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Unemployment Insurance and the Stability of Earnings: A Comparison of Work Exits from Unemployment in the United States and West Germany*

By Markus Gangl

Abstract

Viewing unemployment insurance (UI) as a search subsidy to workers, job search models predict that unemployment benefits improve job outcomes for unemployed workers. Based on 1984–1995 data from the U.S. Survey of Income and Program Participation and the German Socio-Economic Panel, the paper reports earnings regression estimates for an inflow sample of displaced workers. Consistent with the search model, the analysis shows positive effects of unemployment benefit coverage on workers' subsequent earnings in both countries. UI effects are particularly strong in the lower tails of the earnings change distribution, particularly for West German workers.

JEL-Classification: J 64, J 65

1. Introduction

Welfare state transfers buffer the economic consequences of events like unemployment, ill health or family changes. By partially replacing market and family income sources, transfers tend to smooth individual and household income streams, and thus contribute to the economic security of individuals and households. Cross-nationally, however, there are significant differences in the extent to which welfare states interfere with income distribution issues, and in consequence, the extent of welfare state buffering of income risks varies considerably between countries (McFate et al. 1995; Gallie/Paugam 2000).

* The SIPP data used in the paper have kindly been provided by the U.S. Bureau of the Census, Washington D.C. and the Interuniversity Consortium of Political and Social Research at the University of Michigan, Ann Arbor. The GSOEP data have kindly been provided by the German Institut for Economic Research (DIW Berlin). Of course, neither institution bears any responsibility for the use made of the data, nor the inferences drawn by the author. The paper is a substantially shortened version of Gangl (2002). I am grateful to Jennifer Hunt and the participants of the GSOEP 2002 conference for insightful comments and discussions.

Given substantial differences in their welfare state institutions, the United States and West Germany are cases in point, and much recent research consequently documents higher life-cycle fluctuation in incomes in the United States (e.g. McManus/DiPrete 2000). To some extent, the higher volatility of incomes reflect both higher levels of earnings mobility and higher rates of divorce and remarriage in the United States (DiPrete/McManus 1996, 2000), yet the more extensive German welfare state is also more successful in buffering income losses related to negative trigger events. DiPrete and McManus (2000:355 ff.) report evidence that the German welfare state is able to reduce about two thirds of the loss of household income related to unemployment, while in the U.S., welfare state measures achieve a reduction of only one third of lost household income in this case.

While these results emphasise the effectiveness of welfare states in buffering income fluctuations in the short-run, they tend to underestimate potential positive welfare state effects on workers' post-unemployment earnings, and thus on household incomes in the longer run. Such longer-run effects would occur if the relative financial security provided by unemployment benefits allowed workers to sustain searches for adequate reemployment, and thus to protect their accumulated human capital. Precisely this effect is expected from basic job search theory, that predicts that unemployment benefits raise workers' reservation wages, i.e. the minimum job offer required by workers to accept a job and stop searching (Mortensen 1986). Although much research continues to stress the disincentive aspects related to job opportunities foregone, the key innovation of job search theory is in stressing the dynamic trade-off between short unemployment duration and improved job quality. In emphasising the productivity aspect of unemployment insurance (UI), Burdett (1979) was the first to refer to unemployment benefits as a search subsidy to workers.

To date, however, there has been surprisingly little empirical research on the likely magnitude of the effects involved. Recent analysis by Burda and Mertens (2001), that finds much smaller wage losses among displaced workers in Germany than common for workers in the United States, could be read as providing some indirect evidence on the matter. The only available direct evidence on wage effects comes from the study by Addison and Blackburn (2000), who found evidence of positive UI effects on post-unemployment wages from U.S. data. Their preferred estimates ranged between two and five percent gains in workers' monthly wages, yet positive effects were obtained only in models contrasting benefit recipients to non-recipients. Addison and Blackburn's results of positive, but small effects of unemployment insurance tend to echo findings in the earlier economic literature, notably of the Ehrenberg and Oaxaca (1976) study (cf. Burtless 1990; Cox/Oaxaca 1990 for surveys of the literature up to the late 1980s).

Against the dearth of available empirical evidence, this paper will provide a test of the search subsidy view of unemployment insurance based on estimates

of the effect of unemployment insurance on workers' post-unemployment earnings. Below, I report estimates from a series of earnings change regressions for U.S. and West German workers, using data from the Survey of Income and Program Participation (SIPP) and the German Socio-Economic Panel (GSOEP). The data and the analysis are discussed in more detail in the following sections of the paper. For both countries, the empirical evidence shows strong evidence of positive UI effects on earnings, in particular in the lower tail of the earnings change distribution. For the individual worker, unemployment insurance provision is thus particularly effective in preventing severe earnings losses related to unemployment. In a cross-national perspective, the United States and West Germany differ much more in terms of UI coverage levels than in the behavioural effects of unemployment insurance.

2. Data

The analysis reported here draws on employment history data from the U.S. Survey of Income and Program Participation (U.S. Bureau of the Census 1991) and the German Socio-Economic Panel study (SOEP Group 2001). Both studies are household panel surveys representative of each country's residential population, and both surveys provide rich databases on individual labour market behaviour, employment, unemployment and job dynamics. For the current paper, harmonised data from the combined SIPP Panels 1984, 1986, 1988, 1990, 1992, and 1993, and the West German data from GSOEP waves A-M (samples A+B) have been used to generate monthly calendar information in the 12-year observation window between January 1984 and December 1995. As a basis to the following analyses, a sample was drawn that comprised the total inflow from wage and salaried employment into unemployment in both countries. This sample includes about 20,000 non-censored unemployment spells from the pooled SIPP panels, and still some 2,850 non-censored spells from the smaller GSOEP data. The database for all subsequent analyses will be the 14,786 unemployment spells from the SIPP and the 1,178 spells from the GSOEP that ended in reemployment and where gross earnings data in the first post-unemployment job spell has been available. The key dependent variables of the subsequent analysis will be monthly real earnings in the first month (for the SIPP), and the first earnings observation for a worker's first post-unemployment job spell (in the GSOEP). As the earnings data has been defined at the spell level, individual workers potentially contribute multiple earnings observations to the final dataset. The average number of spells per worker is 1.2 in the SIPP, and 1.5 in the GSOEP data.

In terms of covariates, the spell database includes gender, age, ethnicity, workers' education (including completion of vocational training for the German sample), actual labour force experience, as well as tenure, occupation, in-

dustry, and gross earnings with the previous employer, but also a measure of the quarterly vacancy ratio calculated from the full SIPP and GSOEP datasets by the quarterly number of hires over the average number of unemployed in any given quarter as an indicator of aggregate labour market dynamics. All earnings data are deflated to 1990 prices, with German earnings data being converted to dollars using 1990 purchasing power parities after deflation. The key independent variable of interest is individual unemployment benefit status which has been measured as time-constant, with benefit receipt being recorded if workers reported receiving UI transfers (*Arbeitslosengeld* or *Arbeitslosenhilfe* for German workers) in any month of the unemployment spell. Compared to properly accounting for the effects of late benefit take-up, temporary benefit disqualification or simple measurement errors, this seems the much more robust measure, especially for the purpose of cross-national comparison. If anything, the time-constant measure should also give a theoretically preferable conservative test of UI effects on post-unemployment earnings.

Table 1 gives the distribution of covariates in the two samples. Unemployed workers in Germany tend to be older on average, tend to have higher levels of experience, but also higher levels of tenure and earnings with their last employer than unemployed workers in the United States. Also, most likely due to considerably lower vacancy levels in the German labour market, German workers tend to need considerably more time to locate reemployment. With respect to the role of the welfare state, country differences in unemployment insurance coverage levels are telling indeed. While about 90 % of displaced workers in Germany received unemployment benefits at some point during their spell,¹ less than 40 % of U.S. workers had access to unemployment benefits. In both countries, access to unemployment benefits increases sharply with experience, tenure and previous earnings. If there is any evidence of positive effects of UI benefits on post-unemployment earnings, however, the substantially higher average coverage rates in the German UI system are likely to result in significantly more favourable earnings outcomes for the average unemployed worker in Germany.

3. Empirical results

Figures 1 and 2 show the earnings change probability density and the earnings change cumulative density among reemployed workers in each country. Though differences in means are hard to discern from the figures, it is immediately evident that the earnings change distributions differ in terms of both

¹ In the later exit sample, 5.7 % of all unemployed workers received *Arbeitslosenhilfe* only, and 7.9 % received both *Arbeitslosengeld* and *Arbeitslosenhilfe* during their unemployment spell. In the total spell sample, corresponding figures would be 6 % and 10 %.

Table 1

Summary statistics for the estimation samples, means of spell data

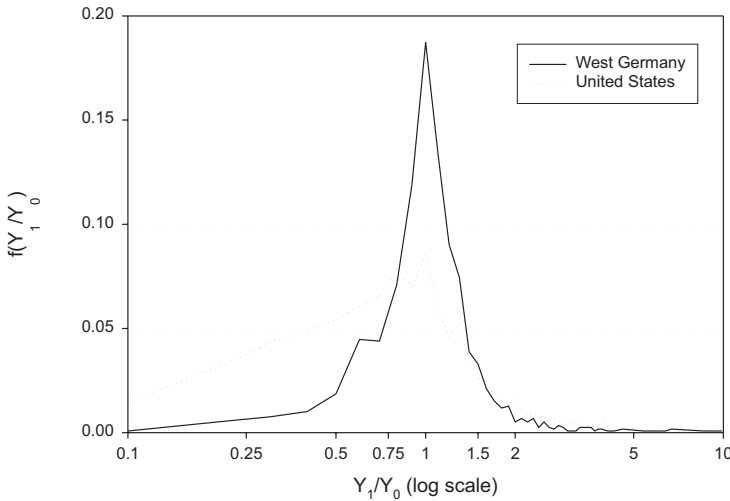
	United States			West Germany		
	All	With UI benefits	Without UI benefits	All	With UI benefits	Without UI benefits
Spell duration (months)	4.41 (5.06)	4.81 (4.34)	4.18 (5.41)	10.02 (12.88)	10.85 (12.37)	7.19 (12.63)
Women	0.400 (0.490)	0.357 (0.479)	0.422 (0.494)	0.385 (0.487)	0.382 (0.486)	0.412 (0.493)
Non-white / Non-German	0.184 (0.387)	0.152 (0.359)	0.189 (0.391)	0.118 (0.322)	0.116 (0.320)	0.135 (0.342)
Age	33.05 (11.68)	36.96 (11.23)	30.35 (11.11)	34.99 (12.21)	35.62 (12.32)	29.75 (9.84)
Years of education	12.52 (1.89)	12.60 (1.88)	12.45 (1.90)	10.85 (2.12)	10.82 (2.07)	11.11 (2.56)
Vocational training	–	–	–	0.607 (0.489)	0.628 (0.484)	0.435 (0.496)
Labour force experience (years)	12.76 (11.31)	16.60 (11.38)	10.32 (10.56)	16.02 (12.38)	16.82 (12.48)	9.43 (9.26)
Tenure in previous job (months)	20.56 (52.51)	32.79 (65.93)	12.78 (39.86)	51.38 (93.25)	54.25 (95.87)	27.67 (63.06)
Earnings in previous job (1990 US-\$, PPP-adjusted)	1141.05 (1131.41)	1510.13 (1280.90)	906.54 (953.69)	1554.83 (758.69)	1585.90 (731.61)	1279.54 (922.96)
Vacancy ratio (quarterly)	3.072 (1.924)	2.966 (1.874)	3.140 (1.953)	0.794 (0.247)	0.796 (0.246)	0.760 (0.204)
Proportion receiving unemployment benefits	0.389 (0.487)	–	–	0.892 (0.317)	–	–
N spells (unweighted)	24,100	8,941	15,159	3,251	2,856	395

Notes: Standard deviations in parentheses.

Source: Survey of Income and Program Participation, Panels 1984, 1986, 1988, 1990, 1992, and 1993; German Socio-Economic Panel, 1984–1995 data (Waves A-M); weighted data.

dispersion and shape. Compared to the German data, the earnings change density among U.S. workers is much wider, and shifts outwards particularly in the lower tail of the distribution. The probability distributions of both countries have their modal value at one, i.e. with workers experiencing no or small earnings changes at reemployment (Figure 1).² However, the proportion of workers at the modal value differs sharply between both economies: while less than 10 % of U.S. workers experience no or small earnings changes, the corresponding figure amounts to almost 20 % among German workers. Also, as is evident from the point estimates of Table 2 below, both the median and the

² The density has been calculated from figures rounded to the first decimal.

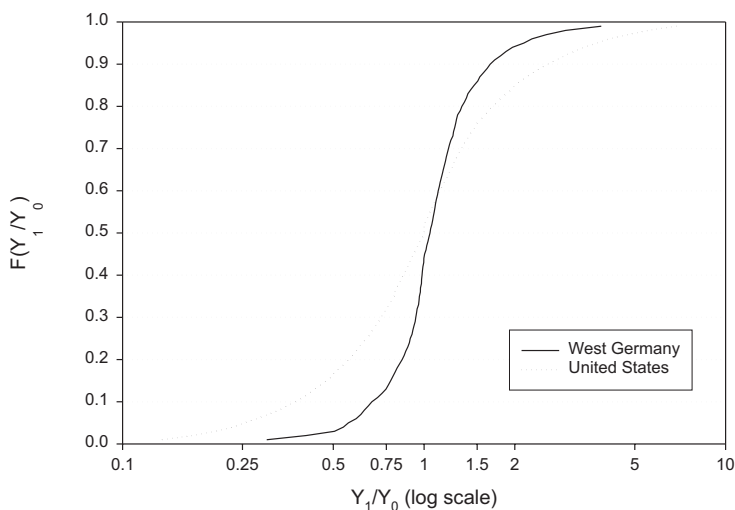


Notes: N = 14.786 (SIPP) and N = 1.178 (GSOEP). All earnings data deflated to 1990 values.
Source: Survey of Income and Program Participation, Panels 1984, 1986, 1988, 1990, 1992, and 1993; German Socio-Economic Panel, 1984–1995 data (Waves A-M), weighted data.

Figure 1: Real earnings change density, U.S. and West German displaced workers 1984–1995

mean of the German earnings change distribution are some 4–6 percentage points above the U.S. one, so that unemployed workers in Germany indeed tend to have slightly more favourable reemployment outcomes than U.S. workers.

It is not just the stability of earnings, however, but more the variance of earnings change across unemployment spells that differs between the two labour markets. This is particularly true at the lower tail of the earnings change distribution, where U.S. workers face considerably higher risks of incurring substantial earnings losses. According to the point estimates in Table 2, the lower quartile of the earnings ratio is 0.9 for German, yet only 0.64 for U.S. workers. Expressed in slightly different terms, a full 43 % of U.S. workers incur real earnings losses of at least 10 %, and 35 % of U.S. workers experience earnings losses of 20 % and more on exiting unemployment to a job. The corresponding figures among West German workers are as low as 26 % and 16 %, respectively. On the other hand, the variance of the U.S. earnings change distribution is also larger in the upper tail of the distribution, so that U.S. workers are somewhat more likely than German workers to experience positive earnings trajectories across unemployment spells. On average, however, German workers have certainly incurred smaller scar effects of unemployment during the 1980s and 1990s.



Notes: N = 14.786 (SIPP) and N = 1.178 (GSOEP). All earnings data deflated to 1990 values.
 Source: Survey of Income and Program Participation, Panels 1984, 1986, 1988, 1990, 1992, and 1993; German Socio-Economic Panel, 1984–1995 data (Waves A-M), weighted data.

Figure 2: Real earnings change distribution, U.S. and West German displaced workers 1984–1995

Table 2

Real earnings change distribution, U.S. and West German displaced workers 1984–1995

	United States			West Germany		
	All	With UI benefits	Without UI benefits	All	With UI benefits	Without UI benefits
Mean log earnings change (log points)	-0.020	-0.094	0.022	0.046	0.033	0.191
P ₂₅ (earnings ratio)	0.644	0.640	0.646	0.900	0.901	0.881
Median earnings ratio	1.000	0.953	1.000	1.047	1.037	1.114
P ₇₅ (earnings ratio)	1.476	1.306	1.600	1.264	1.253	1.434
Pr(Earnings loss)	0.494	0.531	0.473	0.459	0.473	0.307
Pr(Earnings loss > 10%)	0.434	0.458	0.420	0.255	0.260	0.200
Pr(Earnings loss > 20%)	0.355	0.370	0.347	0.160	0.161	0.153
Pr(Earnings loss > 30%)	0.285	0.289	0.282	0.110	0.111	0.102
Pr(Earnings loss > 50%)	0.161	0.162	0.161	0.039	0.038	0.051

Notes: N = 14.786 (SIPP) and N = 1.178 (GSOEP). All earnings data deflated to 1990 values. P₂₅ refers to the ratio at the 25th percentile; P₇₅ refers to the ratio at the 75th percentile.

Source: Survey of Income and Program Participation, Panels 1984, 1986, 1988, 1990, 1992, and 1993; German Socio-Economic Panel, 1984–1995 data (Waves A-M), weighted data.

As a first step towards addressing the effects of unemployment insurance, Table 2 also provides a breakdown of the earnings changes by UI benefit status. This simple contrast does clearly not support the hypothesis that UI benefits have positive effects on workers' post-unemployment earnings. In terms of both the mean and the variance, the earnings change distribution for the non-covered unemployed is preferable to the one among covered workers for both economies.³ On the other hand, Table 1 above had already provided evidence of clear differences in background characteristics between the two groups: covered workers tend to be older, more experienced, and tend to have had higher pre-unemployment earnings and wages. Against this background, the naïve contrast in Table 2 is of course an invalid estimate of the genuine causal effect of unemployment insurance, and we thus need to turn to regression estimates that adjust for respective covariate effects on earnings.

Regression estimates

To establish the causal effect of unemployment insurance on workers' post-unemployment earnings, Table 3 presents the parameter estimates of two different earnings change models for each of the two labour markets. The first, more conventional model predicts the log earnings change between workers' pre- and post-unemployment job, while the second uses a probit specification to predict the probability of experiencing earnings losses of at least 20 %. Both models control for a wide range of observed and unobserved covariates. The latter are accounted for by incorporating a normally distributed random effect into each model which is identified from the presence of multiple spells per individual in the dataset. As the key variable of interest, the models also include the time-constant UI benefit receipt dummy that identifies the average UI treatment effect on the treated for both labour markets.

The earnings change models provide evidence of strikingly similar structures in earnings dynamics across unemployment in the two labour markets. In both the United States and West Germany, scar effects of unemployment increase with unemployment duration, and more strongly so for German workers. Also, women tend to experience worse post-unemployment earnings than men, while education and labour force experience show positive effects on workers' earnings. In both economies, the risk of earnings losses increases with workers' pre-unemployment earnings, or alternatively, the fraction of human capital that can be carried over to the post-unemployment job declines with pre-unemployment earnings levels.⁴

³ Given near universal UI coverage rates, the marginal German earnings change distribution of course closely parallels the distribution for covered German workers.

⁴ The presence of measurement error would bias this coefficient down, however.

Table 3

**Earnings change regressions, U.S. and West German displaced workers
1984–1995**

	United States		West Germany	
	Ln(Y_1 / Y_0)	Pr($Y_1 / Y_0 < 0.8$)	Ln(Y_1 / Y_0)	Pr($Y_1 / Y_0 < 0.8$)
Unemployment benefit receipt	0.139** (.014)	-0.284** (.031)	0.118** (.036)	-0.518** (.168)
Spell duration (months)	-0.016** (.004)	0.050** (.009)	-0.022** (.005)	0.078** (.024)
Spell duration ² (x 100)	0.045* (.023)	-0.165** (.053)	0.078** (.023)	-0.167 (.116)
Spell duration ³ (x 10,000)	-0.026 (.020)	1.080* (.461)	-0.632* (.255)	0.686 (1.47)
Women	-0.224** (.015)	0.267** (.034)	-0.279** (.030)	0.703** (.129)
Non-white / non-German	-0.043** (.018)	0.032 (.038)	0.008 (.029)	0.068 (.114)
Years of schooling	0.040** (.004)	-0.039** (.008)	0.037** (.007)	-0.072** (.032)
Vocational training	–	–	-0.036 (.027)	0.046 (.111)
Labour force experience (years)	0.012** (.002)	-0.014** (.004)	0.010** (.004)	-0.036** (.018)
Labour force experience ² (x 100)	-0.019** (.005)	0.026** (.010)	-0.020* (.011)	0.092** (.045)
Tenure in previous job (months)	0.00029 (0.00029)	0.00023 (.001)	-0.00027 (0.00046)	0.001 (.002)
Tenure in previous job ² (x 100)	0.00016 (0.00016)	0.00018 (0.00023)	0.00004 (0.00015)	-0.00041 (.001)
Ln earnings in previous job	-0.631** (.009)	0.836** (.034)	-0.753** (.027)	1.394** (.157)
Quarterly vacancy ratio	0.004 (.005)	-0.005 (.011)	0.013 (.037)	-0.015 (.192)
Intercept	3.712** (.077)	-5.580** (.243)	5.167** (.210)	-10.534** (1.185)
σ_1	0.268	0.263	0.252	0.001
R ² (overall) / log-likelihood	0.309	-6,493.2	0.345	-452.0
Marginal UI effect	+0.139	-0.091	+0.118	-0.130

Notes: N = 11.160 (SIPP) and N = 1.158 (GSOEP). All earnings data deflated to 1990 values. Model (1) estimated by random-effects GLS, model (2) as a random-effect probit model. Both specifications also control for 12 occupation and 6 industry dummies, and two dummy variables for missing occupation or industry data in the GSOEP (results not shown). Robust standard errors in parentheses; statistical significance levels at *p < .05 and **p < .01, respectively. Marginal benefit effect calculated at the mean covariate vector.

Source: Survey of Income and Program Participation, Panels 1984, 1986, 1988, 1990, 1992, and 1993; German Socio-Economic Panel, 1984–1995 data (Waves A-M), own calculations.

Interestingly, the finding of strong similarity in dynamics carries over to the case of UI effects as well. For both economies, and consistent across the two model specifications, the results show clear positive effects of unemployment insurance on workers' earnings at leaving unemployment. Moreover, the magnitude of the effects involved is far from trivial. Among U.S. workers, the parameter estimates imply a marginal effect of +14 % on workers' earnings, and an eight percentage point reduction in workers' risk of experiencing a 20% earnings loss. The corresponding figures for German workers yield an effect of +12 % on workers' earnings, and a reduction in workers' risks of severe earnings losses by a full 13 percentage points. These results are absolutely consistent with a job search reading that UI raises workers' reservation wages, and that, if financially supported, workers tend to trade off unemployment duration against adequate reemployment.⁵ The job search interpretation is strengthened further by the fact that particularly strong UI effects occur in the lower tail of the earnings change distribution. This is again perfectly consistent with job search theory predicting UI will put a bound on the magnitude of post-unemployment earnings losses. Apparently, unemployment insurance is quite effective in protecting individual earnings across unemployment by providing an implicit individual wage floor to covered workers.

4. Conclusions and discussion

According to the results presented in this paper, unemployment insurance has a twofold stabilizing effect on living standards and incomes. As has long been well recognized, the income replaced by unemployment benefits is effective in smoothing incomes and consumption in the short run, i.e. during ongoing unemployment spells. What has been less well recognized so far are substantial second-order effects of unemployment insurance on workers' post-unemployment earnings. Apparently, supporting worker job search through unemployment benefits allows workers to search and find relatively more adequate reemployment than otherwise possible. This finding clearly supports the search theory view of unemployment benefits as a search subsidy to workers: over and above the smoothing of incomes in the short run, there is an additional benefit to unemployment insurance in the longer run because UI proves effective in limiting the scar effects of unemployment, in particular by preventing large reductions in worker earnings capacity.

This view emphasizing positive productivity effects of unemployment insurance is at odds with a view of the welfare state merely as a source of work

⁵ This trade-off is more properly addressed in the full version of this paper. There, it is also shown that the trade-off between unemployment duration and job quality is more pronounced in the high-turnover labour market in the United States. The reduced-form models presented here thus tend to overstate positive UI effects among U.S. workers.

disincentives. Further results not contained in this paper show that the disincentive view is not plain wrong, though misleading, insofar as positive UI effects on productivity and human capital indeed occur against a trade-off in terms of prolonged unemployment duration. To some extent, maintaining accumulated human capital through adequate reemployment apparently requires accepting slightly longer search durations. Stronger welfare state commitments hence implicitly always favour longer-run objectives in terms of human capital protection over minimizing unemployment duration in the short run. More extensive welfare state support for unemployed workers in Germany thus partly explains why German workers experience both longer unemployment durations and a higher stability of earnings across unemployment spells than is common for U.S. workers.

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