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Long-term unemployment and labor force participation

A decomposition of unemployment to test for the discouragement and added worker hypotheses

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A decomposition of unemployment to test for the discouragement and added worker hypotheses

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Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

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Contents

Abstract

We sharpen tests for “discouragement” and “added worker” effects by splitting the explanatory variable – the unemployment rate – into a short-term and a long-term component. While short-term unemployment might not result in additional workers on a large scale, long-term unemployment reduces household income more, increasing the need for additional income. On the other hand, it may discourage older workers for psychological and sociological reasons. Applying our model to the German labor market, these hypotheses could be confirmed. Even for men, about whom only few empirical studies on this issue are available, distinguishing between short-term and long-term unemployment reveals discouragement effects.

Zusammenfassung

Bislang liegen kaum Untersuchungen zum Einfluss von Langzeit- und Kurzzeitarbeitslosigkeit auf die Erwerbsbeteiligung vor. Deshalb haben wir mit Daten für Deutschland, getrennt nach Alter und Geschlecht, die Arbeitslosenrate nach Kurz- und Langzeitarbeitslosigkeit getrennt und untersucht, welche Schlüsse sich daraus für die sogenannte „discouragement“ bzw. die „added worker hypothese“ ziehen lassen. Für den deutschen Arbeitsmarkt erwarteten wir insbesondere für den Einfluss der Kurzzeitarbeitslosenrate einen „discouragement effect“, der sogenannte Zusatzarbeitereffekte („added worker effect“) überwiegt. Den Einfluss der Langzeitarbeitslosenrate sahen wir dagegen als empirisch eher offen an.

Die Schätzungen ergaben für die meisten Gruppen signifikante Effekte sowohl für die Kurzzeit- als auch für die Langzeitarbeitslosigkeit, im Übrigen auch bei den Männern, für die bislang wenige empirische Studien zu dieser Thematik vorliegen. Insbesondere ergaben sich altersspezifische Unterschiede, die möglicherweise mit dem Vorhandensein „alternativer Rollen“ erklärt werden können, die es einigen Gruppen ermöglichen, aus dem Erwerbsleben (zeitweise) auszuscheiden.

JEL classification: C32, E24, J21

Keywords: Added worker effect, discouraged worker, labor force participation, long-term unemployment

1 Introduction

The response of the labor force to fluctuations in unemployment has been discussed for decades. Especially the labor supply of females seems to be affected by the demand side, or by the business cycle. The question of the relationship between cyclical variations in economic activity and labor force participation was typically examined under the dichotomy of the discouragement hypothesis vs. the added worker effect.

According to the discouragement hypothesis workers withdraw from a deteriorating labor market (e. g. Dernburg/Strand 1966). Following a search-theoretical interpretation, a person who becomes unemployed can be expected to give up looking for work as it does not pay off (e. g. Kollmann 1994).

On the other hand, additional labor force participants may enter the labor market, especially to ensure their family income (e. g. Prieto-Rodríguez/Rodríguez-Gutiérrez 2000). This “added worker effect” is often discussed in the context of the labor market regime of females as secondary workers.

Empirical studies have produced discordant results (for a discussion see Gong 1975). The literature concerning the added worker effect (AWE) provides evidence of a small but significant influence in most but not all cases (e. g. Tano 1993; Maloney 1991; Lundberg 1985).

One possible reason for this is that, especially in macro investigations, typically only the net effect of the influence that unemployment has on labor force participation is estimated (e. g. Agbola 2005; Filatriau/Reynès 2012): a positive effect represents the AWE, a negative effect shows discouragement. If the modeling makes it possible to distinguish between the added worker and the discouragement effect, the two “are not mutually exclusive” (Tano 1993: 116). Which effect dominates depends on the relative strength of discouragement and AWE and is thus an empirical question.

Furthermore, studies from different countries indicate the importance of the institutional background (such as the social security system) and some cultural and socioeconomic factors. Therefore the results are country-specific.

The European Commission shows for the EU that discouragement increases in countries with high shares of long-term unemployment (EU 2013:13). But only a few studies refer to this aspect in passing (e. g. Blundell et al. 1998).

To close this gap in the empirical literature, our paper provides an analysis that splits the unemployment rate into a short-term and a long-term component. Both are subsequently used to explain cyclical variations in the labor force participation rate. The research was conducted for Germany, which serves as a model for a Central European welfare state with a high female participation rate and a long tradition of early retirement.

For most groups our results support the assumption that long-term unemployment has a substantial influence on labor participation. Even for men, about whom only few empirical studies on this issue are available, the distinctions between long-run and short-run unemployment reveal significant discouragement and added worker effects. In contrast, German women respond more quickly, i. e. short-term unemployment leads to discouragement, whereas long-term unemployment has weaker discouragement effects.

This paper is structured as follows. Section 2 summarizes the relevant literature and outlines the model. In Section 3 we describe the data used in the empirical analysis. The results of our estimations are discussed in Section 4. The final Section 5 concludes.

2 The background theory and the econometric model

2.1 Unemployment and labor force participation

The discouragement effect and the added worker effect are understood as relationships between unemployment and labor force participation. In this context, international comparisons show the importance of the level of labor force participation[1] (Bredtmann et al. 2014; Prieto-Rodríguez/Rodríguez-Gutiérrez 2003) and the type of welfare regime, i. e. the social security system, the availability of unemployment compensation, the tax and pensions systems (Bredtmann et al. 2014).

Furthermore, results for a broad range of countries suggest that cultural and socio-economic differences also play a role (see e. g. Kohare 2010 for Japan; Agbola 2005 for Australia; Lee/Cho 2005 for Argentina and the Republic of Korea; Başlevent/Onaran 2003 for Turkey; Prieto-Rodríguez/Rodríguez-Gutiérrez 2000 for Spain; Holst and Spiess 2002 for EU countries).

Discouragement is often explained within a search-theoretical approach. With increasing unemployment the costs of job search rise, making efforts to find a job less worthwhile (e. g. Blundell et al. 1998; Kollmann 1994). Nevertheless some psychological aspects should also be considered, as the level of the reported unemployment seems to signalize to unemployed persons what chances they have of finding a job again (Gong 1975). This might be especially relevant if the unemployed person belongs to a group with particularly poor prospects (see Benati 2001; van Ham et al. 2001). In the case of older workers this effect could be reinforced by the possibility of retirement (see O'Brien 2000).[2] The job-search prospects and the option of alternative roles might be reasons why the empirical results for the discouragement/added worker effect depend on age and sex.

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1 A high level of female labor participation indicates that their role as secondary workers has changed.

2 Long-term sickness or invalidity can also be regarded as options for unemployed workers with poor chances of re-employment . At least in Germany this might be the case for older individuals.

Explaining his non-significant results for older workers, Benati (2001) argues that these groups can stay outside the labor market permanently, i. e. the influence of unemployment might be outperformed in some cases when alternative roles are available, such as taking retirement. In this respect, short-term labor market developments would not easily affect participation. The question arises of whether this also is true of long-term unemployment.

O'Brien (2000) found a highly significant influence of long-term unemployment, but he did not use a direct measure for the long-term unemployed. Instead, he assumed that individuals receiving an unemployment allowance for older unemployed persons were "actually long-term unemployed" (O'Brien 2000: 217).

As unemployment duration might be relevant for labor participation, this paper adds an analysis that splits the unemployment rate into a short-term and a long-term component. Both are subsequently used to explain cyclical variations in the labor force participation rate.

Our research was conducted for Germany, which serves as a model for a Central European welfare state. Important aspects for our analyses are that (i) older unemployed persons are entitled to unemployment compensation for a longer period and (ii) early retirement, although being reduced for a number of years, is still a possible option.

Furthermore, the role of females as secondary workers has become less important in Germany. Female participation rates are high, even if most women only work part-time. All in all, reviewing the empirical literature above, short-term unemployment should not, in the German case, activate many additional female workers. The discouragement effect should thus be stronger.

In contrast, as unemployment compensation is paid for a limited duration, long-term unemployment might reduce household income, thereby increasing the need for additional income. The opposing conflictive hypothesis would be that long-term unemployed individuals may become discouraged for some psychological/sociological reasons and leave the labor force on these grounds (see Mayer 2014).

2.2 The model

At the current stage in our analysis, we formulate a model that is typical in this field of macroeconomic research (e. g. Agbola 2006; Briscoe/Wilson 1992; Österholm 2010). The general model is formulated for a yearly frequency, because only annual data are available.

We denote the observed participation rates by p_t (see equation 1). The unemployment rate u_t is decomposed into the long-term unemployment rate ltu_t and the short-term unemployment rate stu_t. (To be precise, ltu_t and stu_t add up to the overall unemployment rate u_t.)

As most studies have shown the influence of age and sex for the analysis, the models are estimated for different age groups, with the population aged 25 to 64 split into five-year age groups.[3] So, p_{it}, ltu_{it} and stu_{it} are differentiated by age and sex and 16 equations are estimated.

We take into account the possibility of shifts in levels and trends occurring at the time of the German reunification in 1990 and the Hartz labor market reforms[4] in 2005. In addition, the German labor force survey, one of our data sources, was redesigned in 2005. Up to 2004, the survey was conducted once a year in April/May; since 2005 it has been conducted monthly, so yearly averages are available.

In the equations for older workers a further break might occur in the year 2000, when early retirement schemes began to be phased out.

(1) $$p_{i,t} = a_{i,1} + a_{i,2}t + a_{i,3}stu_{i,t-k} + a_{i,4}ltu_{i,t-l} + shifts_i + \epsilon_{i,t}$$

where
index i represents groups by age and sex
ltu_t = long-term unemployment in the year t
stu_t = short-term unemployment
shifts = represents possible breaks in the trend and dummies

Concerning the unemployment variables, the equation allows for different lags k, l in different groups i. Several specifications were tested and discriminated based on statistical significance. Following the literature (for overall unemployment) a specification without any lag or with lag 1 should generally perform well. For the long-term unemployment variable specifications with larger lags were additionally tested. In the case of older workers, where early retirement and the different compensation regulations play a role, longer lags could be visible.

Discouragement effects would be implied by $a_3 < 0$ or $a_4 < 0$ for short- and long-term unemployment, respectively. Added worker effects would follow from $a_3 > 0$ or $a_4 > 0$.

[3] We did not analyze the situation for young workers, aged 15 to 24, because long-term unemployment should be quite irrelevant for them. This is due to age (with a tendency towards left censoring) and the German education and training system (with great importance attached to vocational training).

[4] There were various labor market reforms in Germany in the early years of this millennium (see Klinger/Rothe 2012). For our research question the last reform in 2005 should be the most important, as the system of unemployment compensation was subjected to fundamental reforms.

3 Data

Labor force participation rates are obtained from the German labor force survey (LFS). Until 2004, they were observed every 12 months, since then an annual average has been available (see above). As the German LFS is a 1 % sample of the overall population (ca. 80m), age- and gender-specific labor force participation rates are based on large samples.

Our unemployment data are defined according to the Federal Employment Agency (FEA), that is, we use the national unemployment register, which covers all unemployed persons in Germany in a given year. As a consequence, information about the duration of unemployment was not obtained from individuals' answers in a survey (like the LFS), but was drawn from the register of the FEA. The data about the duration are recorded once a year in September.

Long-term unemployed persons are those who have been unemployed for one year or longer, which follows the ILO definition.[5]

The rates for long-term and short-term unemployment were constructed as follows: the numerator contains the number of long-term or short-term unemployed respectively. For the denominator we added the number of employed persons and all unemployed persons. Our rates therefore correspond to the usual definition of the unemployment rate, but are differentiated by duration. The two rates add up to the overall unemployment rate.[6]

We use western German data, for which the time series cover a period from 1984 to 2011.

The labor force participation rate in western Germany has risen steadily since the 1970s. The main driving factor was the labor participation of prime aged women, which increased strongly in the past (see Figure 1). In addition, the participation of the older workforce has improved considerably, particularly in the last decade. In contrast, the participation rate of the young, especially of females, peaked in the early 1990s and declined afterwards. This picture of labor force participation is quite similar to many other EU countries and the US.

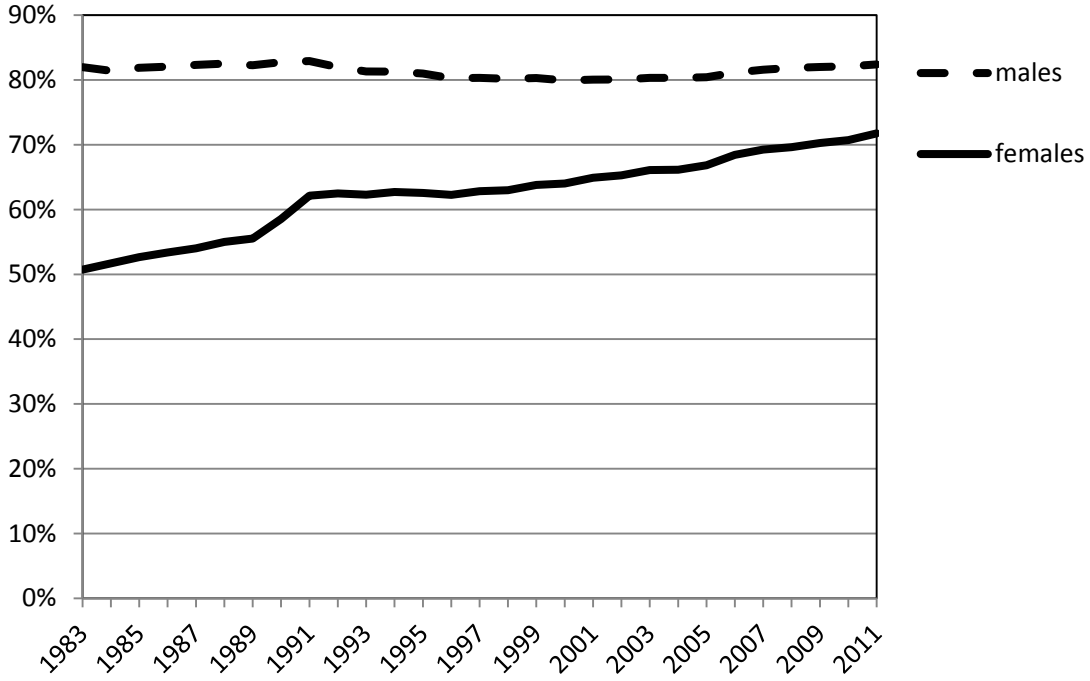
Unemployment in western Germany in general shows several upward steps, some swings and a major downward step over the course of the strong labor market de-

[5] As the ILO unemployment is based on a questionnaire, the self-reported duration of unemployment in ILO/OECD statistics does not correspond entirely to the duration obtained from the national register. The latter, for example, excludes spells of long-term sickness. Respondents' answers in the labor force survey can differ for different reasons (for instance due to recall errors).

[6] In order to calculate age-specific rates the employment figures were taken from the LFS. There are small differences to the official unemployment rate, which is calculated using several statistical sources for the employment data in addition to the LFS.

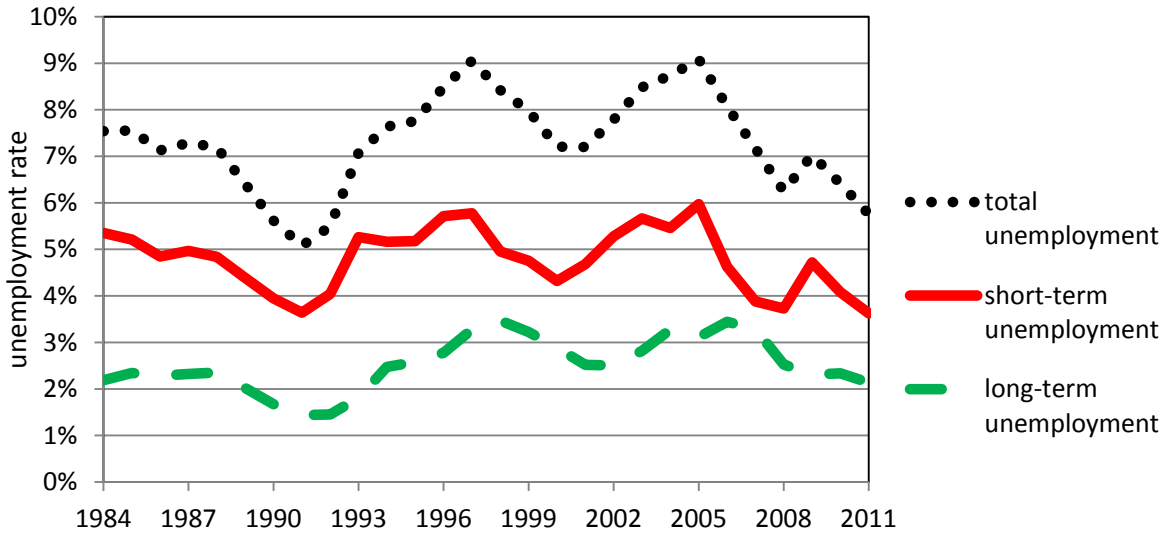
velopment in recent years (Figure 2). This development was mainly driven by short-term unemployment. Long-term unemployment did not develop entirely differently, but as can be seen from Figure 2 the series is slightly less volatile. In addition, the movements seem to be shifted to the right compared to the short-term unemployment rate.

Figure 1
Labor force participation rate of 15-64-year-olds by gender
Western Germany, 1983-2011



Source: Own calculations using data from the LFS

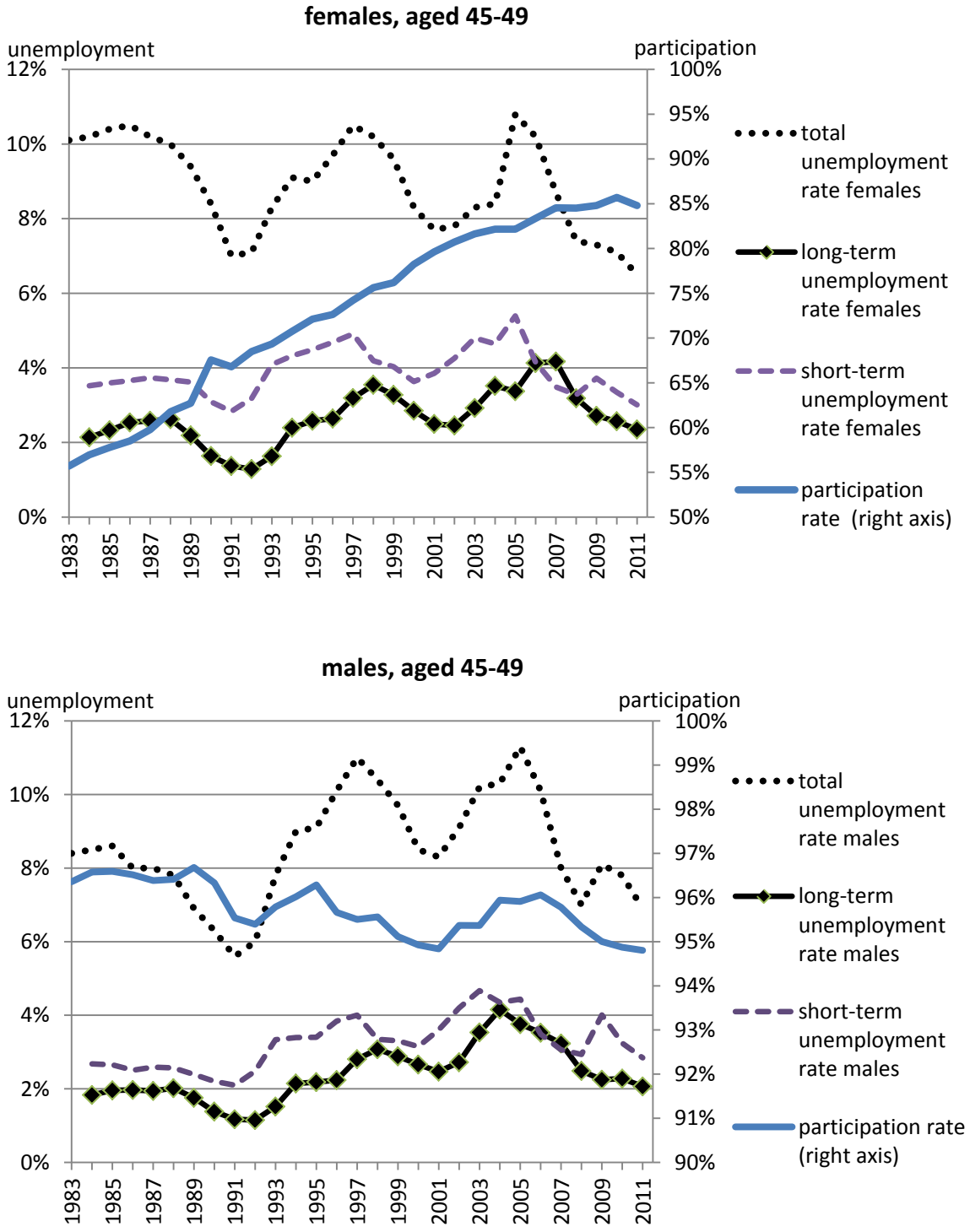
Figure 2
Unemployment in western Germany, 1984-2011



Sources: LFS and FEA, own calculations of long-term and short-term rates, using data from the Institute for Employment Research (Nuremberg) (IAB-ITM)

As far as age- and gender-specific relationships are concerned, Figure 3 shows two typical examples for the link between labor force participation and unemployment among prime-age women and men.

Figure 3
Labor participation rate and unemployment for selected groups



Sources: LFS and FEA, own calculations of long-term and short-term rates, using data from the Institute for Employment Research (Nuremberg) (IAB-ITM)

Both graphs contain the short-term, the long-term and the total unemployment rate by gender. There appears to be no striking difference in the change in the gender-specific unemployment rates. The trends in the participation rates, however, differ strongly with respect to the direction. Whereas female labor force participation has increased considerably, men's participation has fallen slightly since 1983.

4 Empirical results

Men

First we analyze the results for males. The models were estimated using WLS with the empirical weights p_t $(1-p_t)$.[7] Table 1 shows the condensed results, considering especially the effects of short-term and long-term unemployment.

Our results for both the short-term and the long-term unemployment variable indicate that men can become discouraged, but the effects differ according to age. For example, a one percentage-point increase in the short-term unemployment (STU) rate reduces the participation rate of the 25-29 age group by more than 0.4 percentage points. Those aged 30-34 would be affected by only -0.15 points.

The age-specific STU rate is significant for almost all age groups. The smallest coefficients are found for the middle age groups, which is not surprising considering the scarcity of alternatives to taking up employment. Only long-lasting unemployment may stimulate them to leave the labor force, perhaps by means of a disability pension.

Evidently there is a difference between career entry and periods later in working life. The 25-39-year-olds exhibit discouragement effects due to short-term unemployment, but long-term unemployment induces additional workers. Maybe in the short run the younger age group can opt for staying in or returning to education. In a labor market that remains structurally weak, however, this is a less attractive option, such that the additional worker effect predominates.[8] Accordingly, the net effect of both unemployment rates could become very small. Indeed, the pattern of our results resembles an earlier study by Briscoe/Wilson (1992), who used the overall unemployment rate for 25-39-year-olds, i. e. without the distinction between short- and long-term unemployment. Their unemployment rate was insignificant for the age categories 25-29, 30-34 and 35-39.

Table 1 shows that prime-age and older workers might become discouraged after some time of looking for work. Again the results are partly in line with previous re-

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[7] Due to the large number of cases, the empirical participation rates p_t should be a good representation of the true rates. Therefore no attempt was made to estimate the weights with a two-step approach. In cases where tests still exhibited heteroskedasticity, the White procedure was applied – or if necessary in cases of autocorrelation – the Newey-West procedure. All the estimations were conducted using EViews 8.

[8] In the case of 30-39-year-olds, early returns from further training or shorter periods of sickness (or a few longer periods) should also be considered as possible explanations.

sults obtained by Briscoe and Wilson (1992), who report that for the oldest workers (60+) the overall long-term unemployment rate works better than the total unemployment rate.

For those aged 40 and above, the lagged influence of the long-term unemployment rate (LTU) indicates that the major effect occurs after three years on average. Long-term sickness, disability pensions, and early retirement schemes[9] may be important in this case.

Table 1
Basic results for the labor force participation rate of males

Age	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
STU	-0.417***	-0.151*	-0.27**	-0.178**	-0.090	-0.308*	-1.099***	-0.882***
LTU	0.890	0.519***	0.371***	-0.321***	-0.334**	-0.243***	-0.518***	-0.702***
Note				LTU_{t-3}	LTU_{t-3}	LTU_{t-3}	LTU_{t-3}	LTU_{t-1}
Trend								0.215***
D90			-0.588***	-0.743***	-0.756***			
TB2000						0.445***	0.466***	
D2005	-0.827**		0.831***	1.026***	1.273***	1.203***		
TB2005		-0.253***	-.344***	-0.258***	-0.264***	-0.484***		2.508***
R^2 adj	0.34	0.69	0.82	0.82	0.65	0.91	0.94	0.99
BG-LM test	0	0.34	0	1.87	0.58	8.0**	1.35	4.57

Notes: Dependent variable is the labor force participation rate
Participation and unemployment rates are between 0 and 1
STU, LTU: short-term and long-term unemployment rate respectively
Lagged variable, e. g. LTUt-3 is the long-term unemployment rate with a lag of three years
Dt = dummy, 0 until year t-1, 1 thereafter
TBt = break in the trend; 0 before t, from t onwards plus 1 year on year
Constant significant at the 1 % level in all cases
BG-LM test: Breusch-Godfrey LM test for serial correlation (with Lag 2 for the residuals)
Significant at the *** 1 %, ** 5 %, * 10 % level, respectively; otherwise non-significant

Source: Own calculations.

The two oldest groups seem to be especially susceptible to discouragement. This is in line with studies that highlight the unemployment problem of older workers in Germany. The statistic shows that older workers have very low prospects of re-employment (see Dietz/Walwei 2011).

[9] One can further distinguish between “pre-retirement”, which stands for programs that precede early retirement schemes, and the latter, granted by the pension insurance fund (see OECD 2005: 87).

Our results for older workers should also be seen within the relevant institutional framework in Germany.[10] In spite of several changes during our investigation period, older unemployed workers continued to have longer entitlement to unemployment compensation, special disability pensions due to labor market problems were available, and early retirement schemes were still feasible for those aged 60 years and over. The latter option could provide an incentive to retire after entitlement to unemployment compensation has expired. This may explain the comparably short one-year lag in LTU for workers aged 60-64.

Women

The models for women were reformulated slightly. Female labor force participation is undergoing a strong trend. To improve the matching with the data we transformed the basic linear model into a non-linear one, assuming a logistic trend for the participation rate. The dependent variable is $\ln(\frac{p_t}{1-p_t})$ in all cases. This also ensures that the estimated participation rates remain within the range of 0-1. Again, we concentrate our discussion on the effects of short-term and long-term unemployment (Table 2).

For each age group, apart from the 60-64–year-olds, the coefficient of the short-term unemployment rate was significant and, due to its negative sign, indicates discouragement. The long-term unemployment rate proves to be influential in most cases as well. Here, the results are mixed. For the younger and medium-age females the influence of the long-term unemployment variable was rather weak, partly insignificant or, when positive, signalized an added worker effect. As was the case for men, older women become discouraged as a consequence of higher rates of long-term unemployment.

As the absolute effect cannot be derived directly from the coefficient (due to the logit formulation), we evaluated the effect of a one percentage point change in the long-term unemployment rate in 2011.The results lie in a sensible range of up to two thirds.

For women aged 30-34 we find a strong AWE for the long-term unemployment rate, similar to the result obtained for men of the same age. Regarding the interpretation, for females we may add the aspect of starting a family, i. e. deferring births.[11] When one partner has been unemployed for some time, the other partner applies for a job – in the case of women this would probably have consequences for potential motherhood.

As was the case for men, older women show clear discouragement effects.

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[10] For some background information see OECD 2005, e. g. Box 3.1, 70 f.

[11] The average age of women giving birth in Germany has risen steadily in the last few decades. Currently mothers are over the age of 30 on average when giving birth; the average age was 27.6 years in 1990.

We also checked for cross-effects of male unemployment on female participation (and vice versa) with regard to household (or spouse) influences. The additional term is significant only in the equation for the female 50-54 age group. This equation was improved substantially by including the long-term unemployment variable of men of the same age, which has a positive effect.

Table 2
Basic results for the labor force participation rate of females

Age	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
STU	-0.0391***	-0.0274**	-0.0498***	-0.0216*	-0.0368**	-0.0227*	-0.0217**	-0.024
LTU	-0.0032	0.0383**	-0.0135	-0.0227**	0.0004	-0.0439***	-0.0148**	-0.028***
Note							LTU_{t-3}	LTU_{t-1}
LTU men						0.0667**		
Trend	0.013***	0.041***	0.048***	0.060***	0.067***	0.054***	0.047***	0.034***
D2005		-0.290***				0.045**	0.072*	
TB2005			-0.054***	-0.046***	-0.040***			0.071***
Δp/Δstu	-0.68	-0.46	-0.81	-0.28	-0.46	-0.34	-0.44	-0.57
Δp/Δltu	-0.06	0.63	-0.22	-0.29	0.00	-0.65	-0.30	-0.68
R^2 adj	0.93	0.98	0.99	0.99	0.99	0.99	0.99	0.97
BG-LM test	0 ns.	0 ns.	1.85 ns.	1.59 ns.	0 ns.	0 ns.	0 ns.	8.28**

Notes: Dependent variable is the logit of the labor force participation rate ln (p/(1-p)), with participation rate p
Participation and unemployment rates are between 0 and 1
STU, LTU: short-term and long-term unemployment rate respectively
Lagged variable, e.g. LTUt-3 is the long-term unemployment rate with a lag of three years
Dt = dummy, 0 until year t-1, 1 thereafter
TBt = break in the trend; 0 before t, from t onwards plus 1 year on year
Δp/Δstu, Δp/Δltu: effect of a 1 % increase in the unemployment rate on the participation rate (change measured in percentage points, p.p.), evaluated for 2011
BG-LM test: Breusch-Godfrey LM test for serial correlation (with Lag 2 for the residuals)
Significant at the *** 1 %, ** 5 %, * 10 % level, respectively; otherwise non-significant

Source: Own calculations.

To sum up, discouragement arises from short-term unemployment with a magnitude comparable to results found in the existing literature for the overall unemployment rate. In contrast, the influence of long-term unemployment varies with age, which was revealed by the decomposition of unemployment in our approach. Nevertheless, the analysis does not indicate an AWE. This can be explained in the light of empirical findings in the literature often referring to the labor market situation of married women as secondary workers. The very high labor force participation rates of German women, compared to other European countries, suggest that this labor market regime has become less important in Germany.

Modelling Issues

Specification

Our results are slightly less significant when the total short-term or long-term unemployment rate is used instead of the age-specific rates. Although we could not analyze the reason for this in more depth, it might be concluded that personal experience of unemployment is more influential than the signaling effect of a high (low) unemployment rate, which was mentioned above.

Autocorrelation

Both Tables 2 and 3 show the Breusch-Godfrey test statistic for serial correlation (with Lag 2; all results are identical for Lag 1). The test does not indicate any autocorrelation for most of the groups. The exceptions are the equation for females aged 60-64, with a highly significant first-order autocorrelation, and the equation for males aged 50-54. A borderline case is an almost 10 % significance for the equation for males aged 60-64.

In sum, this shows that the equations are dynamically well specified. The major effects should be captured and no risks of spurious regressions are evident.

Endogeneity

On both sides of each equation the number of unemployed persons is included in the generated rate, as the labor force participation rate, on the right hand side, is defined as the number of employed plus the unemployed divided by the population.[12] An obvious case of endogeneity would occur if lower participation reduced unemployment to a disproportionate extent, and vice versa (i. e. if there were a positive effect between the rates). We therefore applied an instrumental variable method (IV) to address a possible bias due to simultaneity. The lagged short-term and long-term unemployment rates were used as instruments.[13]

If participation caused unemployment, the estimated coefficients of the unemployment rates would be overestimated in the equations above. In the case of endogeneity the magnitude of the IV coefficients should be smaller than those of the basic specification. For women, this occurs in none of the age groups, neither for STU nor for LTU. For men, there are four cases (25-29, 35-39, 50-54, 55-59) where the coefficient of STU becomes smaller by some tenths. However, since all these coefficients were significantly negative without IV, “smaller” means even more away from zero in the negative direction. Thus, our results for the STU impacts are strengthened.

[12] Due to differences in definition and data collection, the total number of unemployed persons in the ILO survey and the FEA register only overlap for about 60 %. In principle this could mitigate endogeneity problems.

[13] Regressors with a lag are left unchanged in the IV regression.

5 Conclusions

We analyzed the influence of long-term and short-term unemployment on labor force participation in Germany. Following the literature we expected short-term unemployment not to result in additional workers in general. In this respect, the discouragement effect should be stronger. Long-term unemployment, however, might reduce household income more strongly, thereby increasing the need for additional income. On the other hand, it may discourage especially older workers for psychological and sociological reasons.

The estimations were conducted according to age and sex. The coefficients for both the short-term and the long-term unemployment variables are significant for most groups. Even for men, about whom only few empirical studies on this issue are available, distinguishing between short-term and long-term unemployment reveals discouragement effects. This applies especially for older workers.

In conclusion, short-term unemployment seems to discourage workers across all age groups and both sexes, but differs with respect to the magnitude of the effects. We suspect that this pattern should be seen within the possibility of “alternative” roles (sickness, disability, student).

According to our estimations medium-age and older male workers are discouraged by long-term unemployment after some time. For older women the influence is similarly delayed. This can be explained by the institutional framework. In Germany, older unemployed individuals were permitted to retire earlier during the period under investigation. When entitlement to unemployment compensation expires[14], early retirement schemes provide an incentive to exit from the labor market.

Long-term unemployment increases the labor force participation of men aged 25-39 and women aged 30-34. The AWE of the 25-39-year-old men might be a result of shorter scheduled further training programs or shorter long-term sickness periods (or few longer sickness periods). For the youngest in these groups, the time spent in education should be seen as relevant.

For women this AWE could be expected under the “secondary worker hypothesis”. However, it must be borne in mind that family formation is an additional interesting aspect (the average age at which a women gives birth in Germany is 30). The partner experiencing a longer period of unemployment may threaten the family income, so shorter periods of childcare leave would be an option for some women. With the labor force participation rate of women aged 30-34 reaching almost 79 %, a mutual partnership model could be a more appropriate explanation for Germany than the

[14] In fact, unemployment compensation for older unemployed persons is granted in full for a certain period and is then followed by a period at a reduced rate, but in many cases, due to mandatory statutory regulations, an older unemployed person has to retire as early as possible.

“secondary worker model” - though it should be noted that more than half of all female workers only work part-time.

Many OECD countries are expected to suffer from population ageing and, as a consequence, from a shrinking labor force in the future (OECD 2015). As a consequence, the development of labor force participation rates has received considerable attention. The influence of long-term unemployment on the appearance of discouraged and added workers might therefore be of particular importance when considering our results in conjunction with high long-term unemployment rates in many OECD countries. Especially older workers are seen as a tremendous resource to compensate for a possible lack of skilled workers (for Germany see Fuchs 2015; OECD 2005). But also the entry of women and younger workers into the labor market offers considerable potential. Against the background of our results, combating unemployment, especially long-term unemployment, would integrate not only the official unemployed but also the so-called hidden unemployed into the labor market. Therefore, reducing (long-term) unemployment would increase the labor force beyond the number indicated by official statistics.

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