August 2003
IMF Country Report No. 03/240

Kingdom of the Netherlands—Netherlands: Selected Issues

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International Monetary Fund
Washington, D.C.

INTERNATIONAL MONETARY FUND

KINGDOM OF THE NETHERLANDS—NETHERLANDS

Selected Issues

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Approved by European I Department

July 9, 2003

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A. Introduction

1. Employers compensate their workers through wages and a variety of non-wage benefits, including—importantly—retirement pensions. In the Netherlands, company pension plans (the so-called "second pillar" pensions) are a substantial fraction of retirement income. In defined benefit plans, which prevail in the Netherlands, the company guarantees a payout to the pensioner, regardless of the future value of capitalized pension contributions. This contingent liability is financed upfront by contributing to a pension fund. As in other European countries, Dutch pension funds have accumulated substantial assets over the years (see table) and have become large players in international capital markets. With population aging and less reliance on pay-as-you-go public pensions in many developed countries, pension fund assets are expected to increase even further in the future.[2]

Table I-1. Pension Fund Assets as a Percent of GDP in Selected European Countries (2000)

	(In percent)
France	5
Spain	5
Portugal	12
Belgium	14
Germany	15
Italy	23
Norway	34
Finland	50
Ireland	54
United Kingdom	81
Sweden	96
Netherlands	110
Denmark	115
Switzerland	128

Source: UBS Asset Management.

[1] Prepared by Enrica Detragiache.

[2] Van Ewijk and others (2000) estimate that pension fund assets will reach 195 percent of GDP in the Netherlands by 2040.

2. In recent years, Dutch pension funds have increasingly invested in risky assets, particularly equity, to take advantage of higher long-run expected returns. While markets boomed in the 1990s, this strategy yielded high returns, the financial position of the funds improved, and funds were able to lower contributions by giving discounts to their members. With sharp declines in stock markets worldwide since 2000, though, the situation reversed, and coverage ratios eroded.[3] In defined benefit plans the employer must cover the shortfalls, so companies must raise contributions or renegotiate pension plans. The former means additional pressure on balance sheets already hurt by asset price declines and the recession. Problems are particularly acute in the Netherlands, but also in the United States, the United Kingdom, and Japan (IMF, 2003).

3. In the Netherlands, the macroeconomic consequences of the need to recapitalize second pillar pension funds have been widely debated in recent months, especially as the economy is now in the third year of a cyclical downturn and unemployment, though low by international standards, is on the rise. Will the need to cover pension fund shortfalls lead to higher contributions? Will this translate into higher labor costs and put further pressure on employment? Does this mechanism exacerbate the business cycle? Should regulators exercise forbearance and allow coverage ratios to fall below required minima to reduce pro-cyclicality?

4. The answers to these questions are not obvious. Pension benefits, just like any other form of worker compensation, are undoubtedly labor costs and thus, all else equal, increasing pension benefits lowers labor demand. The current problems at pension funds, however, do not arise from an increase in pensions benefits, but from losses on the assets set aside to finance pension obligations already incurred. These losses, therefore, are sunk costs, and, as such, should not enter the calculation of the marginal cost of labor nor affect labor demand. Similarly, it seems intuitively wrong to treat increases in pension fund contributions to meet regulatory coverage ratios as higher labor costs, unless promised pension benefits also become more generous. Yet regulation, forcing firms to finance their pension liabilities in a particular way, must have some economic cost.

5. To shed some light in these issues, this chapter develops a theoretical model of a firm with a pension plan. The model is used to study the effects of pension fund solvency regulation and negative shocks to pension fund assets on the employment and investment decision of the firm. As it turns out, in the case of large firms with individual pension plans losses on accrued liabilities do not affect the marginal cost of labor, because these losses are correctly recognized as sunk costs, unaffected by the current labor market behavior of the firm. Labor demand, however, is generally not first best, because the regulatory requirement that future pension liabilities be funded upfront introduces a distortion. The larger the difference between the internal rate of return of the firm and the expected future return on

[3] The coverage ratio is the ratio between the assets of the fund and the present discounted value of its liabilities.

pension fund assets, the lower is labor demand. In the case of a small firm belonging to an industry-wide pension plan, on the other hand, losses on pension fund asset holdings that cause an increase in contributions indeed raise labor costs and lower labor demand, because these firms fail to internalize the budget constraint of the industry-wide fund.

6. These results suggest that empirical models that treat increases in pension fund contributions to cover losses on pre-existing obligations as increases in the marginal cost of labor may overstate the impact of the "contribution shock" on growth and employment, and thus concerns about the pro-cyclicality of defined-benefit pension schemes.

7. The Chapter is organized as follows: after a brief overview of the Dutch pension system and the debate over the "contribution shock" in the Netherlands, a benchmark model in which there is no requirement to pre-fund pension obligations is presented (Section C); the case of a company with an individual funded pension plan is in Section D; and the model of a small firm belonging to an industry-wide pension fund is in Section E. A brief discussion of the case of imperfect capital and labor markets follows (Section F). Section G concludes.

B. Second Pillar Pensions in the Netherlands[4]

The main features of the system

8. In the Netherlands, although employers are not obliged to offer pensions, over 90 percent of workers are covered by occupational pension plans. This is partly the result of the administrative extension of branch-level collective wage agreement between the unions and employers' organizations to all industry members.[5] Second pillar pensions account for about 40 percent of retirement income. First pillar, public pensions account for another 40 percent, while the remaining 20 percent consists of third pillar pensions (Carey, 2002).

9. Pension funds are legal entities separate from the companies that sponsor them and are often organized at the industry level. Individual private-sector company funds represent around 30 percent of the industry, industry-wide funds account for 50 percent, while the remaining 20 percent consists of the pension fund of civil servants and health care workers. This distinction is important for the issues discussed in this Chapter, because it turns out that the employment effects of higher pension contributions differ between single-employer and sectoral funds. Representatives of employers, workers, and pensioners sit on the board of directors.

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[4] For a comprehensive overview of the Dutch pension system, see Kremers (2002).

[5] See Chapter II for a discussion of collective bargaining in the Netherlands. While this structure allows for risk-sharing within the industry, it virtually eliminates any potential competition among funds (van Ewijk and van de Ven, 2003).

10. Another important feature of Dutch second pillar pensions is that 97 percent of the plans are of the defined benefit type.[6] For a majority of workers (54.5 percent), benefits are based on the wage in the final year of work, while for 31.8 percent they are based on average pay. Most workers have a replacement rate of 60-70 percent of gross wage, including what the worker receives from the first pillar, the government-sponsored universal pension. The latter is paid after the age of 65. In terms of net wage, though, the replacement rate is considerably higher, as taxation is lighter in retirement. To achieve the full pension, workers must contribute for 40 years. Pension payments are usually indexed to wages or, less often, to prices, but indexation is typically conditional on the financial health of the fund. Over the years, however, Dutch workers have come to expect full pension indexation. Pension contributions are on average 11 percent of wages, with employers typically paying two-thirds of the total.

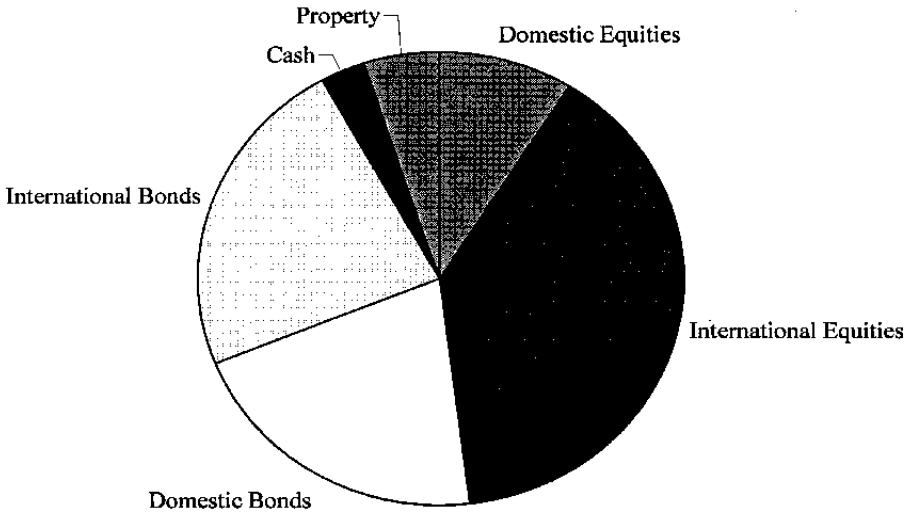
11. Dutch employers often offer an early retirement benefit financed in a pay-as-you-go fashion. These schemes have been quite popular, as the pensioner bear hardly any financial penalty from retiring early. With the goal of raising labor market participation of older workers, these schemes are now being phased out in favor of more actuarially fair ones, in which pension benefits are reduced for workers who retire early (Carey, 2002).

Financial losses on pension fund assets and their macroeconomic consequences

12. In the Netherlands, as in other countries, during the 1990s pension funds have increasingly changed their investment strategy to take advantage of booming stock markets. At present, stocks represent almost a half of the asset portfolio (see Figure below). After years of double-digit gains, returns turned negative in 2000, and have not recovered since. As a result, the average coverage ratio declined from a peak of over 130 percent in 1999 to around 105 percent in 2002, and a number of individual funds now fall short of 100 percent coverage (van Ewijk and van de Ven, 2003).

[6] By way of comparison, in the United States about half of employees with a pension plan have a defined benefit scheme. Some of these workers also have defined contribution plans as supplementary insurance (Hinz, 2000). In the United Kingdom, about 85 percent of pension plans are of a defined benefit type (Association of British Insurers, 2000). In both countries the trend has been toward defined contribution plans. For a theory of the costs and benefits of different types of company pension plans, see Bodie (1990).

Figure I-1. Asset Allocation of Dutch Pension Funds, End-2000



Source: UBS Asset Management.

13. To address the problem, funds began to increase contributions and consider limiting indexation. Concerned that this process was not sufficiently fast, the Dutch insurance and pension supervisor (PVK) clarified and strengthened coverage requirements in September 2002. Coverage must remain at or above 105 percent and additional buffers must be held to ensure solvency in the case of a 40 percent decline in equity values relative to the peak in the previous 48 months, or a 10 percent decline from the lowest value in the last 12 months. A similar requirement applies to declines in bond values. To avoid abrupt increases in contributions, the PVK has given funds eight years to reach full compliance with the regulation on additional buffers. Nonetheless, employers reacted negatively to the new measures, pointing out that they would have strong adverse effects on corporate balance sheets and labor costs, resulting in a further worsening of the competitiveness of Dutch producers.

14. More generally, the macroeconomic and fiscal impact of pension fund shortfalls has featured prominently in recent discussions on the Dutch economy. A serious concern is that pension funding costs will aggravate the current economic downturn and delay recovery. The Dutch central bank recently estimated that higher employer pension contributions would increase unit labor costs in the private sector by 0.8 percentage points in both 2003 and 2004, after having increased them by 0.7 percentage points in 2002 (Nederlandsche Bank, 2002). The bank also stressed that higher employee contributions would reduce disposable income, resulting in lower consumption.

15. The CPB has pointed out that higher pension contributions would lower profits and disposable income and increase labor costs, resulting in lower economic growth. The CPB estimates that a coverage ratio of around 130 percent would be necessary to comply with the PVK regulation buffers. To reach such coverage rate in the absence of pension reform, average contributions would have to rise from the current 11 percent of gross wages to 15 percent. This would result in higher labor costs, lower employment, and lower GDP (see table). In addition, since contributions are tax exempt and, furthermore, the government needs to fund shortfalls in its own pension fund, tax revenues will be lower and fiscal outlays higher, resulting in a deterioration of the fiscal balance.

Table I-2. Economic Effects of the Pension Shock, 2002–07

	Cumulative change in percentage points
Labor costs (private sector)	1.3
Employment (private sector)	-0.8
GDP	-1.2
General government balance	-1.3

Source: van Ewijk and van der Ven, 2003.

16. The CPB has also raised the issue of limiting equity investment by pension funds. With the current asset structure, contributions rise in periods of falling asset prices, which often coincide with economic downturns, thereby exacerbating the cycle. This also makes the tax and contribution wedge highly variable, contrary to principles of optimal taxation.

17. The next section explores the connection between pension fund losses and labor demand in a basic model of a competitive firm facing perfect capital and labor markets.

C. The Benchmark Model

18. In the benchmark model the firm pays a portion of the worker salary as deferred compensation, i.e. after the worker retires. The firm can precommit to pay the pension even if it later goes bankrupt. Hence, with full information and rationality, there is no reason to impose regulatory constraints on funding. As in conventional models, the firm is assumed to be perfectly competitive in product and factor markets. Also, implicit in this specification is that the firm has full access to capital markets and there are no information imperfections or other distortions, so that the production decisions of the firm are separate from the financial decisions. [7]

[7] The implications of imperfect capital markets are discussed in Section E.

19. The production technology is represented by a standard neoclassical production function $f(k_t, l_t)$, where k_t is capital (assumed, for simplicity, to depreciate fully after one period) and l_t is labor. The firm maximizes the present discounted value of future profits by choosing capital and labor inputs. The rental rate on capital is r_t, and the rate at which firms discount future profits is $\beta < 1$. Employees receive a wage w_t when they work and a pension λw_t when they retire, so that λ is the replacement ratio. For simplicity, it is assumed that each worker spends one year in employment and one year in retirement, so that the entire labor force turns over each period.[8] The profit maximization problem is

$$\max_{\{k_t\}_{t=1}^{\infty},\{l_t\}_{t=1}^{\infty}} \sum_{t=1}^{\infty} \beta^t [f(k_t, l_t) - r_t k_t - w_t l_t - \lambda w_{t-1} l_{t-1}]$$

Let $V(l_{t-1})$ be the maximum profit at period t. Then, at any t, this value function must satisfy the following Bellman equation

$$V(l_{t-1}) = \max_{k_t, l_t} f(k_t, l_t) - r_t k_t - w_t l_t - \lambda w_{t-1} l_{t-1} + \beta V(l_t).$$

The necessary first order conditions are

$$\partial f / \partial l_t = w_t + \beta \frac{\partial V(l_t)}{\partial l_t} = w_t (1 + \beta\lambda)$$

$$\partial f / \partial k_t = r_t.$$

Thus, the marginal cost of labor is simply the current wage plus the (discounted) deferred compensation.

Result 1. With no regulation requiring pre-funding of pensions, labor demand depends on the wage rate and the discounted value of the benefits promised to workers.

D. Funded Company Pension Plan

20. Suppose now that the company cannot pre-commit to pay out pensions in case of bankruptcy. To protect pensioners, the regulator mandates that pension liabilities be funded

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[8] This model can be easily adapted to the case of uncertain survival. If h is the probability of surviving in the second period, then the expected pension is $h \lambda w_t$. Other factors that make the pension payment uncertain in practice, such as the fact that benefits depend on the wage in the last years before retirement rather than the current wage, that they may be only partially indexed to inflation, or may be indexed to wage developments over the retirement period would be more complex to integrate into the model.

upfront.[9] In particular, in the Netherlands funds are autonomous and they are financed by contributions from the firm.[10] The fund must abide by a regulatory solvency requirement stating that the market value of its assets A_t must be at least x times the present discounted value of its liabilities. The parameter x is the coverage ratio, thus x=1 correspond to a fully funded plan. The present discounted value of liabilities is computed using the actuarial discount rate q <1.[11] Each period the pension fund administrators set the level of contributions c_t to meet the solvency requirement.[12] The fund resources are invested in a risky asset paying a gross return ρ_t every year. ρ_t is the realization of a first-order Markov stochastic process, such that $\rho_t \in P$ and $\Pr(\rho_t \leq \rho \mid \rho_{t-1} = \rho') = G(\rho, \rho')$. Under these assumptions, the present discounted value of the firm's profits is

$$E_o \sum_{t=0}^{\infty} \beta^t [f(k_t, l_t) - r_t k_t - (w_t + c_t) l_t] \tag{1}$$

21. The dynamic of the pension fund assets is given by the following equation

$$A_{t+1} = A_t \rho_t + c_t l_t - \lambda w_{t-1} l_{t-1}, \tag{2}$$

while the solvency constraint for the pension fund is

$$A_{t+1} = xq\lambda w_t l_t \forall \rho_t \in P and \forall t.$$

Combining those two equations yields

$$c_t l_t = xq\lambda w_t l_t + \lambda w_{t-1} l_{t-1}(1 - xq\rho_t). \tag{3}$$

22. Contributions are equal to the amount needed to provision against new pension liabilities plus the difference between what is paid to pensioners in the current period and the

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[9] The funding requirement may be enforced by making it a necessary condition for the pension plan to receive favorable tax treatment.

[10] Workers also contribute, but this is immaterial to the extent that the firm is a price-taker in the labor market. See Section E below for a discussion of imperfect labor markets.

[11] In the Netherlands, the regulator mandates that the actuarial interest rate must not exceed 4 percent, hence q cannot be less that 0.96.

[12] In practice, Dutch pension funds are prohibited by their statutes from raising contributions more than a given amount in each year, so that the return to the regulatory level of coverage may be gradual over time. Also, as discussed in section E, the value of the funds has exceeded the regulatory minimum, but this possibility is ignored here for simplicity.

funding already set aside to cover that payment. The first term is a function of the current wage bill, while the second depends only on past hiring decision. Naturally, contributions are decreasing in the realized return on the pension fund assets. Substituting (3) into (1), the profit maximization problem of the firm becomes

$$\max_{\{k_t\}_{t=1}^{\infty},\{l_t\}_{t=1}^{\infty}} E_o \sum_{t=1}^{\infty} \beta^t [f(k_t,l_t) - r_t k_t - w_t l_t (1+xq\lambda) - \lambda w_{t-1} l_{t-1} (1-xq\rho_t)]$$

and the Bellman equation is

$$V(l_{t-1},\rho_t) = \max_{k_t,l_t} f(k_t,l_t) - r_t k_t - w_t l_t (1+xq\lambda) - \lambda w_{t-1} l_{t-1} (1-xq\rho_t) + \beta E_t \max[0, V(l_t,\rho_{t+1})].$$

This expression explicitly recognizes the possibility that the firm may choose to close down rather than continue at time t.[13]

23. Let $\rho^r(l_{t-1})$ be the value of the shock for which the firm is exactly indifferent between staying in business or shutting down. Then $P^r_t = \{ \rho \mid \rho \geq \rho^r(l_{t-1}) \}$ is the set of all realization of the shock for which the firm chooses to remain in business. Denoting a E^r_t expectation taken over this set, the necessary first order conditions for profit maximization are[14]

$$\partial f / \partial l_t = w_t + xq\lambda w_t - \beta E^r_t \frac{\partial V(l_t,\rho_{t+1})}{\partial l_t} = w_t(1+\beta\lambda) + xq\lambda w_t (1-\beta E^r_t(\rho_{t+1})) \quad (4)$$

$$\partial f / \partial k_t = r_t. \quad (5)$$

24. These equations show that pension fund regulation and the financial performance of the fund do not affect the marginal cost of capital, but may affect the marginal cost of labor. This is reflected by the second term in (4), which represents the opportunity cost to the firm of setting aside resources in the pension fund. If the firm's discount rate is equal to the expected return on pension fund assets ($1/\beta = E^r_t \rho_{t+1}$), that is the firm earns as much investing in the pension fund as in its best alternative opportunity, then the marginal cost of labor is

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[13] In the Netherlands, workers have no recourse against the assets of the sponsoring firm in the event it goes bankrupt and the plan is underfunded. This contrasts with the United States, where some benefits are guaranteed by the Pension Benefit Guarantee Corporation, and the firm is liable for up to 30 percent of unfunded guaranteed benefits (Bulow, 1982).

[14] The boundary of P^r_{t+1} is a function of l_t, but since $V(l_t, \rho_{t+1})=0$ for $\rho_{t+1} = \rho^r(l_t)$ this can be ignored in computing $\partial V/\partial l_t$.

just $(1+\beta\lambda)w_t$, as in the benchmark model of Section C.[15] However, in the realistic case of $1/\beta > E^r_t \rho_{t+1}$, hiring more workers means setting aside more funds in the pension fund, an inferior investment opportunity. This increases labor costs and reduces the demand for labor. This distortion, which could be called the "regulatory wedge" is increasing in the regulatory coverage ratio x, the actuarial discount factor q, and the replacement rate λ. On the other hand, the higher the returns on pension fund assets, the smaller is the wedge.

25. Perhaps less intuitively, comparing (4) with (3) also reveals that the marginal cost of labor is generally not equal to the wage rate plus the contribution to the pension fund ($w_t + c_t$). This is the case because the contribution reflects, besides the additional pension liability that the firm incurs by hiring one more worker, charges or discounts on liabilities related to pension rights already matured. The latter are sunk costs, and thus do not enter the labor demand decision of the firm.

Result 2. Regulation forcing firms to pre-fund pension obligations increases the marginal cost of labor if the expected returns on the pension fund assets is smaller than the internal rate of return for the firm. The marginal cost of labor is generally not the sum of the wage rate and the contribution to the pension fund.

Labor demand and shocks to asset prices

26. Another implication of equation (4) is that if asset returns are uncorrelated over time, then the marginal cost of labor (and hence labor demand) is independent of ρ_t, the current realization of the pension fund return. This is the case even though a low asset return forces the firm to increase contributions to maintain the fund's solvency, creating the impression that labor costs have increased. On the other hand, if the shocks are correlated over time, an adverse shock today would induce the firm to revise (presumably down) how much it expects to earn on the pension fund assets next period. This increases the regulatory wedge, and hence the marginal cost of labor. If the news also induces the firm to revise down its internal rate of return, however, the effect of a negative shock on pension fund returns may be small or nil.

Result 3. Losses on pension fund asset holdings do not affect labor demand. However, if low asset returns cause the firm to lower its expectation of future returns, then opportunity cost of pension fund regulation will increase, pushing up the marginal cost of labor.

27. Even when they do not change the marginal cost of labor and capital, financial losses or gains on pension fund assets do affect the *level* of profits. In terms of the model, the maximum level of profits $V(l_{t-1}, \rho_t)$ is an increasing function of the current realization of the shock ρ_t. Hence, for low realizations of ρ_t $V(l_{t-1}, \rho_t)$ may be negative, and the firm may be

[15] On the interpretation of β in a general equilibrium framework, see for instance Blanchard and Fischer (1989), Chapter 6.

better off closing down. If the pension fund happens to be underfunded in that period, pensioners will lose part of their pension.[16] If these firms are non-negligible segment of the market, then aggregate labor demand may be negatively affected by financial losses on pension fund investments (as would the aggregate demand for capital), even if the regulatory wedge does not change.

Result 4. Financial losses on pension funds may reduce aggregate labor demand because they may cause some firms to shut down.

The effects of higher coverage ratios

28. From (4), the effect of a higher regulatory coverage ratio on the marginal cost of labor is

$$\frac{dMCL_t}{dx} = q\lambda w_t(1-\beta E_t^r(\rho_{t+1})) \tag{6}$$

which is positive in the realistic case in which the internal rate of return of the firm is higher than the expected return on pension fund assets ($1>\beta E_t^r(\rho_{t+1})$). Accordingly, a higher coverage ratio reduces labor demand. However, the effect is smaller than the increase in the contribution rate necessary to comply with the higher coverage ratio. To see this, using equations (3) and (4), the increase in contributions is

$$\frac{dc_t}{dx} = q\lambda w_t - \frac{1}{(l_t)^2} w_{t-1} l_{t-1}(1-xq\rho_t)\left(\frac{dl_t}{dx}\right). \tag{7}$$

In the realistic case in which $1>\beta E_t^r(\rho_{t+1})$, dl_t/dx is negative, as labor demand falls as the coverage ratio increases, and

$$\frac{\frac{dc_t}{dx}}{\frac{dMCL_t}{dx}} = \frac{q\lambda w_t - (1/l_t)^2 w_{t-1} l_{t-1}(1-xq\rho_t)(dl_t/dx)}{q\lambda w_t[1-\beta E_t^r \rho_{t+1}]} > \frac{1}{1-\beta E_t^r \rho_{t+1}} > 1.$$

29. The difference between the increase in contributions and in the marginal cost of labor can be quite substantial. Consider a case in which the firm internal rate of return is 15 percent (so β=0.87) and the expected return on the pension fund assets is 5 percent. Then 1-

[16] This is why regulators may require pension funds to be over funded (x>1). Of course, in practice shocks other than pension fund returns affect firm profitability and, hence, its decision to stay in business.

$\beta E_t^r(\rho_{t+1})$=0.09 and the increase in the marginal cost of labor is only 9 percent of the increase in contributions.

Result 5. If pension fund regulation is costly to the firm, an increase in the regulatory coverage ratio increases labor cost and reduces labor demand. The associated increase in the marginal cost of labor, however, is much smaller than the increase in pension fund contributions necessary to meet the higher coverage ratio.

E. A Small Company in a Funded Industry Pension Plan

30. For small companies, setting up individual pension plans can be very expensive because of high fixed administrative costs or because the size of the workforce may be too small to diversify survival and other risks. Thus, small and even medium size firms may choose to form sector-wide pension funds, as is indeed the case in the Netherlands. To analyze this case, the extreme assumption is made that firms are atomistic. The sectoral pension fund is assumed to be subject to the same regulatory constraints as the individual company fund examined above, and to levy contributions proportional to the current wage bill of each member firm. Let the sector consist of a continuum of identical firm, indexed by i. $\mu(i)$: I→[0, 1] is the measure of firms, and $l_t(i)$ is labor demand of firm i and similarly for capital. Finally, let total employment in the sector be defined as

$$L_t \equiv \int_I l_t(i)\mu(i)di.$$

Then the dynamic of pension fund assets is

$$A_{t+1} = A_t\rho_t + c_tL_t - \lambda w_{t-1}L_{t-1} \tag{8}$$

and the solvency constraint for the sector-wide pension fund is

$$A_{t+1} = xq\lambda w_tL_t \forall \rho_t \in \mathrm{P} and \forall t.$$

The contribution rate must satisfy

$$c_t \equiv c(L_{t-1}, L_t, \rho_t) = xq\lambda w_t + \lambda w_{t-1}(L_{t-1}/L_t)(1 - xq\rho_t). \tag{9}$$

while the cost of funding pension for the individual firm is

$$c_tl_t = xq\lambda w_tl_t + l_t\lambda w_{t-1}(L_{t-1}/L_t)(1 - xq\rho_t). \tag{10}$$

31. Now, and in contrast with the case of an individual company plan, cutting back on employment not only reduces what the firm has contributed to the fund to cover new obligations, but it also reduces the transfer that the firm must make (receive) to offset losses (gains) on past obligations. The Bellman equation for the firm becomes

$$V(\rho_t) = \max_{k_t, l_t} f(k_t, l_t) - r_t k_t - [c(L_{t-1}, L_t, \rho_t) + w_t] l_t + \beta E_t \max[0, V(\rho_{t+1})].$$

The first order conditions for profit maximization are

$$\partial f / \partial l_t = w_t + c(L_{t-1}, L_t, \rho_t) = w_t(1 + xq\lambda) + \lambda w_{t-1}(L_{t-1} / L_t)(1 - xq\rho_t)$$

$$\partial f / \partial k_t = r_t.$$

These equations show that the labor demand decision is affected by the performance of the pension fund in a very different manner than in the case of an individual company plan.

Result 6. In the case of an atomistic firm belonging to a sector-wide pension fund, the marginal cost of labor is sum of the current wage and the (exogenous) pension contribution rate. The latter is decreasing in the return on pension fund assets.

32. With a sector-wide pension fund, the firm does not internalize the link between the deferred wages it owes to its workers and pension fund contributions. The latter depend on the hiring decisions of all the members of the fund, as well as on asset returns, and are therefore exogenous to the individual member. Through their effects on the pension plan contribution rate, then, returns on asset markets directly affect labor demand decisions. In addition, the contribution rate is influenced by the rate of growth of the total labor force belonging to the fund. In particular, if returns on the assets are low ($xq\rho_t<1$), then contributions are higher in shrinking industries and lower in growing industries. This is because contributions levied on current workers must make up for losses on maturing obligations to old workers. By the same token, in periods in which fund assets are overperforming, declining industries benefit, because the "financial windfall" per worker is higher.

33. The contrast between the case of an industry plan and a company plan is entirely due to the assumption (consistent with common practice in the Netherlands) that fund members are charged by the fund in proportion to their current wage bill. A two-part pricing scheme could restore equivalence between the two cases. To see this, suppose the fund charges each participants the following contribution

$$tc_t = a(w_t l_t) + b(w_{t-1} l_{t-1}, \rho_t) = xq\lambda w_t l_t + \left(\lambda w_{t-1} l_{t-1} - \frac{w_{t-1} l_{t-1}}{w_{t-1} L_{t-1}} A_t \rho_t \right)$$

34. The first term, $a(w_t l_t)$, is the amount that the firm needs to contribute to cover new pension liabilities. This amount is proportional to the current wage bill, and hence should enter the current marginal cost of labor.[17] The second term, $b(w_{t-1} l_{t-1}, \rho_t)$, is the difference

[17] This is sometimes refereed to by practitioners as the cost-covering level of contributions.

between what the fund pays out to the firm pensioners and the value of the firm's share in the fund at the beginning of the period (after current returns are realized but before new contributions are added). The share is calculated using the previous period wage bill. If the pension payment is larger than the share in the fund, then the firm must put in some more money to cover its commitments to pensioners, and vice versa. In period t this adjustment is a sunk cost to the firm, because it cannot be reduced by hiring fewer workers in the current period. Using (6) to eliminate A_t,

$$tc_t = xq\lambda w_t l_t + \lambda w_{t-1} l_{t-1}(1 - xq\rho_t)$$

which is the same as the contributions in the case of the individual pension plan (see equation (3)).

Result 7. The labor demand decision of a small firm in a sector-wide pension fund would be the same as that of a company with an individual plan if contributions consisted of two parts, one to cover new pension liabilities and the other to reflect the capital gains or losses on accrued liabilities.

35. This two-part pricing scheme, although somewhat more complex than the standard one, allows firms to better internalize the effects of its labor market decision on pension costs. In addition, a new firm joining the fund would not have to pay contributions reflecting capital gains or losses on past obligations (since $l_{t-1}=0$ for such a firm), but would pay only what is necessary to fund the pensions of its current workers.

F. Market Imperfections

Imperfect capital markets

36. The models assume that firms have unrestricted access to capital markets. In practice, though, informational asymmetries and other contracting problems may create a wedge between the cost of internal and external finance, so that financing investment or working capital through retained earnings is cheaper than raising funds from the capital markets. This wedge, in turn, may become larger during downturns, when firms become more levered and face financial difficulties. In this case, losses on pension fund assets may increases the need to resort to costly external finance, inducing the firm to cut back on current production. An extreme case of this problem is that of a credit-constrained company. For such a company, the need to finance the pension shortfall would crowd out investment or working capital one for one. This would increase the negative impact of higher premium contributions on employment.

Imperfect labor markets

37. Another important assumption is that the firm is a price-taker in the labor market, thus the compensation it promises workers (both immediate and delayed) is not affected by the profitability of the firm. If the labor market is not perfectly competitive, perhaps because workers are unionized or hiring and firing costs are present, then the firm no longer takes the

wage as given. In particular, a financial loss on pension fund assets, by reducing current profitability, may induce the firm to strike a better bargain with its workers. This could result in an increase in employee contributions to the pension fund that is not offset by a higher wage rate. Alternatively, there may be a reduction in the pension replacement ratio λ, for instance by forgoing indexation. Accordingly, with imperfect labor markets the effect of losses on pension fund assets on profitability and cash-flow is likely more limited than in the perfectly competitive model, because workers end up sharing some of the losses. On the other hand, lower wages would reduce labor supply, which might curtail economic activity. If there is disequilibrium unemployment in the short-run, however, a decline in labor supply may not have a sizable effect on growth.

G. Conclusions

38. With asset values declining around the world for three years in a row, large holders of securities have realized substantial losses. Prominent among them, are occupational pension funds in a number of industrialized countries. With defined contribution pensions, the losses are borne by employees, who face the prospect of lower retirement income. Where pensions are mainly of the defined benefit type, as in the Netherlands, employers must pay higher contributions to restore the solvency of the plan.

39. To gain insights on the possible macroeconomic repercussions of these large financial losses, this chapter has developed a theoretical framework to study how firm behavior – in particular labor demand – changes when the firm sponsors a defined-benefit pension fund and the returns on the fund assets are uncertain. The model also sheds light on the economic costs of solvency regulation for pension funds.

40. In the case of large firms with individual pension plans, the marginal cost of labor, which determines labor demand, is equal to the sum of three components: the wage, the present discounted value of the pension benefit, and a "regulatory wedge," that captures the opportunity cost of tying up assets in the pension fund. This marginal cost generally differs from the sum of the wage and the pension fund contribution. Thus, losses on accrued pension liabilities do not directly affect the marginal cost of labor, even if they result in higher contributions. The intuition is that shortfalls in pension fund coverage depend on past labor market decisions, not on the current ones, and are therefore a sunk cost. A low rate of return on pension fund assets, however, may make labor more expensive if it signals low returns in the future, because this would increase the regulatory wedge.

41. In the case of small firms belonging to industry-wide pension plans, on the contrary, the marginal cost of labor is equal to the sum of the wage and the pension fund contribution, because small firms take contribution rates as exogenous. Accordingly, as contributions raise and fall reflecting losses or gains on pension fund assets, so does the marginal cost of labor, and labor demand from these firms tends to be more pro-cyclical.

42. Both in the case of large and small firms, losses on pension fund assets lower profits and cash-flows, which may make it more difficult for weak firms to access external capital

markets, causing them to reduce activity. Firms and pension funds may also seek to negotiate concessions from workers on the level of pension benefits, for instance by increasing the retirement age or indexing the benefit to the average rather than the last wage. Reducing the pension benefit, just like a reduction in the current wage, should increase labor demand by large firms, but it may curtail labor supply in the long run.

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II. Wage Bargaining in the Netherlands[18]

A. Introduction

43. The Dutch wage formation system is being put to the test once again. During previous economic downturns in the early 1980s and 1990s, the collective bargaining model reacted vigorously, if slowly, through economy-wide multi-year wage moderation. In the late 1990s, rapidly rising wages undermined external competitiveness and the subsequent economic slowdown increased unemployment. The question arises whether the history of appropriate wage responses to these challenges will be repeated.

44. The current juncture also seems a suitable moment for a broader reassessment of the existing bargaining framework. In the past decade, wage bargaining has become somewhat more decentralized and differentiated, but it is not clear to what extent this has improved the functioning of the system. Also, as political differences have widened and economic growth has come to a halt, tensions have mounted. Although the positioning of the bargaining parties should, of course, be evaluated in the context of the negotiation process, the tone of the discussion has sharpened remarkably. In light of a diminishing and graying trade union membership, the employers organization suggested last year that it would favor firms bargaining directly with their works councils, rather than negotiating with the trade unions. Trade unions, for their part, have threatened not to cooperate in renewed multi-year wage moderation out of dissatisfaction with employer attitudes and government fiscal policies. Finally, the minister for social affairs recently reminded social partners that, if they fail to act responsibly, the government has the power to intervene in the wage formation process and could impose a wage cap on the private sector (a measure that has not been applied since the 1970s).

45. This chapter examines the strengths and weaknesses of the existing bargaining model. Section B first provides a brief overview of Dutch wage bargaining in the post WWII period; section C describes the structure of the current wage bargaining framework; section D examines the past macro-economic performance of the Netherlands in light of wage flexibility; and section E addresses the issues of wage dispersion and differentiation; section F concludes by discussing future prospects and challenges for the bargaining model.

B. A Brief History of Wage Bargaining in the Netherlands

46. During the "rebuilding" years after the second World War, wage formation was highly centralized and subject to officially imposed wage guidelines, which were determined by the government after consultation with the social partners. Recognizing the importance of external competitiveness for the small and open Dutch economy, wage moderation was broadly accepted as leading principle. The policy was highly successful in fostering competitiveness and generating growth and employment.

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[18] Prepared by David Hofman.

47. The success of the post-war guided wage moderation, however, planted the seeds of its eventual failure. By the early 1960s, as a result of sustained moderation, wages had become very low in comparison with those in neighboring countries. In addition, the labor market had become very tight, with the unemployment rate falling to less than one percent. Under these circumstances, compliance with the formal wage norm proved increasingly difficult to monitor as employers resorted to "black wages" and wage drift increased (Visser and Hemerijck, 1997). As a result, by the mid-sixties, the guided wage system had effectively collapsed, and was replaced by a "free" collective bargaining system.

48. The 1970s saw a lack of consensus, polarized labor relations, and steep wage increases fueled by widespread indexation of wages to prices. Although ritual attempts at central coordination were made every year, social partners generally failed to reach agreement and, in the course of the decade, the government had to intervene several times by imposing wage caps to limit excessive wage increases.

49. By the end of the decade, the economy was characterized by high wage increases, an expanded social security system, low corporate profitability, increasing unemployment, and high public expenditure. In 1982, a new government took office and embarked on drastic measures to address the unemployment and fiscal problems. Against this somber background, and under the treat of government intervention, wage coordination was finally restored in the "Wassenaar" agreement.

50. The 1982 Wassenaar agreement between the employers and the trade unions entailed a return to multi-year wage moderation, based on the shared conviction that a restoration of competitiveness and corporate profitability was a precondition for economic recovery and employment growth. Although this basic principle echoed the policies of the 1950s, the Wassenaar agreement brought two important innovations. First, it was essentially a form of self regulation by the social partners, intended to pre-empt the need for government intervention. It therefore strengthened the role of the social partners in the wage coordination process. The government's main role was to formally extend wage agreements and support wage moderation through the lowering of the collective burden of taxes and social security contributions, thus softening the effects of wage moderation on net household income. As a second major innovation, the central agreement contained only a broad recommendation with regard to wage moderation: the ultimate wage negotiations were left to the sectoral level. The framework thus combined national coordination with flexibility to meet specific sectoral needs. Initially, this flexibility was regarded by some as a major weakness of the agreement, but it turned out to work well, as the central recommendations proved to have a large impact on the sectoral negotiations.

51. The bargaining framework and the resolve to moderation of wages that were brought about in 1982 broadly remained in effect throughout the 1980s and, after a reconfirmation in the 1993 "A New Course" agreement, also in the 1990s.

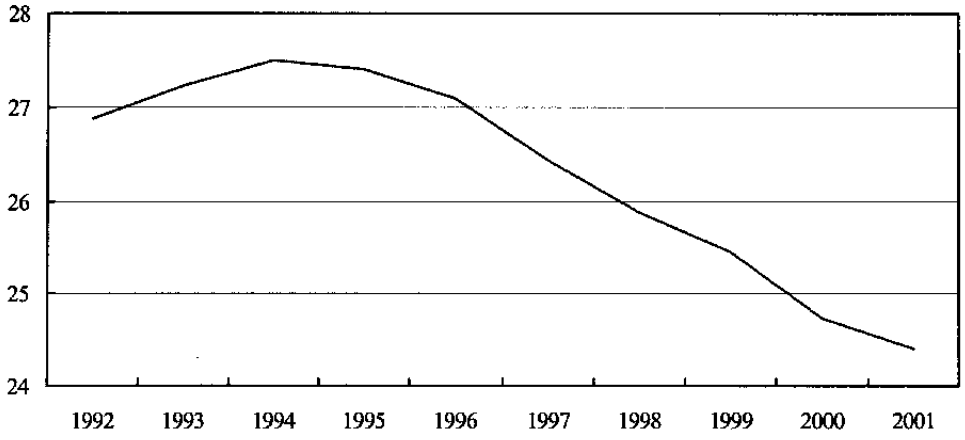
C. Structure of the Bargaining Framework

52. The current bargaining framework is broadly the heritage of the Wassenaar agreement. Bargaining predominantly takes place at the industry level, although wage

agreements at the company level have been gaining popularity. Nevertheless, there tends to be a considerable degree of coordination at the national level, which sometimes takes the form of formal pacts between employers an union confederations. Traditionally, such pacts do not pin down actual numbers for wage growth, but rather formulate a broad recommendation towards wage moderation, to be interpreted at the sector level. The coordination not only concerns wages but also other policy items that affect workers and social security beneficiaries, including government policies. For example, past negotiations have included such items as working time reduction, training and education, savings tax breaks and the reform of the national disability insurance scheme. Sometimes the national agreements have a multi-year focus (e.g. the 1982 agreement), but not always. Most recently, in October 2002, the social partners and the government agreed on a pact that encompassed only 2003, as broader agreement proved beyond reach. Unusually, this agreement set an explicit ceiling for wage increases (at 2.5 percent).

53. Industrial relations in the Netherlands are characterized by a relatively high degree of organization among employers (covering firms accounting for nearly 80 percent of workers). Trade union membership, on the other hand, is low (less than 25 percent of workers) and declining (Figure II-1). In addition, union membership is graying as the inflow of new members is small. The public sector is substantially more unionized than the market sector. Dutch unions tend to represent not only workers, but also the unemployed and recipients of social security benefits (accounting for about one fifth of total membership). Despite low union density, collective wage agreements apply to over 80 percent of workers, mainly as a result of wide employer participation in the collective bargaining. High employer participation in central bargaining is fostered by the contract extension policies of the government: wage agreements reached by the sectoral representatives of employers and trade unions are usually made binding on non-organized employers and employees in the same industry. This practice provides employers with a strong incentive to engage in central bargaining to ensure their interests are reflected. In the event, administrative extension of collective agreements actually applies to only 9% of workers, mostly in small firms with fewer than 10 employees.

Figure II-1. Union Membership
(Percent of employees)



Source: CBS

54. The basic structure of the Dutch model has similarities to those elsewhere in Europe. The degree of employer and employee organization differs considerably among European countries, with trade union coverage being relatively high in the Nordic countries, and relatively low in France, Germany, the Netherlands and Spain. Nonetheless, the coverage of collective wage agreements is similar, typically above 70% (Table II-1). In addition, European countries generally take the industry level as the primary bargaining locus, and combine this with some form of inter-industry coordination. The degree of coordination varies, however, with Germany and Austria showing particularly high coordination. A notable outlier in Europe is the United Kingdom, where bargaining mostly takes place on the company level, and where coordination is largely absent. In this respect, the United Kingdom more closely resembles the decentralized bargaining structures of the United States and Canada.

Table II-1. Collective Bargaining Characteristics
(In percent, 1994)

	Trade Union Density	Employer Organization Density	Collective Agreement Coverage	Centralization (OECD Ranking)	Coordination (OECD Ranking)
Austria	42	96	98	2+	3
Belgium	54	72	90	2+	2
Denmark	76	48	69	2	2+
Finland	81	58	95	2+	2+
France	9	74	95	2	2
Germany	29	72	92	2	3
Ireland	43	39	n.a.	n.a.	n.a.
Italy	39	n.a.	82	2	2.5
Netherlands	26	79	81	2	2
Norway	58	54	74	2+	2.5
Portugal	32	34	71	2	2
Spain	19	72	78	2	2
Sweden	91	56	89	2	2
Switserland	27	37	50	2	2
United Kingdom	34	54	47	1.5	1
United States	16	n.a.	18	1	1
Canada	38	n.a.	36	1	1
Japan	24	n.a.	21	1	3

Source: Boeri et al. (2001) and OECD (1997)

D. Wage Flexibility and Macroeconomic Performance

55. Like those in many other European countries, the Dutch wage bargaining system is usually regarded as being roughly in the undesirable middle of the so called Calmfors-Driffill curve.[19] Based on a closed economy framework, Calmfors and Driffill (CD, 1988) postulated

[19] See Boeri et al. (2001), Teulings and Hartog (1998), and OECD (1997) for useful overviews of centralization rankings.

a "hump shaped" relationship between the bargaining structure and the real wage level. When wage bargaining is very decentralized (at the company level), so the argument goes, wage levels will be contained through the pressure of product market competition. At the other end of the spectrum, fully centralized bargaining will also keep wages in check, because in this case the adverse macro economic effects of wage increases (e.g. the effects on inflation and unemployment) will be internalized in the bargaining process. Bargaining at the intermediate, industry level, however, is not disciplined by market competition – as competitors will typically be included in the same wage settlement – nor does it internalize the macro effects. Consequently, bargaining at the industry level is expected to result in an undesirable equilibrium of high wages and high unemployment. Despite its intuitive appeal, however, empirical cross-county evidence for the CD hypothesis has never been very robust (Flanagan, 1999). Moreover, in recent years, favorable evidence seems to be disappearing altogether. Using a relatively up-to-date data set, including the first half of the 1990s, the OECD (1997) had difficulty finding any relationship between bargaining structure and economic performance.

56. Indeed, the predictions of the CD hypothesis are not borne out by the Dutch experience over the past two decades. The excessive real labor cost growth during the 1970s, was corrected during the 1980s in a remarkable manner (Figure II-2). Under the regime brought about by the Wassenaar agreement, real contractual wages even declined in some years and were roughly flat over the full decade.[20] By 1990, most of the earlier imbalance in wages seems to have been corrected, competitiveness largely restored, and the labor income share of GDP brought down to about 81 percent (from a peak of over 95 percent in the first years 1980s). The unemployment rate also declined substantially, to about 7 percent. During the 1990s the real labor costs – wage costs including incidental pay components, labor related taxes, and employer social security contributions – roughly mirrored productivity growth.

57. Apart from the goodwill of the social partners to live up to the Wassenaar agreement, other factors may have contributed to wage moderation. Since the Netherlands is a very open economy, bargaining at the industry level does not eliminate the disciplinary effect of product market competition. Indeed, external competitiveness is generally recognized as a key variable in the Dutch wage bargaining process. Also, an earlier IMF study concluded, on the basis of wage equation estimates made by the IMF and by the Netherlands Ministry of Economic Affairs, that wage moderation in the 1980s seems to have been triggered by underlying fundamentals (productivity growth, changes in taxes, and unemployment), rather than an exogenous shift in labor union attitudes (Watson et al., 1999). This conclusion suggests that the bargaining structure may not be decisive for economic outcomes.

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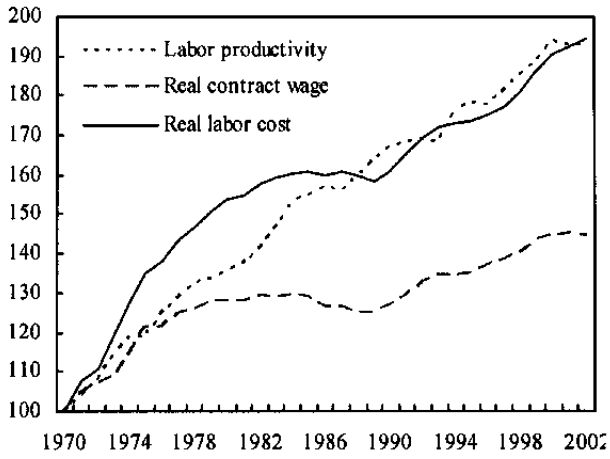
[20] Consistent with the trade unions' support for the policy of moderation in the 1980s, Lever and Marquering (1996) find for the period 1971-1990, that the upward effect of union coverage on wages is relatively small in the Netherlands.

Figure II-2. Productivity vs Real Wage Growth
(1970 = 100)



Source: CPB

58. In light of the substantial wage adjustment during the 1980s, the Netherlands performs relatively well in cross-country studies on wage flexibility, which is usually defined as the responsiveness of wages to changes in the unemployment rate. Recent wage equation estimates by the Nederlandsche Bank show that, over the period 1975-2001, changes in the unemployment rate had a larger impact on the wage rate in the Netherlands than in France, Germany, or the United States (Peeters and Den Reijer, 2002). This result broadly confirms the earlier findings of Layard, Nickell and Jackman (1991), which used a sample that did not include the 1990s (Table II-2).

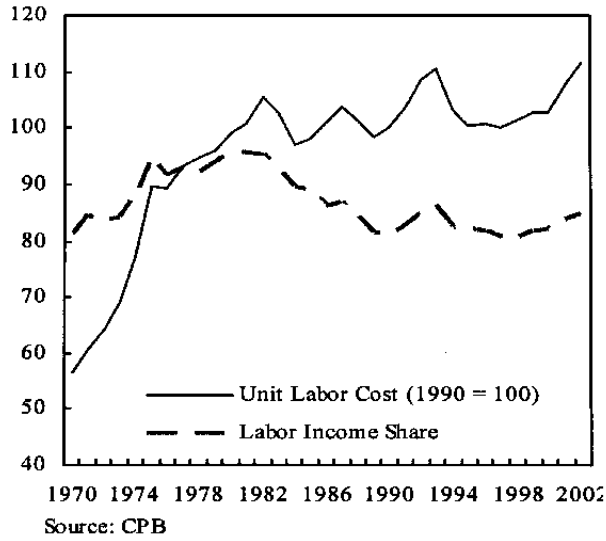
Table II-2. Elasticity of Wages With Respect to Unemployment

	Peeters and Den Reijer (2002)	Layard et al. (1991)
Germany	0.74 - 0.81	1.01
Spain	1.60 - 2.60	1.21
France	0.85 - 1.15	4.35
Netherlands	1.00 - 1.25	2.28
United States	0.44 - 0.48	0.94

59. On the other hand, the Dutch wage formation process has often been criticized for a slow speed of wage adjustment. For example, in the early 1980s unemployment had been rising for three years before the social partners finally reached their formal agreement on wage moderation. Although wage growth had already slowed somewhat before the agreement, sizable imbalances had build up between wages and productivity growth. A rising labor income share and increasing unit labor costs in the early 1990s, as well as during the

current downturn, again suggest a somewhat sluggish reaction in wages when the economy switches from boom to bust (Figure II-3).

Figure II-3. Labor Income Share and Unit Labor Cost, 1970-2002



Source: CPB

60. Some lags in the reaction of wages may be inevitable, as perceptions of productivity growth and underlying inflationary pressures change only gradually. Nonetheless, the structure of the Dutch wage formation does not seem to minimize these delays. In particular, performance related remuneration elements (such as profit-sharing, bonuses, and stock-options), that would allow wages to reflect changes in economic growth more directly and automatically, play a minor role in the Netherlands. Although individual remuneration elements have gained importance, less than 4 percent of the total wage bill is currently directly related to company performance. The only fiscal arrangement intended to stimulate profit sharing (the "winstdelingsregeling") was abolished in early 2003. Sluggishness may also be partly related to the fact that wage contracts are often negotiated for two years at the time. Shorter contract periods would increase flexibility, although this gain would have to be weighted against the increased negotiating cost of more frequent bargaining.

E. Wage Dispersion and Differentiation

61. Empirically, centralized or coordinated wage bargaining systems are associated with relatively little wage dispersion (Flanagan, 1999). The Netherlands is no exception. Table II-3 shows three measures of wage dispersion. The first two, from a study by Teulings and Hartog (1998), give the variance of overall individual wages (vertical dispersion) and of wages by industry (horizontal dispersion), based on data from the early 1990s. The third measure is the ratio of the ninetieth percentile of the distribution of gross earnings to the tenth percentile, based on the latest available OECD data for each country. It must be noted that these data are rather rough and unsatisfactory measures of wage dispersion. However, invariably, the decentralized bargaining systems of the Anglo-Saxon countries display the

highest dispersion, while the Nordic countries have the lowest. The Netherlands holds a position in the middle.

Table II-3. Wage Dispersion

Country	Individual wages in % (T&H)	Industry differential in % (T&H)	90th to 10th percentile of gross income distribution
United States	58	14	4.6
United Kingdom	58	14	3.4
Canada	52	14	4.2
France	47	6	3.1
Germany	44	11	3.0
Netherlands	40	7	2.9
Finland	38	6	2.4
Austria	35	5	2.8
Norway	31	9	2.0
Sweden	31	4	2.2
Denmark	27	6	2.2

Source: Teulings and Hartog (1998); OECD

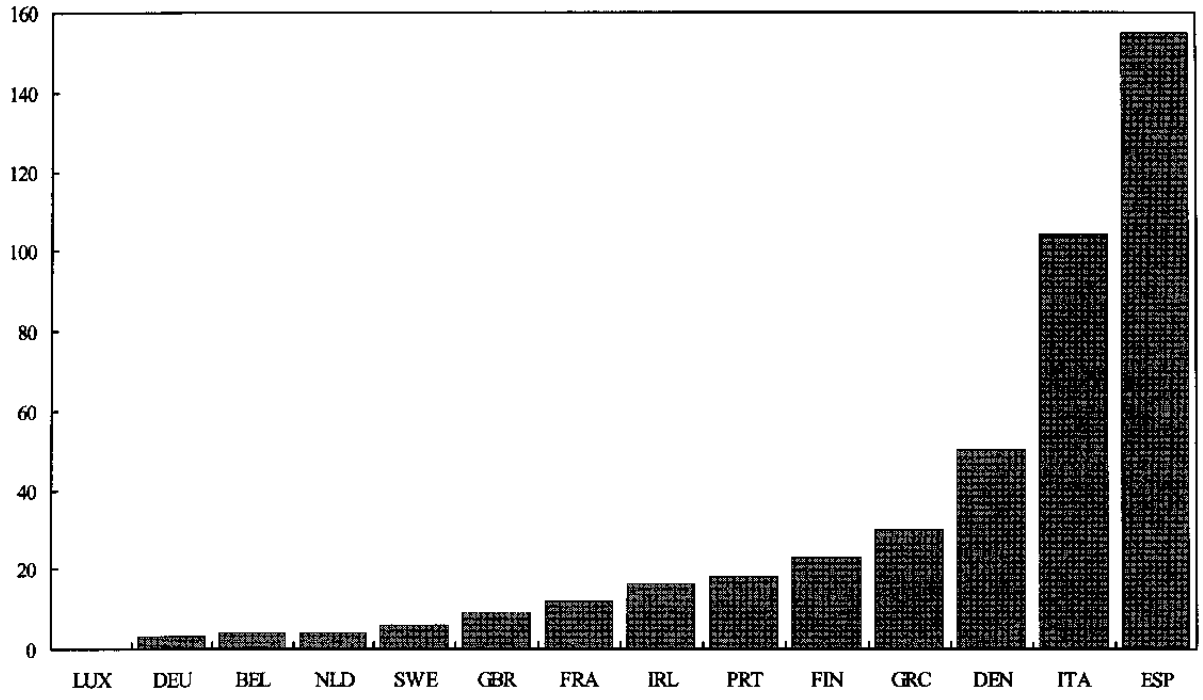
62. This relatively low wage dispersion may reflect general Dutch attitudes towards what is considered a "fair" distribution of income. In the Netherlands, the view is widely held that cultural factors limit the scope for income differences. In this context, both trade unions and politicians have long criticized the increasingly high remuneration of top managers, which is regarded as undermining the favorable climate for wage moderation and industrial peace. Such preferences aside, however, low wage dispersion may signal a problem, as a lack of possibilities for wage differentiation may tend to distort price signals and could result in misallocation of labor. In particular, there seems to be a risk that labor shortages in specific industries or professions lead to higher wages across the board, thus unduly raising the general wage level and hampering adjustment in the tighter sectors. The resulting inefficiencies can have a negative effect on economic performance. Earlier IMF research has shown that low wage differentiation is associated with lower long term output growth (Thomas, 2002).

63. Contributing to the relatively narrow wage structures in many European countries, including the Netherlands, is the policy of formal extension of wage agreements. Central to the Dutch wage formation framework, since 1937, is the so called "algemeenverbindendverklaring" (AVV), by which wage agreements between employers and unions are more or less automatically extended to the unorganized firms and workers in the same industry. The AVV is a cornerstone of the collective bargaining structure, as it provides both employers and employees with clear incentives to organize and participate in the negotiations at the industry level. The AVV grants labor unions a more central role than might be justified on the basis of their membership alone; although it may also be a cause of low membership, as workers can free ride, benefiting from union representation without having to pay membership fees.

64. The AVV has clear disadvantages. In particular, it establishes minimum or uniform standards for wage developments by industry, thus limiting intra-industry wage differentiation and wage cost competition. Also, in practice, contracts are extended almost regardless of possible undesirable macro-effects. Therefore, some have criticized the AVV and suggested its scope be narrowed. For instance, the government could apply more discretion in granting AVV, extending only those terms of agreements that are regarded as beneficial to the economy at large. In this case, agreements that entail unduly large wage increases or contain elements that run counter to (the spirit of) government policies – e.g. the topping-up of disability benefits – would not be extended.

65. But the practice also has certain advantages. In particular, it promotes industrial peace – the amount of days lost in strikes is very low in the Netherlands (Figure II-4). The AVV also enables industries to include non wage items (such as training programs and promotional activities on behalf of the industry) in their bargaining, as contract extension guarantees that those agreeing to such terms do not face a cost penalty relative to others in the sector. Since the bargaining concerns a broader package of items, the emphasis on wage increases may be reduced, perhaps moderating wages, if not necessarily overall labor cost. The AVV thus enjoys broad support from the main players in Dutch wage bargaining. In its previous "advisory document on social economic policy", the SER, a main advisory body to the government (and including the social partners), concluded that there was no reason for a fundamental reassessment of the AVV.

Figure II-4. Days Lost to Strikes: Average 1993-2001
(per 1000 workers)



Source: Eurostat

66. In any event, collective wage agreements have increasingly allowed for more differentiation between and within industries, as well as between employees. Since 1975, the number of different collective industry wage agreements has increased from 180 to 220 and the number of company wage agreements from 450 to 800. In recent years, an increasing number of industry wage agreements contains dispensation clauses that allow for some divergence from the central contract at the individual company level. Also, the role of the works councils was strengthened, facilitating more bargaining at the company level. Finally, individual remuneration items have risen, although they remain relatively small.

67. It is not clear, however, that these developments have actually resulted in more wage dispersion. In a study comparing inter-industry differentials in the period 1973-1982 with those in 1983-1995, the Netherlands Bureau for Economic Policy Analysis (CPB) found that, over the long run, wage growth differentials have been remarkably stable (Van der Wiel, 1998). In fact, the overall differential was even slightly smaller in 1983-1995 than earlier. With regard to individual wage differences, another CPB study shows that dispersion increased in the 1980s, but then broadly stabilized in the period 1993-1998 (Stegeman and Waaijers, 2001). This study also shows that increases in individual dispersion had been mainly due to developments in the tails of the income distribution, whereas the middle ground – which is typically covered by collective agreements – had been broadly stable. As regards recent developments, the OECD gross earnings distribution data have shown a slight increase of dispersion from 2.8 in 1995 to 2.9 in 1999. All in all, the available evidence points to only some marginal increases in differentiation.

F. Concluding Remarks

68. Looking forward, the main question in the short term seems to be whether employers, trade unions and government will once again agree on multi-year wage moderation. The pressure to deliver such a pact is huge in light of the current economic slump, weakened competitiveness, rapidly rising unemployment, and the problems with regard to the funding of occupational pensions. The broad recognition of the issues by all the parties concerned, the marked sense of shared responsibility, and the past response to similar circumstances, all bode well. Last year's agreement to moderate wage growth in 2003 already signaled a continued tendency towards this time-tested remedy.

69. Admittedly, the hard-won partial agreement and the ongoing discord afterwards also revealed that differences have widened, and that further alignment may prove harder than before. In part, this likely reflects the difficult economic situation and the associated painful policy choices to be made. An additional underlying issue at play is the decline of trade union membership, which may be forcing the unions to build a stronger profile towards their (potential) constituency, resulting in tougher bargaining positions. However, too tough a stance also carries a risk of being sidelined, as that would increase the incentives for employers to seek for alternative bargaining partners. The position of the trade unions thus seems difficult at the moment, and it is as yet unclear where it will settle.

70. The wage formation system also faces medium term challenges that go beyond wage moderation. In the past two decades, the existing framework of industry bargaining with substantial central coordination has usefully facilitated the large adjustment that was needed

to redress the imbalances of the early 1980s. Moreover, it did so in a climate of remarkable industrial peace. In those respects, wage coordination has served the Netherlands well. However, the framework also has its weaknesses. When economic circumstances change, wages have tended to be sluggish to react. In addition, the relatively high level of aggregation of bargaining probably hampers differentiation and wage dispersion. Now that the structural labor market surplus of the 1980s and early 1990s has been absorbed and the Dutch economy seems to have landed in a fundamentally more benign equilibrium, there would appear to be scope to address such weaknesses.

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III. Estimating Potential Growth and Output Gaps for the Netherlands[21]

A. Introduction

71. During the 1990s, the Dutch economy outperformed the euro area and was almost on a par with the United States (Figure III-1 and Table III-1). This robust performance was mainly a result of high trend employment growth. One key contributing factor was the expenditure-based fiscal consolidation program, which led to cuts in both the deficit and the tax burden. Labor market participation and employment were stimulated by cuts in taxes and social contributions, as well as by significant wage moderation and lower benefit replacement rates resulting from structural reforms.

Table III-1. Sources of Growth, 1992-2000
(Annual percentage change)

	GDP growth	*Contribution of labor*	*Contribution of capital*	*Growth of TFP1/*
Netherlands	3.0	1.2	1.0	0.8
Belgium	2.2	0.3	1.2	0.7
France	2.0	0.4	1.0	0.6
Germany	1.6	0.0	1.4	0.2
U.K.	2.8	0.2	0.8	1.8
U.S.	3.6	1.0	1.0	1.6

Source: IMF WEO database and Staff estimates.
1/ Solow's residual, using labor share of 0.6 and capital share of 0.4.

72. Since 2000, growth in the Netherlands has fallen sharply, in line with the euro area and the U.S. The slowdown has, however, been especially marked in the Netherlands: GDP growth was only 0.2 percent in 2002—one of the lowest in the euro area—and GDP could decline in 2003. This has raised concerns about the future course of the Dutch economy. Is the recent decline just a cyclical phenomenon, or the beginning of a more protracted slowdown? Looking ahead, as the population ages, sustaining the high employment growth of the past decades seems difficult without substantial structural reforms to further increase labor-force participation and employment rates.

73. This chapter presents estimates of potential growth and output gaps in the Netherlands, using a variety of approaches. These include two statistical detrending methods (HP filter and band-pass filter), a production function approach, and a system estimate of potential output and the associated non-accelerating inflation rate of unemployment (NAIRU). Based on this evidence, we now estimate annual Dutch potential growth at 2¼ percent, down from our previous estimate of 2½ percent. Estimating the output gap is important for assessing the stance of fiscal policies, but results are often sensitive to methods as well as sample selections used for estimation. Accordingly, we attempt to solve this

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problem by taking a different approach where the level of potential output is derived by using the estimated potential growth and the identified time point when the output gap closes based on empirical evidence. Specifically, the level of potential output is derived assuming potential growth of 2¼ percent over the period 1980-2004 and that the output gap closed near the end of 2002 (Figure III-2).

74. The remainder of the chapter is organized as follows. Section B describes the empirical methods and data used for estimation, and discusses the benefits and weaknesses associated with each method. Section C presents the estimation results.

B. Estimation Methods

Statistical detrending methods

75. *Hodrick-Prescott (HP) filter.* Deriving potential output using the HP filter is a popular procedure because of its flexibility in smoothing fluctuations in output (Hodrick and Prescott, 1980). However, results from the HP filter are sensitive to the smoothing parameter λ, the choice of which is arbitrary, leading to at times excessive smoothing of structural breaks.[22] Moreover, the HP filter is known for its high end-of-sample biases, because the weights in the HP filter change rapidly near the ends of the sample. This could result in substantial distortions of the trend at the end of the sample, just when an accurate estimate is most valuable.

76. *Ideal band-pass filter (Ouliaris filter).* Band-pass filtering selects components of the time series with periodic fluctuations between 6 and 32 quarters, while removing components at higher and lower frequencies (Baxter and King, 1999). Most recently, Ouliaris and Corbae (2002) propose an "ideal" band-pass filter based on Monte Carlo simulations. Compared to the Baxter-King filter and the HP filter, the Ouliaris band-pass filter is considered to be statistically consistent in the sense that the filtered series asymptotically converges to the true growth cycle.

Production function approach

77. Under this approach, potential output is estimated using a simple two-factor Cobb-Douglas production function (for example, see EC, 2002). In particular, our estimation of potential output growth is based on the trend growth of (i) the capital stock; (ii) the labor input based on an NAIRU estimate, a trend labor participation rate, and working-age population growth; and (iii) TFP estimates based on two alternative assumptions about the labor's share (0.6 and 0.8).

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[22] Consequently, there have been attempts to identify the "optimal λ", but in our case the identified "optimal λ (λ=374)" is associated with small output gaps through out the whole sample period (Table III-2).

78. The production function approach is very similar to detrending methods, in that the components of the production function are smoothed, in this case using an HP filter (with λ=100). It nonetheless provides useful information on the determinants of potential growth. Labor and capital inputs my be incorrectly measured due to labor-hoarding and changes in capacity utilization, as these are both cyclical in nature. However, using full-time equivalent employment and a net capital stock series adjusted for capacity utilization yield very similar results.[23] Finally, since the capital stock data are only available for the business sector, we also estimate potential growth for this sector alone. This turns out to be only slightly higher than the estimated potential growth for the whole economy (Figure III-3 and Table III-2).

Multivariate model approach

79. The following unobservable component (UC) model was proposed by Apel and Jansson (Apel and Jansson, 1999) to jointly estimate the potential output and NAIRU:

$$\Delta\pi_t = \sum_{i=1}^{3} \rho_i \Delta\pi_{t-i} + \sum_{j=0}^{1} (u_{t-j} - u^*_{t-j}) + \sum_{k=0}^{4} \omega_k z_{t-k} + \varepsilon_{1t} \quad (1)$$

$$y_t - y^*_t = \sum_{l=0}^{1} \phi_l (u_{t-l} - u^*_{t-l}) + \varepsilon_{2t} \quad (2)$$

$$u^*_t = u^*_{t-1} + \varepsilon_{3t} \quad (3)$$

$$y^*_t = \alpha + y^*_{t-1} + \varepsilon_{4t} \quad (4)$$

$$u_t - u^*_t = \sum_{m=1}^{2} \delta_m (u_{t-m} - u^*_{t-m}) + \varepsilon_{5t} \quad (5)$$

where π_t is the CPI inflation, u_t the registered unemployment rate, and y_t the log of real output (all at a quarterly frequency). The NAIRU is assumed to follow a random walk, and the potential output is assumed to follow a random walk with drift. All error terms are assumed to be iid and mutually uncorrelated with constant variances.

80. The idea behind this method is to provide a economic structure by linking output gaps to unemployment gaps through Okun's Law (equation 2), and both to changes in inflation through the Phillips curve (equation 1). For estimation, the Kalman filter and maximum likelihood method are used to obtain the estimates of the unknown parameters and of the unobserved variables, i.e. potential output and the NAIRU. Also included in the Philips curve equation are four variables to capture supply shocks: import prices, the oil price (both deflated by the CPI), the real exchange rate, and labor productivity. In addition, a dummy variable captures the impact of the structural reforms which took place in mid-1990s. Finally, in equation 2, a lagged employment gap is included to capture the effect of labor hoarding.

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[23] Note that using the capacity adjusted capital stock did generate a much smoother TFP series.

Data

81. Seasonally adjusted quarterly data are used for all variables for the period of 1970:1-2003:4, except for the production function approach, where annual data for 1970-2004 are used.

C. Estimation Results

82. Potential GDP growth rates derived from these methods prove very similar over the whole sample period of 1977-2003. They range from 2.1 to 2.4 percent, against the actual average growth of 2.3 percent during this period (Table III-2). However, the estimates for the short-run do vary considerably. Estimates based on the production function approach show that the higher potential growth during the 1990s, relative to 1980s, was a result of high trend employment growth (associated with a declining NAIRU) and trend capital accumulation, offsetting a decline in trend TFP (see Figure III-4). Assuming unchanged trend growth for TFP and capital stock accumulation, to sustained the output growth at 2¼ percent would require an employment growth of about 2 percent per year.

83. All methods used yield similar estimates of the location of cyclical peaks and troughs (Figures III-5 and III-6). Cyclical developments (measured by the deviation between actual output and unemployment from potential output and the NAIRU, respectively) generated by the Apel-Jansson model are illustrated in Figure III-6. Overall, the Apel-Jansson approach is found to yield larger economic fluctuations (reflected in the larger output gaps), compared to other three methods. This result is consistent with previous studies.[24]

84. Overall, the evidence suggests that the large positive output gap, notably in 1999 and 2000, either closed in 2002 or will close in 2003. The various methods produce a range of results for output gaps as expected. Estimates based on the HP filter are sensitive to the choice of the smoothing parameter λ and the end point of the sample. Using the HP filter, the Ouliaris filter, and the production function approach, the Dutch economy fell to its potential in 2002, while Apel-Jansson estimation implies that the gap closes in 2003. Specifically, estimates of the output gap for 2002 range between 0.9 percent below potential (using Band-Pass filter) to 2.4 percent above potential (using the Apel-Jansson multivariate method), compared to the CPB estimate of zero gap and the OECD estimate of -1 percent.

[24] For example, Cerra and Saxena (2000).

Table III-2. A Comparison of Output Gaps and Potential GDP Growth Using Various Approaches

	Output gaps				Potential growth		
	2000	2001	2002	2003	2001	2002	1977-2003
	(% of potential GDP)				(percent)		
Statistical detrending methods:							
HP (10000)	2.5	1.4	-0.5	-2.1	2.37	2.18	2.36
HP (1600)	1.6	0.9	-0.4	-1.2	2.00	1.51	2.30
HP (1200)	1.4	0.8	-0.4	-1.0	1.93	1.38	2.29
HP (800)	1.2	0.6	-0.3	-0.8	1.85	1.20	2.29
HP (optimal 374)	0.8	0.4	-0.3	-0.4	1.72	0.92	2.29
Band-pass filter 1/	1.9	0.8	-0.9	-1.8	2.45	1.93	2.30
Production function approach: 2/							
with labor share = 0.6	3.0	1.6	-0.4	-2.5	2.42	2.22	2.20
adjusted for capacity utilization					2.46	1.52	2.24
excluding government sector					2.35	1.38	2.29
with labor share = 0.8	3.3	1.9	0.0	-2.2	2.36	2.31	2.13
memo: HP (100)	3.4	2.3	0.4	-1.8	2.25	2.10	2.36
Multivariate method: 3/	5.4	4.2	2.4	0.6	2.40	2.17	2.23
Average of various potential growth estimates					*2.21*	*1.74*	*2.27*
Actual growth					*1.22*	*0.25*	*2.24*
Official estimation 4/							
Production function approach		2.0	0.0	-1.2	2.75		2.25
European Commission 5/							
HP	2.4	0.8	-0.3	-0.1	2.70		
Production Function	2.2	0.5	-0.9	-0.8	2.80		
OECD 6/	2.8	1.2	-1.0	-2.4	2.82	2.63	2.39

1/ The pre-specified frequency band is [pi/16, pi/3], which implies that a cycle could be between 6 quarters and 8 years.

2/ Based on Annual data 1969-2004.

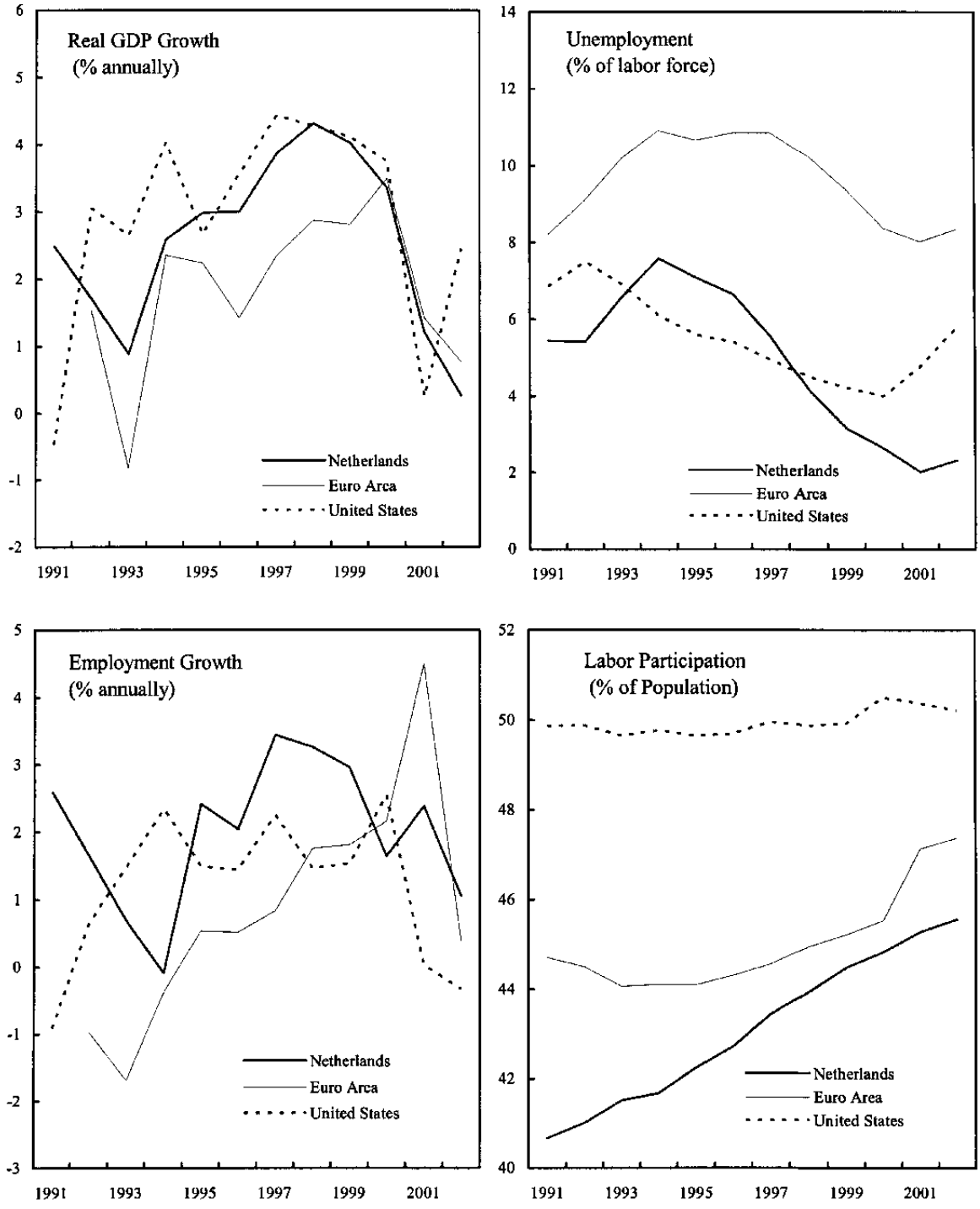
3/ Using the unobserved-components model of Apel and Jansson (1999), with sample 1970:1-2004:4.

4/ Bureau for Economic and Policy Research, June 2003.

5/ EC (2002).

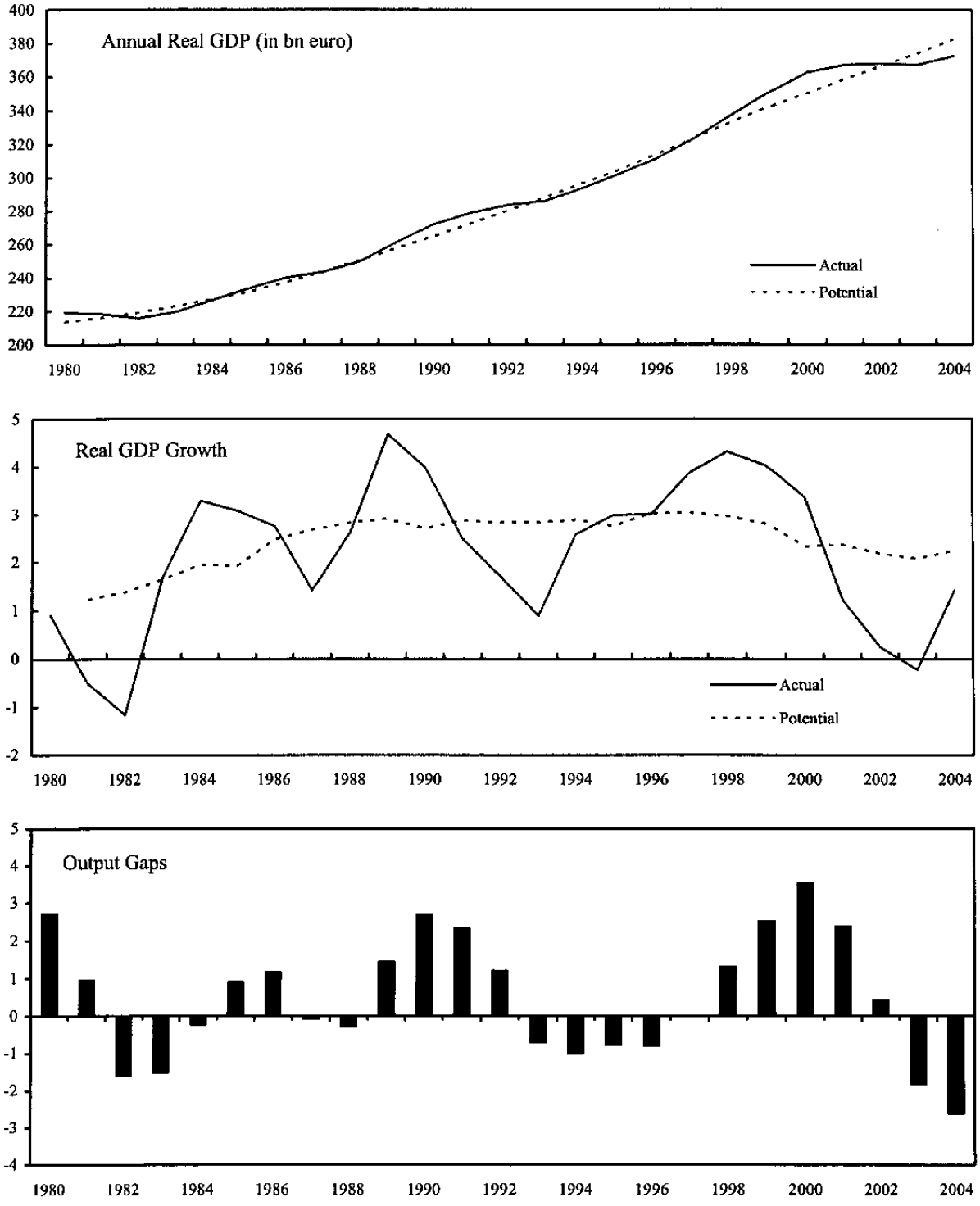
6/ OECD database, as of June 23, 2003.

Figure III-1. Economic Performance: Netherlands, United States, and the Euro Area, 1991-2002



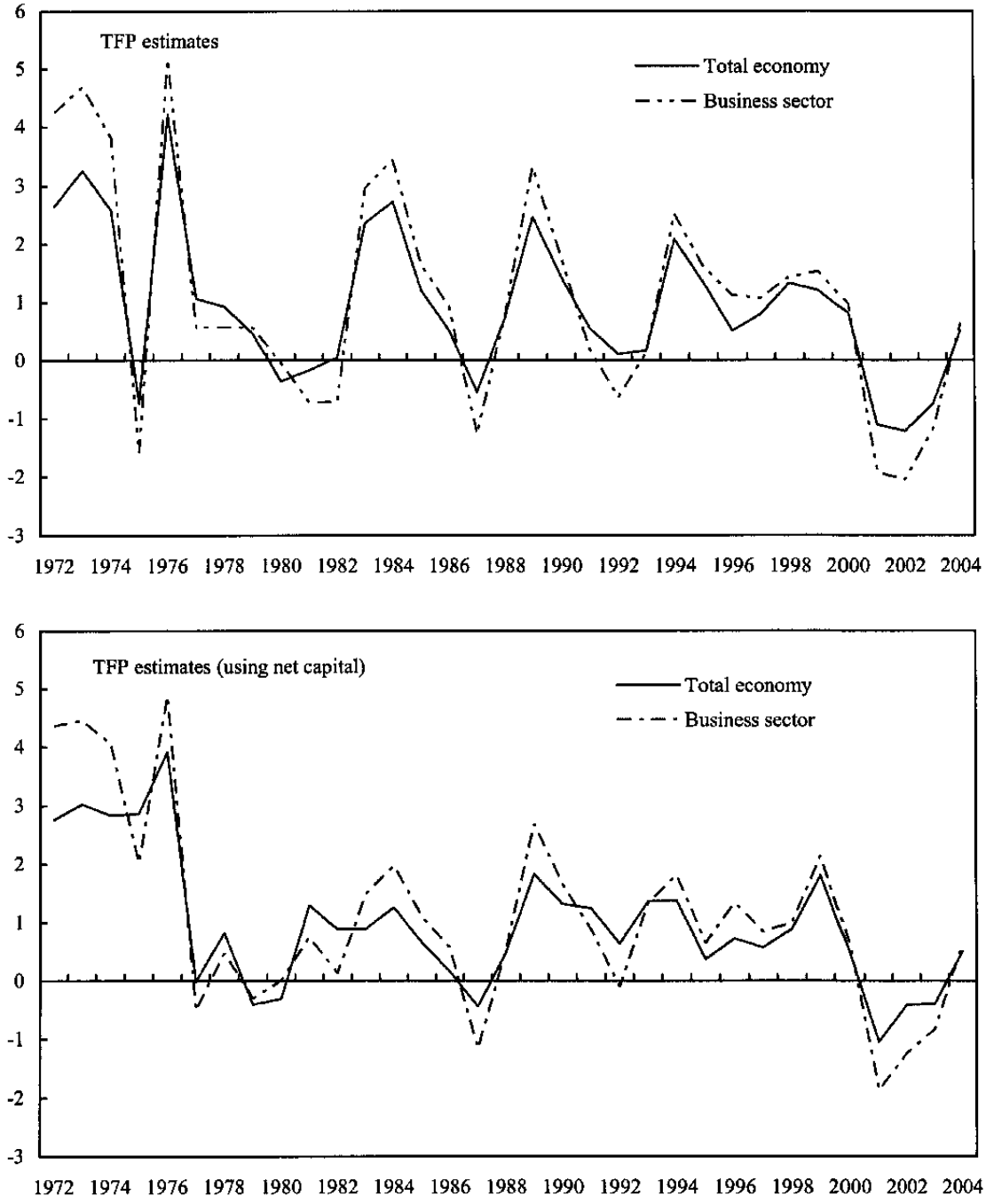
Source: WEO.

Figure III-2. Potential Output, Growth, and Output Gaps



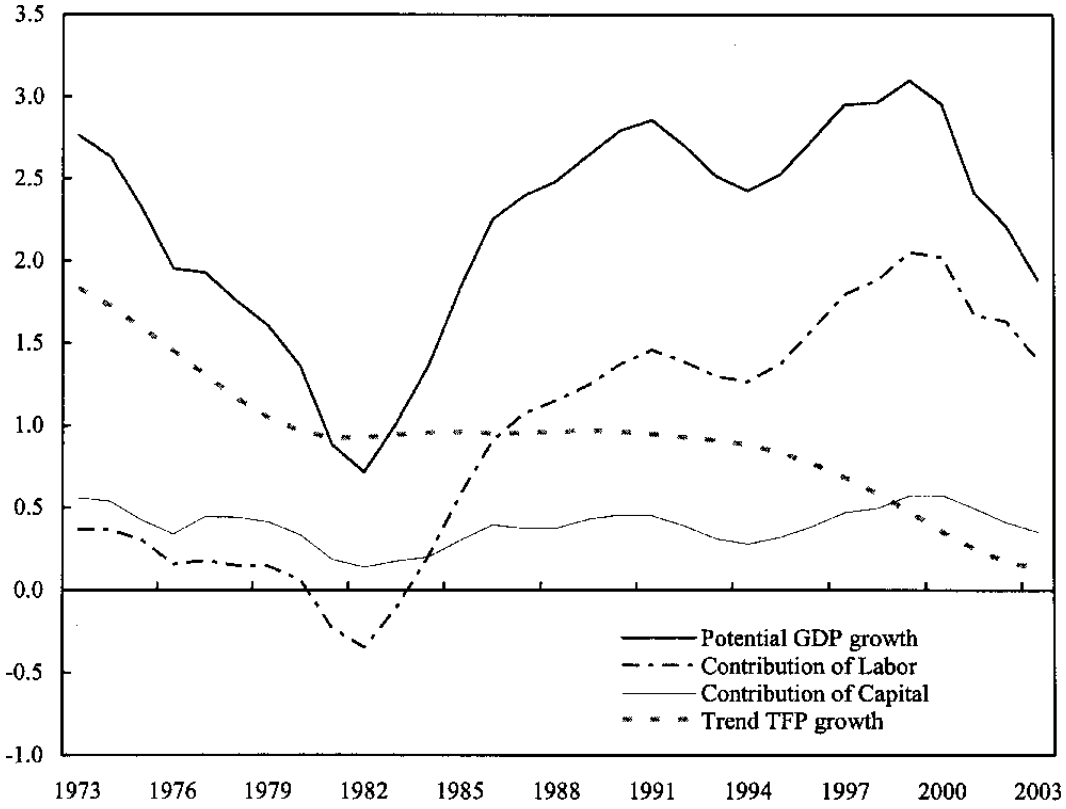
Source: IMF Staff estimates.

Figure III-3. Total Factor Productivity (TFP)1972-2004 1/
(Annual percentage change)



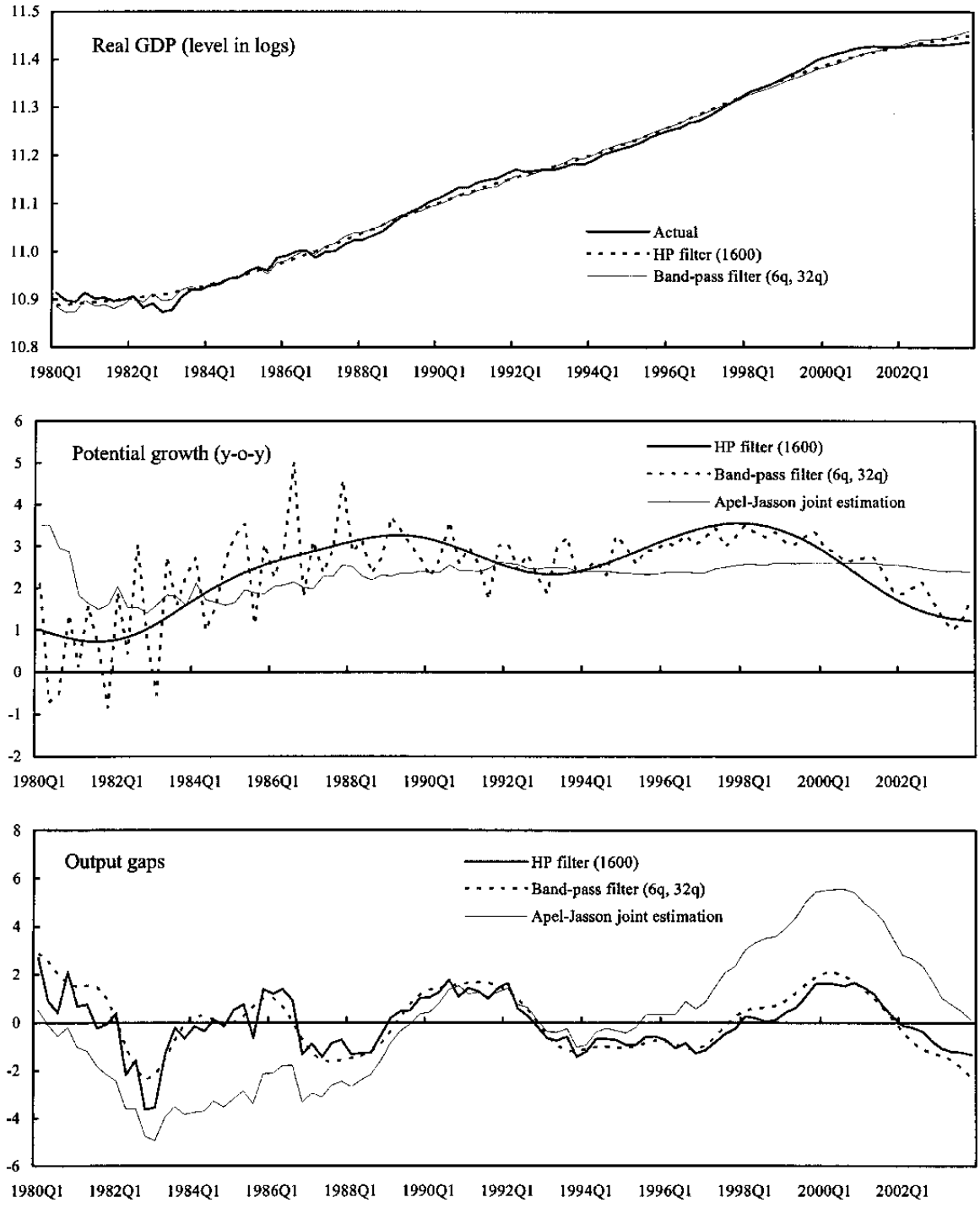
1/ Solow's residual, with labor share of 0.6.
Source: IMF staff estimates.

Figure III-4. Sources of Potential Output Growth
(Annual percentage change)



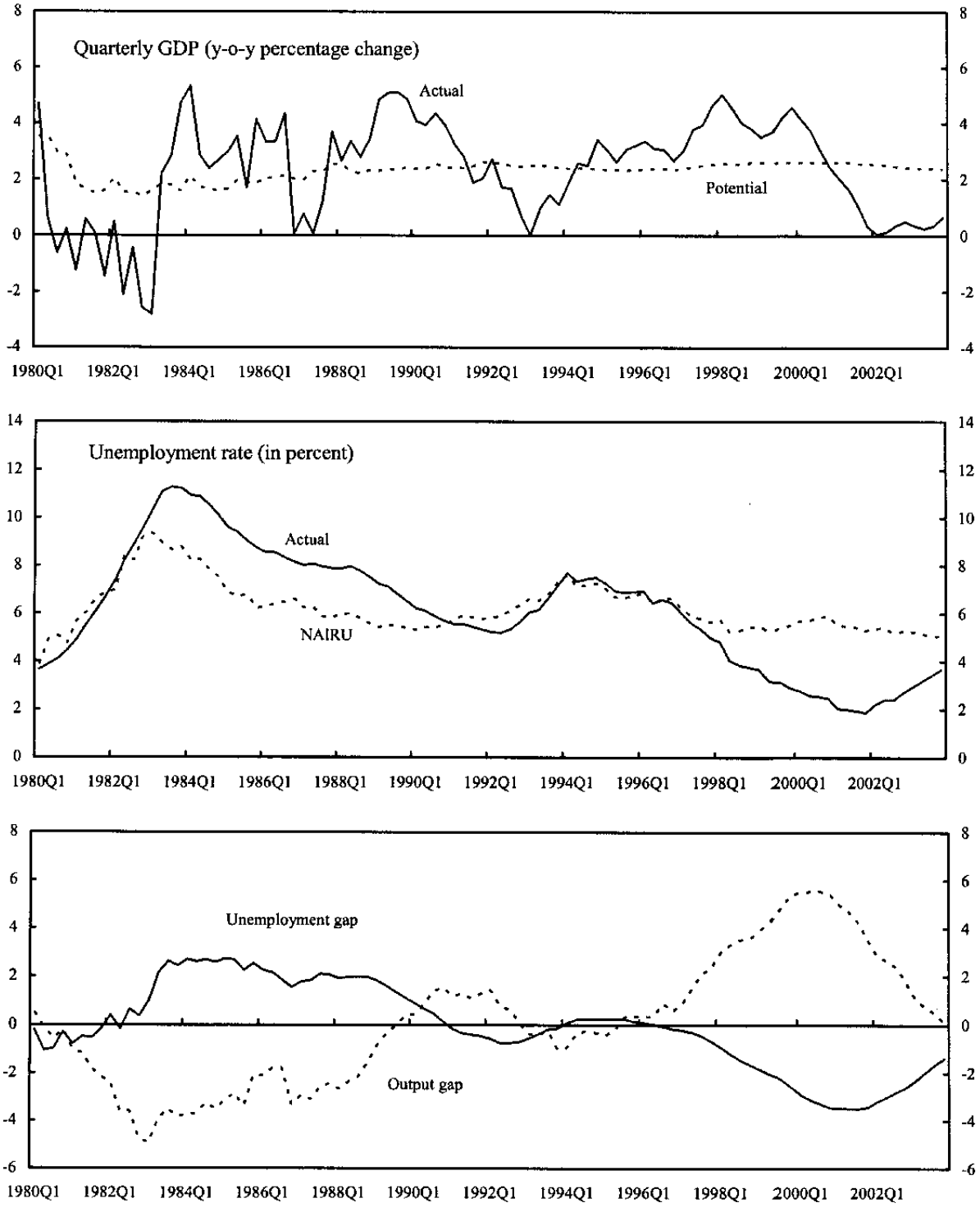
Source: IMF staff estimates.

Figure III-5. Potential Output, Growth, and Output Gaps



Source: IMF Staff estimates.

Figure III-6. Netherlands: Potential Output and NAIRU Based on Apel-Jansson Joint Estimation, 1980 Q1-2003 Q4



Source: IMF staff estimates.

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