

REFORMING HOME CARE PROVISION IN GERMANY. EVIDENCE FROM A SOCIAL EXPERIMENT*

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Abstract

In a long-run social experiment, personal budgets have been tested as an alternative to the home care programs of the German long-term care insurance (LTCI). Due to extending the coverage beyond LTCI approved services and agencies, personal budgets may improve care outcomes compared to the provision of in-kind services at a constant benefit level. This is a highly desirable result in light of the ongoing demographic challenge. However, personal budgets also compete with the less generous cash option of the LTCI. Any transition from cash recipients to personal budgets increases LTCI spending, while care outcomes may remain unchanged if informal caregivers are crowded out by formal care. This paper compares care outcomes of the different home care programs and provides a rough cost analysis from the perspective of the LTCI. While personal budgets improve care outcomes compared to in-kind services, the nationwide introduction of personal budgets increases LTCI spending for former cash recipients without any traceable effect on care outcomes.

Keywords: consumer directed long-term care; long-term care insurance; crowding out; formal and informal care

JEL Classification: I38, I12, C93

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Non-technical Summary

Rising numbers of frail elderly and simultaneously shrinking numbers of informal carers pose a challenge to future viability of the mandatory and non-means-tested long-term care insurance in Germany (LTCI). In particular, the retreat of informal care and the corresponding rising demand for formal home care (i.e. agency care) or nursing home care increases LTCI spending. With the aim of reforming professional home care to better address care needs, the German legislator therefore passed an amendment to test personal budgets (*Pflegebudget*) as an alternative to agency care. A personal budget is a professionally assisted consumer-directed home care program that grants the monetary value of agency services in cash for the purchase of any care-related services, thus expanding the restricted catalogue of services and providers in case of agency care. If personal budgets supplemented existing LTCI home care programs, personal budgets would, however, also compete with the cash option of the LTCI, a consumer-directed home care program that is less generous but somewhat less restrictive than personal budgets.

Based on a long-run social experiment, we therefore estimate the heterogeneous effect of personal budgets on total care hours as a proxy of the attained care level, and the contribution of formal and informal carers. While we may expect personal budgets to increase formal care and the attained care level among agency care recipients, the corresponding effects for former cash recipients are ambiguous due to a potential substitution of informal by formal care. From the perspective of the LTCI, the feasibility of supplementing its home care programs by personal budgets largely depends on the resulting cost effects though. We therefore bound the likely cost effects in the short run based on a number of scenarios concerning the prospective participation rates of frail elderly in personal budgets among the existing types of home care benefits. We further discuss potentially counteracting forces such as reduced administrative cost and an increasing stability of home care. We examine the latter based on the self-assessed likelihood of moving to a nursing home.

The results indicate that for former recipients of agency-directed care, personal budgets allow for extending formal home care measured in hours per week and may thus be a means of improving care outcomes. Moreover, we find a relevant shift of cash recipients to the personal budget for whom a strong substitution of informal care by formal care increases LTCI spending, but does not have any traceable effects on care outcomes. Moreover, the significant increase in the the stability of home care can only attenuate the short-run increase of LTCI spending in case of extending the LTCI scheme by personal budgets. In the long-run, however, the demographic change towards increasing numbers of agency care recipients works to the advantage of the personal budget.

1 Introduction

Recent projections of future long-term care expenditures demonstrate that the proportion of GDP required to fund long-term care needs to rise substantially over the next decades in many countries including Germany (Comas-Herrera, Wittenberg, Gori, Costa-Font, di Maio, Paxtot, Pickard, Pozzi, and Rothgang, 2006).¹ The driving forces behind that development are a strong rise in the number of frail elderly and simultaneously shrinking numbers of informal carers due to reduced and delayed childbearing, but also higher migration rates and increasingly fractured social networks (see, for example, Pezzin and Schone, 1999, and Kotlikoff, 1989). Given that most long-term care is currently provided by informal carers, this poses a challenge to maintain a sufficient level of long-term care in the future since the number of persons demanding formal home care or institutional care will rise.

In Germany, a non-means tested, mandatory social long-term care insurance provides supplementary coverage for either home care or institutionalized care and for three levels of disability. Home care recipients can choose between services in kind (agency services) and services in cash that amount to half the benefit level of agency services, and a combination of the two. While

¹The expenditure of the universal, non-means tested long-term care insurance in Germany is projected to increase from 1.24% of GDP in 2000 to 3.32% in 2050.

cash payments can be used at the full discretion of the person in need of care, agency services are limited to an approved catalogue of services and a limited number of providers that have been authorized by the LTCL. Currently, the majority of frail elderly in home care receive benefits in cash (about 71% in 2006, German Federal Ministry of Health, 2007), while only about 14% and 15% of households receive agency services and mixed benefits, respectively. However, a proceeding retreat of informal care is likely to rise the demand for agency services or institutional care. Moreover, agency services are unlikely to fully meet care needs due to its limited set of services and providers. This generates a further push factor towards costly institutional care.

With the aim of reforming professional home care to better address care needs, the German legislator therefore passed an amendment to test personal budgets (*Pflegebudget*) as an alternative to agency services. A personal budgets is a professionally assisted consumer-directed home care program that grants the monetary value of agency services in cash for the purchase of any care-related services, thus expanding the restricted catalogue of services and providers in case of agency care. In addition, a personal care manager supports and monitors the decisions of the care households. Consumer-directed home care programs similar to personal budgets can be found in a number of countries including Austria, France, Netherlands, Norway, Sweden, United Kingdom and the US, see Kodner (2003), Wiener, Tilly, and Cuellar (2003), Tilly and Wiener (2001), or Lundsgaard (2005) for overviews. Compared to agency-directed care, evaluations of similar consumer-directed programs in the US and the Netherlands as well as evaluations of the consumer-directed cash option in the Austrian and German long-term care insurance suggest that clients who self-direct their home care arrangement gain control and express a higher level of satisfaction (Benjamin, Matthias, and Franke, 2000 and Foster, Brown, Phillips, Schore, and Carlson, 2003, Miltenburg and Ramakers, 1999). Personal budgets may thus yield better care outcomes for a given benefit level and may therefore help to postpone transitions from home care to nursing homes.

From the perspective of the LTCI, personal budgets are thus considered as a potential cost containment device. For this reason, personal budgets were tested in a long-run social experiment in seven German counties between 2004 and 2008. However, personal budgets are a close substitute for the cash payment that already provides the care household with a maximum of discretion. If LTCI home care programs were supplemented by personal budgets, the LTCI would face a situation of two competing consumer-directed home care programs one of which is less generous, but somewhat less restrictive in coverage than the other. For recipients of cash benefits, the more generous personal budget enables care households to potentially increase total service hours. Whether this happens, however, is an empirical question because a number of empirical studies show that subsidized formal home care may crowd out informal care (Greene, 1983; Hanley, Wiener, and Harris, 1991; Ettner, 1994, Pezzin, Kemper, and Rechovsky, 1996, Arntz and Thomsen, 2008). As a consequence, public spending on long-term care may rise while total care provided remains constant (Grabowski, 2006).

The main purpose of this paper therefore is to assess the feasibility of extending the existing LTCI home care programs by personal budgets. For this purpose, we first analyze the causal effect of personal budgets on care outcomes for both agency care and cash payment recipients. By exploiting the random assignment into a treatment group of personal budget recipients and a control group of standard home care recipients, we estimate the effect on total care hours as a proxy of the attained care level, and the contribution of formal and informal carers.² Moreover, we identify the short-run effect of an introduction of personal budgets on LTCI spending based on a number of scenarios concerning the prospective participation rates of eligible LTCI recipients in personal budgets. In addition to this static analysis, we further discuss potentially counteracting forces that could be effective in the long-run such as the demographic transition, reduced administrative overhead and an increased stability of home

²Formal and informal carers may be further distinguished. Informal carers, for example, comprise relatives but also volunteers and friends, while formal cares consist of both approved agencies and independent providers. A detailed analysis of the effects of personal budgets can be found in Arntz and Thomsen (2008).

care. We examine the latter based on the self-assessed likelihood of moving to a nursing home. The results indicate that personal budgets may improve care outcomes for former agency care recipients. Moreover, we find a relevant shift of cash recipients to the personal budget for whom a strong substitution of informal care by formal care increases LTCI spending, but does not have any traceable effects on care outcomes. Personal budgets thus crowd out informal care compared to a agency care, a result that is also relevant for international policy advisors in the field of long-term care. We also find that despite a significant increase in the stability of home care for personal budget recipients, LTCI spending rises in the short-run if the LTCI scheme is extended by personal budgets. In the long-run, however, the demographic change towards increasing numbers of agency care recipients works to the advantage of the personal budget.

The remainder is organized as follows: In the next section we provide some details on the home care programs in comparison to the personal budget and introduce the design and data collection of the *Personal Budgets* demonstration. Section 4 compares care outcomes of personal budgets to the existing home care programs whereas section 5 presents the cost analysis of extending the current LTCI scheme by a personal budget. The final section provides the conclusions.

2 German Long-Term Care Insurance (LTCI) and Personal Budgets

The German social insurance scheme for long-term care (Social Long-Term Care Insurance, LTCI) was introduced in 1995 to provide a supplementary coverage of care costs for persons in need of long-term care. It is a mandatory and non means-tested insurance that covers about 90% of Germany's population. Financing is arranged on a pay-as-you go system by social security contributions of 1.95% to 2.15% of employee's gross earnings. Persons in jobs not subject to social security need to have coverage by a private long-term care insurance.³ Persons are eligible for LTCI benefits if they are impaired in two or more activities of daily live (ADL)

³For further information on German LTCI see, e.g., Wasem (1997) or Schulz, Leidl, and König (2004).

and require help several times per week. With regard to the need of support, three levels of disability are distinguished. Beneficiaries can choose between a nursing home and three home care programs. The latter comprise the provision of services in cash (cash benefits) or services in kind (agency services) that are only provided by agencies that have been authorized by the LTCI. In addition, if the monthly claim for agency services is not exhausted the remaining percentage can be granted as a cash benefit (mixed benefits). The amount of benefits granted depends on the level of disability and the type of program chosen, since cash benefits are only about half the level on cash benefits. In 2006, around a third of beneficiaries received nursing home care, while the remaining 70% received one of the three home care programs.

Due to the ageing of society doubts on the fiscal sustainability of German LTCI have been raised since its introduction. On the one hand, the growing share of elderly persons in the population leads to a growing share of frail persons with care needs. On the other hand, as home care is mainly provided as family care, demographic change may reduce the number of informal caregivers (for a corresponding projection see Schulz, Leidl, and König, 2004). Both reasons may lead to a higher level of institutionalization even for persons with low levels of disability. Since costs for institutionalized care exceed costs of home care for the highest disability level by a factor of two, increasing the duration of care at home provides an important cost containment device. According to forecasts of Kronberger Kreis (2005), Häcker and Raffelhüschen (2004) and Herzog Commission (2003), contribution rates to LTCI of gross earnings would have to triple in the next decades to maintain, *ceteris paribus*, the current level of support. With the dual purpose of sustaining independent living of older persons and mitigating the impact of the demographic transition on public expenditures for long-term care, the legislator therefore passed an amendment of the LTCI law in 2002 as the legal basis for testing alternative benefit schemes including personal budgets.

Personal budgets differ from current home care programs in a number of respects.⁴ First of all,

⁴See Table A.1 in the Appendix for a summary of the main characteristics of each of the German programs.

a personal care manager is employed who assists the client in organizing an adequate care plan, monitors the adequacy of care provision and the compliance with the regulations. In addition, compared to agency services that cover only a limited list of approved services and have to be provided by an agency that is authorized by the LTCI⁵, personal budgets grant recipients the monetary value of agency services as a cash payment and expand its use to any type of care-related and legal services including the hiring of non-authorized, independent workers. Compared to the cash option, personal budgets grant about twice the benefit level of the existing cash option, but restrict its coverage. In particular, cash benefits can be considered as an income supplement that can be used for any goods and services, while personal budgets can only be used for care-related goods and services and also preclude the hiring of first-degree relatives, i.e. spouses and children. Hence, personal budgets are a professionally-assisted consumer-directed program, whereas cash benefits are a non-assisted consumer-directed program with a maximum of discretion left to the client.

Depending on the former receipt of home care, we thus have different expectations regarding the likely impact of personal budgets on care outcomes. In particular, results of an empirical evaluation by Benjamin, Matthias, and Franke (2000) indicate that clients experience a higher level of satisfaction due to self-directing the home care arrangement. In addition, consumer directed-care tends to increase total service hours due to a missing overhead and lower fringe benefits the hiring of independent workers is less costly than the hiring of agency workers. Since in Germany prices for agency services are negotiated with the LTCI, independent providers may also offer services at lower prices because of operating on a more competitive market for long-term care services. Given the existing empirical evidence, personal budgets could therefore be expected to yield better care outcomes per Euro of benefits granted by the German LTCI than agency services. In particular, we expect cheaper independent providers to partially crowd out authorized agencies in which case total hours of formal care would rise for a given constant

⁵These agencies have to fulfill certain criteria concerning the organization and quality of care.

level of benefits. If we assume the quality of care provision to be comparable for agency and independent workers, this could be interpreted as a rising level of care for a given level of benefits.⁶

The monetary advantage of personal budgets compared to cash payments is likely to make personal budgets an attractive alternative for at least some share of cash recipients. Moreover, there likely is a substitution of informal by formal care. To illustrate this point it is useful to refer to the model suggested by Stabile, Laporte, and Coyte (2006) whereby a household consisting of a care recipient and a caregiver first decides on the optimal care level and subsequently decides on the optimal choice of informal care by family and friends, and privately and publicly funded formal home care. If people exhaust the publicly available home care, but do not complement home care by privately funding services, further subsidizing public home care should crowd out informal care and increase the use of formal home care. In Germany, exhaustion of cash benefits is guaranteed by design as recipients do not have to give any account on its usage. In addition, care households heavily rely on informal care and the majority does not spend private funds on formal home care (see e.g. Klie, 1999). By reducing the effective unit cost of public home care, the personal budget is thus likely to crowd out informal care.⁷

3 The Personal Budget Demonstrations

The *Personal Budgets* demonstrations were conducted as a social experiment in seven German counties between 2004 and 2008, launched on behalf of the association of compulsory health insurers (*Verband der deutschen Angestelltenkassen, VdAK*).⁸ As a minimum requirement, in-

⁶This may be a reasonable assumption since concerns regarding a lower quality of care provision in the case of consumer-directed programs could not be confirmed in a number of studies (Badelt, Holzmann-Jenkins, Matul, and Österle, 1997, Nemeth and Pochobradsky, 2004, and Schneekloth and Müller, 2000, Foster, Brown, Phillips, Schore, and Carlson, 2003).

⁷This result only holds if private and public home care are perfect substitutes. While this may not be true for agency services, this assumption should hold for the personal budget.

⁸Sites were chosen to include both rural and urban regions as well as regions in eastern and western Germany, but cannot be considered to be representative for Germany as a whole. Still, the counties cover a wide range of regions, from the rural and unemployment-struck Annaberg in eastern Germany to urban and prospering regions in western Germany. The sites chosen for the experiment were: Annaberg, Erfurt, Kassel, Marburg-Biedenkopf, Munich, Neuwied, and Unna.

dividuals eligible to participate in personal budgets had to be eligible for LTCI benefits. In addition, at five of the sites, access to personal budgets was granted only to home care recipients with a share of agency services of at least 50%. Only at two sites, Neuwied and Erfurt, individuals irrespective of the current choice of home care program were eligible to participate in personal budgets. Participants of the social experiment were then randomly assigned to a treatment group that received personal budgets with additional support from a care manager and a control group that continued to receive agency care, cash benefits, or a combination of both. Due to random assignment, characteristics that have an effect on care outcomes should be balanced and observed differences in the outcome of interest between both groups reflect the causal effect of the personal budget.⁹ The subsequent analyses are based on two data sets that were collected among the participants of the demonstration project.

The participants' panel. All participants have been interviewed semiannually over the entire time period of the demonstration. Base interviews were conducted by local care managers to collect information on the demographic and socioeconomic background of the elderly person and his/her household as well as the current organisation of care. In addition, information was collected on the care recipient's abilities to accomplish basic activities of daily life (ADL) such as dressing, preparation of food, housekeeping, being mobile, shopping etc., and the instrumental activities of daily life as well (IADL). In cases in which the care recipient was not able to answer the survey on his own, the main carer, mostly a close relative, was asked to answer the questionnaire instead.¹⁰ In the follow-up interviews repeated information was collected on all time-varying characteristics.

Table 2 contains the number of available treatment and control group interviews by the type of former benefit receipt. First of all, note that there are more than 300 base interviews in

⁹See Arntz and Thomsen (2008) for a further discussion of the social experiment of personal budgets.

¹⁰Around 30 % of the interviews could be conducted with the care recipient only. In 50% of the cases, the interview was conducted with both the care recipient and the main carer, while 20% of the interviews were pure proxy interviews with the main carer.

the treatment group and only 150 in the control group. This excessive assignment into the treatment group is due to the fact that random assignment had been suspended during the early in-take period. As this may have introduced selection, we take account of the suspension in the estimations below. Second, despite the fact that the intake of former cash recipients was restricted to two sites, Table 2 demonstrates that a high number of participants formerly received cash payments. As previously hypothesized, personal budgets thus seem to be attractive to at least some share of former cash recipients. In fact, in the two counties where program eligibility was not restricted to recipients of agency services, the share of home care recipients who participated in the demonstration was 5.5% among recipients of agency services, 3.5% among mixed benefit recipients and 3.4% among cash benefit recipients. Among those who contacted local program organizers for further information on personal budgets, 40% of all agency care recipients, 44% of all mixed benefit recipients, and 32% of all cash benefit recipients decided to participate in the program. On the one hand, these figures suggest that personal budgets are not equally attractive to all home care recipients. On the other hand, the participation rates imply that the share of former cash recipients opting for program participation in order to receive the personal budget is not negligible and only somewhat lower than the participation rate for recipients of agency services.

Include Table 2 about here

Sample descriptives for the base interview can be found in Table A.2 in the Appendix. At least for some characteristics – e.g., the county of residence, age, pre-treatment care arrangement – we do find some imbalances between both sub-groups that suggest that randomization was incomplete. Moreover, binary probit models of the probability of assignment to the treatment group confirm that randomization may have been incomplete as some socio-demographic variables and an individual’s care needs significantly affect the probability of being in the treatment

group.¹¹

The supplementary survey in Neuwied. To complement the participant’s panel with further evidence on aspects not covered in the panel data set, a supplementary survey was conducted in Neuwied in 2007. Neuwied was chosen because of the unrestricted eligibility of program participation among home care recipients. Among the 109 individuals who were actively participating in the program during summer 2007, 89 agreed to be interviewed. The sample is thus small. As interviews have been conducted by independent interviewers in both groups, the survey opened up the chance of asking participants for their opinion on the personal budget, the relief or burden it meant to them and their families, and the relevance of care managers.

Furthermore, the participant’s panel had proved to be an infeasible tool for analyzing the stability of home care arrangements, as the state of transition (e.g. nursing home, death) was unknown for many attrited individuals. We could thus not establish whether personal budgets prolonged the time that an individual can be cared for at home. For this reason, the supplementary survey included a number of questions on the subjective assessment of participants concerning inevitable movement to a nursing home in a number of hypothetical situations (e.g. loss of main caregiver).

Sample descriptives for the Neuwied survey can be found in Table A.3 in the Appendix. Compared to the sample of all participants, the Neuwied sample includes a higher share of former cash recipients due to the fact that eligibility was not restricted to recipients of agency care. Thus, the sample is more likely to reflect the future composition of personal budget recipients than the participant’s panel as eligibility would not be restricted in case of extending the LTCI scheme by personal budgets. Moreover, we do not find any evidence for significant differences in observable characteristics between the program and control group as shown in Table A.3.

¹¹See Arntz and Thomsen (2008) for a detailed analysis of randomization and a discussion of possible solutions.

Hence, differences in the outcomes of interest between both groups can be interpreted as causal effects of personal budgets.

4 Effects on home care arrangements

4.1 Some methodological notes

As discussed in section 2, personal budgets correspond to very different treatments depending on the benchmark home care program and thus motivate different hypotheses with regard to the effects they exert on care arrangements and care outcomes. Therefore, evaluation of the effects has to take account of the different effects with regard to the benefit type of the control group. As mentioned above, there may be some self-selection due to the suspension of the randomization in the early intake period in the participants' panel. A detailed analysis and discussion of methodological issues is provided in Arntz and Thomsen (2008). While selection on observables can be taken care of by including relevant characteristics as covariates, there is also some evidence for selection on unobservables because pre-program care arrangements significantly affect the probability of being treated despite controlling for observable individual and household characteristics. Moreover, asymmetric non-random panel attrition between both groups should be considered. The control group does not directly benefit from participating in personal budgets group and is therefore more likely to leave the experiment. A probit model of the probability of participation in the follow-up interviews revealed that panel attrition is indeed systematically related to a number of individual and household-related characteristics.

Therefore, it does not suffice to evaluate the impacts of the personal budget by comparing average care outcomes between the treatment and control group based on the participants' panel. The fundamental assumption that randomization of participants into treatment and control group identifies the causal effect of treatment may be not completely satisfied.¹² The

¹²See Orr (1999) and Smith (2000) for a comprehensive discussion of social experiments and Bijwaard and Ridder (2005) and Heckman and Smith (1995) for a discussion of possible sources for biases.

subsequent analysis thus takes account of both a selection into the treatment group as well as non-random panel attrition by applying a difference-in-differences approach (DiD, see e.g. Ashenfelter and Card, 1985) that disentangles the causal impact of the personal budget from the pre-program differences in outcomes for the treatment and the control group and the changes in care outcomes that are common to both groups. The corresponding DiD-estimator for outcome y_{it} can be written as

$$y_{it} = \beta_0 + \beta_1 treat + \delta_0 t_2 + \delta_1 t_3 + \delta_2 treat \times t_{x=2,3} + \delta_3 treat \times t_3 + \mathbf{x}_i' \boldsymbol{\beta} + c_i + u_{it}, \quad (1)$$

where $treat$ is a dummy variable capturing differences between treatment and control group before program start at t_1 . t_2 and t_3 are dummy variables for the follow-up interviews six and twelve month after program start. These dummies take account of aggregate factors affecting y in the absence of the program. δ_2 is the parameter estimate of the treatment effect, defined as the interaction of t_2 and $treat$. δ_3 allows this treatment effect to differ with an increasing duration of the program. \mathbf{x}_i is a matrix of additional covariates such as program site or socio-demographic characteristics that may be relevant for both the selection into treatment and the outcome of interest. In addition, we allow for an unobservable individual effect c_i . To estimate eq. 1 consistently and efficiently we use a fixed effects panel estimator in order to allow for an arbitrary correlation between unobservable characteristics and observable covariates. A further advantage of the fixed effects estimator is that it also takes account of panel attrition problems.¹³ Moreover, we evaluate treatment effects only for the first year of program participation as the number of observations in the control group becomes too small for any reliable estimate. Furthermore, our analysis excludes those for whom the treatment is an unknown mixture of two heterogenous treatments due to claiming LTCI benefits for the first time or previously receiving mixed benefits.

¹³As a robustness check, pooled and random effects estimates with a Heckman-type correction for panel attrition and pre-program control variables such as program site or socio-demographic characteristics yielded comparable findings which are discussed in detail in Arntz and Thomsen (2008).

4.2 Care providers and total care hours

One of the main outcomes of interest is the level of care that can be achieved in comparison to either home care program. While any improvement in care received for former recipients of agency services can be traced back to a combination of extending the allowed range of services and providers and the assistance of the care managers, any changes in care outcomes for former recipients of cash benefits are due to a combination of the doubling of expenditures, the exemption of reimbursing close relatives and the assistance of a care manager. As a result, personal budgets are likely to affect the composition of caregivers involved in the care arrangement.

In particular, we expect a partial substitution of agency by independent care providers for previous recipients of agency services so that total hours of care provided per week may increase. For former cash recipients, independent workers are likely to substitute for informal support and the expected effect on total hours of care is unclear. For former cash and agency care recipients, we therefore examine the extent of support by informal and formal caregivers measured in log care hours per week as well as the log total care hours provided per week. For lack of a better measure, the latter proxies for the achieved level of health and care. We thus implicitly assume one hour of care to be comparably effective for all types of carers. A similar assumption is used by other studies as well, see, e.g., van Houtven and Norton (2008). However, it should be noted that this is a quite strong assumption. Hours do not capture the quality of caregiving, and there may be productivity differences between formal and informal carers. In the ideal case, one would like to estimate effects in terms of standardized care hours. Unfortunately, there is no information in the data allowing to define an adequate weighting scheme.

Include Table 3 about here

Based on the participant's panel and the previously described difference-in-differences approach, Table 3 presents the corresponding estimates for former cash and agency care recipients. As

expected, the effect of personal budgets tend to differ depending on the respective counterfactual situation. Compared to agency services, personal budgets imply an increase in the number of formal care hours provided by about 37 percent. This increase is possible because budget recipients can also engage independent formal providers that may be cheaper compared to authorized agencies. If we assume that independent providers fulfill care tasks with a similar level of quality to agency workers, this indicates that personal budgets enable a significant extension of support for an identical level of benefits granted.

With regard to former cash recipients, the picture clearly differs. On the one hand, the estimates establish a clear, and even stronger increase in the number of formal care hours; on average, there is more than a doubling of time of formal care in the arrangement (104%). On the other hand, informal care is reduced substantially with an average effect of about -56%. Adding these opposing effects together, total care hours per week also significantly decrease for former recipients of cash payments. The results thus indicate a strong substitution of informal care by formal care, but no positive effect on care outcomes proxied by total care hours. However, interpretation in terms of quality should be taken with a grain of salt for reasons mentioned above. Nevertheless, the finding of a doubling of the benefit level for former cash recipients that does not translate into a more extensive provision of care clearly conflicts with the reform idea of containing cost by introducing personal budgets as an alternative to agency-directed care.

4.3 Stabilization of home care arrangements

Besides the short-term effects of personal budgets on the structure and extent of care provision, there may be long-run effects on the stability of home care arrangements. To the extent that improving care outcomes and/or the relief of relatives make a care arrangement more robust to shocks such as a deteriorating health status of the frail elderly, the observed changes in the previous section may help contain costs in the medium to long-run by avoiding or postponing transitions from home to institutionalized care.

In order to assess the effect of personal budgets on the duration of home care provision until a transition to a nursing home occurs, we use information from the supplementary survey in Neuwied on the subjective perception of frail elderly and their households regarding the stability of their home care arrangements. In order to assess the risk of institutionalization, respondents were asked whether they thought that continued home care was possible in case their health status would deteriorate. In addition, they had to name all care providers involved in their care arrangement and to separately assess the likelihood of moving to a nursing home in case any of these had to stop caring.

Include Table 4 about here

Table 4 presents the responses of individuals in the treatment and control group and tests for equal responses. Since there is no evidence for a selection into the treatment group in our Neuwied sample, differences between both groups can be interpreted as the causal effect of the personal budget. Hence, personal budgets seem to make home care arrangements more robust, but there also seem to be limits to this stabilizing effect. In particular, if the main caregiver who is mostly a close relative is no longer able to care for the frail elderly, almost 60% of the respondents irrespective of their current home care program indicate that staying at home would be infeasible. Thus, the main caregiver plays a central role in enabling the frail elderly to receive home care and the personal budget does not seem to affect this perception significantly.

In contrast, caregivers who are not considered to be main caregivers and who often are formal caregivers seem to be substitutable to a higher degree. Only 12% among those receiving the personal budget, but 29% among those receiving standard home care programs consider it necessary to move to a nursing home if these additional caregivers could no longer provide any care services. This significant difference indicates that personal budget recipients are better prepared to maintain their home care arrangement at least in case of minor shocks such as the loss of a less important caregiver. In addition, only 14% of those receiving personal budgets, but

27% of those receiving standard home care programs report that a deteriorating health would necessitate a move to a nursing home. The corresponding difference between both groups misses significance though and may at most be considered as a weak evidence in favour of an increasing robustness of home care arrangements in case of personal budgets.

Tentatively, we can thus conclude that there is some evidence that suggests a higher degree of robustness of home care arrangements among recipients of personal budgets compared to recipients of standard home care programs. Unfortunately, the small sample size precludes any decomposition of these results by the type of former home care program received. Moreover, note that the sample is dominated by former cash recipients and may thus mainly reflect the effect of personal budgets as compared to the receipt of cash benefits. Whether personal budgets sufficiently postpone transitions to nursing homes to carry the additional LTCI spending on the higher benefit levels in the long run cannot be derived from this descriptive finding. In the subsequent cost analysis, however, we will return to this question.

5 Short-term effects of introducing personal budgets on LTCI spending

From the perspective of the LTCI, the feasibility of introducing personal budgets as an additional home care program strongly hinges on its cost effects both in a short- and in a long-run perspective. In the short run, cost differences between the current and the counterfactual home care provision mainly arise from former cash recipients who opt for personal budgets in case of an extended LTCI system. Additional costs stem from the mandatory care management for each personal budget recipient. In order to identify a lower bound and an upper bound of the short-term effect on LTCI spending for home care grants, we use a number of plausible scenarios for the prospective numbers and composition of personal budget recipients with regard to the counterfactual program receipt and the level of disability that is granted. In addition, several scenarios bound the likely costs that arise from care management. We then compare

the resulting costs of this counterfactual LTCI system to the LTCI spending on standard home care provision of the reference year, 2007.

After presenting the estimated short-term costs, we further discuss the likely long-run effects as well as the likely impact of administrative cost factors. In particular, we discuss two main factors that may reduce additional cost that stem from an introduction of personal budgets in the long-run: the stabilization of home care arrangements and the long-term transition to decreasing numbers of cash recipients.

5.1 Definition of scenarios

The starting point of the short-run cost analysis is the status quo of the current LTCI system for home care provision. As the benchmark, we choose the number and composition of home care recipients as reported by the Federal Statistical Office for 2007 as shown in Table 5.

Include Table 5 about here

The figures show that most recipients are eligible for the lowest care level. Irrespective of the level of care, frail elderly are much more likely to receive cash benefits compared to agency services or mixed benefits. Moreover, a higher level of care coincides with an increasing share of mixed benefit recipients as the reverted relation between agency services and mixed benefits indicates. Assessing the costs for the standard home care programs is straightforward based on the known and fixed benefit levels. For estimating the counterfactual costs of an extended LTCI system, we need to predict the transition probability to personal budgets for each of the nine cells of the reference situation in Table 5. Moreover, we need to take account of additional care management cost. We now discuss these aspects successively.

Transition probability to personal budgets. Observed participation rates in the demonstration provide an empirical starting point for predicting transition probabilities from standard

home care programs to personal budgets. Of course, any prediction based on a demonstration at a limited number of sites and a relatively small sample comes with some degree of uncertainty. We therefore use three alternative scenarios as shown in Table 6 to bound the transition probabilities for home care recipients between a likely lower and upper bound.

Observed participation rates among local home care recipients at the two sites with no restrictions to program eligibility form the basis for the first two scenarios. However, observed participation rates in relation to all potentially eligible local home care recipients are likely to be an underestimation of the true participation rate. Although major LTCI providers contacted eligible recipients via an information letter and there have been public meetings to inform local home care recipients about the program, not all eligible persons are likely to have known or perceived the program as an option that they seriously considered as an alternative to their current home care provision.

Include Table 6 about here

As a minimum scenario, we thus relate the number of participants to only half the local home care recipients. In other words, we consider every second individual to have enough information to seriously consider participating in the program. This doubles predicted participation rates compared to the observed ones (see above) to a range of 7% for cash and mixed benefit recipients and 11% for recipients of agency-directed care. As a medium scenario, we instead assume only every fourth home care recipient to have sufficient knowledge of the program, thus again doubling the predicted participation rates to 14 to 22%. While these choices may seem to be quite arbitrary, we have some evidence that observed participation rates among local home care recipients are far too small because participation rates among individuals who contacted program organizers for further information turned out to be much higher. As mentioned above, conditional participation rates with regard to the type of benefits amounted to 40% of all agency care recipients, 44% of all mixed benefit recipients, and 32% of all cash benefit recipients. Of

course, the sub-sample of individuals who contacted the program need not be representative for local home care recipients. On the other hand, a comparison of the composition of local home care recipients and the sub-group of individuals seeking further information did not reveal any significant selection with regard to the type of program or the level of disability that is granted by the LTCI. We therefore consider participation rates among informed individuals as a relevant maximum benchmark for our cost analysis. In the medium and long-run, however, transition rates to personal budgets may further increase if program participation rates also hinge on a growing familiarity with this new type of program.

Caremanagement costs. The cost differential for each personal budget recipient depends on its counterfactual standard home care program and the additional care management cost. While the former can be calculated based on the known and fixed benefit level, the latter can only be approximated because care management cost depend, among others, on the number of recipients that is assisted by one care manager. For this reason, we derive three scenarios as shown in Table 7 concerning the cost of care management and the resulting cost differential of personal budgets compared to standard home care programs.

In a lower bound scenario, we take account of the recent reform of the German LTCI in April 2008 that introduced a nationwide care management financed by a higher contribution rate. In this case, the introduction of personal budgets would not lead to additional costs for care management. However, it is rather unclear to what extent this care management is comparable in intensity to the care management applied in the demonstration. In order to ensure a similarly intensive assistance, it may be necessary to finance additional care managers. Hence, we apply two additional scenarios regarding care management costs. As a maximum cost scenario, we consider each care manager to assist 50 personal budget recipients. In the demonstration, each care manager was responsible for somewhat less than thirty personal budget recipients, but care managers were also involved in substantial research tasks so that we assume a recipient/care

manager ratio of fifty instead. As a medium cost scenario, we assume this ratio to further increase to 100.

Include Table 7 about here

As shown in Table 7, the cost differential between personal budgets with a mandatory care management compared to standard home care programs is highest for recipients of cash benefits and increases with the level of disability and care management cost. While for the scenario with no additional care management cost, agency-directed care and personal budgets result in equal LTCI spending, the largest cost differential of monthly 873 Euro can be found for scenario C for individuals with disability level three having received care cash benefits that switch to personal budgets.

5.2 Calculated effects on LTCI spending

With the participation rates from Table 6, we can calculate the number of recipients for each of the cells in Table 7 and compare the resulting monthly cost to the cost calculation for the benchmark in 2007. Table 8 shows the additional monthly LTCI expenditures for home care grants in case personal budgets were introduced as a standard home care program for the various scenarios. As a first estimate, the table displays the predicted total number of personal budget recipients. The corresponding cost depend on the care management scenario and on the composition of these recipients with regard to their counterfactual home care program and their level of disability. If all personal budget recipients had previously received agency-directed care and we would assume a zero care management cost scenario, the additional LTCI spending compared to the current LTCI scheme would be nil. Due to non-zero participation rates among mixed benefits and cash benefit recipients, short-term cost under this counterfactual LTCI scheme will exceed the cost for the benchmark year 2007. For these additional monthly LTCI spending on home care recipients, we calculate a number of interesting indicators: the additional

monthly cost per personal budget recipient and the necessary increase of the contribution rate to finance these extra cost by higher LTCI revenues.

Include Table 8 about here

Depending on the scenario, the predicted number of personal budget recipients lies between 110,000 and 530,000. The corresponding total additional cost from the perspective of the LTCI amount to 25 to close to 120 Mio. Euro per month in case of zero additional care management cost. If we are willing to assume that the current reform introduces a sufficient level of care management, this would be the likely range for the short-term cost effects of introducing personal budgets as a standard home care program. In case of assuming the maximum scenario for additional care management cost, the corresponding total additional cost from the perspective of the LTCI range from 36 to 175 Mio. Euro per month. In order to finance these additional expenditures, the LTCI contribution rate for childless individuals of 1.7% in the benchmark year 2007 would have had to increase by 0.03 to 0.2 percentage points.

Compared to the latest reform (in 2008) that increased contribution rates by 0.25 percentage points in order to finance, among others, more generous benefit levels and a nationwide care management, we can thus conclude that extending LTCI home care programs by personal budgets is likely to raise cost to a limited but non-negligible extent. Moreover, the comparison of care outcomes suggests that most of the money is used to crowd out informal by formal carers, while care outcomes for frail elderly with a previous receipt of cash payments remain rather unchanged. These findings clearly challenge the view of personal budgets as a feasible reform option that helps in containing long term LTCI spending.

5.3 Possibly counteracting forces

So far we have bounded the static and partial effect of introducing personal budgets on short-term LTCI spending. Thus, we do not take account of the possible long-run effects on the

stability of home care arrangements, nor do we consider the long-term effects of the demographic transition on the counterfactual number and composition of future home care recipients. Moreover, data restrictions render it impossible to take account of a changing administrative overhead in case of introducing personal budgets. Also, personal budgets may provoke general equilibrium effects that may affect LTCI revenues and that we omit in our analysis. All of these aspects tend to counteract the short-term costs as projected in the previous section which therefore are likely to overestimate the costs of an extended LTCI system in the long-run. We therefore complement our cost calculation by discussing the likely impact of these counteracting forces on LTCI spending.

Personal budgets effects on stability of home care. As discussed above, personal budgets may contribute to a reduced transition of home care recipients to costly nursing homes. Based on the available information it is impossible though to evaluate by how long personal budgets are able to postpone transitions to nursing homes. Nevertheless, it is insightful to calculate the break-even point, i.e. the extension of home care provision by personal budgets that is necessary to carry the cost differential between personal budgets and the counterfactual type of home care program.¹⁴ Such a break-even point is possible because the cost differential between institutionalized care and standard home care programs exceeds the cost differential between personal budgets and standard home care programs for recipients of care levels one and two.

Denote the cost differential between standard home care provision and institutionalized care averaged across all predicted personal budget recipients as shown in Table 1 as y . Further, denote the cost differential between standard home care provision and personal budgets as shown in Table 8 as x . The break-even point is then given as $t_2 = \frac{y}{y-x}t_1$ with t_1 as the time spent in home care before moving to a nursing home in the current LTCI scheme and t_2 as the necessary time spent in home care before moving to a nursing home in case of alternatively

¹⁴This break-even point only refers to the benefit levels and again does not take account of administrative cost or investment costs for nursing homes.

receiving a personal budget.

Include Table 1 about here

Table 1 thus displays t_2/t_1 for the various scenarios with t_1 normalized to one. Compared to receiving standard home care, a personal budget recipient, on average, has to remain 1.5 to 1.9 times longer in home care before moving to a nursing home in order to neutralize the cost increases as shown in Table 8. While this already seems demanding, it becomes highly unlikely that personal budgets produce no extra cost for the LTCI due to such a long-run effect if one further takes into account that only a small share of current home care recipients actually move to a nursing home before they die. According to Rothgang and Borchert (2006), around 10% of men and 20% of women move to a nursing home within six years of home care receipt. Thus, for most home care recipients t_1 does not exist and an increasing stability of their home care arrangement does not have any cost effect. As a consequence, for those who actually move to nursing homes, the figures shown in Table 1 are severely underestimated. If only every fifth personal budget recipient had moved to a nursing home in the counterfactual receipt of a standard home care program, these recipients would now have to remain 3.3 to 5.3 times longer in home care before moving to a nursing home. We can thus conclude that the long-run effects on the stability of home care provision may only contribute to a reduction of the additional cost for home care grants but are unlikely to fully compensate for the static cost increases.

Long-term effects of demographic transition. The short-term cost in Table 8 have been calculated in comparison to the benchmark year 2007. The counterfactual composition of benefit recipients, however, is likely to change in the next decades. In particular, the demographic transition is expected to increase the share of frail elderly who due to a lack of close relatives receive agency-directed home care or institutionalized care. In a simulation study by Blinkert (2008), the share of frail elderly among a projected one million home care recipients is likely to

rise to 75% until 2050 according to a medium scenario. As a consequence, the cost differential between the current LTCI scheme and an alternative LTCI scheme including personal budgets would diminish. For a scenario III from Table 6 and the expected numbers and composition of home care recipients for 2050, the estimated cost differential between an unchanged and an extended LTCI scheme would only range between 45 to 90 Mio. Euro per month compared to the currently estimated 118 to 175 Mio. Euro. In the long run, the demographic transition thus works to the advantage of the personal budget.

Administrative cost and general equilibrium effects. Due to data restrictions we do not take account of any effects the introduction of personal budgets may have on the administrative overhead of the LTCI. For the Netherlands, agency-directed programs have been shown to increase administrative overhead by 30-40% compared to consumer-directed program (see Miltenburg and Ramakers, 1999). Thus, personal budget recipients who formerly received agency services may help contain administrative cost. On the other hand, administrative overhead for a recipient of a personal budget is unlikely to be much lower than for a cash recipient since unlike in the case of agency-directed care no direct accounting between LTCI and care providers is necessary for these benefits. In order to get a rough estimate for the likely scale of potential cost savings among former agency care recipients we assume that the results found for the Netherlands were applicable to the German case. We further assume 15% of the 600 Mio. Euro spent on administration in 2005 (German Federal Ministry of Health, 2007) to apply to agency-directed care. A reduction of these costs in the range of 30-40% would thus boil down to a monthly saving of 1-1.3 Mio. Euro in the case of scenario III, i.e. with 44% of agency care recipients switching to personal budgets. Additional savings could be possible if home visits as a quality check of care provision among cash recipients could be discontinued due to the assistance of a care manager. For recipients with a disability level one or two, there are semiannual visits that cost 16 Euro averaged across the German Länder. For recipients with a

disability level three, there are quarterly visits that cost 20 Euro each. For scenario III with a transition rate of 32% among cash recipients, this would result in additional monthly savings of approximately 1 Mio. Euro. Thus, cost savings for the administrative overhead is unlikely to compensate for the additional spending on home care grants.

Finally, we do not consider general equilibrium effects that may affect LTCI revenues. If, for example, the relief of informal caregivers fosters higher labor force participation, this could raise LTCI revenues from social insurance contributions. At the program sites, we do not find any evidence for increasing working hours among main caregivers though.¹⁵ Transferability of this finding for the case of a general introduction of personal budgets may be limited due to the demonstrative character of the program. Nevertheless, it casts some doubts on the likely relevance and magnitude of such labor market effects.

6 Conclusion

In this study, the effects of introducing personal budgets as a professionally-assisted consumer-directed program in long-term care in Germany have been analyzed. Based on a long-run social experiment heterogenous impacts of personal budgets on care provided by formal and informal carers with regard to agency-directed care and cash benefits have been estimated. In addition, it has been approximated whether personal budgets are able to postpone transitions from home to institutionalized care based on a self-assessment by the care recipient. Finally, we have identified a likely range for the short-term and static effects of implementing personal budgets as a further benefit scheme on LTCI spending for home care grants. In addition, we discuss the relevance and likely magnitude of a number of counteracting forces, including the likely impact of personal budgets on the administrative overhead and the stability of home care arrangements.

¹⁵There has been a supplementary survey among main carers. A Tobit model of working hours choices did not yield any significant differences between the control and the program group.

The results indicate that for former recipients of agency-directed care, personal budgets allow for extending formal home care measured in hours per week and may thus be a means to improve care outcomes. However, since personal budgets are not targeted to those who lack alternative informal caregiving resources, the feasibility of personal budgets as an additional home care program also hinges on the effects personal budgets exert on former recipients of cash payments. The corresponding results indicate a relevant shift of cash recipients to the personal budget for whom a strong substitution of informal care by formal care increases LTCI spending, but does not have any traceable effects on care outcomes. From an LTCI perspective, complementing the LTCI cash benefit by personal budgets thus crowds out informal care compared to a system that complements cash benefits with agency-directed home care only. This is because personal budgets are a closer substitute for privately funded home care than agency-directed care. For international policy advisors, our findings therefore point to the need to always consider all direct and indirect effects when designing or reforming home care programs.

The analysis of the potential stabilization effect of personal budgets on home care indicates that the program is able to make home care arrangements more robust to deteriorating shocks such as a decreasing health status or the loss of a formal caregiver. With respect to the loss of the main (informal) caregiver, no stabilizing effect can be found. Even when taking into account reduced transitions to institutionalized care as well as a reduction in administrative overhead, an extended LTCI scheme that includes personal budgets as an additional home care program is likely to raise LTCI spending in the short run. In the long-run, the demographic change works to the advantage of the personal budget. The financial feasibility of extending the LTCI scheme by personal budgets may thus be enhanced in the long-run. However, as long as LTCI home care programs are neither means-tested nor try to explicitly target those who otherwise would be dependent on agency-directed care, personal budgets always partially crowd out informal care. From the perspective of the LTCI, this even puts doubts on the feasibility of extending its schemes by personal budgets in a longer time frame. From a broader economic perspective,

some crowding out may be desirable if the corresponding relief of informal carers has positive effects on health outcomes and labor force participation that we cannot take into account but should be considered in future research.

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Tables

Table 1: Number of Treatment and Control Group Interviews by Former Benefit Receipt^a

Former benefit receipt	Treatment group				Control group			
	base	fup6	fup12	fup18	base	fup6	fup12	fup18
Agency care	122	99	79	59	39	25	17	10
Cash payment	94	73	56	45	66	43	22	13
Mixed benefits	58	44	32	18	25	14	8	4
Initial claim	36	28	18	10	19	12	4	3
Total	310	244	185	132	149	94	51	30

^a fup x = follow up interview after x months.

Table 2: Fixed effects estimates of treatment effect on log care hours for formal carers and informal carers and log total hours^a

	<i>Informal carers</i>	<i>Formal carers</i>	<i>Total care hours</i>
<i>Agency Services</i>			
t_2	-0.0059	0.0767	0.1170
t_3	0.2786	0.0856	0.2302
$treat \times t_{x=2,3}$	-0.1535	0.3669*	0.0510
$treat \times t_3$	-0.1194	0.2331	0.1067
N	161	161	161
<i>Cash Payments</i>			
t_2	0.0600	0.2453*	0.1438
t_3	-0.0105	0.3800	0.1303
$treat \times t_{x=2,3}$	-0.5625***	1.0432***	-0.2893*
$treat \times t_3$	0.1808	0.3170	0.1890
N	160	160	160

Stars denote significance on 10%(*), 5%(**) and 1%(***) level.

^a Further covariates considered in the estimations comprise age, age (squared), female, married, number of children, further persons living in the household, number of friends, a care index (ranging from 0 to 100 indicating the level of disability), the level of disability, and the experiment site.

Table 3: Share of home care recipients in the program and control group who report a likely transition to a nursing home in case of deteriorating health or the loss of caregivers

	Number of cases ^a		Share of positive answers		$\chi^2 - Test$ <i>p</i> -value
	Treaties	Controls	Treaties	Controls	
<i>Sociodemographics</i>					
Deteriorating health status	58	27	73.8%	26.9%	0.15
Loss of main caregiver	59	29	57.6%	55.2%	0.83
Loss of further caregiver	61	28	11.5%	28.6%	0.05

^a Number of observations for the loss of caregivers may depart from sample size because of reflecting answers for each caregiver involved in the care arrangements.

Table 4: German home care recipients by type of program and level of dependency in 2007

Level of care needs ^b	Agency services	Mixed benefits ^c	Cash benefits
Level I	144,162	95,924	597,751
Level II	83,916	89,021	301,605
Level III	18,142	34,827	81,069

^a Source: Federal Statistical Office, 2007.

^b As a simplification, care level III+ is not taken into account.

^c Mixed benefits refer to a 75% receipt of agency services.

Table 5: Predicted transition rate to personal budgets by the type of home care program and level of dependency, three scenarios^a

Level of care needs ^b	Agency services	Mixed benefits ^c	Cash benefits	Total
Scenario I: Participation rate among local home care recipients, program known to 50%				
Level I	13.3%	7.1%	6.6%	7.7%
Level II	7.7%	8.2%	6.9%	7.3%
Level III	8.4%	4.7%	8.3%	7.3%
Total	11.3%	7.1%	6.9%	7.5%
Scenario B: Participation rate among local home care recipients, program known to 25%				
Level I	26.6%	14.1%	13.3%	15.4%
Level II	15.4%	16.3%	13.9%	14.5%
Level III	16.8%	9.3%	16.6%	14.6%
Total	22.5%	14.2%	13.7%	15.0%
Scenario C: Participation rate among those contacting local care managers for information				
Level I	52.4%	47.8%	31.1%	36.7%
Level II	30.4%	55.3%	32.5%	36.4%
Level III	33.2%	31.4%	38.8%	36.1%
Total	44.4%	48.1%	32.1%	36.5%

^a All scenarios are based on observed participation rates at the two site with an unrestricted program eligibility among local home care recipients (Neuwied and Erfurt). See text for further details.

Table 6: Monthly cost differential (Euro) between a personal budget and current home care program by care management scenario^a

Level of care needs ^b	Agency services	Mixed benefits ^c	Cash benefits
Scenario A: No additional care management cost			
Level I	0	45	179
Level II	0	128	511
Level III	0	192	767
Scenario B: 100 care recipients per manager			
Level I	53	98	232
Level II	53	181	564
Level III	53	245	820
Scenario C: 50 care recipients per manager			
Level I	106	151	285
Level II	106	234	617
Level III	106	298	873

^a Total labour cost per care manager are based on TVÖD, job grading 10, experience level 3, and an overhead of 40% for extensive travel costs etc.

^b As a simplification, care level III+ is not taken into account.

^c Mixed benefits refer to a 75% receipt of agency services.

Table 7: Excess LTCI spending on home care provision in case of introducing personal budgets as an additional home care program compared to standard home care provision in the benchmark year 2007

Scenario ^a	Personal budget recipients	Monthly excess cost		Necessary change of contribution rate		Excess cost per recipient
		Mio. Euro	in %	in %	in <i>pp</i>	Euro/month
I - A	108,724	24.5	4.1%	1.8%	0.03	225.4
I - B	108,724	30.3	5.0%	2.2%	0.04	279.3
I - C	108,724	36.2	6.0%	2.6%	0.04	333.2
II - A	217,448	49.0	8.1%	3.5%	0.06	225.4
II - B	217,448	60.7	10.0%	4.4%	0.07	279.3
II - C	217,448	72.4	12.0%	5.2%	0.09	333.2
III - A	528,250	117.8	19.5%	8.5%	0.14	223.1
III - B	528,250	145.9	24.1%	10.5%	0.18	276.2
III - C	528,250	174.0	28.8%	12.5%	0.21	329.4

^a Scenarios I-III refer to the predicted transition probabilities in Table 6. Sub-scenarios A-C reflect the different cost assumption with regard to care management.

Table 8: Break-even point for the excess cost of personal budgets compared to standard home care programs

	Scenario^a	I,II	III
Avg. monthly excess cost of institutionalised care among personal budget recipients (Euro)		725.5	711.7
	A	1.45	1.46
Care management cost scenarios	B	1.62	1.63
	C	1.85	1.86

^a Scenarios I-III refer to the predicted transition probabilities in Table 6.

A Appendix

Table A.1: Comparison of Personal Budgets with Standard Benefits of LTCI^a

	agency care	cash payments	personal budget
benefit level (in % of agency care)	100%	44.5-53.5% ^b	100% + overhead for care management
coverage of services and goods	only services from approved catalogue provided by authorized agencies	none	no payment of first-degree relatives
monitoring	yes, by agency services' provider	no, but semiannual health checks	yes, by care manager
requirement of benefit exhaustion	no, excess funds are paid as cash payments (combination benefits)	no	yes, excess funds have to be refunded
care management	no	no	yes

^a Combination benefits are a mixture of agency care and cash payments depending on the share of agency care spent.

^b Level of payments varies according to the level of dependency assigned to the person in need of care.

Table A.2: Selected Descriptives and t -Tests of Equality or χ^2 -Tests of Independence (means, wave 1)

	Full Sample			Cash Payments			Agency Care		
	Treaties	Controls	p -value	Treaties	Controls	p -value	Treaties	Controls	p -value
<i>Sociodemographics</i>									
age (years)	74.5	71.9	0.10	73.0	72.3	0.84	74.1	69.2	0.04
female	0.64	0.67	0.95	0.70	0.64	0.39	0.64	0.69	0.54
married	0.29	0.31	0.59	0.29	0.41	0.12	0.28	0.13	0.03
<i>Number of Children</i>									
none	0.23	0.25		0.23	0.23		0.25	0.38	
one	0.23	0.15		0.17	0.18		0.25	0.08	
two and more	0.55	0.60	0.20	0.60	0.59	0.98	0.50	0.54	0.05
<i>Need of care</i>									
care needs index ^a (1-100)	66.2	63.9	0.29	66.1	61.0	0.13	63.7	60.5	0.39
LTCI-level 1	0.55	0.54		0.58	0.58		0.58	0.64	
LTCI-level 2	0.32	0.36		0.28	0.38		0.30	0.26	
LTCI-level 3	0.13	0.09	0.42	0.14	0.04	0.13	0.12	0.10	0.81
<i>Care arrangement</i>									
total care hours/week	64.5	55.2	0.09	86.4	62.5	0.02	41.1	31.1	0.15
informal care hours/week	51.0	41.7	0.11	73.8	53.6	0.06	27.1	18.7	0.19
formal care hours/week	13.6	13.5	0.97	12.6	8.9	0.45	14.0	12.4	0.72
help from relatives	0.76	0.79	0.52	0.81	0.85	0.51	0.70	0.62	0.30
help from friends/volunteers	0.33	0.25	0.07	0.41	0.23	0.01	0.25	0.33	0.33
help from agency workers	0.62	0.54	0.09	0.16	0.26	0.13	0.88	0.87	0.93
help from independent worker	0.38	0.40	0.65	0.36	0.42	0.42	0.34	0.36	0.88
<i>Program site</i>									
Annaberg	0.08	0.03		0.00	0.00		0.14	0.03	
Erfurt	0.15	0.19		0.23	0.20		0.17	0.31	
Kassel	0.13	0.08		0.00	0.00		0.20	0.21	
Marburg	0.15	0.18		0.00	0.00		0.20	0.31	
Neuwied	0.37	0.48		0.73	0.80		0.13	0.10	
Unna	0.10	0.04	0.01	0.00	0.00	0.58	0.16	0.05	0.07
<i>Type of benefits before program</i>									
initial claim	0.12	0.13		0.00	0.00		0.00	0.00	
agency care	0.39	0.26		0.00	0.00		1.00	1.00	
cash payments	0.30	0.44		1.00	1.00		0.00	0.00	
mixed benefits	0.19	0.17	0.01	0.00	0.00		0.00	0.00	
observations	310	149		94	66		122	39	

^a The care index is based on the self-assessed ability to accomplish activities of daily life. The index is constructed to be 100 in case of full dependence on care and support by others.

Table A.3: Descriptives for the sample of the supplementary survey in Neuwied and t -Tests of Equality or χ^2 -Tests of Independence between program and control group

	Total	Treaties	Controls	Type of test	p -value
<i>Sociodemographics</i>					
age (years)	72.5	71.3	75.0	t-test	0.15
female	63.4%	62.5%	65.4%	χ^2	0.40
lives alone	32.9%	33.9%	30.8%	χ^2	0.78
number of household members	2.1	2.1	2.1	t-test	0.92
<i>Number of Children</i>					
none	18.3%	21.4%	11.5%		
one	13.4%	16.1%	7.7%	χ^2	0.25
two and more	68.3%	62.5%	80.8%		
<i>Need of care</i>					
care needs index ^a (1-100)	71.8	73.4	68.3	t-test	0.15
LTCI-level 1	51.2%	48.4%	57.7%		
LTCI-level 2	37.8%	41.1%	30.8%	χ^2	0.66
LTCI-level 3	11.0%	10.7%	11.5%		
<i>Care arrangement</i>					
total care hours/week	72.1	70.3	75.9	t-test	0.29
<i>Type of benefits before program</i>					
initial claim	6.0%	7.0%	3.9%		
agency care	10.8%	14.0%	3.9%	χ^2	0.49
cash payments	68.7%	64.9%	76.9%		
mixed benefits	14.5%	14.0%	15.3%		
observations ^b	83	57	26		

^a The care index is based on the self-assessed ability to accomplish activities of daily life. The index is constructed to be 100 in case of full dependence on care and support by others.

^b Descriptives are available only for those individuals that could be matched with the panel data set. Full sample size is 89.