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Abstract

The administration of social assistance benefits is devolved to local agencies in Belgium, which raises questions about how much variation in spell lengths of benefit receipt is associated with differences across agencies. We address this issue by analysing the monthly hazard of benefit exit using administrative record data for 14,270 individuals in 574 welfare agencies. Our random-effects model allows for differences in both the observed and unobserved characteristics of beneficiaries and of local agencies. There are large differences in median benefit duration for individuals serviced by different welfare agencies: the range is from two months to more than 24 months. We find strong associations between beneficiary characteristics (sex, age, foreign nationality, citizenship acquisition, work history, and being a student) and spell length. The estimates show higher odds of exiting social assistance receipt in bigger municipalities and in agencies which provide more generous supplementary assistance, and also strong evidence of shorter episodes in agencies where active labour market programme participation rates are higher.

JEL Classification: I38, J68, R50

Keywords: Social assistance duration, Local welfare agency, Municipalities, Welfare, Duration analysis

1. Introduction

Social assistance for able-bodied persons of working age in Belgium is a shared responsibility between the national state and local welfare agencies. Although there is a nationwide guaranteed minimum income, local agencies enjoy considerable discretion in how they implement the federal statutory framework on the conditions for eligibility (e.g. labour market availability) of the benefit. Local agencies can provide supplementary assistance in cash or in-kind on top of the federally-defined minimum benefit level. Also, agencies have discretion in how they use active labour market programmes regulated and subsidised by the federal government, and they also decide which beneficiaries they give access to these programmes. This raises the question of how much variation in spell lengths of benefit receipt is associated with differences across local agencies.

In this paper, we study how the monthly hazard of exit from social assistance is associated with beneficiary and local agency characteristics in Belgium. We use a representative sample of 14,270 beneficiaries in 574 local agencies who entered social assistance in the course of 2004 and are followed for a two-year period. We use discrete-time random-effects event history analysis to examine whether the probability of benefit exit is associated with elapsed duration since the start of benefit receipt, seasonal variation in employment opportunities, benefit recipient characteristics (age, sex, nationality at birth, citizenship acquisition, recent work history, and being a student), characteristics of the local welfare agencies (generosity level of supplementary assistance and participation rate in active labour market programmes), and municipality characteristics (local unemployment rate and municipality size).

We study exits from social assistance of any kind. An exit may result from varying types of agency policies (e.g. punitive measures versus labour market participation), changes in household income or composition (e.g. paid employment of another household member or re-partnering), becoming eligible for other social security schemes (e.g. unemployment or invalidity benefit), or moving to another place of residence (e.g. to another country).

The contribution of this study to the existing international literature on benefit dynamics lies in the combination of the following features. First, we examine administrative record data

on benefit receipt rather than survey data, which allows the use of a sufficiently large sample to estimate the effects of local agency differences, and which reduces measurement error. Second, the analysis of longitudinal micro data on social assistance beneficiaries is supplemented with information on local area characteristics and local agency policy from other data sources. Earlier studies have usually focused on the association of individual characteristics with benefit exit. In this paper, we analyse whether agency policy and local area characteristics are associated with spell length, and also whether the association with individual characteristics changes when controlling for agency characteristics. Belgium is an interesting case to look at spell lengths at the level of local welfare agencies, as social assistance is moderately to highly decentralised, with important local variations in terms of generosity and use of active labour market programmes. Third, to our knowledge, this paper is the first study to analyse the hazard of social assistance exit using a random-effects model that includes time-varying covariates at the level of both beneficiaries and local agencies, while allowing for unobserved heterogeneity at the level of beneficiaries and agencies.

The outline of the paper is as follows. In the second section we describe the Belgian social assistance scheme, with particular attention for the discretionary power of local agencies. In the third part we briefly review the literature on variation in spell length. The fourth section describes the data, and introduces the model specification and covariates used. In the fifth section we use life tables to show how the conditional probability of exiting social assistance changes with elapsed duration, and also to illustrate how variation in this probability is associated with agency characteristics. Next, we present the estimates of a multivariate model that shows the net effects of agency-level variables, controlling for beneficiary-level covariates. In the final section we summarise the findings, consider some limitations of the study, and discuss possible implications for policy and further research.

2. The Belgian Social Assistance Scheme

2.1. Rights and Conditions in the Belgian Social Assistance Scheme on the National Level

In Belgium, the non-contributory tax-financed social assistance scheme serves as the ultimate financial safety net for able-bodied persons of working age. The scheme fulfils a residual role, as it is supplementary to social insurance benefits, as well as to other categorical minimum income schemes such as the one targeted at disabled people. There are in fact two social assistance schemes, regulated by two different acts, namely the 'Right to Social Integration' and the 'Right to Social Assistance'-acts. Persons with Belgian or other European nationality, as well as some categories of non-EU foreigners, are eligible for the first scheme. Other conditions include that beneficiaries are aged 18 or older and that they have insufficient economic resources. Moreover, beneficiaries must be available for work, unless they are exempt for health or other reasons (see below). People who are not eligible for the 'Right to Social Integration' can apply for benefits under the 'Right to Social Assistance'. Most of these beneficiaries are foreigners who entered Belgium less than five years earlier and, in the period of study, include asylum seekers. In principle, social assistance entitlement in both schemes is unlimited in duration, as long as the eligibility conditions are fulfilled. Persons above retirement age can apply to another social assistance scheme (i.e. the 'Income Guarantee for Older people'), which provides more generous benefits than those directed at non-retired people. At the time of study, the retirement age was 63 for women and 65 for men.

Both schemes provide a guaranteed minimum income (the 'Revenu d'Intégration Sociale' and its equivalent under the 'Right to Social Assistance'), which is defined at the federal level. It is subject to a means-test, which includes the income of the partner, as well as that of children and parents living in the same household according to the de facto living arrangement. Beneficiaries are divided into three categories, depending on their household situation: single persons, persons within couples (married or cohabiting) without children, and persons (single or non-single) with dependent children. Each adult in a couple without dependent children is individually entitled to a benefit, and the amounts are paid out separately. In other household situations, the benefit is paid out as a single amount to one person in the household. On 1 August 2005, the amounts were 417 euro, 626 euro and 834

euro for a person within a childless couple, a single person, and a person or family with dependent children respectively. Families with children usually also receive child benefits, which are administered by the national Administration for Child Allowances. Welfare agencies are required by law to re-assess benefit recipients' situations regularly and at least once a year. Minimum income protection in the Belgian social assistance scheme is regarded as being rather low by international standards, especially for single persons and couples with children, mainly due to the virtual absence of rent support (Cantillon, Van Mechelen, & Schulte, 2008; Saraceno, 2010).

In June 2005, 1.7 per cent of the population of working age was entitled to the guaranteed minimum income in social assistance, which by European standards is a low proportion (Carcillo & Grubb, 2006). The main reason for this is that unemployment benefits in Belgium are, at least in principle, unlimited in time (though, they can be stopped under certain conditions). Hence, the long-term unemployed need not necessarily fall back on social assistance. Moreover, school leavers with a diploma can claim a flat-rate unemployment benefit (after a waiting period), without ever having had paid employment.

The rather low number of natives who have to fall back on the guaranteed minimum income in social assistance, due to the wide coverage of social insurance schemes, is one of the reasons for the high proportion of immigrants. See Table 1 below. Other explanations are that in the period 2002 to 2005 Belgium had one of the highest immigration rates per head of the population in Western Europe, and also received a relatively high number of asylum seekers during the period 1999 to 2005.[1] Furthermore, the huge unemployment gap between Belgian-born and foreign-born persons may play a role (Corluy & Verbist, 2010; Jean, Causa, Jimenez, & Wanner, 2010). According to Corluy and Verbist (2010), non-EU born individuals also have a higher probability to receive social assistance relative to Belgian-born individuals. This overrepresentation of foreign-born individuals is in line with the majority of the findings of European studies, though there is mixed evidence whether the higher participation rate holds controlling for (un)observed characteristics (Barrett & McCarthy, 2008; Gustafsson, 2013; Hansen & Lofstrom, 2011; Mood, 2011; Riphahn, 1998; Riphahn & Wunder, 2013; Zorlu, 2013).

[1] Source: Eurostat (http://epp.eurostat.ec.europa.eu/portal/page/portal/population/data/main_tables)

During the period under study, the Belgian economy was characterized by sluggish growth and stable or slightly rising unemployment until the end of 2005, followed by an economic upturn during 2006 accompanied by a falling unemployment rate.[2]

2.2. Discretion of Local Agencies in Social Assistance

Social assistance for persons of working age is administered by local welfare agencies, called Public Social Welfare Centres. Each municipality has one and only one local agency. Local welfare agencies are autonomous organisations subject to public law. They are governed by a board elected by the local municipal council, and are responsible for their own budgets. Funding comes from a variety of sources, of which the municipal subsidy and federal refunds are the most important. The federal state refunds several expenditures partially or wholly. Benefits granted under the 'Right to Social Integration' are refunded for at least 50 per cent; the federal share may increase up to 65 per cent for agencies with a high number of beneficiaries. The 'Right to Social Assistance'-benefit is funded entirely by the federal government. One explicit goal of the federal subsidies is to somewhat equalise the burden of social assistance across municipalities, as larger cities bear the biggest burden. Another equalising subsidy is linked to active labour market participation efforts (see below).

In addition to the guaranteed minimum income, local welfare agencies can grant supplementary assistance in cash or in-kind. The amounts of and the conditions for supplementary assistance are completely at the discretion of the local welfare agencies, resulting in very large differences between agencies (Van Mechelen & Bogaerts, 2008; see also Table 2 below). Agencies also have substantial discretionary power with regard to the assessment of exemption from labour market availability due to health or a limited number of other reasons (e.g. being a full-time student for persons aged up to 25, caring for a handicapped child, or an intensive language course), job search monitoring, counselling, sanctioning, and the allocation of individuals to active labour market and training programmes. Local discretion with regard to job seeking requirements is partly due to ambiguities in the relevant legislation (e.g. no definition of a suitable job) in combination

[2] Source: National Bank of Belgium (http://www.nbb.be/pub/stats/stats.htm?l=en)

with the absence of federal targets or profiling systems. A particular case concerns students. Full-time students aged between 18 and 25, whose parents are unable to support them and whose studies are deemed to enhance their chances in the labour market, can claim social assistance benefits. Student allowances do not cover all living expenses. They are eligible for a social assistance benefit as long as it takes a normal student to finish the (secondary or higher) education they are pursuing. Students are exempted from availability for work, but they are encouraged to do student jobs during school holidays.

2.3. Can Social Assistance Beneficiaries Choose Where to Apply?

In principle, a claimant can only apply to the welfare agency of the municipality of his or her actual and usual place of residence. This does not necessarily apply to students, who are assigned to the welfare agency of the municipality where they originally lived, and not to that of the town where they pursue their studies, and where they may also have their usual residence. However, more than three quarters of the students receiving social assistance live in the municipality of the agency by which they are served (De Wilde et al., 2011). Another exception to the rule was made for asylum seekers. These persons (as any free citizen of Belgium) are free to settle where they want and, in practice, often choose to live in one of the bigger cities. However, in order to relieve these cities from the heavy administrative and financial burden this imposes, the responsibility for providing social assistance for asylum seekers was distributed across local agencies according to set quota, independent of their actual place of residence.

The fact that social assistance beneficiaries are free to move, in combination with the substantial variation in the generosity of supplementary assistance across local welfare agencies, opens up the possibility of 'benefit shopping', i.e. moving to a municipality where the benefit level is more generous. For a number of reasons it is unlikely that benefit shopping is an important phenomenon in Belgium. The amounts granted in supplementary assistance are specific for each individual application and, while many agencies use guidelines, these are not made public. Also, welfare agency workers enjoy considerable freedom in the application of these guidelines (Cornelis et al., 2012). This implies that even when a certain welfare agency has a reputation for being generous in supplementary

benefit, social assistance beneficiaries cannot be certain that that generosity will extend to their particular case. Furthermore, moving residence can involve substantial costs. In other words, 'benefit shopping' in Belgium seems a risky strategy with uncertain benefits. Moreover, within the sample of beneficiaries used here, moves between agencies were most often towards agencies where the average level of supplementary benefit was lower or at an approximately equal level as at the agency of origin.

2.4. Active Labour Market Programmes

Subject to federal rules and an assessment by local welfare workers, beneficiaries of social assistance can enter various active labour market programmes. The most important of these in terms of persons reached is specifically targeted at social assistance beneficiaries. This involves employment where the wage costs are mostly completely subsidized by the local welfare agency, which is in fact also the employer. Claimants can work within the local welfare agency, or they can be seconded to other organisations. The goal is to give social assistance beneficiaries the opportunity to gain work experience, or to ensure that they qualify for a social insurance income, in particular an unemployment benefit. For each beneficiary of this active labour market scheme, the federal government provides a subsidy that is equal to the guaranteed minimum income of a person living with a partner, but only for a period that is just sufficient to make the beneficiary eligible for social insurance benefits. Local welfare agencies thus have a clear financial incentive to move persons receiving a benefit under the 'Right to Social Integration' (which is generally refunded at only 50 per cent) into these active labour market programmes. Beneficiaries of the 'Right to Social Assistance' (for which expenditure is refunded at 100 per cent) are not excluded from these active labour market programmes, except for some categories of asylum seekers which are not permitted to work. In the period under study, only a small though increasing number of beneficiaries of the 'Right to Social Assistance' participated in an employment scheme.

On top of refunding the wage costs of these programmes, the federal government provides subsidies for supporting and training the participants. An additional subsidy for active labour market participation efforts is targeted at municipalities with more than 40,000 inhabitants,

who have a relatively large number of beneficiaries in active labour market programmes. In addition to these employment programmes specifically targeted at beneficiaries of social assistance, a number of other more general active labour market schemes are also open to them, though these are of relatively minor importance. These involve employment that is partly subsidized and/or supported by counselling. We note that participation in active labour market programmes implies exit from social assistance.

3. Literature Review

The literature on social assistance dynamics identifies four kinds of variables that could influence exit rates and spell lengths. First, there are variables on the individual (or household) level. Beneficiaries can differ in their probability of exiting social assistance due to personal and household characteristics such as sex, age, household type, education or nationality. Heterogeneity in the composition of local social assistance beneficiaries populations can result in differences in the average spell length across welfare agencies.

Second, the length of the social assistance spell as such can influence individuals' probability of exiting, as a result of depreciation or stagnation of human and job-specific capital, and employers' negative perception of social assistance receipt (Andrén, 2007; Bane & Ellwood, 1994; Dahl & Lorentzen, 2003; Hansen, Lofstrom, Liu, & Zhang, 2013). This mechanism is generally referred to as negative duration dependence.

Third, the design of the social assistance scheme, such as the generosity level and the job seeking requirements, can account for variation in spell lengths. Job search theory argues that a more generous benefit is likely to raise the reservation wage and to reduce the job seeking effort, entailing a longer episode of social assistance benefit receipt (Cahuc & Zylberberg, 2004). This theoretical argument is empirically well substantiated, although the magnitude of the effect of generosity levels on episode duration is not always substantial (Atkinson & Micklewright, 1991 (for unemployment insurance); Fortin, Lacroix, & Drolet, 2004; Lemieux & Milligan, 2008 (for welfare in Canada); Moffitt, 2002 (for welfare in the USA)). Gustafsson et al. (2002) mention another argument with regard to the generosity of the benefit. A low benefit level may be insufficient to survive, compelling beneficiaries to

seek work in the informal economy in order to attain an 'assisted equilibrium' by combining informal work and social assistance receipt. Although the guaranteed minimum benefit in social assistance is the same all over Belgium, these arguments suggest that the local variation in supplementary assistance (shown in Table 2 below) may well translate into variation of spell lengths in social assistance.

Studies also indicate that counselling and monitoring of jobseekers positively affect beneficiaries' likelihood of exiting social assistance (Boone, Frederiksson, Holmlund, & van Ours, 2001; Engström, 2009). Welfare agencies in Belgium have substantial discretionary power with regard to the assessment of exemption from labour market availability due to health or other reasons, job search monitoring, counselling, sanctioning, and the allocation of individuals to active labour market and training programmes.

Available resources relative to demand may also play a role in the degree to which social assistance beneficiaries are subject to monitoring and counselling. Some welfare agencies may be overwhelmed by the number of social assistance beneficiaries relative to the number of social workers. Also, agencies in small municipalities may have less institutional capacity than those in larger communities to empower beneficiaries and to help them find a suitable job. Some studies for other policy fields suggest that this is one of the pitfalls of decentralisation (De Vries, 2000; Pollitt, 2005; Prud'homme, 1995). However, Cockx (1997) finds for Belgium in the late 1980s a lower turnover in big cities. Dahl and Lorentzen (2003) do not find a significant effect of municipality size on exit to work for the 1995 entry cohort in Norway.

A fourth set of relevant variables refers to the economic context. There is mixed evidence of the impact of conditions on the labour market on episode lengths. Hoynes (2000) reports a substantial effect of local labour market conditions and the economic cycle on the likelihood of exiting social assistance. Some studies also show that labour market characteristics can have a differential effect on individuals depending on their characteristics (Hansen, 2008; Hoynes, 2000; Riphahn & Wunder, 2013; van der Klauw & van Ours, 2001). Other studies report no impact of local area unemployment on exit (Cappellari & Jenkins, 2013).

4. Data and Methodology

4.1. Data

We use administrative longitudinal data from the Belgian Data Warehouse Labour Market and Social Security to track individuals (not households) over time. Administrative data have the advantage, in comparison to survey data, that they provide a sufficiently large sample to study local variation in exit probabilities, while reducing measurement error. We have a one in three random sample of all beneficiaries entering social assistance in 2004 which is proportionally stratified by age, sex, province, applicable act, and municipality size. All beneficiaries were aged 18 to 64 when entering social assistance and had not received social assistance benefits in the preceding fifteen months. The sample provides 160,624 person-months of observation on 14,270 beneficiaries served by 574 welfare agencies who were followed over two years.[3] Observations are censored at the end of the two-year observation period.

4.2. Characteristics of the Beneficiaries and Local Welfare Agencies

Summary statistics about beneficiaries' characteristics are shown in Table 1. Half of the persons entitled to social assistance are women and half are men. Nearly half of the beneficiaries are aged between 25 and 44, and more than one-third are under 25. Less than 50 per cent of the sample have the Belgian nationality at birth, though one in four beneficiaries are naturalised after birth. Among beneficiaries having foreign nationality at birth, those holding non-European nationality constitute the largest group. Almost 60 per cent of the beneficiaries have not worked in Belgium in the past five years, and nearly 15 per cent are students. Nearly one in ten have switched welfare agencies at least once during the observation period.

[3] All the tables and figures included in the paper are based on this sample from the Data Warehouse Labour Market and Social Security.

Table 1: Socio-economic characteristics of the beneficiaries at entry (N=14,270)

Characteristic	Total	No agency change	At least one agency change
Sex			
Male	49.8	49.8	49.5
Female	50.2	50.2	50.5
Age			
18 – 24	36.5	35.8	44.1
25 – 44	46.3	46.8	41.8
45 and over	17.2	17.5	14.2
Nationality at birth			
Belgian nationality	47.3	48.0	40.8
EU nationality	13.2	13.3	12.0
Non-EU nationality	38.3	37.6	45.9
Unknown nationality	1.2	1.2	1.4
Naturalisation			
No (includes Belgians at birth)	75.5	75.7	73.6
Yes	24.5	24.3	26.4
Work intensity in Belgium over the past five years			
0 %	57.2	55.9	70.7
1 – 50 %	28.0	28.4	23.9
51 – 75 %	6.4	6.8	2.6
75 – 100 %	8.4	9.0	2.8
Full-time student			
No student	85.4	85.7	82.7
Student	14.6	14.3	17.3
Welfare agency change over the observed period			
No agency change	91.4	100.0	0.0
At least one agency change	8.7	0.0	100.0

Table 1 also shows the characteristics of those who changed agency and those who did not. Beneficiaries who changed agency are younger relative to those who did not change agency, more often hold a non-EU nationality, have less work experience in Belgium, and are more often a full-time student.

Table 2 provides an overview of the characteristics of the 572 welfare agencies of the beneficiaries at entry.[4] More than 90 per cent of the municipalities (representing half of the beneficiaries) have fewer than 40,000 inhabitants. Two-thirds of the municipalities have an unemployment rate of under 10.4 per cent, and only a little more than one out of four beneficiaries live in a municipality with an unemployment rate under 10.4 per cent. In nearly

[4] The agencies at entry cover 572 of the 574 local agencies in the sample.

60 per cent of the local agencies (which corresponds with 52 per cent of the beneficiaries) the participation rate in active labour market programmes (ALMPs) is below 10 per cent. As for the generosity of supplementary assistance, half of the agencies (representing 70 per cent of the beneficiaries) on average pay less than 500 euro per year per beneficiary, whereas 22 per cent granted between 500 and 999 euros.

Table 2: Welfare agency characteristics at entry (N=572)

Characteristic	N (Beneficiaries)	% (Beneficiaries)	N (Agencies)	% (Agencies)
Municipality size				
< 10,000 inhabitants	1,346	9.4	238	41.6
10,000 - 19,999 inhabitants	2,729	19.1	199	34.8
20,000 - 39,999 inhabitants	3,073	21.5	100	17.5
40,000 - 99,999 inhabitants	3,432	24.1	27	4.7
100,000 inhabitants and over	3,690	25.9	8	1.4
Municipal unemployment rate (quintile groups)				
< 5.7 %	783	5.5	114	19.9
5.7 - 7.4 %	1,525	10.7	116	20.3
7.5 - 10.3 %	1,767	12.4	112	19.6
10.4 - 13.6 %	1,856	13.0	115	20.1
> 13.6 %	8,339	58.4	115	20.1
ALMP participation rate				
< 10 %	7,471	52.4	336	58.7
≥ 10 % & < 20 %	6,146	43.1	191	33.4
≥ 20 %	653	4.6	45	7.8
Generosity level (average amount per year per beneficiary)				
< 500 €	9,968	69.9	283	49.5
≥ 500 & < 1,000 €	2,507	17.6	128	22.4
≥ 1,000 & < 2,000 €	551	3.9	54	9.4
≥ 2,000 €	188	1.3	21	3.7
Unknown	1,056	7.4	86	15

4.3. Definition of Exit

For beneficiaries having entered social assistance in 2004, we analyse the duration in months until their first unspecified exit. As is customary in life-table analysis and hazard models, we study duration in social assistance by estimating the (monthly) conditional probabilities of exiting for those who are still in social assistance. In calculating the episode durations, breaks of one month were not taken into account as such short interruptions are often due to administrative errors.[5]

We lack monthly data on paid labour other than the federal active labour market programmes to define mutually exclusive states in work and social assistance. Therefore, if beneficiaries combine participation in a federal active labour market programme (which usually involves full-time or four-fifths employment) with a complementary minimum income benefit, we consider their episode as ended. By contrast, we count anyone working in another type of job and still receiving complementary minimum income benefit as a social assistance beneficiary, as we cannot identify those cases accurately.

4.4. Model Specification

The administrative records provide data on social assistance spell lengths (measured in months), as well as time-varying data on the characteristics of beneficiaries and welfare agencies throughout the observation period. By the end of the observation period, spells are completed (there has been an exit from social assistance) or right-censored (a spell remains in progress). We use random-effects models, also known as multilevel models, to estimate the coefficients of a discrete-time hazard regression model, the precise specification of which is provided shortly.

The model relates the monthly probability of exiting social assistance to elapsed duration since entry to receipt (capturing duration dependence), and time-varying characteristics of

[5] Breaks of one month between subsequent episodes are frequent: thirty-seven per cent of the breaks last one month. Fifteen per cent of the breaks between subsequent episodes last two months, and 10 per cent last three months. Some 37 per cent of the breaks last longer than three months.

beneficiaries and welfare agencies, while also controlling for unobserved heterogeneity ('frailty') at the beneficiary-level and at the agency-level. For previous examples of multilevel models applied to spell data, see Barber, Murphy, Axinn, and Maples (2000); Hedeker, Siddiqui, and Hu (2000); and Steele (2011).

We use a piece-wise linear specification for duration dependence, including as regressors binary variables identifying spell months grouped into three-month intervals (spell months 0–3, 4–6, …, 22–24). We control for potential seasonal variation in employment opportunities in a given spell month by including quarter-of-the-year dummy variables.

In common with most multilevel models, we assume that the beneficiary and agency random effects are each normally distributed with zero mean with a fixed variance that is estimated from the data, and both effects are assumed to be uncorrelated with the observed regressors. Due to limitations in the software we use, MLwiN (Rasbash, Charlton, Browne, Healy, & Cameron, 2009), we assume that the random effects at the beneficiary-level and agency-level are uncorrelated.

The beneficiary-level random effect accounts for unobserved time-constant characteristics of beneficiaries that affect the hazard of leaving social assistance (Mills, 2011). Failing to control for unobserved heterogeneity would be likely to overstate negative duration dependence (Blossfeld, Golsch, & Rohwer, 2007; Jenkins, 2007; Lancaster, 1990; Wooldridge, 2002). The agency-level random effect captures time-constant between-agency variation in the hazard of exiting social assistance that is not captured by the regressors summarising observed agency characteristics.

Because 8.7 per cent of the beneficiaries change agency during the observation period, we do not have a standard multilevel model. That is, instead of every spell month for each beneficiary being consistently 'nested' within a single agency throughout the whole of each beneficiary's spell of benefit receipt, the data for each beneficiary are instead 'cross-nested'. Multilevel models that incorporate cross-nested random effects are discussed by, for example, Beretvas (2011); Fielding and Goldstein (2006); Hox (2010); and Leckie (2013). Disregarding the cross-classified structure results in a misspecified model that can lead to both negatively biased standard error estimates and inaccurate variance component

estimates, while deleting the individuals with cross-classified structures reduces the generalizability of the results (Beretvas, 2011).[6]

Our model for the monthly hazard of exit from social assistance, conditional on entry in 2004 can be written as:

$$\ln\left[\frac{P(T_{ij}=t|T_{ij}\geq t)}{1-P(T_{ij}=t|T_{ij}\geq t)}\right]=\beta_0+\sum_{k=1}^{7}\beta_k d_{ijk}+\gamma' X_{ijt}+\delta' Z_{jt}+u_i+v_j$$

Where $u_i \sim \mathrm{N}(0,\sigma_u^2)$ and $v_j \sim \mathrm{N}(0,\sigma_v^2)$.

The expression $P(T_{ij}=t|T_{ij}\geq t)$ represents the monthly hazard, i.e. the probability for beneficiary *i* in agency *j* of leaving social assistance in month *t* conditional on having been in social assistance until at least month *t*. This is a proportional odds model (Jenkins, 2007; Singer & Willett, 2003), as the logit of the monthly hazard is related to a linear function of covariates. The model generates parameter estimates that are similar to those derived from a discrete-time proportional hazard model if the discrete hazard rate is small (Singer & Willett, 2003), as is the case in this study.

The intercept β_0 represents the log-odds of leaving social assistance in the first three spell months for a beneficiary with the mean value for each random effect (zero) while setting the observed characteristics equal to zero. The β_k represent the differences in log-odds of leaving social assistance in each spell interval *k* relative to the reference interval (the first three spell months), and the elements of γ and δ represent the effects of the observed beneficiary-level explanatory variables X_{ijt} (including seasonal effects) and agency-level explanatory variables Z_{jt}, respectively. The beneficiary-level random effect is u_i and the agency-level random effect is v_j, with variances σ_u^2 and σ_v^2 respectively.

The parameters of the model are identified by the assumptions made about the distributions of the random effects and, broadly speaking, their estimates have desirable properties such as consistency because of the large sample sizes involved, not only of beneficiaries but also of welfare agencies.

[6] We assigned individuals who were recorded as being present in more than one agency in any given month to the agency providing the highest payment amount.

All model specifications were estimated using Bayesian Markov Chain Monte Carlo (MCMC) procedures as simulation studies have shown that these procedures generate less bias than likelihood-based estimation methods in case of random-effects logistic regression models (Browne & Draper, 2006). In contrast to likelihood-based procedures, which yield point estimates (and associated standard errors) of the population parameters that maximize the likelihood of the observed data, MCMC is a simulation based estimation method which generates a chain of parameter values based on successive sampling from the posterior distributions of the model parameters (Goldstein 2011). The IGLS-estimates for the nested model were used as priors for the MCMC-estimation of the cross-classified model (Browne, 2012). We use a burn-in of 5000 iterations followed by a monitoring chain of 80000 iterations, and orthogonal parametrisation to improve the efficiency of the MCMC-estimation procedure (Browne, 2012; Browne, Steele, Golalizadeh, & Green, 2009). Table 3 and Table 4 report the means and standard deviations of the posterior distribution of parameter values, which have a similar interpretation to parameter estimates and standard errors obtained from maximum likelihood estimation (Goldstein, 2011; Leckie, 2013). Given that we estimate a proportional odds model, the antilog of the mean of the posterior distribution of parameter values can be interpreted as an odds-ratio (OR).

We use the Deviance Information Criterion (DIC), a Bayesian equivalent of Akaike's Information Criterion (AIC), to compare models (Spiegelhalter, Best, Carlin, & Van Der Linde, 2002). Like AIC, DIC takes into account both goodness-of-fit and model complexity. Lower values of the DIC reflect models that better fit the data.

4.5. Beneficiary-level and Agency-level Characteristics

The multivariate model analyses how the probability of exiting social assistance varies in terms of the following beneficiary-level covariates: (1) sex, (2) age at entry into social assistance (in years, centred at 31, quadratic effect), (3) nationality at birth, distinguishing the Belgian nationality (reference category), European nationalities,[7] non-European

[7] In addition to the EU-27 countries, Switzerland, Iceland, and Norway are also considered as European nations.

nationalities and beneficiaries with unknown nationality, (4) quarterly information on naturalisation status (a dummy variable contrasting foreigners who acquired Belgian nationality with Belgians and foreigners keeping foreign nationality), (5) work intensity in Belgium in the five years preceding entry into social assistance (measured in quarters and centred at value 11), (6) quarterly information on student status (a dummy variable indicating whether the beneficiary was enrolled in full-time education), and (7) change in welfare agency (a dummy variable indicating whether the beneficiary has changed welfare agency during the observation period at least once).[8]

Apart from characteristics of beneficiaries, the multivariate model analyses how the probability of exiting social assistance varies in terms of the following characteristics of welfare agencies and municipalities: (1) yearly data on municipality unemployment rate in quintile groups for 2004 (less than 5.7 per cent, 5.7 to 7.4 per cent, 7.5 to 10.3 per cent, 10.4 to 13.6 per cent, and more than 13.6 per cent) (2) yearly data on municipality size (fewer than 10,000 inhabitants; 10,000 to 19,999 inhabitants; 20,000 to 39,999 inhabitants; 40,000 to 99,999 inhabitants; and 100,000 inhabitants or over), (3) active labour market programme participation rate of social assistance beneficiaries in 2004 (less than 10 per cent, 10 to 19.9 per cent, and 20 per cent and over), and (4) generosity level of supplementary benefit in 2004 (less than 500 euro; 500 to 999 euro; 1,000 to 1,999 euro; 2,000 euro and over; and an unknown average amount per beneficiary per year). To calculate this variable, we divide the total yearly budget for cash and in-kind supplementary benefits per agency by the agency's total number of social assistance beneficiaries in the course of the year. However, a number of recipients of supplementary benefit are not entitled to social assistance. This implies that the indicator may overestimate the average supplementary benefit actually received by social assistance beneficiaries. More details on the calculation and shortcomings of the agency-level variables are provided in Annex 1. Since every municipality has one and only one local welfare agency, the municipal employment rate and the municipality size are treated as agency-level variables.

[8] As adequate information on the actual living arrangements, which is relevant for the determination of the benefit amount, is not available in the register data, the household situation is not included in the analysis.

5. Results

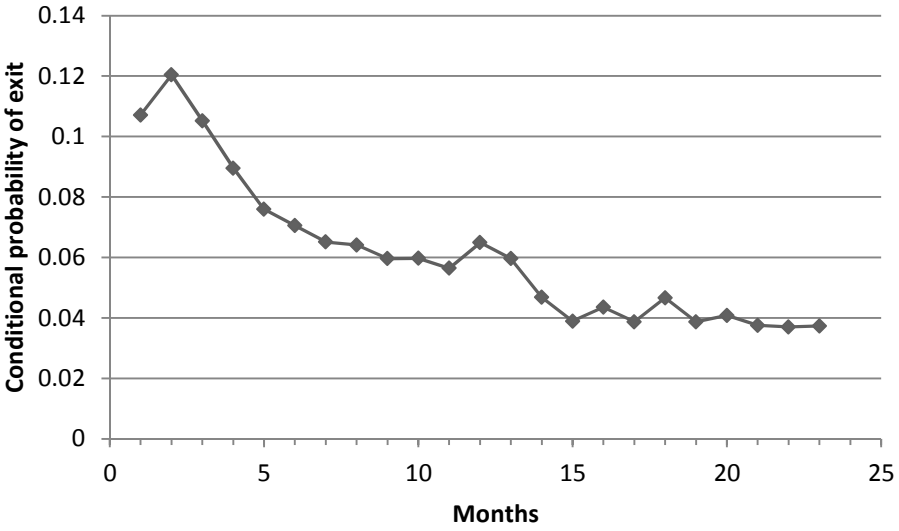
The results section consists of three parts. Section 5.1 uses life tables to illustrate how the conditional monthly probability of exiting social assistance changes with elapsed duration since entry to receipt (observed hazard function) and documents between-agency variation in the median duration in social assistance. Subsequently, section 5.2 uses life tables to illustrate how the observed hazard functions of exiting social assistance are differentiated in terms of agency-level characteristics. Based on these descriptive results, section 5.3 presents the estimates of the multivariate random-effects model that show how the odds of exiting social assistance are associated with duration since entry to receipt (Specification 1), beneficiary-level characteristics (Specification 2) and agency-level characteristics (Specifications 3 and 4).

5.1. Probability of Exiting Social Assistance by Elapsed Duration since Entry

Figure 1 plots the discrete-time hazard function.[9] Apart from relatively high hazards in the first few months, the hazard function indicates that the conditional probability of exiting social assistance decreases over time: this may reflect both duration dependence or the increasingly selective profile of beneficiaries who are observed at longer durations. The hazard of exiting social assistance is slightly higher during the 12th month of the observation period than before or after. We assume this is due to the fact that, in practice, eligibility for benefits is re-assessed after a period of one year, and more beneficiaries leave during the last month of the year.

[9] We obtained descriptive statistics on the duration in social assistance by calculating actuarial life tables (i.e. assuming that exits occur on average at the midpoint of each time interval) (Gehan, 1975).

Figure 1: Conditional monthly probability of exiting social assistance to elapsed duration since entry to receipt



Of the beneficiaries in our sample, 61 per cent exit social assistance within a year, while 22 per cent where censored in social assistance at the end of the two-year observation period. The median duration of the observed spells in social assistance is 7.9 months. This median spell length is somewhat longer than estimates for the late 1980s: for beneficiaries entering between June 1987 and November 1990, Cockx (1997) reports median durations in social assistance of 4.5 and 7 months for men and women respectively (considering changes to other agencies as exits). A median duration of approximately eight months is a medium turnover rate from an international perspective. Gustafsson et al. (2002) found that the duration of the first episode for entrants ranged from three months (in Gothenburg) to 34 months (in Lisbon).

To explore between-agency variation, the median duration of social assistance spells was calculated for each local welfare agency having at least 20 beneficiaries in the sample. We find substantial between-agency variation. While the median duration is limited to a minimum of two months in some agencies, the median duration exceeds 24 months in five local welfare agencies. The distribution of median durations at the municipality level is skewed, however, towards shorter durations. We are unaware of previous studies on within-country local variation in duration. In Gustafsson et al. (2002) within-country variation is only based on two cities within a country: Gothenburg and Helsingborg in Sweden present similar scores (respectively three and four months), and also Milan (five months) and Turin (six

months) in Italy show the same pattern. By contrast, in Spain, the findings for Barcelona (27 months) and Vitoria (12 months) diverge. In summary, the within-country variation in Belgium seems to be nearly as substantial as the between-country variation in Gustafsson et al. (2002).

5.2. Probability of Exiting Social Assistance by Welfare Agency Characteristics

To explore how the probability of leaving social assistance is associated with characteristics of local welfare agencies, we derive life table estimates separately for groups of individuals classified according to characteristics of their benefit agency. The estimates are graphed in Figure 2, by characteristic, and illustrate the gross effects of each agency characteristic.[10]

The differentiation of hazard in terms of municipality-level unemployment rates is pronounced during the first months: see Figure 2a. Welfare agencies in municipalities with low to medium unemployment rates generally have the highest exit rates, but the effect diminishes as the duration in social assistance increases. Exit hazards vary little by municipality size, but the exit probability seems to be generally lower in welfare agencies that are located in smaller municipalities: see Figure 2b. By contrast, hazards clearly differ by participation rate in active labour market programmes during the first year of the observation period: beneficiaries located in agencies with higher participation rates show higher hazards of exiting social assistance: see Figure 2c. After the first year, the differences between the hazard curves become less distinct which may be due to a selection effect, as beneficiaries with a more favourable profile leave social assistance already at shorter durations. Finally, we find that, during the first six months, the hazard of leaving social assistance is generally higher in local welfare agencies that provide more generous supplementary assistance: see Figure 2d. The hazard curve decreases rapidly after the first

[10] In order to test whether the differences between agencies with various characteristics in Figure 2 give rise to significant gross differences in exit for the agency-level variables, we estimated multivariate models including elapsed duration since entry to receipt and each of the agency characteristics separately (not reported). They show that differences between curves in Figure 2 are statistically significant for each of the agency-level characteristics. The estimates for Specification 4 in Table 4 indicate whether the agency-level covariates are significant when controlling for (un)observed beneficiary-level and agency-level characteristics.

month for the highest generosity level: as only a small subset of beneficiaries is involved, the hazards are less stable for this group.

In summary, differences by agency type in exit hazard functions are more obvious during the first year of the observation period, with between-agency variation being largest in terms of generosity level and participation rate in active labour market programmes. In the next section, we will explore whether these findings hold in a multivariate model including (un)observed beneficiary-level and agency-level characteristics.

Figure 2a: Observed within-group hazard function by unemployment rate

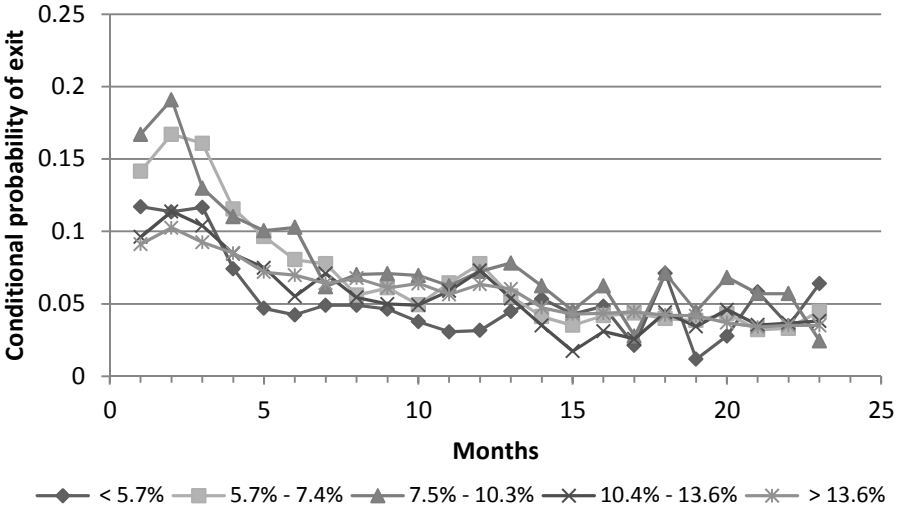


Figure 2b: Observed within-group hazard function by municipality size

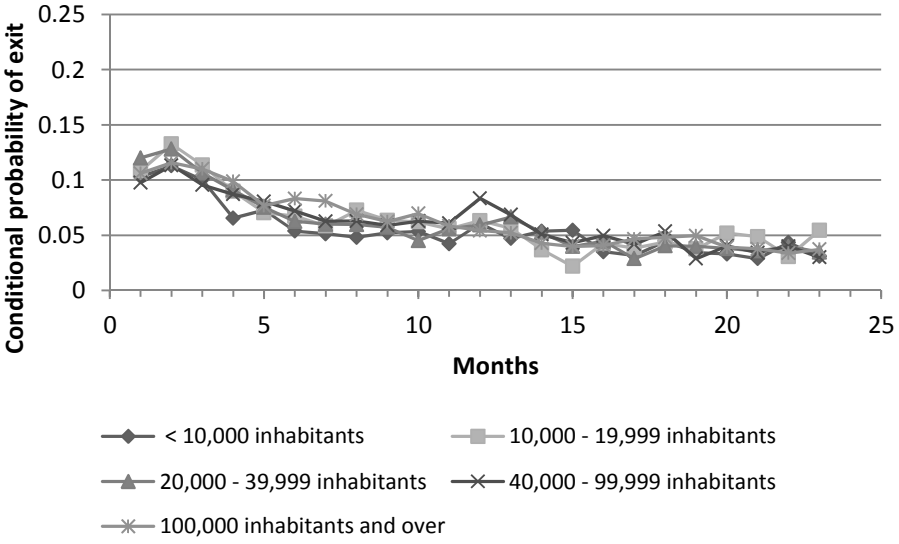


Figure 2c: Observed within-group hazard function by ALMP participation rate

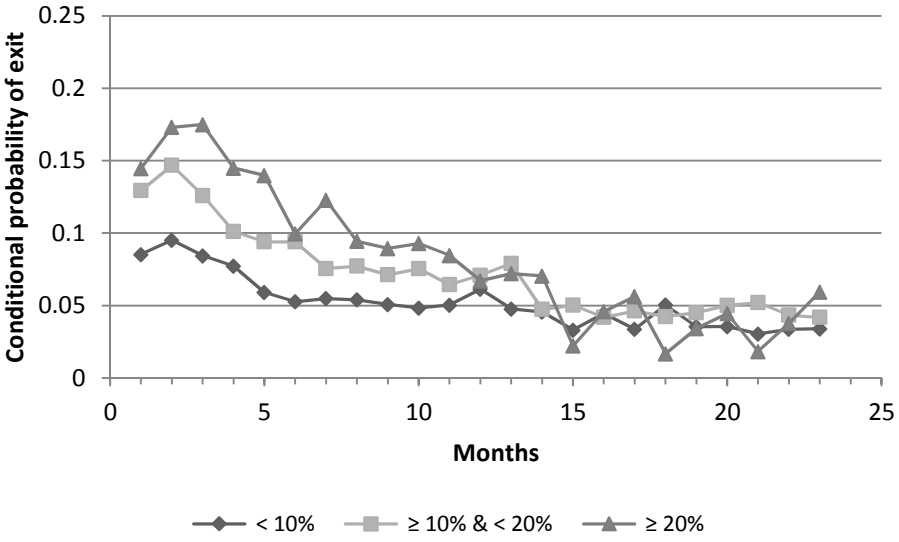
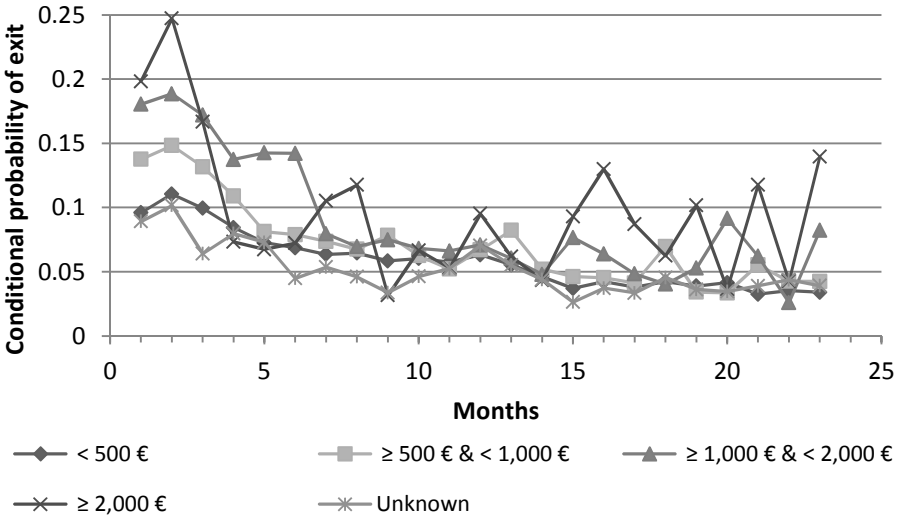


Figure 2d: Observed within-group hazard function by generosity level



5.3. Multivariate Model Estimates of the Monthly Exit Rate from Social Assistance

We present four specifications of the multivariate model to highlight the contribution of the inclusion of agency-level information: see Tables 3 and 4. The first model specification only includes the elapsed duration since entry into social assistance and seasonal effects. The second specification introduces observed beneficiary characteristics as well as an individual-level random effect to account for unobserved characteristics ('frailty') affecting the odds of exiting social assistance. In the third specification, we add observed agency-level variables. The fourth and final specification in addition includes an agency-level random effect. As sensitivity tests, we fit two additional specifications, for which the estimates are presented in Annex 2. First, we estimate Specification 4 without the observed agency-level variables. This specification only includes a cross-nested agency-level random effect, as well as the beneficiary-level variables and a beneficiary-level random effect. The significant agency-level random effect illustrates that there is significant variation between welfare agencies in the odds of exiting social assistance that is not accounted for by the beneficiary-level characteristics included in the model. Second, we estimate Specification 4 for the beneficiaries in the sample that have not changed agencies.

Specification 1 only includes the duration since entry into social assistance (grouped in 3-month intervals) and a variable capturing seasonal or quarterly variation in exit hazard rates: see Table 3. Apart from the variable capturing seasonal variation, this specification is the multivariate analogue of the observed hazard function pooled across all individuals shown in Figure 1. The constant in this specification reflects the odds of exiting social assistance within three months after entry to receipt and in the first quarter of the calendar year. The parameter estimates indicate that the odds of exiting decline as the duration since entry into social assistance increases. The estimates also illustrate that the exit rate declines rather quickly during the first year in social assistance, and then levels off, a pattern also seen in Figure 1 above. The exit rate is subject to seasonal variation as well, with odds being significantly higher in the second and fourth quarters relative to the first quarter.

Table 3: MCMC-estimated means and standard deviations of the log-odds of the hazard of exiting

	Specification 1			Specification 2		
	Mean	**Std.dev.**	**OR**	**Mean**	**Std.dev.**	**OR**
Fixed Part						
Constant	-2.21***	0.02	0.11***	-1.92***	0.04	0.15***
Elapsed Duration and Seasonal Variation						
Duration since entry into social assistance (Month 1 to 3 = ref. category)						
Month 4 to 6	-0.35***	0.03	0.70***	0.14***	0.04	1.16***
Month 7 to 9	-0.59***	0.03	0.55***	0.13*	0.05	1.14*
Month 10 to 12	-0.63***	0.04	0.53***	0.25***	0.06	1.28***
Month 13 to 15	-0.86***	0.04	0.42***	0.19*	0.08	1.20*
Month 16 to 18	-0.99***	0.05	0.37***	0.14	0.09	1.15
Month 19 to 21	-1.09***	0.05	0.34***	0.10	0.09	1.10
Month 22 to 24	-0.98***	0.05	0.38***	0.25*	0.10	1.28*
Seasonal employment opportunity (Quarter 1 = ref. category)						
Quarter 2	0.11***	0.03	1.12***	0.12***	0.03	1.12***
Quarter 3	0.05	0.03	1.05	0.03	0.03	1.04
Quarter 4	0.12***	0.03	1.13***	0.15***	0.03	1.16***
Beneficiary Characteristics						
Female				-0.04	0.03	0.96
Age				0.04***	0.01	1.04***
Age squared				-0.00***	0.00	1.00***
Naturalised				0.72***	0.04	2.06***
Work intensity				0.01***	0.00	1.01***
Student				-2.52***	0.07	0.08***
Agency switch				-1.40***	0.06	0.25***
Nationality at birth (Belgian = ref. category)						
EU Nationality				-0.75***	0.07	0.47***
Non-EU nationality				-1.46***	0.06	0.23***
Unknown nationality				-1.04***	0.19	0.36***
EU Nationality*time linear				0.00	0.01	1.00
Non-EU nationality*time linear				0.02***	0.00	1.02***
Unknown nationality*time linear				0.00	0.02	1.00
Variance Estimates for Random Effects						
Beneficiary-level				1.16***	0.10	
Deviance Information Criterion (DIC)	78,378.51			71,190.20		

Significance levels: * if p < 0.050, ** if p < 0.010 and *** if p < 0.001. Tv = Time-varying

The reported means and standard deviations of the distributions of parameter values have a similar interpretation as parameter estimates and standard errors obtained from maximum likelihood estimation.

In addition to the elapsed duration since entry into social assistance and seasonal effects, Specification 2 includes beneficiary-level covariates as well as a beneficiary-level random effect to account for unobserved characteristics affecting the odds of exiting: see Table 3. This model corresponds to the standard 'frailty' model in the literature, which is commonly used when no agency-level information is available. The constant for this specification reflects the monthly odds of leaving social assistance in the period 1 January to 31 March within three months after entry into social assistance for a 31-year old male beneficiary holding Belgian nationality, with a work intensity of 11 per cent who is not enrolled in full-time education and did not change welfare agencies during the observation period. Adding (un)observed beneficiary-level predictors to the model strongly affects the duration pattern of the odds of exiting. Controlling for beneficiary-level characteristics, the odds of exiting

during the duration intervals after the first three months are either significantly higher or not significantly different from those during the first three months in social assistance. The negative duration dependence pattern observed in Specification 1 can thus be explained in terms of an increasingly selective composition of the risk set at longer durations.

When we control for other beneficiary characteristics, no significant difference emerges between men and women. The estimates for the quadratic specification for age indicate that the odds of exiting social assistance increase with age, but at a much lower rate at older ages. Regarding nationality, non-EU nationality at birth reduces the odds of exiting social assistance substantially compared to those of beneficiaries holding Belgian nationality. The significant interaction between non-EU nationality and the elapsed duration since entry into the social assistance scheme indicates, however, that the initial gap in the odds of exiting declines as the time spent in social assistance increases. For those holding a European nationality at birth, the odds of exiting social assistance are 53 per cent ((1 - 0.47) * 100) lower than for native Belgians. Naturalised beneficiaries have odds of exiting social assistance that are 106 per cent higher than those of non-naturalised beneficiaries. The employment history is also positively associated with the odds of exiting social assistance. For full-time students the odds of exiting social assistance are 92 per cent lower than for beneficiaries who are not enrolled in education. This finding is consistent with the fact that full-time students are exempted from job searching requirements. Furthermore, changing welfare agencies during the observation period is associated with a reduction of 75 per cent in the odds of exiting social assistance.

The specifications reported in Table 4 differ from those in Table 3 in the addition of agency-level covariates in Specification 3, and, in Specification 4 additionally, an agency-level random effect. The latter specification therefore takes into account the cross-nested structure of beneficiaries in agencies. As a result, the standard deviations of the parameters for the agency-level variables are larger for Specification 4 than for Specification 3, which suggests that the standard deviations in Specification 3 are underestimated. For this reason, some associations with the odds of exiting (e.g. for unemployment rate and municipality size) appear to be statistically significant in Specification 3, whereas Specification 4 indicates that they are not. As we prefer the conservative Specification 4, and both specifications yield

similar parameter estimates, we discuss the associations of the agency-level predictors with the odds of exiting social assistance on the basis of Specification 4.

The constant for Specifications 3 and 4 reflects the odds of exiting social assistance for a reference beneficiary similar to the one in Specification 2 in a municipality with fewer than 10,000 inhabitants and a very low unemployment rate, who is served by a welfare agency that has a very low generosity level and a low participation rate in active labour market programmes. Including the agency-level predictors in Specifications 3 and 4 does not substantially affect the parameter estimates for the elapsed duration since entry into social assistance and seasonal variation compared to Specification 2. For the beneficiary-level characteristics, parameter estimates in Specification 3 and Specification 4 are also largely similar to the estimates in Specification 2. However, an exception is sex in Specification 4 for which we now find that the odds of exiting for women are 6 per cent lower than for men. Also, compared to Specification 2, the estimate for naturalisation in Specifications 3 and 4 is reduced by 11 per cent and 20 per cent respectively. Persons who acquired Belgian nationality after birth are concentrated in cities, where exit rates are generally higher (see below).

We now turn to the agency-level variables. The estimates in Specification 4 reflect the relation between the odds of exiting and observed agency-level characteristics controlling for (un)observed individual characteristics, and other observed and unobserved agency-level characteristics. The odds of exiting social assistance do not vary significantly with the municipality-level unemployment rate. This finding differs from those in studies by Hoynes (2000) and van der Klauw and van Ours (2001), while it is in line with Cappellari and Jenkins (2013). In Figure 2a above, we observed significant differences between agencies with various rates of unemployment, but apparently these are due to other covariates in the model.

Municipality size, however, is significantly associated with the odds of leaving social assistance: the odds of exiting are 25 per cent ((1.25 - 1) * 100) and 51 per cent ((1.51 - 1) * 100) higher for beneficiaries in municipalities with 20,000 to 39,999 inhabitants and in large cities (100,000 inhabitants and over) respectively, than those of beneficiaries in municipalities with fewer than 10,000 inhabitants. This shows that spells of social assistance

receipt are generally shorter in larger cities, as illustrated in Figure 2b. This is in contrast with earlier findings of Cockx (1997), who reported longer durations in Belgian cities with over 100,000 inhabitants in the late 1980s. Dahl and Lorentzen (2003) concluded that municipality size does not matter in Norway.

Beneficiaries in agencies with medium to high participation rates in active labour market programmes have odds of exiting social assistance that are respectively 54 per cent and 148 per cent higher than those of similar beneficiaries in agencies with low participation rates. Figure 2c above revealed large differences in exit rates between agencies with varying participation rates in these programmes, and these are confirmed in the multivariate analysis. Recall that participation in an active labour market programme implies exit from social assistance. Finally, a higher generosity level is generally associated with higher odds of exiting social assistance compared to those of agencies with low generosity levels. This finding confirms the results shown in Figure 2d.

To check the robustness of the findings of the cross-classified model, we re-estimated Specification 4 for beneficiaries who did not change welfare agency throughout the observation period: see Model B in Annex 2. The estimates for the subsample who did not change agencies are generally in the same order of magnitude for the beneficiary-level variables. However, omitting beneficiaries who changed agencies affects the parameter estimates for elapsed duration in social assistance: for all duration intervals the odds of exiting do not differ significantly from the first interval (1 to 3 months in social assistance). This again suggests that the negative duration dependence pattern can be accounted for in terms of the changing profile of beneficiaries over time, similar to the results from the cross-nested model. Finally, we find that agency-level associations with the odds of exiting are slightly lower than in the cross-nested model. Excluding beneficiaries that switched agencies from the estimation sample does not necessarily remove all kinds of bias that might result from 'benefit shopping'. The remaining sample of 'stayers' might still be affected by selection bias. However, as noted in section 2, it is unlikely that many beneficiaries are motivated by higher supplementary assistance to switch agencies.

Table 4: MCMC-estimated means and standard deviations of the log-odds of the hazard of exiting

	Specification 3			Specification 4		
	Mean	**Std. dev.**	**OR**	**Mean**	**Std. dev.**	**OR**
Fixed Part						
Constant	-2.44***	0.09	0.09***	-2.41***	0.10	0.09***
Elapsed Duration and Seasonal Variation						
Duration since entry into social assistance (Month 1 to 3 = ref. category)						
Month 4 to 6	0.16***	0.04	1.18***	0.18***	0.04	1.20***
Month 7 to 9	0.17**	0.06	1.18**	0.18***	0.06	1.20***
Month 10 to 12	0.29***	0.07	1.34***	0.31***	0.07	1.36***
Month 13 to 15	0.23**	0.08	1.25**	0.25**	0.08	1.28**
Month 16 to 18	0.18*	0.09	1.19*	0.20*	0.09	1.22*
Month 19 to 21	0.14	0.10	1.15	0.16	0.10	1.17
Month 22 to 24	0.29**	0.10	1.34**	0.32**	0.10	1.38**
Seasonal employment opportunity (Quarter 1 = ref. category)						
Quarter 2	0.12***	0.031	1.13***	0.12***	0.03	1.13***
Quarter 3	0.04	0.032	1.04	0.04	0.03	1.04
Quarter 4	0.15***	0.031	1.16***	0.15***	0.03	1.16***
Beneficiary Characteristics						
Female	-0.04	0.03	0.96	-0.06*	0.03	0.94*
Age	0.04***	0.01	1.04***	0.04***	0.01	1.04***
Age squared	-0.00***	0.00	1.00***	-0.00***	0.00	1.00***
Naturalised	0.67***	0.04	1.95***	0.62***	0.04	1.86***
Work intensity	0.01***	0.00	1.01***	0.01***	0.00	1.01***
Student	-2.50***	0.07	0.08***	-2.49***	0.07	0.08***
Agency switch	-1.41***	0.06	0.25***	-1.40***	0.06	0.25***
Nationality at birth (Belgian = ref. category)						
EU Nationality	-0.71***	0.07	0.49***	-0.71***	0.07	0.49***
Non-EU nationality	-1.35***	0.06	0.26***	-1.34***	0.06	0.26***
Unknown nationality	-0.99***	0.19	0.37***	-0.94***	0.19	0.39***
EU Nationality*time linear	0.00	0.01	1.00	0.00	0.01	1.00
Non-EU nationality*time linear	0.02***	0.00	1.02***	0.02***	0.00	1.02***
Unknown nationality*time linear	0.00	0.02	1.00	0.00	0.02	1.00
Local Agency Characteristics						
Unemployment rate (< 5.7 % = ref. category, tv)						
5.7 -7.4 %	0.15	0.08	1.16	0.12	0.10	1.13
7.5 - 10.3 %	0.21**	0.08	1.23**	0.17	0.10	1.19
10.4 - 13.6 %	-0.06	0.08	0.94	-0.07	0.10	0.93
> 13.6 %	-0.08	0.08	0.92	-0.11	0.10	0.90
Municipality size (<10000 inhabitants = ref. category, tv)						
10,000 – 19,999 inhabitants	0.06	0.06	1.06	0.06	0.07	1.06
20,000 – 39,999 inhabitants	0.17**	0.06	1.19**	0.22**	0.08	1.25**
40,000 – 99,999 inhabitants	0.22***	0.06	1.24***	0.18	0.10	1.20
100,000 inhabitants and over	0.42***	0.07	1.53***	0.41**	0.15	1.51**
ALMP participation rate (<10 % = ref. category)						
≥ 10 % & < 20 %	0.48***	0.03	1.61***	0.43***	0.06	1.54***
≥ 20 %	0.92***	0.07	2.50***	0.91***	0.11	2.48***
Generosity (< 500 € / year = ref. category)						
≥ 500 € & < 1,000 €	0.15***	0.05	1.16***	0.20*	0.08	1.22*
≥ 1,000 € & < 2,000 €	0.10	0.08	1.10	0.13	0.12	1.14
≥ 2,000 €	0.42**	0.14	1.51**	0.47**	0.17	1.60**
Unknown	-0.14*	0.06	0.87*	-0.15	0.09	0.86
Variance Estimates for Random Effects						
Agency-level				0.13***	0.02	
Beneficiary-level	1.13***	0.10		1.06***	0.09	
Deviance Information Criterion (DIC)	70,799.98			70,541.41		

Significance levels: * if p < 0.050, ** if p < 0.010 and *** if p < 0.001. Tv = Time-varying

The reported means and standard deviations of the distributions of parameter values have a similar interpretation as parameter estimates and standard errors obtained from maximum likelihood estimation.

6. Conclusion

Social assistance for able-bodied persons of working age in Belgium is a shared responsibility between the federal state and local agencies. Although there is a nationwide guaranteed minimum income, local agencies enjoy considerable discretion in how they implement the federal statutory framework on the conditions for eligibility (e.g. labour market availability) of the benefit. Local agencies can provide also supplementary assistance on top of the federally defined minimum income level. This raises questions about how much variation in spell lengths of benefit receipt is associated with differences in local area characteristics and in local policy. Using random-effects event history analysis, we examined the hazard of exiting social assistance over a two-year observation period in a representative administrative data sample of 14,270 entrants in the course of 2004 aged 18 to 64.

We found that the median duration varies substantially at the local level from two months to over 24 months, with an overall median duration of eight months. The magnitude of this within-country variation is nearly as large as the between-country variation found by Gustafsson et al. (2002).

We found strong associations between beneficiary characteristics (sex, age, foreign nationality, citizenship acquisition, work history, and being a student) and spell length. Controlling for beneficiary characteristics, we found no evidence pointing to negative duration dependence. Beneficiaries with a more favourable profile tended to leave earlier.

The main interest of this paper is the association of agency-level characteristics with the odds of exiting, given that agency-level information is rarely used in other studies. The local unemployment rate was not significantly associated with the odds of exiting when controlling for beneficiary-level covariates and agency characteristics, while the estimates show higher odds of exiting in bigger municipalities, and in agencies which provide more generous supplementary assistance. We found also strong evidence of shorter episodes in agencies where the participation of beneficiaries in active labour market programmes is higher. Including agency-level variables had a small effect on the estimates of the coefficients for a limited number of the beneficiary characteristics.

We draw attention to some methodological limitations of the present study, which may be addressed in further research. First, we note that the data applied in this study do not allow an analysis of (sustainable) labour market integration, as no distinction is made between reasons why beneficiaries exit social assistance. Moreover subsequent benefit episodes may occur (Gustafsson, Müller, Negri, & Voges, 2002; Walker & Shaw, 1998): 26 per cent of our sample experienced more than one episode in social assistance during the 24-month observation period (disregarding breaks of one month), 21 per cent experienced two spells and 5 per cent went through three episodes. The highest number of episodes was six. Consequently, a short duration of an episode in social assistance does not necessarily reflect durable labour market integration (Gustafsson et al., 2002; Kazepov, 1999). Second, in spite of sensitivity analysis, the analysis may not fully control for possible selection bias due to 'benefit shopping'.

Despite these limitations, this study is, to the best of our knowledge, the first European study that explicitly models exit from social assistance in a decentralised scheme, and uses a random-effects model that allows for differences in both the observed and unobserved characteristics of beneficiaries and of local agencies.

In Belgium, social assistance is moderately to highly decentralised, leading to important variations in welfare agency policies across municipalities, despite a national statutory framework and cost equalising mechanisms in the federal subsidies to local agencies. The findings of this study show that these variations in policy are clearly associated with differences in exit rates from social assistance. This raises a number of issues, both for researchers and for policy makers. Researchers of social assistance dynamics, who have until now mainly looked at the effects of beneficiary variables and local area characteristics, should consider collecting and using indicators of local policies (including the way that national policies are locally implemented). Better policy indicators could be devised than the rather rough ones used in this study. Also, attention could be given to how these differences in policy come about. Both political preferences and variations in financial and other resources are likely to play a role. An issue that is of importance for both policy makers and researchers is that the system of partial reimbursements of social assistance benefits and subsidies for various purposes by the Belgian federal government creates incentives for local social assistance agencies to engage in particular activities, and to target their efforts to

particular beneficiaries. The effects and design of such incentives merit further research, which could perhaps take advantage of the literature on decentralisation and fiscal federalism. Finally, the findings could raise concerns about equity, as beneficiaries with equal characteristics are treated differently, and, consequently, have different chances of exiting social assistance, depending on where they live.

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Annex 1: Calculation and Drawbacks of the Agency-level Variables

Table 5: Calculation and data source of the agency-level predictors

Variable	Data Source	Calculation
Population size	Population Register January 2004 - 2006	Number of inhabitants
Unemployment rate (%)	Local Employment Accounts 2004 - 2006	Annual mean of the share of the workforce (aged 15 to 64) that is job seeker and non-working
Active labour market programme participation rate (%)	Social Integration Administration data 2004	Number of unique beneficiaries in the course of the year participating in one of the federal active labour market programmes in the agency, divided by the agency's number of unique beneficiaries in the course of the year
Generosity level (€) (Average amount per beneficiary per year)	Dexia Survey – Welfare Agency Accounts 2004, Flemish Agency for Local and Provincial Government – Welfare Agency Accounts	Total budget for cash or in-kind supplementary assistance per agency divided by the agency's total number of social assistance beneficiaries in the course of the year

Source: Authors' compilation

We use the municipal unemployment rate for the population aged 15 to 64 as a proxy for labour market tightness, as comparable data between regions on the number of job vacancies are not available. Similarly, we are not able to link unemployment rates for bigger areas to our sample of social assistance beneficiaries.

We use the participation rate in active labour market programmes at the agency-level as an indicator for active labour market policy. The participation rate considers all beneficiaries (not just entrants) participating in the course of the year in one of the seven federal ALMPs targeted at social assistance beneficiaries. We use this variable as we lack agency-level information on the presence and intensity of job search monitoring and counselling, punitive measures, and the number of invitations to participate in a federal active labour market programme. Similarly, data on beneficiaries' job seeking behaviour are not available. Although beneficiaries may also move into other types of employment (e.g. interim work or a regular job), we use this measure as a proxy for the effort made by the agency to integrate beneficiaries into the labour market.

We apply the total budget for cash or in-kind supplementary benefits per agency divided by the agency's total number of social assistance beneficiaries in the course of the year. A shortcoming of this variable - the best available - is that it disregards that agencies spend a (variable) part of their budget on residents who are not entitled to the social assistance benefit. In addition, the benefit amount allocated can diverge strongly between beneficiaries within the same agency, while we apply a mean amount per beneficiary.

Annex 2: Sensitivity Analysis

Table 6: MCMC-estimated means and standard deviations of the log-odds of the hazard of exiting for Specification 4 without observed agency-level variables (N=14,270) and for the beneficiaries without agency change (N=13,034)

	No agency-level variables			No agency switch		
	Specification A			Specification B		
	Mean	**Std. dev.**	**OR**	**Mean**	**Std. dev.**	**OR**
Fixed Part						
Constant	-2.00***	0.05	0.14***	-2.27***	0.11	0.10***
Elapsed Duration and Seasonal Variation						
Duration since entry into social assistance (Month 1 to 3 = ref. category)						
Month 4 to 6	0.17***	0.04	1.18***	0.09	0.07	1.09
Month 7 to 9	0.17**	0.05	1.19**	0.02	0.10	1.02
Month 10 to 12	0.30***	0.06	1.35***	0.09	0.13	1.10
Month 13 to 15	0.23**	0.08	1.26**	-0.02	0.15	0.98
Month 16 to 18	0.19*	0.08	1.21*	-0.13	0.17	0.88
Month 19 to 21	0.15	0.09	1.16	-0.19	0.18	0.83
Month 22 to 24	0.30**	0.10	1.35**	-0.08	0.19	0.92
Seasonal employment opportunity (Quarter 1 = ref. category)						
Quarter 2	0.12***	0.03	1.13***	0.11***	0.03	1.12***
Quarter 3	0.04	0.03	1.04	0.04	0.03	1.04
Quarter 4	0.15***	0.03	1.16***	0.16***	0.03	1.17***
Beneficiary Characteristics						
Female	-0.06*	0.03	0.94*	-0.07*	0.03	0.93*
Age	0.04***	0.01	1.04***	0.04***	0.01	1.04***
Age squared	-0.00***	0.00	1.00***	-0.00***	0.00	1.00***
Naturalised	0.63***	0.04	1.87***	0.62***	0.05	1.85***
Work intensity	0.01***	0.00	1.01***	0.01***	0.00	1.01***
Student	-2.49***	0.07	0.08***	-2.38***	0.11	0.09***
Agency switch	-1.40***	0.06	0.25***			
Nationality at birth (Belgian = ref. category)						
EU Nationality	-0.71***	0.07	0.49***	-0.71***	0.07	0.49***
Non-EU nationality	-1.35***	0.06	0.26***	-1.30***	0.07	0.27***
Unknown nationality	-0.94***	0.19	0.39***	-0.93***	0.19	0.40***
EU Nationality*time linear	0.00	0.01	1.00	0.01	0.01	1.01
Non-EU nationality*time linear	0.02***	0.00	1.02***	0.03***	0.00	1.03***
Unknown nationality*time linear	0.00	0.02	1.00	0.01	0.02	1.01
Local Agency Characteristics						
Unemployment rate (< 5.7 % = ref. category, tv)						
5.7 - 7.4 %				0.13	0.09	1.14
7.5 - 10.3 %				0.17	0.10	1.18
10.4 - 13.6 %				-0.08	0.10	0.92
> 13.6 %				-0.125	0.10	0.88
Municipality size (< 10000 inhabitants = ref. category, tv)						
10,000 – 19,999 inhabitants				0.07	0.07	1.07
20,000 – 39,999 inhabitants				0.20**	0.08	1.22**
40,000 – 99,999 inhabitants				0.18	0.10	1.19
100,000 inhabitants and over				0.35*	0.14	1.42*
ALMP participation rate (< 10 % = ref. category)						
≥ 10 % & < 20 %				0.39***	0.06	1.48***
≥ 20 %				0.84***	0.11	2.32***
Generosity (< 500 € / year = ref. category)						
≥ 500 € & < 1,000 €				0.17*	0.07	1.18*
≥ 1,000 € & < 2,000 €				0.11	0.11	1.12
≥ 2,000 €				0.39*	0.16	1.48*
Unknown				-0.15	0.08	0.86
Variance Estimates for Random Effects						
Agency-level	0.24***	0.03		0.11***	0.021	
Individual-level	1.04***	0.09		0.82***	0.18	
Deviance Information Criterion (DIC)	70,618.13			65,315.50		

Significance levels: * if p < 0.050, ** if p < 0.010 and *** if p < 0.001. Tv = Time-varying

The reported means and standard deviations of the distributions of parameter values have a similar interpretation as the parameter estimates and standard errors obtained from maximum likelihood estimation.