacement rate for new pensioners will be reduced over time.** Starting in 2010, the replacement rate will be cut by 0.3 percentage points each year until 2030, so that by 2030 the standard replacement rate for a new pensioner would amount to about 64 percent (Figure V-9).
- **A number of private saving schemes will qualify as a private pension plan.** They will include insurances, mutual funds, and bank saving plans. Providers will, however, have to guarantee the paid-in principal. Wage earners will have the right to participate in company pension schemes and claim the above described fiscal incentives.

174. **The impact of the proposal on the projected contribution rate is modest (Table V-1).** The contribution rate is lowered relative to the status-quo projection, but only by a total 1¼ percentage points by 2030 (Figure V-10). This mainly reflects the limited projected decline in the standard replacement rate. Overall, the parametric changes in contribution and replacement rates are modest, both against the historical trends in these parameters shown in Figure V-6 and against the uncertainties attached to the longer-term projections.

Figure V-9. Germany: Projected PAYG Replacement Rates  
2000-2030 1/

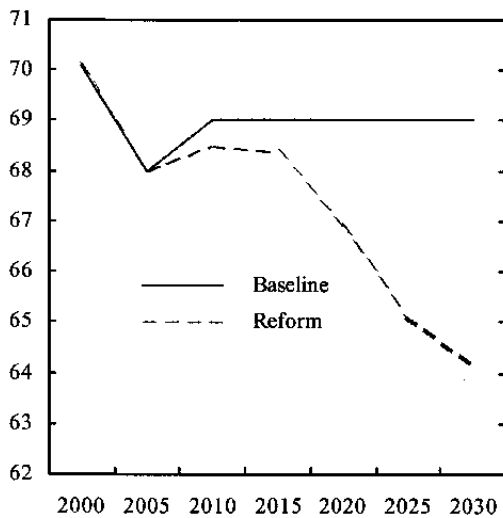
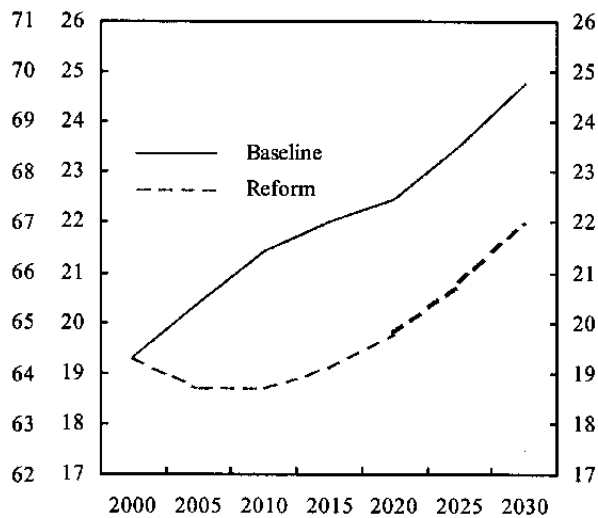


Figure V-10. Germany: Projected PAYG Contribution Rates  
2000-2030 2/



Sources: Ministry of Labor; and staff calculations.

1/ Standard pension (Eckrente) replacement rate (as percent of average net wage earnings in the economy); from 2011 onwards for new pensioners only.

2/ Required pension contribution rate to finance pension spending (in percent).

175. **The funded pillar is likely to be sizeable.** Rewriting the reserve fund accumulation equation in percent of GDP gives:

$$a(t) \approx [r(t)-g(t)]a(t-1) + \lambda s - p(t), \quad (3)$$

where  $g(t)$  is nominal GDP growth,  $s$  is the share of gross wages subject to contributions as a percent of GDP, and  $p(t)$  is spending on second-pillar pensions as a percent of GDP. Assuming a steady state nominal rate of return of 5 percent and a nominal GDP growth rate of 3 percent, a second pillar could afford to pay out 3 percent of GDP per year if it accumulated some 50 percent of GDP (in steady state). This second pillar size would be sufficient to top up the replacement rate from the first pillar by about 15 percentage points, to an average of some 80 percent.

176. **The cost of fiscal incentives is estimated at some ½ percent of GDP by 2008.** At the same time, part of this cost could be clawed back later if pensions from the second pillar are subject to income tax. Moreover, the federal budget would benefit from the reduced amounts of transfers required under a reform scenario.

#### **E. Assessment of Reform Proposal**

177. **An unreformed pension system would be economically inefficient and risky for Germany's retirement security in view of the looming aging population challenge.** By putting systemic pension reform at the top of the policy agenda, the proposal marks a watershed in public policy thinking. It breaks with past cycles of periodic parametric reform attempts that threatened to undermine the longer-term credibility of the security of retirement income provision.

178. **On efficiency grounds, the reform should improve the functioning of the labor market.** It diminishes the need for further hikes in the across-the-board level of social contribution rates, which have harmed past labor market performance. The reform could also moderate incentives for early retirement, as the safety valve function of the present PAYG system is reduced. The use of targeted fiscal incentives to reduce the burden of contributions on lower-paid workers in the funded pillar recognizes the particular employment difficulties at the lower end of the labor market. It is noteworthy, however, that multipillar pension systems usually use the public pillar for redistributive purposes, while the private funded pillar is reserved for the insurance and saving objectives of the overall pension system.

179. **The reform's impact on national saving is less clear but could be positive.** The empirical literature is largely agnostic on the relationship between different designs of pension systems and saving. In the case of Germany's reform proposal, participation in the new second pillar system is voluntary and additional savings put into the second pillar could simply substitute for other forms of private savings. On the other hand, there are significant fiscal incentives for participation in the second pillar and younger generations are likely to be more subject to liquidity constraints, factors that could boost aggregate saving through a "forced saving" effect.

180. **The reform's impact on capital markets could boost equity culture in Germany.** Across countries, there is a clear positive correlation between the size of private funded pension pillars and stock market capitalization. With the size of the accumulated reserve fund likely to exceed 50 percent of GDP, this should provide a boost to financial intermediation through capital markets.

181. **The future trend of pension reforms in the EU will likely be influenced by the German proposals.** Given Germany's size and leadership role in the EU, the decision to move to a more diversified multipillar pension structure could act as a catalyst in the EU pension reform debate, as some convergence of the present social insurance systems in the EU is likely to take place over time.



182. **But the reform proposal also raises three issues:**

- With regard to the **relative size of pension pillars**, the planned downsizing of the public pillar appears to be modest. The envisaged size of the first pillar would still be large-sized, clearly so against the benchmark of countries with more diversified multipillar systems in continental Europe such as the Netherlands and Switzerland (see Figure V-2).
- The **planning horizon** featured in Germany's pension reform debate (some 30 years) is too short. The present planning covers less than one half of an average individual's average life expectancy. A longer planning horizon would be needed to bring out the full burden that population aging will put on Germany's pension system in the longer run.
- International experience with multipillar systems—Australia being a noteworthy example—suggests that the **second funded pillar is better designed as mandatory** to avoid free rider problems. In Germany, the first-pillar pension insurance scheme is presently supplemented by means-tested social assistance and housing benefits, which, in the case of a single-person household, cumulatively replace about 40 percent of the average net wage in the economy. To the extent that the first pillar is downsized, contributions to the second pillar could amount to a straight tax as the combined pensions (first and second pillar) may just reach the social assistance minimum, thus posing a possible free rider problem.

**PAYG Algebra for Germany's Public Pension System<sup>105</sup>**

183. The basic budget constraint of a PAYG public pension system is given by:

$$N^*(\alpha W) = M^*(\beta W) \quad \text{or} \quad \alpha = \beta(M^*/N^*), \quad (\text{A.1})$$

where  $N^*$  denotes the number of contributors,  $M^*$  the number of pensioners,  $\alpha$  the contribution rate,  $\beta$  the pension replacement rate, and  $W$  denotes average gross earnings. The ratio  $(M^*/N^*)$  is the system dependency ratio, i.e. the number of pensioners per contributor. To further approximate the institutional details of the main German pension fund—the wage and salary earners' fund—two important characteristics need to be added:

- Pensions are indexed to net wages. This can be modeled by replacing gross wage earnings ( $W$ ) by net earnings  $((1-\alpha)W)$ . This represents a rough approximation as in practice net wages are defined as gross wages minus employees' social insurance contributions and minus wage income taxes.
- And a (fixed portion) of pension spending ( $\tau$ ) is financed by budget transfers. Inserting these characteristics in (1) gives:

$$\alpha = \beta(1-\alpha)(1-\tau)(M^*/N^*) \quad (\text{A.2})$$

184. The link between public pension finances and population aging can be brought out by assuming that the number of pensioners is proportional to the number of persons aged 60-and-over:  $M^* = \delta M$ , while the number of contributors is proportional to the number of persons at working age:  $N^* = \eta N$ . Thus,  $(M/N)$  is the elderly dependency ratio, a variable that depends only on demographic developments. Moreover, if the symbol  $\psi$  is used to stand in for the ratio  $(\delta/\eta)$ , termed the pension system's "coverage ratio," the equation describing the evolution of the PAYG system's equilibrium pension contribution rate is:

$$\alpha = \beta(1-\alpha)(1-\tau)\psi(M/N), \quad (\text{A.3})$$

which corresponds to equation (1) in the main text.

185. Equation (A.3) is mute on the issue of income taxes on pensions. This reflects an idiosyncrasy of Germany's income tax system: the income tax code assumes that only about 25 percent of public pension benefits represent previously untaxed income, an assumption

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<sup>105</sup> This follows the analytical framework used in Chand and Jaeger (2000) to discuss policy options for reforming PAYG pension systems.

that amounts in practice to a full income tax exemption. This assumption is, however, difficult to rationalize. It is based on the presumptions that: (i) all pension contributions were subject to income tax (although only employees' pension contributions are subject to tax) and that public pension benefits include a tax-free interest income component of about 25 percent.

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