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Abstract

This paper estimates a non-linear wage equation for the Netherlands. The long-term equation is derived from a wage bargaining model in which the threat point of employees involves income earned in the untaxed informal sector. The model implies that the various components of the tax wedge exert the same impact on wage costs. Wages depend also on the consumer price, the producer price, labour productivity, the unemployment rate and the replacement rate. The ways the latter two variables affect wages are related. In particular, the wage pressures generated by the replacement rate rise with the unemployment rate. Furthermore, the moderating influence of unemployment on wages falls with the replacement rate.

Estimation results for the Netherlands show a highly significant long-term impact of the tax wedge on wages. The implied elasticity of the average tax rate is about 0.5. The marginal tax rate exerts a small negative impact on wages of -0.15. Both elasticities are more or less stable over the estimation period (1967-1993). The elasticity of the replacement rate and unemployment rate, in contrast, show a large variation. The elasticity of the replacement ratio increases from 0.1 during the sixties to over 0.5 in the eighties. The semi-elasticity of the unemployment rate varies from -1.4 during the second half of the seventies to −2.7 during the second half of the sixties. The long-run impact on wage costs of various components of the tax wedge − *i.e.* the employers' social premium rate, the employees' tax and social premium rate and the consumer price − do not differ significantly. Our results suggest that, compared to government assistance, social security benefits are less relevant to the threat point of employees' in wage bargaining.

Estimation of the dynamic effects shows that the employers' social premium rate exerts a substantial impact on wages costs in the short run, which is twice as large as the short-term wage effect of the employees' tax and social premium rate. However, the large impact is short-lived, because the estimated error correction mechanism implies that the wage rapidly converges towards its long-term level.

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1 Introduction

In any macroeconometric model the wage equation is of crucial importance. Indeed, the wage equation largely determines the macroeconomic impact of taxes and social benefits. For example, if the impact on wage costs of the employers' social premium rate exceeds that of the employees' social premium rate, as in the macroeconometric model of the Netherlands Bureau of Economic Policy Analysis (CPB, 1992), a shift from employers' to employees' contributions reduces labour costs. Or, as another example, if the consumer price increases wages more than the employees' tax rate does, like in the Quest model (European Commission, 1994), a shift from employees' taxes to VAT raises wage costs. The macro-economic impact of unemployment benefits depends largely on how the replacement rate enters the wage equation.

Unfortunately, theoretical notions and empirical studies do not agree in this respect. Theoretical models of wage setting suggest that employers' and employees' tax rates and VAT-rates should exert the same impact on wages. In some models, tax rates exert no influence on wages whatsoever. This contrasts to many empirical studies. For example, testing a macro wage equation for ten OECD countries, Knoester and Van der Windt (1987) find that the employers' and employees' tax rate have a larger impact on wage costs than indirect tax rates in the case of Australia, Canada, Germany, Italy, Japan, The Netherlands, Sweden and the United Kingdom. For the United Kingdom, Layard and Nickell (1986) find that only the labour tax rate of employers affects wages. Layard, Nickell and Jackman (1991, 1994) suggest that the tax wedge exerts no long-term influence on wage costs.

Table 1 Estimates of the replacement rate elasticity in wage equations

study	country	estimate
Minford (1983)	United Kingdom	0.6
Layard and Nickell (1986)	United Kingdom	0.18
Nickell (1987)	United Kingdom	0.15 to 0.35
Manning (1993)	United Kingdom	0.18 to 0.21
Central Planning Bureau (1992)	Netherlands	0.15
Lever (1991)	Netherlands	0.17
Graafland (1992a, 1992b)	Netherlands	0.31
Calmfors (1990)	Norway, Sweden	0
	Denmark	0 to 0.28
	Finland	0.18
Christensen and Knudsen (1992)	Denmark	0.05
Dolado, Malo de Molina and Zabalza (1986)	Spain	0.45
Adams and Coe (1990)	USA	0.05

Also on how the replacement rate affects wages, theoretical and empirical studies come to different conclusions. Theoretical studies provide abundant support for a substantial influence of unemployment benefits on wages. However, the empirical evidence is scarce and mixed. Most empirical studies do not detect any significant effect, although some do find a rather large impact (see Table 1).

This paper develops a wage equation in which the effect of taxes and benefits on wages is not constant but depends on specific circumstances. To illustrate, the elasticity of the replacement rate depends on the unemployment rate. By distinguishing between short-term and long-term coefficients, we reconcile the divergence between theoretical predictions and empirical estimates of various components in the tax wedge. Section 2 develops a theoretical wage bargaining model, which yields a non-linear wage equation. Section 3 presents the estimation results. Section 4 summarizes the main findings and reviews some policy implications.

2 Derivation of the wage equation

The wage equation is derived from a wage bargaining model for a representative employer and employee. The outcome of the wage bargain is described by the maximisation of the following Nash-function:

(1) $$\max \arg(w)\ g = ge^{\alpha}\ gu^{1-\alpha} \qquad 0<\alpha<1$$

ge and gu denote the employer's and employee's utility, respectively, and α represents the relative bargaining power of the employer. Employer's utility amounts to the surplus generated by the employee. This surplus is given by value added price (py) times labour productivity (h) minus wage costs (w):

(2) $$ge = py\ h - w$$

The employee's utility corresponds to the surplus from working, which is the net wage offered by the employer minus the opportunity costs of taking the job (*i.e.* the reservation wage):

(3) $$gu = w\ (1-t) - \hat{w}$$

t denotes the average tax and social premium rate and $\hat{w}$ stands for the reservation wage.
The reservation wage is a weighted average of the opportunity wage in the official labour market ($\hat{w}_o$) and that in the informal sector (consisting of the household production sector and the underground labour market) ($\hat{w}_b$):

(4) $$\hat{w} = \beta\hat{w}_o + (1-\beta)\hat{w}_b$$

The reservation wage in the official labour market depends not only on the expected wage of other jobs but also on the unemployment benefit. The reason is that the employee generally spends some time in unemployment before finding an alternative job. Income during unemployment equals the replacement rate (*rp*) times the macro wage[1]. The expected wage of other jobs equals the macro wage rate ($\bar{w}$). The time spent unemployed before finding an alternative job is assumed to be positively but less than proportionally related to the unemployment rate (ur^{δ} with $\delta<1$)[2]. This gives:

$$(5) \qquad \hat{w}_o = \gamma\, ur^{\delta}\, rp\, \bar{w}\,(1-t) + (1 - \gamma\, ur^{\delta})\, \bar{w}\,(1-t) \qquad \gamma>0,\ 0<\delta<1$$

Instead of looking for another job on the official labour market, the employee can withdraw from the official labour market and seek work in the informal sector. No taxes are levied in the informal sector. Labour productivity in the informal sector is proportionally related to labour productivity in the formal sector (*h*). The output price in the informal sector is assumed to be linked to the consumer price (*pc*):

$$(6) \qquad \hat{w}_b = \varepsilon\, h\, pc \qquad \varepsilon<1$$

ε is added to allow for a relatively low productivity in the informal labour market compared to the official labour market.[3]
After substituting equations (2) and (3) into equation (1) and deriving the first-order condition for the Nash solution, we arrive at the following wage equation:

$$(7) \qquad w = [\alpha\, \hat{w} /(1-t_w) + (1-\alpha)\, py\, h\,] \,/\, [\alpha(1-t)/(1-t_w) + (1-\alpha)]$$

[1] In case of social insurance, the unemployment benefit is related to the previous wage and in case of government assistance to the macro wage. For a representative worker, the previous wage equals the macro wage.

[2] If the matchingsfunction is Cobb-Douglas, the expected proportion of time spent in the next period in unemployment equals (m) (1−exp(−1/m), where m denotes the ratio between unemployment and matchings. (See Gelauff and Graafland, 1994, pp. 119).

[3] Another way of including the informal sector in the threat point of the employee is to assume that unemployed persons do not withdraw from the official labour market but earn some informal income in addition to the unemployment benefit they receive. Then, the threat point is specified as:
$\hat{w} = \gamma\, ur^{\delta}\, (rp\, \bar{w}\, (1-t) + \delta\, h\, pc) + (1 - \gamma\, ur^{\delta})\, \bar{w}\, (1-t)$
This alternative equation implies that the impact of the informal sector on the threat point of the employee depends on the unemployment rate (see footnote 4).

where t_w denotes the marginal tax rate. Equation (7) shows that the wage outcome strikes a balance between the threat points of both bargaining parties. If the employer dominates bargaining (α=1), the employee is driven back to his threat point and the wage equals the reservation wage. If the employee dominates bargaining (α=0), in contrast, employer's utility is zero and the wage equals the producer price times labour productivity. Since a wage contract will be concluded only if the maximum wage offer (*py h*) exceeds the minimum wage claim ($\hat{w}$), equation (7) implies that the marginal tax rate unambiguously reduces the wage. At a given average tax rate a rise in the marginal tax rate implies that the government absorbs a larger share of a wage increase. Hence, increasing wages becomes less attractive for the employee (Hersoug, 1984; Hersoug *et al.*, 1986).[4]

To derive the wage equation to be estimated, we use the equilibrium condition $w=\bar{w}$. After substitution of equations (4) to (6) into equation (7) and some rewriting, we arrive at:

$$(8) \qquad \log w = \log h + \log[py + \alpha'(pc/(1-t_w)-py)] - \log[1 + \alpha/(1-\alpha)\,(1-t)/(1-t_w)\,\{1 - \beta(1-\gamma ur^{\delta}\,(1-rp))\}] + \eta$$

with: $\alpha' = \alpha(1-\beta)\varepsilon/(1-\alpha+\alpha(1-\beta)\varepsilon)$

$\eta = \log[1+\alpha/(1-\alpha)(1-\beta)\varepsilon]$

Equation (8) implies that, at a given marginal tax rate, the average tax rate unambiguously raises the wage. Intuitively, taxes raise the relative attractiveness of working in the informal sector, thereby improving the bargaining position of the employee. Equation (8) reveals also that various components of the average tax rate exert the same effect on wages in the long run. The same holds for the sum of the average and marginal tax rate and the consumer price (including the terms of trade and indirect tax effect) . A third implication of equation (8) is that wage effects of the replacement rate and unemployment rate are related. If unemployment is low, spells of unemployment are only short. Hence, the unemployment benefit level does not affect the alternative wage in the official sector much.[5] The influence of the unemployment rate on wages diminishes with the level of the replacement rate,

[4] In this aspect the wage bargaining model differs from the demand-supply equilibrium model, in which wages follow from equilibrium between labour demand and labour supply. In this type of model, the marginal tax rate has a positive impact on wage costs, because it decreases labour supply (See Graafland, 1991).

[5] If the threat point is specified as in footnote 3, the wage effect of the tax wedge depends also on the unemployment rate. However, empirical tests rejected the hypothesis that the wage effect of the tax wedge depends on the unemployment rate.

becoming zero if the replacement rate equals one. A final implication of equation (8) is that the labour productivity affects wages with a unitary elasticity.
If the informal economy is irrelevant for the threat point of the employee (β=1), equation (8) can be simplified to:

$$(9) \quad \log w = \log h + \log py - \log[1 + \alpha/(1-\alpha)\ (1-t)/(1-t_w)\ \gamma ur^{\delta}\ (1-rp)]$$

The consumer price vanishes and the tax rate affects the wage only insofar changes in the average tax rate differ from changes in the marginal tax rate.

3 Estimation results

The appendix contains the data, which are based on the National Accounts of the Dutch Central Bureau of Statistics. The estimation period is restricted to 1967 to 1993, because data of the replacement rate are not available for the period before 1965. Data of the tax rate relate to the median worker.[6]

The dynamic wage growth equation is specified as a error correction model:

$$\begin{aligned}(10) \quad \triangle \log w = {} & d_1 \triangle \log pc + d_2 \triangle \log(1-s) + d_3 \triangle \log(1-t_l) + \\ & d_4 \triangle \log(1-t_w) + d_5 \triangle \log py + \\ & d_6 \triangle \log h + d_7 \triangle \log rs + d_8 \triangle \log rl + d_9 \triangle \log ur - \\ & d_{10} \{(\log w - (\log h + \log[py + \alpha'(pc/(1-t_w)-py)] - \\ & \log[1 + \alpha/(1-\alpha)\ (1-t)/(1-t_w)\ \{1 - \beta(1-\gamma ur^{\delta}\ (1-rp))\}] + \eta)\end{aligned}$$

Equation (10) consists of two parts. The first two lines reflect the short-term effects of the explanatory variables considered. s denotes the social premium rate paid by employers (as a rate of wage costs), t_l the rate of direct taxes and social premiums paid by employees (as a rate of gross wages), rs the social insurance replacement rate and rl the social assistance replacement rate. The other part of equation (10) is

[6] Empirical tests showed this definition to be more relevant than the average tax wedge of all employees.This might reflect that, at the time of wage bargaining, unions have no full information about the average tax wedge of all workers and use the tax wedge of the median worker instead. Another explanation is that the tax wedge of the median worker better represents the tax wedge of the average union member if union members disproportionally consist of low income workers.

the error correction term, defined as the difference between the last year' wage level and the preferred long-term wage level as specified in equation (8).

Equation (10) can be estimated in two alternative ways. The so-called two stage estimation method first estimates the long-term wage level equation and adds the error term from the estimated long-term equation as explanatory variable to the short-term wage growth equation (see Graafland and Huizinga (1988)). The alternative way is to simultaneously estimate the short and long-term wage equations. We adopt the latter procedure because it tends to reduce the finite sample bias in the estimated long-run coefficients (see *e.g.* Banerjee et al., 1993, pp 214-23). To deal with simultaneity between wage, producer price, consumer price, labour productivity and unemployment, we employ 2SLS using one year lagged values and import prices as instrumental variables. Dickey Fuller and Augmented Dickey Fuller test statistics (see Graafland en Huizinga (1988) and Graafland (1992b)) indicate that all variables included in equation (8) are integrated of the first order (some even of the second order). In order to test for stationarity of the residual, table 2 reports the Durbin Watson test statistic.

Column (1) of Table 2 presents the estimation result of equation (10). We first comment on the long-term coefficients. The elasticity of the tax wedge (α') of 0.23 appears to be highly significant. We find that the bargaining power of the employer (α) somewhat exceeds that of the employee ($1-\alpha$). The estimate of β significantly differs from one, which implies that the threat point of the employee is influenced by the opportunity wage in the informal sector. The estimates of α', α and β imply that the ratio between the productivity in the informal sector and official sector (ε) equals 0.42[7]. From these results, the elasticities of the average and marginal tax rate can be calculated (see table 3). These elasticities show only little variation over the estimation period. The elasticity of the average tax rate is almost five times larger than the (absolute value of the) elasticity of the marginal tax rate. This implies that a 1 % rise in both the average and marginal tax rate will increase the wage by about 0.4%. This contrasts with Layard, Nickell and Jackman (1991, 1994), who argue that taxes exert no long-term effect on wage costs. The negative wage effect of the marginal tax rate is supported by other studies for the United Kingdom (Lockwood and Manning, 1993), Italy (Malcomson and Sartor, 1987) and other OECD countries (Tyrväinen, 1994).[8]

The term involving the unemployment rate and the replacement rate (γ) is not highly significant. The influence of the unemployment ratio is almost proportional

[7] The interpretation of η is less straightforward because this coefficient also corrects for differences in scaling of the other explanatory variables.

[8] The negative effect of the marginal tax rate on wages implies that the demand-supply equilibrium model is rejected against the wage bargaining model. See Graafland (1991).

(i.e. δ is close to unity). The interdependence between unemployment rate and replacement rate implies that the elasticities of the replacement rate and the unemployment rate have varied considerably over time . At the low unemployment

Table 2 *Estimation results*[a]

	(1)		(2)		(3)	
short term coefficients[b]						
△ log pc	0.41	(2.8)	0.54	(3.0)	0.62	(2.5)
△ log(1-s)	−0.61	(2.7)	−0.58	(2.1)	−0.37	(0.8)
△ log(1-t_l)	−0.33	(4.6)	−0.32	(3.6)	−0.32	(2.7)
△ log(1-t_w)	0.21	(4.4)	0.24	(3.9)	0.25	(3.2)
△ log py	0.35	(2.6)	0.31	(2.0)	0.26	(1.4)
△ log h	0.19	(2.7)	0.18	(1.9)	0.22	(1.9)
△ log rs	0.14	(3.1)	0.17	(2.9)	0.20	(2.4)
△ log rl	0.17	(3.5)	0.16	(2.6)	0.14	(1.7)
△ log ur	–		–		–	
long term coefficients						
error correction (d_{10})	0.57	(6.4)	0.55	(6.5)	0.58	(5.6)
α’	0.23	(5.4)	0.20	(2.6)	0.35	(2.1)
α	0.66	(11.1)	0.67	(8.0)	0.79	(4.4)
β	0.58	(8.1)	0.63	(4.8)	0.58	(4.9)
γ	9.80	(1.7)	4.72	(1.2)	3.42	(0.9)
δ	0.82	(4.0)	0.55	(2.0)	0.48	(1.4)
η	−0.38	(0.0)	−0.38	(0.0)	−0.38	(0.0)
employers’ tax rate (κ)[c]	–		0.38	(0.4)	–	
employee’s tax rate (λ)[c]	–		0.89	(2.0)	–	
weight of rl in rp	–		–		0.82	(2.9)
statistics						
Adjusted standard error (*100)	0.43		0.52		0.61	
Adjusted R^2	.991		.986		.982	
Durbin Watson coefficient	2.4		2.5		2.6	

Symbols

w wage cost
pc consumer price
s employer’s social premium rate (as a rate of wage costs)
t_l employee’s tax and social premium rate (as a rate of gross wages)
t_w marginal tax and social premium rate
py value added price
h labour productivity
ur unemployment rate
rs replacement ratio of social insurance benefits
rl replacement ratio of social assistance

[a] T-values between parenthesis
[b] All short term variables are unlagged, except Δlog rl which is one year lagged. All long term variables are one year lagged.
[c] For this test the specification of the average tax rate in the long-term wage level (1−t) in the last line of equation (10) was replaced by $(1-\kappa s-\lambda t_l/(1+s))$. If κ and λ equal one, the specification in equation (10) results.

Table 3 *Long-run elasticities in different subperiods*

period	average tax rate[a]	marginal tax rate[b]	replacement rate[c]	unemployment rate[d]
1966-1970	0.49	−0.18	0.13	−2.72
1971-1975	0.49	−0.15	0.18	−2.19
1976-1980	0.51	−0.13	0.32	−1.45
1981-1985	0.58	−0.13	0.56	−1.56
1986-1990	0.61	−0.18	0.54	−1.93
1991-1993	0.60	−0.18	0.42	−2.37

[a] $(\partial w/w)/(\partial t/(1-t)$
[b] $(\partial w/w)/(\partial t_w/(1-t_w)$
[c] $(\partial w/w)/(\partial rp/rp)$
[d] semi-elasticity, defined as $(\partial w/w)/\partial ur$

rates during the sixties, the replacement rate did not generate much wage pressure (see table 3). The rise in unemployment rate during the seventies increased the effect of the replacement rate on wages, reaching its peak after the recession in the beginning of the eighties. In the nineties, the impact of replacement rate on wages diminishes, but it is still well above the level in the seventies. The elasticity of the unemployment rate varies inversely with the replacement rate, which has increased from 0.72 in 1966 to 0.83 in 1974 and has fallen since then to 0.70 in 1993.

On the estimates of the short-term coefficients, we find that the effect of the employers' rate of social premiums on wage growth exceeds that of the consumer price or employees' tax and social premium rate (although the difference is not significant). This is consistent with other studies on Dutch wages (Fase et al, 1990; Central Planning Bureau, 1992; Graafland, 1991, 1992a; Graafland en Verbruggen, 1993). The relatively large influence of employers' social premium rates on wage costs can be explained by institutional aspects of wage bargaining. In the Netherlands, collective bargaining concludes contracts for the gross wage (e.g. wage costs excluding social premiums paid by employers). If the gross wage is fixed, an unanticipated increase in the employers' tax rate will, in the short run, cause a similar change in wage costs. An unexpected increase in the employees' tax rate, in contrast, is absorbed by workers in terms of a lower net wage. In this way, unexpected changes in the employers' and employees' tax rate imply different short-run effects on wage costs. However, these effects due to nominal contracting are not likely to persist in the long run.

Significant short-term effects on wage growth are also found for the producer price, labour productivity and the replacement ratio of both government assistance and social insurance. The latter two coefficients are more or less equal. We did not find any short-term effect of the unemployment rate and thus dropped it. However, the high value of the error-correction term implies a strong feedback from last year's divergences from the long-term wage level. Almost two thirds of the difference between last year's actual wage level and the preferred long-term wage level is reversed within a year. Indeed, within three years, 90 % of the convergence towards the long-term wage level is realized.

The second and third columns of table 2 provide two additional tests. The second column separately estimates the influence of the employers' social premium rate and employees' tax and social premium rate, as a ratio of the influence of the consumer price (α'). For both variables we find that the estimates do not significantly differ from one. This implies that the hypothesis that various components of the tax wedge have an equal impact on wage costs cannot be rejected. This contradicts most other studies on wage formation in the Netherlands mentioned before. The explanation might be that most of these studies estimate wage growth equations that reflect short-term dynamics rather than long-term wage formation.

Column (1) specifies the replacement rate as the average of the replacement rate for social insurance (for unemployment and disability) and government assistance. The third column allows for a free estimate of the weight of the government assistance replacement rate in the overall replacement rate. Although the estimate does not significantly differ from 0.5, the high value suggests that government assistance affects the threat point of employees more than social insurance benefits do.

4 Conclusions and policy implications

This paper estimates a structural non-linear wage bargaining model for The Netherlands. The estimation results show a significant positive long-term impact of the average tax wedge on wages. The long-run wage effects of different components of the tax wedge − the employers' social premium rate, employees' tax and social permium rate and the consumer price − do not differ significantly. The marginal tax rate exerts a small negative impact on wages. The impact of benefits rises with the unemployment rate.

The findings in this paper yield important policy implications. First, the significant long- term influence of the tax wedge on wage costs implies that tax policy affects equilibrium unemployment. This conclusion contrasts with Layard, Nickell and Jackman (1991, 1994), who argue that the tax wedge leaves equilibrium unemployment unaffected. The negative influence of the marginal tax rate implies that tax base broadening − *i.e.* reducing marginal rates while leaving average rates unaffected − raises wage costs. In the short run, a decrease in the employers' social premium rate seems to be the most effective instrument to moderate wages. The estimation results further suggest that at high levels of unemployment a reduction in unemployment benefits is particularly effective in reducing wage costs.

Appendix Data

	pc	py	h	t	s	t_1	t_w	ur	rs	rl
1965	0.3138	0.3880	0.4229	0.3476	0.1436	0.2327	0.3354	0.0058	0.8180	0.6340
1966	0.3306	0.4016	0.4354	0.3635	0.1583	0.2381	0.3522	0.0082	0.8240	0.6386
1967	0.3402	0.4111	0.4662	0.3730	0.1646	0.2442	0.4096	0.0170	0.7929	0.6145
1968	0.3486	0.4187	0.5000	0.3903	0.1777	0.2515	0.4269	0.0152	0.8134	0.6304
1969	0.3702	0.4401	0.5346	0.4021	0.1813	0.2630	0.4604	0.0108	0.8617	0.6678
1970	0.3864	0.4538	0.5685	0.4081	0.1827	0.2697	0.4685	0.0103	0.8364	0.6482
1971	0.4169	0.4841	0.5890	0.4318	0.1898	0.2911	0.4761	0.0130	0.8561	0.6547
1972	0.4514	0.5244	0.6187	0.4442	0.1929	0.3050	0.4941	0.0204	0.8415	0.6562
1973	0.4899	0.5581	0.6669	0.4728	0.2111	0.3238	0.4904	0.0208	0.8628	0.6645
1974	0.5365	0.5960	0.7024	0.4875	0.2156	0.3398	0.5198	0.0242	0.9181	0.7009
1975	0.5907	0.6449	0.6902	0.4834	0.2153	0.3357	0.5201	0.0325	0.9020	0.7541
1976	0.6438	0.6930	0.7394	0.4901	0.2168	0.3433	0.5308	0.0345	0.8939	0.7664
1977	0.6833	0.7293	0.7558	0.4845	0.2132	0.3386	0.5328	0.0334	0.8848	0.7590
1978	0.7142	0.7626	0.7784	0.4858	0.2113	0.3416	0.5418	0.0335	0.8861	0.7692
1979	0.7449	0.7824	0.7946	0.4887	0.2130	0.3439	0.5496	0.0321	0.8827	0.7612
1980	0.7965	0.8075	0.8014	0.4928	0.2162	0.3450	0.5643	0.0356	0.8469	0.7608
1981	0.8466	0.8303	0.8191	0.4923	0.2157	0.3470	0.5955	0.0559	0.8399	0.7593
1982	0.8917	0.8799	0.8439	0.5113	0.2151	0.3683	0.5977	0.0794	0.8209	0.7548
1983	0.9165	0.8983	0.8716	0.5406	0.2220	0.3956	0.6341	0.0968	0.8366	0.7636
1984	0.9359	0.9054	0.9149	0.5275	0.2212	0.3817	0.6509	0.0966	0.8221	0.7424
1985	0.9566	0.9176	0.9216	0.5185	0.2204	0.3690	0.6310	0.0868	0.7709	0.7209
1986	0.9594	0.9487	0.9341	0.5073	0.2200	0.3589	0.6236	0.0841	0.7692	0.7068
1987	0.9615	0.9561	0.9328	0.5078	0.2162	0.3635	0.6167	0.0845	0.7569	0.6979
1988	0.9666	0.9732	0.9518	0.5043	0.2145	0.3600	0.6144	0.0841	0.7484	0.6896
1989	0.9782	0.9888	0.9801	0.4952	0.2037	0.3591	0.6121	0.0767	0.7179	0.6690
1990	1.0000	1.0000	1.0000	0.4714	0.2049	0.3272	0.5739	0.0699	0.7010	0.6496
1991	1.0319	1.0139	1.0086	0.4738	0.2121	0.3239	0.5777	0.0659	0.7028	0.6459
1992	1.0632	1.0315	1.0090	0.4828	0.2145	0.3318	0.5858	0.0667	0.7013	0.6451

1993	1.0854	1.0383	1.0111	0.4835	0.2138	0.3334	0.5835	0.0771	0.7428	0.6367

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