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Konrad-Zuse-Strasse 1 · D-18057 Rostock · Germany · Tel +49 (0) 3 81 20 81 - 0 · Fax +49 (0) 3 81 20 81 - 202 · www.demogr.mpg.de

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The lifetime risk of and expected time
spent in payment problems**

Aapo Hiilamo | hiilamo@demogr.mpg.de
Åsmund Hermansen

This working paper has been approved for release by: Christian Dudel (dudel@demogr.mpg.de),
Deputy Head of the Research Group Labor Demography.

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Financial strain in Norway: The lifetime risk of and expected time spent in payment problems

Aapo Hiilamo 1,2, Åsmund Hermansen 3

- 1) Max Planck Institute for Demographic Research, Rostock, Germany
- 2) Max Planck – University of Helsinki Center for Social Inequalities in Population Health, Rostock, Germany and Helsinki, Finland
- 3) OsloMet – Oslo Metropolitan University, Faculty of Social Sciences, Department of Social Work, Child Welfare, and Social Policy, Oslo, Norway.

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Conflict of interest

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Ethical approval

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Abstract

While some 10% of adults in Europe report having payment problems, that is, not being able to meet their financial commitments over a prolonged period, how many people experience payment problems at some point in their lives, and how long these payment problems last, remain unknown. We investigated the determinants of the lifetime risks and expectancies of payment problems in Norway, the country with the highest household debt burden among the OECD countries. We derived geographic, demographic, socio-economic, and health variables from national registers and data on monthly payment problems from the national debt collection agency for the 2015-2019 period. We analysed these data in a discrete multistate modelling framework, and calculated the lifetime risk of experiencing payment problems, the expected time spent in payment problems, and total life expectancy. These metrics were calculated for synthetic cohorts who experienced the current risk of payment problems and mortality throughout their life course. Some 39% of the cohort members experienced payment problems at least once during their life course, with the share being higher among men. The life expectancy with payment problems at age 18 was 2.1 years, which corresponded to 3% of the total life expectancy. Across subgroups defined by the intersections of low education, sex, record of psychiatric diagnosis, and area-level income, the longer the payment problem expectancy these groups had, the shorter their total life expectancy was. These findings demonstrate that payment problems are often chronic, and have the same upstream determinants as early mortality.

Introduction

In a highly financialised society, payment problems are prevalent. In Norway, 8% of adults report having unpaid mortgage, rent, utility, or hire purchase bills, a share that is only slightly lower than the European average of 9% (EU-SILC 2024). However, this and similar estimates of payment problems and their determinants are cross-sectional, that is, they are related only to a specific point in time (Angel 2016; Angel and Heitzmann 2015; Oksanen, Aaltonen, and Rantala 2015). We do not know what share of the population are likely to experience payment problems at least once over the course of their lives, and how long these payment problems last.

Having payment problems, that is, the inability to meet one's financial obligations over a prolonged period of time, is a marker of past economic difficulties. While it may appear that payment problems are triggered by becoming unemployed, divorcing, or experiencing health problems, in many cases entry into payment problems is simply a final negative life event towards the end of a longer trajectory defined by a deteriorating income situation. People with a higher risk of experiencing adverse life events that significantly reduce their ability to generate income often have the fewest resources to tackle the income losses that follow. This makes the pathways into payment problems highly selected (Balmer et al. 2006; Brown and Taylor 2008; Patel, Balmer, and Pleasence 2012; Russell, Whelan, and Maître 2013).

Experiencing payment problems also makes subsequent life more challenging (see, e.g., (Mahony and Pople 2018)). This is because having a record of past payment problems leads to higher borrowing costs, as well as significant constraints in access to housing and necessary goods and services, such as internet subscriptions and, in some cases, even employment, which can, in turn, make income generation and repayment more difficult. Having payment problems causes mental distress (Richardson, Elliott, and Roberts 2013), and can lead to a spiral of mental health problems and ever more severe economic difficulties. These consequences of payment problems are likely to contribute to their chronic nature. Thus, it is difficult to resolve payment problems after they have started. To make matters even more challenging for those experiencing payment problems, debt settlement procedures are generally long. In many European countries, there are no quick legal ways out of payment problems (Eurofound 2020). Therefore, it is important to look not only at the prevalence of payment problems at one point in time, but also at how long people experience payment problems, and how that length of time varies across population subgroups.

The aim of this study is to understand how socio-economic and geographic factors are linked to payment problems in Norway. Payment problems are a universal phenomenon, but the

country context determines the predictors and consequences of payment problems. Norway is an interesting research context because it is a wealthy welfare state that paradoxically has record levels of household debt. While the Norwegian context is distinct in this regard, we provide international readers with an example of how to study social problems using demographic tools.

In the multistate framework, the population not experiencing payment problems have a certain probability of remaining free of payment problems, developing payment problems, or dying at a subsequent time point. Similarly, the population with payment problems have a certain likelihood of continuing to experience payment problems, exiting payment problems, or dying. In this study, we summarise these age-specific payment problem and mortality transition probabilities into two intuitive metrics. Our first metric is the lifetime risk of experiencing payment problems. This metric tells us what percentage of a synthetic cohort would enter payment problems at least once during their life course. Our second measure is the expected time spent in payment problems, which reflects the average time the members of this synthetic cohort experience payment problems over their life course. We also combine these two metrics and estimate the expectancy of payment problems after entering payment problems.

Demographic methods in general, and the multistate approach in particular, are powerful tools for describing any well-defined phenomenon involving different states over time (Preston, Heuveline, and Guillot 2000). In a multistate analysis, the members of an imagined birth cohort move across different states throughout their lives. This imagined cohort, also known as synthetic cohort, is a cohort of individuals who live throughout their lives with the contemporary risks as if the calendar time was stopped. The ways in which the members of the synthetic cohort move across different states are dictated by the transition probabilities at each given age that are observed in the real population, as described above. A convenient way of summarising these age-specific probabilities is to calculate the expected lifetime spent in the states, also called state expectancies. For example, the probability of dying across all ages is summarised into period life expectancy, that is, life expectancy at a given time point, and the probabilities of falling ill and recovering and dying are summarised into healthy life expectancy. Similar expectancies can be calculated for any set of states of interest, including payment problems, as long as the states are exhaustive and mutually exclusive and their transition probabilities can be calculated (Dudel 2021).

The added value of this multistate approach is that, without observing the complete life course of a real population, we can still provide reasonable estimates of what the full life

course would look like in the population, on average, given current conditions. Thus, the lifetime risks and expected time spent in payment problems are assumed to correctly forecast the most recent cohort's life course if the risks of experiencing payment problems and mortality do not change. Even if this assumption that conditions do not change is inherently unrealistic and the prevalence of payment problem changes over time, the results from multistate models are still useful, as they summarise the conditions of a given period in easy-to-grasp measures that allow us to compare trends over time and differences between groups.

In this study, we investigate how these metrics vary across population subgroups. The probabilities of transitioning into and out of payment problems vary not only by age, but also across social strata. However, the ways in which these transition probabilities vary are complex, which makes it difficult to compare transition probabilities across groups alone. Nonetheless, these differences can be summarised as differences in the lifetime risk and expectancy of payment problems.

We focus on the geographic, demographic, health, and social determinants of the expected time spent in payment problems. Payment problems act as a mechanism through which social disadvantages accumulate and social and economic opportunities are reduced (Dwyer 2018). Therefore, who is at risk of experiencing payment problems at some point in time, and how long these payment problems last, are important questions for the general public and policymakers interested in reducing social inequalities. Previous studies based on cross-sectional data have shown that payment problems are not evenly distributed across society, but are linked to social and economic circumstances (Angel and Heitzmann 2015). However, the social determinants of payment problems may look different when the life course dimensions of payment problems are taken into consideration. For example, the duration of payment problems may be shorter for those with higher education. These individuals may be able to resolve their payment problems more quickly because they have better employment opportunities, or because they are better able to navigate the complex legal system to access debt settlement procedures.

Determinants of payment problems

We conceptualise payment problems as the end product of a chain of events that starts with borrowing or purchasing goods and services. These events take place in the context of macro-, consumer-, and creditor-level factors (Cesar Leandro and Botelho 2022). These levels are key in shaping the individual-level determinants of payment problems, and are thus discussed briefly below.

The most frequently cited macro-level factors for payment problems include macro-economic cycles and the nexus of financial markets and the welfare state (see, e.g., (Braucher 2006; Dwyer 2018; Rona-Tas and Guseva 2018; Wiedemann 2021). In the US literature, it is argued that debt (payment problems) has been increasing because, on the demand side, the middle class has been coping with welfare retrenchment and stagnating income, while on the supply side, financial markets have been deregulated, through a process also known as the “democratization of credit” (Dwyer 2018). Another relevant macro-level “demand”-side theory is that social comparison and inequality have been increasing, as discussed by (Rona-Tas and Guseva 2018). According to this theory, households and individuals compare their consumption to that of ever wealthier classes, creating an upward spiral of increasing spending and borrowing.

In the Nordic countries, the context of the current study, the inequalities in income and wealth are generally lower than those in the US, but these theories are still relevant. A Swedish study reported that income inequality at the area level led to increasing levels of insolvency (Roth 2023), while a Norwegian study found that positive income shocks led to increasing indebtedness of the neighbours of those who experienced this shock (Gulbrandsen 2021). However, the main driver of indebtedness in the Nordics has been increasing homeownership and the democratisation of mortgages. While mortgages make up the bulk of indebtedness, they also contribute to consumer debt problems when people attempt to cover their increasing housing expenses with consumer debts. Smaller debts are also relevant for low-income families struggling to cope with the everyday cost of living.

It is also worth pointing out in this context that creditors determine access to credit and the quality of credit, and thus shape the social determinants of payment problems. Discriminatory practices of targeting credit with more expensive terms contribute to the social patterning of payment problems (Bolton and Rosenthal 2005). The credit scoring system sorts individuals based on their wealth, history, and employment, among other factors, which leads to some people paying higher fees or having higher prepayments than others. These extra costs are important for explaining differences in payment problems.

These macro-level and creditor-related factors interact with individual-level determinants. It has been previously conceptualised that population subgroups have differential risks of payment problems for three reasons (Angel and Heitzmann 2015). First, groups differ in their financial literacy and spending habits. Second, groups differ in the income they have available to meet their financial obligations. Third, the likelihood of experiencing life events

that either decrease income or increase expenditures varies across groups (Angel and Heitzmann 2015). A Finnish register study found that people with low education, men, younger people, and unmarried people were more likely to be in payment constraints (Oksanen et al. 2015). Another Finnish study reported that young adults were over-represented in debt judgments compared to the general population (Majamaa, Lehtinen, and Rantala 2019). Bakkeli and Drange found that in Norway, an experience of hospitalisation – a critical life event that can reduce a person’s income and change their ability to handle finances – was linked to a higher risk of experiencing payment problems (Bakkeli and Drange 2024). Few studies have considered micro- and macro-level factors simultaneously. A European-wide analysis (Angel and Heitzmann 2015) of EU-SILC data found that in addition to major income drops at the individual level, country-level variables that reflect wider welfare state policies were important determinants of payment problems.

While many of these previous studies have examined the risk factors for payment problems at one point in time, they have largely ignored the time dimension of payment problems. Some studies have focused on how people enter payment problems, but research on how people exit payment problems is missing. Thus, we know little about the distribution of payment problems over the life course, or how long, on average, individuals experience payment problems.

Payment problems in Norway

Norwegian consumers finance their lives with credit to an extent not seen anywhere else. The country has the highest household debt-to-income ratio among the OECD countries, at 250% in 2022 (OECD n.d.). This is largely due to mortgages to finance housing, with mortgages making up some 90% of the aggregated household debt in the country (Vatne 2022). Around 60% of all Norwegian households are homeowners with mortgages – a figure that is the highest among all European countries and is double the EU-27 average (Eurostat 2025).

While mortgages are key to homeownership and, in an era of rising house prices, to wealth accumulation, more expensive consumer debts are also widespread in Norway. Consumer debts are important sources of payment problems because they often carry higher interest rates and are widely accessible. Moreover, consumers can accumulate new debts to pay off their previous debts. In September 2024, some 30% of household had some consumer debt, with the share being higher among younger, larger, and renting households (Gautam et al. 2024). An analysis of the Norwegian debt registry showed that the prevalence of unsecured

debt peaked at around age 45, increased after becoming unemployed, and decreased after becoming a homeowner (Gautam et al. 2024).

When debts are left unpaid for a prolonged period of time, a process of debt collection may start. Norway has a public debt enforcement agency, which can impose mandatory payment actions if individuals do not meet their financial obligations after multiple payment reminders. Payment enforcement for private unpaid bills and debts requires a court order, while unpaid public bills, such as taxes or fines, can be directly deducted. Payment enforcement actions include wage or benefit deductions and asset deductions and freezing. These payment actions result in marks in the debt enforcement registry. Being subject to debt collection action is thus an indicator of serious payment problems, with concrete consequences for the person's financial situation and economic opportunities. Most arrears are resolved before escalating to the enforcement commissioner or the National Collection Agency (NCA), which has the authority to enforce debt collection. When payment problems do escalate, this indicates that the individual has been under financial strain for an extended period of time. In this paper, we assess payment problems using deduction in wages or benefits, measured monthly, which is the most common form of debt enforcement in Norway.

Data and measures

To provide a comprehensive overview of payment problems, we use Norwegian register data covering payment problems on a monthly basis. The Norwegian register data infrastructure is built around administrative registers. These registers collect information from service use records, population registers, tax collection records, and other administrative sources. The unique identification number, which is assigned to all residents, allows for the reliable combination of these sources.

In this study, we focus on all residents of Norway who were aged 18 or older between 2015 and 2019. Our starting population is drawn from a basic demographic dataset. We then merge this dataset with education registers, payment problem registers, and other register sources. We use register data on the year and month of death, but we lack information on the birth month. We therefore impute the birth month as a random number, with the monthly distribution following the actual monthly distribution of births in Norway, which is taken from publicly available data provided by Statistics Norway.

We measure payment problems as markers in the debt enforcement registry. Our measure is, therefore, an objective and administrative measure of payment problems (for the definitions, see (Betti et al. 2007; Vandone 2009)). The data are drawn from the Norwegian public debt enforcement agency. The register consists of all notified wage, benefit, or wealth deductions that are imposed due to unpaid debts. These notifications are recorded regardless of whether the person has anything to deduct from. Public debts, such as unpaid taxes, fines, or service use costs, can be deducted without a court order, but a court order is required before private debts become subject to mandatory deductions. This measure can be regarded as an indicator of severe payment problems, as people may pay off their previous loans with new loans, albeit with considerable difficulties. The measure does not consider the subjective payment burden or foregone resources due to repayments.

We calculate the lifetime risks and expectancies by geographic, demographic, socio-economic, and health-related characteristics. We select covariates based on the previous literature on the most important determinants of payment problems (Angel and Heitzmann 2015; Bakkeli and Drange 2024; Betti et al. 2007; Oksanen et al. 2015). Sex differences in payment problems are well established, and we focus on sex as it is noted in the population registers. We lack data on identified gender.

We calculate the metrics by major geographic area of Norway. While area differences in payment problems are less well known, we suspect that there are major differences across

geographic areas given the social and economic differences between them. We divide the area variable into western, eastern, southern, and northern Norway. In addition, to investigate the role of geographic differences in income, we divide the municipalities into fifths based on their average annual household income. We then calculate the metrics by the municipality income quintile. The area-level variable consists of some missing values, and observations with missing values do not contribute to the analysis of area differences.

Our key social determinant of payment problems is education level. Statistics Norway records education based on the Norwegian Standard Classification of Education, in which the education level is the first digit of the six-digit individual program code (SSB 2017). We categorise education into three levels. The first is low, which includes no education, pre-school education (level 0), primary education (level 1), and lower secondary education (level 2). The second level is intermediate, which consists of upper secondary education (levels 3 and 4) and post-secondary non-higher education (level 5). The third level, high, consists of undergraduate or graduate levels of higher education (levels 6 and 7) and the second stage of higher education (level 8). A key limitation of the education registry used here is the substantial proportion of immigrants with missing education information, which is reported to be as high as 25% by Statistics Norway (ssb n.d.). We therefore include a separate “missing” education category. Individuals with unspecified education levels (code 9) are also assigned to this category.

Our health predictor is based on hospital records of psychiatric diagnoses. We have selected this indicator because previous studies conducted in Norway and elsewhere have shown that psychiatric diagnosis is an important determinant of payment problems (Bakkeli and Drange 2024; Hiilamo et al. 2022; Richardson, Jansen, and Fitch 2018). Psychiatric diagnoses are ascertained from the Norwegian patient registry. We classify people as having a psychiatric diagnosis if they had any hospitalisation records with an F-diagnosis in the previous year. We note that this indicates a severe psychiatric issue, and that a substantial proportion of mental illnesses are not included due to a lack of hospital contact.

While we measure payment problems and mortality on a monthly basis, these covariates are measured yearly. We conceptualised these covariates as unchanging characteristics, as the calculated expectancies may be interpreted as indicating that the groups remain unchanged. Thus, when we calculate expectancies for individuals with low education, we assume that they have low education throughout the rest of their life.

Multistate modelling

We use discrete multistate modelling to calculate the lifetime risks and expectancies of payment problems (Dudel 2021). Multistate modelling is an extension of survival analysis with more than two states. In basic survival analysis, people move from one state, such as working, to another, such as retirement, without returning. In multistate modelling, people can move back and forth between multiple states, such as working, unemployment, and retirement. Multistate modelling has, for example, been applied in epidemiology to calculate healthy life expectancies (Head et al. 2019), or in labour demography to calculate working life expectancies (Dudel et al. 2018; Dudel and Myrskylä 2017; Parker et al. 2020). However, to the best of our knowledge, it has not yet been applied to consumer or social policy research.

Multistate modelling consists of three building blocks. The first is defining both the state space through which people move over time and the unit of time. The states are mutually exclusive and exhaustive, that is, people must be in one and only one state at any given time point. These states can be either transitional – that is, one can move to and from these states – or absorbing – that is, people can only move to these states, not from them. In our study, we use a three-state model in which individuals are either not in payment problems, in payment problems, or dead. Here, "dead" is an absorbing state. When calculating lifetime risks, we use a modified state space in which we add an additional absorbing state of past payment problems in order to take into consideration the elevated re-entry risk of experiencing payment problems. Our unit of time is age in months. Our analysis is discrete because time is treated in discrete steps. These state spaces are shown in Figure 1.

The second step of multistate modelling is estimating transition probabilities across the defined state space for any given age and covariate value of interest. Transition probabilities refer to the probabilities of moving from one state to another per the time unit, in this case, one month. These transition probabilities sum to one at any given age and current state. We estimate transition probabilities using multinomial logistic regression models, in which we regress the current state on the state in the previous month, age, and the covariate indicating the subgroup of interest. We fit a flexible model in which we model age using piecewise linear splines.

The final step is to use these transition probabilities in a Markov chain to calculate the expectancies. The Markov chain calculates expectancies at any given age and starting state. We calculate the main expectancies at age 18 when we assume that everyone starts in a no payment problems state. When calculating the expectancies by education level, we calculate the expectancies at age 23 and with the starting state distribution observed in the population

at this age. The reason for adopting this starting age in the education analysis is that the education level of younger people is still evolving.

We use Stata 18 for the data curation and R for the multistate modelling. We use the dtms package (Dudel and Li 2024).

Results

Our analysed sample consisted of 4,531,632 persons who contributed 247,962,721 person-month observations. Table 1 presents the study characteristics. The majority of the analysed sample were from eastern Norway (including, among other areas, the Oslo capital area), while the smallest geographic area in terms of sample size was southern Norway.

TABLE 1 HERE

One-third of the analysed observations were from people with high education, 41% were from people with intermediate education, and 24% were from people with low education. The education variable was missing for 3% of the analysed person-months. A psychiatric diagnosis was recorded at some point for 460,658 people, and these people had 11,295,062 observations during the period when they had a psychiatric diagnosis.

TABLE 2 HERE

Table 2 presents the unadjusted transition probabilities and the number of transitions. Most of the observations were transitions from no payment problems to no payment problems. Observations without past payment problems had a higher risk of transitioning to the death state (probability of transitioning to death per one month: 0.0008) compared to that of those with payment problems or past payment problems (0.0006), but this difference can be attributed to age differences between the groups. The probability of transitioning from payment problems to payment problems was 0.9355, meaning that 93.5% of those with payment problems remained in payment problems the following month. Observations of past payment problems had a 32-fold risk of entering payment problems in the following month compared to that of those without past payment problems (crude risk of 0.0216 vs 0.0007).

FIGURE 1 and 2 HERE

Figure 2 shows that these transition probabilities, now estimated via multinomial logistic regression models, varied by age and sex. The probability of entering payment problems for the first time peaked at age 23. At this age, the probability of moving for the first time from no payment problems to payment problems in the next month was 0.0016. This transition probability gradually decreased and reached its lowest level after age 80, at less than 0.00016. Men had a substantially higher probability of entering payment problems for the first time across all ages. This sex difference was largest at age 23, when men had a 1.7-fold risk of entering payment problems for the first time compared to that of women (0.002 vs 0.0012).

Table 3 shows the lifetime risks of payment problems, payment problem expectancy, total life expectancy, and conditional expectancies for the full sample, and by sex, area, record of psychiatric diagnosis, and year. Based on data from 2015 to 2019, the lifetime risk of payment problems for the total population was 0.39. This means that 39% of a synthetic cohort - experiencing the risk observed in 2015-2019 throughout their lives - experienced payment problems at some point in their life course. Almost half of men ever entered payment problems, while the lifetime risk for women was substantially lower (0.46 vs 0.31). In terms of geographic area, the lowest lifetime risk was in western Norway (0.36) and the highest lifetime risk was in northern Norway (0.44). There was a linear association between a lower municipality income and a higher lifetime risk of payment problems, with the lifetime risk being 0.35 in the highest fifth of the income distribution and 0.43 in the lowest fifth of the income distribution.

TABLE 3 HERE

The second column shows the payment problem expectancies. In the total sample, the payment problem expectancy at age 18 was 2.1 years. This corresponded to 3.2% of the total life expectancy. The demographic and geographic differences were similar to those observed for lifetime risk. The payment problem expectancy was 1.3 years longer for men than for women. Broken down by geographic area, the payment problem expectancy was 1.8 years in western Norway (2.7% of total life expectancy) and 2.5 years in northern Norway (3.8% of total life expectancy). Having a psychiatric diagnosis was linked to a three-year longer payment problem expectancy (4.9 years with vs. 1.9 years without a psychiatric diagnosis) and a substantially shorter overall life expectancy (53.5 years vs. 65.5 years). There was little year-to-year variation in payment problem expectancy, except in 2019, when the expectancy increased to 2.3 years, up from two years in the previous years.

The last columns show the conditional expectancy, which is the payment problem expectancy divided by lifetime risk. People who entered payment problems spent, on average, 5.3 years in payment problems.

FIGURE 2 HERE

Figure 3 shows that at age 23, education level was associated with a shorter life expectancy and a longer payment problem expectancy. Conditional on surviving to this age, people with low education had a payment problem expectancy of 4.6 years, compared to 0.7 years for those with high education. The difference in payment problem expectancy as a share of total

life expectancy between individuals with low and high education was even larger (8.1% vs 1.1%).

FIGURE 3 HERE

We also examined interactions of low education, low municipal income, sex, and psychiatric diagnoses with payment problem expectancy. Figure 4 indicates that the highest payment problem expectancy (9.2 years) and the second-lowest life expectancy (42.1 years) were observed among men with low education and a record of psychiatric diagnosis who were living in a low-income municipality (this group accounted for some 0.4% of the sample). In contrast, the lowest payment problem expectancy (0.8 years) and the highest life expectancy (63.4 years) were observed among women with none of these characteristics (25% of the sample).

Discussion

In this study, we examined payment problems in Norway using the multistate framework. In this framework, being in payment problems is not a static state. People at different ages have different probabilities of entering and exiting payment problems and of dying. These probabilities also differ across population subgroups. In this study, we summarised these complex probabilities into intuitive metrics: lifetime risks of payment problems and payment problem expectancies.

Our findings suggest that if current conditions remain unchanged, one-third of people aged 18 today in Norway will experience payment problems at least once during their lifetime. This is a substantial proportion, given that in these data the cross-sectional one-month prevalence of payment problems is 3.5% (which is substantially lower than the self-reported prevalence reported in EU-SILC because our measure indicates more severe payment problems). This high lifetime risk may imply that having payment problems is a transient state caused by simple mistakes for a substantial proportion of people experiencing them, while for others, having payment problems is a long-lasting or even permanent state. Payment problems carry significant stigma, which makes it difficult for people to seek help. This might, in turn, cause mental health issues (Birkeland and Vogt 2024; Mahony and Pople 2018; Richardson et al. 2013). As payment problems are likely to be a reality for a significant share of Norwegians, this stigma should be alleviated.

Whether people are in payment problems for a short or a long period matters for individuals and society at large. Payment problem expectancy is, therefore, a useful metric for describing the longitudinal dimension of payment problems. Our headline finding is that Norwegians can expect to spend about two years, or 3% of their life, being subject to mandatory debt deductions, that is, having payment problems. However, this finding represents an average for the whole population, and includes both individuals who experience payment problems at one point in their life as well as individuals who never have payment problems in their entire life. If we focus only on individuals who ever experience payment problems, the expected lifetime spent with these problems is 5.3 years. These figures vary significantly by background. Higher education is linked to a substantially lower payment problem expectancy, both in absolute years and as a share of life expectancy. This implies that people with lower education not only have, on average, a shorter life, but also spend a larger proportion of their life dealing with wage deductions, payment reminders, and difficulties in accessing rental apartments, among other consequences of having payment problems. The finding that education is linked to payment problems aligns with research showing the beneficial role of education in preventing financial distress (Luotonen, Puttonen,

and Rantapuska 2022). We also found differences by sex, with men having a longer payment problem expectancy than women – even though men have a lower life expectancy and, therefore, a shorter exposure time to payment problems.

We also calculated conditional payment problem expectancies, that is, the expected time spent in payment problems after entering payment problems. The results show that once people enter payment problems, they experience them for about five years, on average. This chronic nature of payment problems indicates that finding an exit route from payment problems can be challenging. Simply put, life becomes difficult after becoming subject to debt collection actions. It is particularly difficult to manage levels of deductions, especially when combined with other disadvantages, such as low education. In qualitative work by Birkeland and Vogt (2024), people in payment problems described their lives as “waiting and being outside of society for many years”, illustrating the social exclusion caused by payment problems (Birkeland and Vogt 2024). Kempson and Poppe discussed the "debt trap", in which wage deductions and mental health problems make it difficult for people with payment problems to find hope and ways out of their predicament (Kempson and Poppe 2024). In Norway and many other European countries, the legal system dealing with debt settlements is complex, and there are no easier ways to resolve payment problems (Eurofound 2020).

We also observed substantial area differences in our metrics, both by larger geographic area and by the income level of the area. The lifetime risks and payment problem expectancies were higher in northern Norway and lower in western Norway. These differences are similar to those for life expectancy, and have been reported in previous studies on health inequalities (Clarsen et al. 2022). We also found that compared to people in high-income municipalities, people in the lowest-income municipalities had almost a one-year longer payment problem expectancy and a two-year shorter life expectancy. Our study does not directly address why these differences occurred, but we can speculate that they are related to either area inequalities in opportunities and/or the selection of people into those areas. Moreover, once people in high-income municipalities entered payment problems, they spent less time in them. This suggests that these people could mobilise their social and other forms of capital or use services to resolve their payment problems faster than could people from low-income municipalities. Another potential explanation for this difference is that services in northern areas are harder to reach.

We found that having a psychiatric diagnosis record was linked to a higher lifetime risk of payment problems and a higher payment problem expectancy. These findings align with the results of earlier studies looking at payment problems at a single time point (Bakkeli and

Drange 2024; Hiilamo et al. 2022; Hiilamo, Jensen, and Hermansen 2024; Richardson et al. 2017). These findings also raise concerns about the vulnerability of people with mental health issues to financial distress. We also know that payment problems increase the risk of subsequent adverse physical and mental health outcomes (Richardson et al. 2013). A US study reported that debt collection pressure increased psychological distress (Rhodes, Dwyer, and Houle 2024). A recent Norwegian study found that payment problems are linked to an increased risk of suicide (Hughes and Hermansen forthcoming). Similarly, a Swedish study showed that the odds of suicide are 2.5 times higher among those in debt collection (Rojas 2022). Payment problems may cause a spiral of increasing financial distress and mental health problems. This spiral contributed to the chronic nature of the payment problems we observed.

When examining the interactions of several variables, we found that the accumulation of multiple risk factors led to a substantially lower life expectancy and a higher payment problem expectancy. There was a small population subgroup with a significant accumulation of risk factors who experienced a short life expectancy but a substantial payment problem expectancy. For example, men aged 23 with low education and a psychiatric diagnosis could expect to spend a fifth of their lifetime in payment problems. In general, the higher the payment problem expectancy a subgroup had, the lower their life expectancy was. This may be because payment problems cause higher mortality, or because some shared causal factors explain both payment problems and higher mortality. For example, earlier health problems may cause payment problems and increased mortality risk.

We used full population register data and unique high-frequency data on payment problems, but our findings are still limited by the lack of data on the amount of debt people had. However, the concrete consequences of payment problems arise from even a single payment problem. We note here that our findings rely on the Markov assumption and that there are no unobserved payment problems before 2008, which is seven years before our study period. We therefore anticipate that the lifetime risk of 39% is slightly overestimated.

Policy implications

While our study looked at individual- and area-level factors, these factors are embedded in wider societal contexts, with some groups experiencing unequal and unfair opportunities for achieving financial wellbeing. We did not focus on intergenerational determinants of payment problems due to data limitations, but previous research using the same data source found that people with lower parental income have a substantially higher risk of payment problems in early adulthood (Hiilamo et al. 2024). As our findings show that education is a fundamental

determinant of payment problems, education should be taken into account when seeking to address the accumulation of payment problems and other disadvantages. For example, reducing school dropout rates is a potentially fruitful policy solution.

Debt advice is beneficial for people facing payment problems. Our findings indicate that advice will be relevant for a substantial proportion of Norwegians at some point in their lives. A UK study found that formal debt advice not only reduced payment problems, but also improved the mental health of those experiencing them (Fumagalli, Lynn, and Muñoz-Bugarin 2021). In Norway, debt advice is provided by NAV, the central organisation for social benefits. Policies addressing area inequalities in payment problems are needed, and there may be scope to improve the area-level distribution of debt advice.

Finally, providing faster legal pathways out of payment problems may be relevant, as our findings show that people often experience payment problems for long periods of time. Promoting legal mechanisms for resolving debts is beneficial for those in debt (Dobbie and Song 2015). In the UK, debt relief orders, that is, debt relief for those with no assets or income, are available for individuals with relatively small amounts of debt. This is an innovative policy worth considering in the Nordic context, as people with payment problems often do not have a large amount of debt, but rather a low ability to pay.

Conclusion

Having payment problems is not only an indicator of unmet financial commitments, it can also make life difficult, as people with payment problems may, for example, face challenges in purchasing internet and phone subscriptions or finding an apartment. While only a small share of Norwegians experience payment problems at given point in time, a substantial share are likely to face them at some point in their life. Under the current payment problem transition rates, Norwegians spend an average of two years of their life in payment problems, which corresponds to 3% of their lifespan. Efforts to offer routes out of payment problems are important to reduce the chronic nature of payment problems.

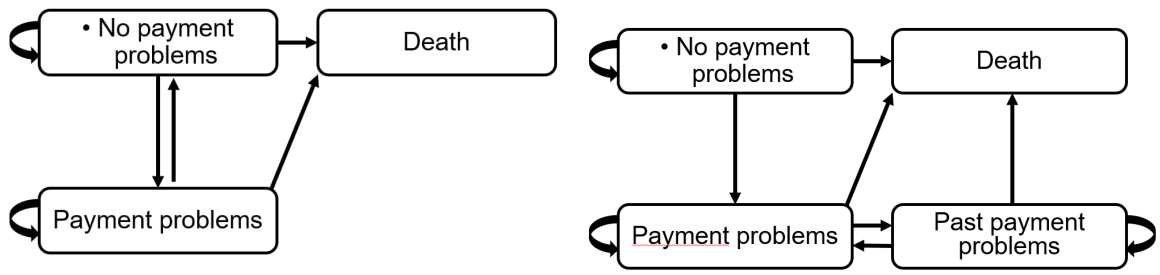


Figure 1. The state spaces used in this study

Table 1. Description of the sample. Persons ever refers to the number of persons ever in this group. Norwegian register data.

	Persons ever	Person-months	%
All	4,531,632	247,962,721	100
Sex			
Men	2,276,933	124,293,212	50
Women	2,254,699	123,669,509	50
Area			
Northern Norway	442,536	23,000,720	9
Trondelag	411,501	21,278,639	9
Western Norway	1,192,615	63,125,397	26
Southern Norway	267,957	13,891,205	6
Eastern Norway	2,322,901	124,047,766	51
Education			
High edu	1,475,457	80,345,471	32
Med edu	1,934,649	100,697,798	41
Low edu	1,346,190	59,864,869	24
Edu missing	193,677	7,054,583	3
Psychiatric diagnosis			
Yes	460,658	11,295,062	5
No	4,473,306	236,667,659	95

Table 2. Month-to-month transitions between payment problem states. Transition probabilities and numbers of observations in brackets. Norwegian register data.

From\ to	No payment problems t+1	Payment problems t+1	Past payment problems t+1	Dead t+1
No payment problems	0.9985 (220,710,751)	0.0007 (149,506)	0 (0)	0.0008 (186,081)
Payment problems	0 (0)	0.9355 (7,727,709)	0.0639 (527,677)	0.0006 (5,175)
Past payment problems	0 (0)	0.0216 (403,791)	0.9778 (18,241,162)	0.0006 (10,869)

Table 3. Lifetime risks of payment problems, payment problem expectancies, total life expectancies, and conditional expectancies by background characteristics at age 18. Lifetime risks and expectancies calculated from different models. Norwegian register data.

	Lifetime risk of payment problems at age 18, probability	Payment problem expectancy at age 18, years	Total life expectancy at age 18, years	Conditional payment problems at age 18, years
All	0.39	2.1	64.9	5.3
Sex				
Men	0.46	2.7	63.2	5.8
Women	0.31	1.4	66.6	4.5
Area				
Northern Norway	0.44	2.5	64.3	5.6
Trondelag	0.38	2.0	65.1	5.3
Western Norway	0.36	1.8	65.4	4.9
Southern Norway	0.38	2.0	64.5	5.4
Eastern Norway	0.40	2.2	64.8	5.4
Municipality income				
Highest fifth	0.35	1.6	66.1	4.5
4	0.37	1.9	65.1	5.0
3	0.39	2.1	64.9	5.4
2	0.41	2.3	64.5	5.6
Lowest fifth	0.43	2.5	64.2	5.8
Psychiatric hospital record				
Yes	0.63	4.9	53.5	7.7
No	0.37	1.9	65.5	5.1
year				
2019	0.44	2.3	65.3	5.3
2018	0.36	2.0	65.1	5.7
2017	0.38	2.0	65.0	5.2
2016	0.37	2.0	64.7	5.3
2015	0.40	2.0	64.6	4.9

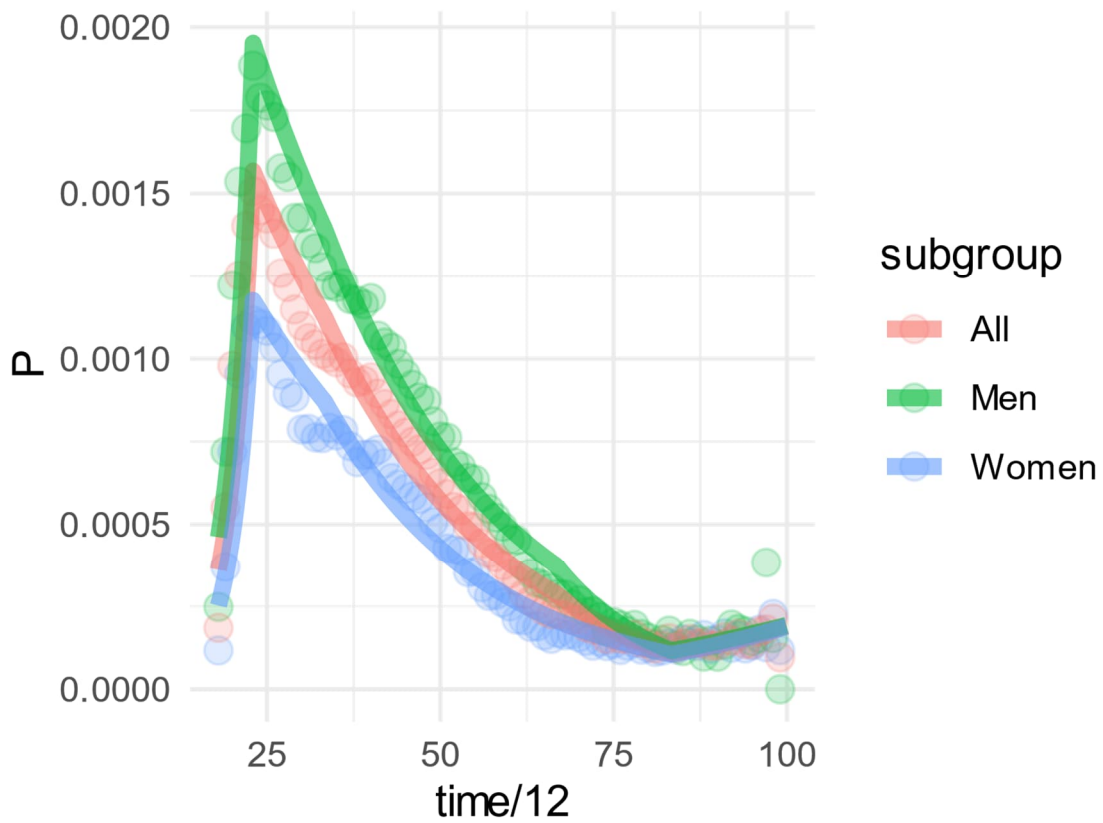


Figure 2. Probabilities of transitioning for the first time from no payment problems to payment problems by age and sex. Dots are age-specific observations and lines are fitted lines. Y-axis reflects month-to-month transition probabilities.

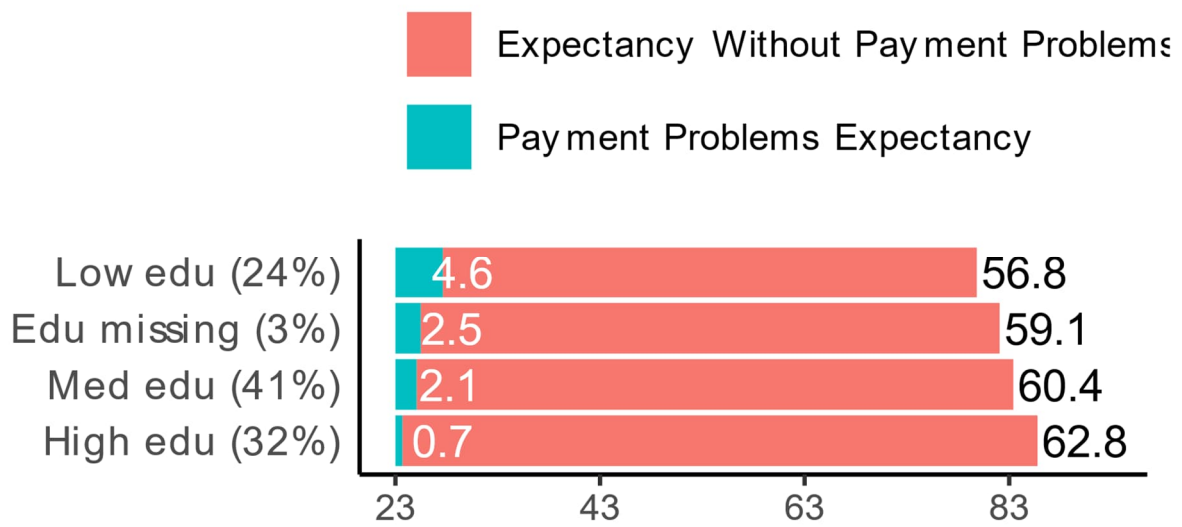


Figure 3. Life expectancy with payment problems by education level at age 23. The share of the total number of observations is in brackets.

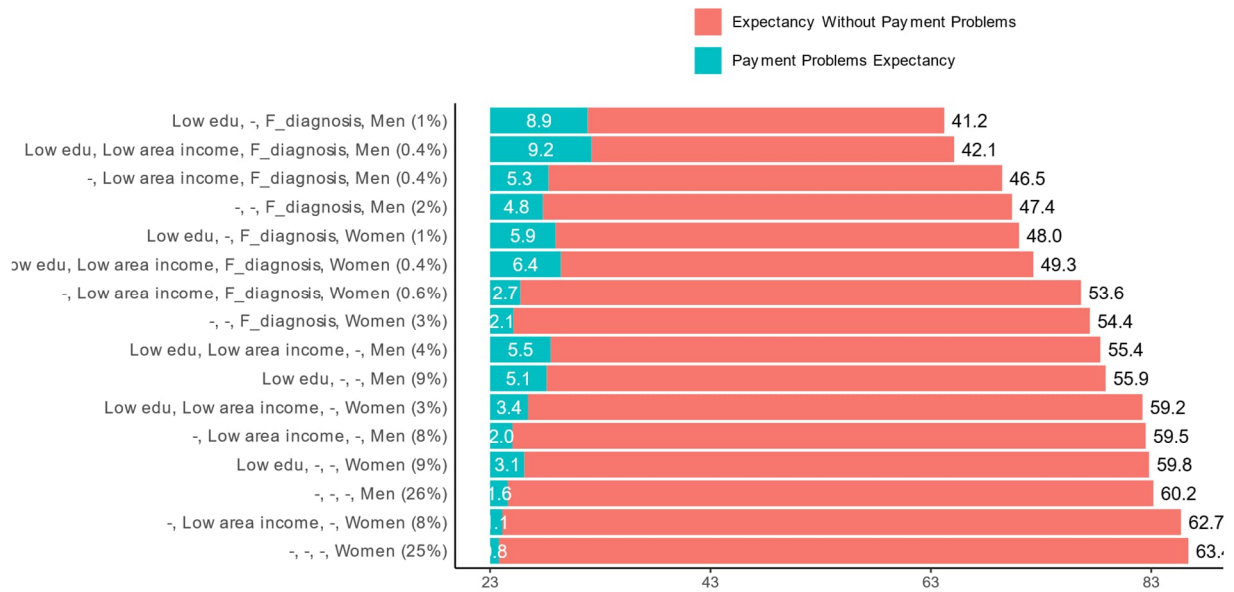


Figure 4. Life expectancy with payment problems by interaction of education, low municipality income, record of psychiatric diagnosis, and sex at age 23. Share of the total number of observations is in brackets.

- Angel, Stefan. 2016. "The Effect of Over-Indebtedness on Health: Comparative Analyses for Europe." *Kyklos* 69(2):208–27. doi: 10.1111/kykl.12109.
- Angel, Stefan, and Karin Heitzmann. 2015. "Over-Indebtedness in Europe: The Relevance of Country-Level Variables for the over-Indebtedness of Private Households." *Journal of European Social Policy* 25(3):331–51. doi: 10.1177/0958928715588711.
- Bakkeli, Nan Zou, and Ida Drange. 2024. "Relationship between Payment Problems and Health: A Nation-Wide Register Study in Norway." *Sociology of Health & Illness* n/a(n/a). doi: 10.1111/1467-9566.13755.
- Balmer, Nigel, Pascoe Pleasence, Alexy Buck, and Heather C. Walker. 2006. "Worried Sick: The Experience of Debt Problems and Their Relationship with Health, Illness and Disability." *Social Policy and Society* 5(1):39–51. doi: 10.1017/S147474640500271X.
- Betti, Gianni, Neil Dourmashkin, Mariacristina Rossi, and Ya Ping Yin. 2007. "Consumer Over-indebtedness in the EU: Measurement and Characteristics." *Journal of Economic Studies* 34(2):136–56. doi: 10.1108/01443580710745371.
- Birkeland, Marthe Bosvik, and Kristoffer Chelsom Vogt. 2024. "Youth Debt in a Life-Course Context: Young People's Ways into and out of Debt in Norway." *Nordisk Velfärdsvetenskap / Nordic Welfare Research* 9(3):238–51. doi: 10.18261/nwr.9.3.3.
- Bolton, Patrick, and Howard Rosenthal. 2005. *Credit Markets for the Poor*. Russell Sage Foundation.
- Braucher, Jean. 2006. "Theories of Overindebtedness: Interaction of Structure and Culture." *Theoretical Inquiries in Law* 7(2):323–46. doi: 10.2202/1565-3404.1128.
- Brown, Sarah, and Karl Taylor. 2008. "Household Debt and Financial Assets: Evidence from Germany, Great Britain and the USA." *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 171(3):615–43. doi: 10.1111/j.1467-985X.2007.00531.x.
- Cesar Leandro, Julio, and Delane Botelho. 2022. "Consumer Over-Indebtedness: A Review and Future Research Agenda." *Journal of Business Research* 145:535–51. doi: 10.1016/j.jbusres.2022.03.023.
- Clarsen, Benjamin, Magne Nylenna, Søren Toksvig Klitkou, Stein Emil Vollset, Carl Michael Baravelli, Anette Kocbach Bølling, Gunn Marit Aasvang, Gerhard Sulo, Mohsen Naghavi, Maja Pasovic, Muhammad Asaduzzaman, Tone Bjørge, Anne Elise Eggen, Terje Andreas Eikemo, Christian Lycke Ellingsen, Øystein Ariansen Haaland, Alemayehu Hailu, Shoaib Hassan, Simon I. Hay, Petur B. Juliusson, Adnan Kisa, Sezer Kisa, Johan Månsson, Teferi Mekonnen, Christopher J. L. Murray, Ole F. Norheim, Trygve Ottersen, Dominic Sgoe, Kam Sripada, Andrea Sylvia Winkler, and Ann Kristin Skrinko Knudsen. 2022. "Changes in Life Expectancy and Disease Burden in Norway, 1990–2019: An Analysis of the Global Burden of Disease Study 2019." *The Lancet Public Health* 7(7):e593–605. doi: 10.1016/S2468-2667(22)00092-5.
- Dobbie, Will, and Jae Song. 2015. "Debt Relief and Debtor Outcomes: Measuring the Effects of Consumer Bankruptcy Protection." *American Economic Review* 105(3):1272–1311. doi: 10.1257/aer.20130612.
- Dudel, Christian. 2021. "Expanding the Markov Chain Toolbox: Distributions of Occupation Times and Waiting Times." *Sociological Methods & Research* 50(1):401–28. doi: 10.1177/0049124118782541.

- Dudel, Christian, and Peng Li. 2024. "Dtms: Discrete-Time Multistate Models. R Package Version 0.2.7."
- Dudel, Christian, María Andrée López Gómez, Fernando G. Benavides, and Mikko Myrskylä. 2018. "The Length of Working Life in Spain: Levels, Recent Trends, and the Impact of the Financial Crisis." *European Journal of Population* 34(5):769–91. doi: 10.1007/s10680-017-9458-9.
- Dudel, Christian, and Mikko Myrskylä. 2017. "Working Life Expectancy at Age 50 in the United States and the Impact of the Great Recession." *Demography* 54(6):2101–23. doi: 10.1007/s13524-017-0619-6.
- Dwyer, Rachel E. 2018. "Credit, Debt, and Inequality." *Annual Review of Sociology* 44(Volume 44, 2018):237–61. doi: 10.1146/annurev-soc-060116-053420.
- Eurofound. 2020. "Addressing Household Over-Indebtedness | Policy Commons."
- Eurostat. 2025. "Distribution of Population by Tenure Status, Type of Household and Income Group." Retrieved January 2, 2025 (https://ec.europa.eu/eurostat/databrowser/view/ilc_lvho02__custom_8426007/default/table?lang=en).
- EU-SILC. 2024. "EU Statistics on Income and Living Conditions (EU-SILC) Methodology - Economic Strain." Retrieved July 5, 2024 ([https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_\(EU-SILC\)_methodology_-_economic_strain](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology_-_economic_strain)).
- Fumagalli, Laura, Peter Lynn, and Jair Muñoz-Bugarin. 2021. *The Effect of Formal Debt Advice on Financial Management and Knowledge: Insights from a New Longitudinal Study in Britain. Working Paper*. 2021–09. ISER Working Paper Series.
- Gautam, Himal, Ella Getz-Wold, Magnus A. H. Gulbrandsen, and Plamen Nenov. 2024. *The Driving Forces behind Households' Accumulation of Consumer Debt. Working paper*. Norges Bank.
- Gulbrandsen, Magnus A. H. 2021. "Peer Effects and Debt Accumulation: Evidence from Lottery Winnings." Retrieved March 11, 2025 (<https://www.norges-bank.no/en/news-events/news-publications/Papers/Working-Papers/2021/102021/>).
- Head, Jenny, Holendro Singh Chungkham, Martin Hyde, Paola Zaninotto, Kristina Alexanderson, Sari Stenholm, Paula Salo, Mika Kivimäki, Marcel Goldberg, Marie Zins, Jussi Vahtera, and Hugo Westerlund. 2019. "Socioeconomic Differences in Healthy and Disease-Free Life Expectancy between Ages 50 and 75: A Multi-Cohort Study." *European Journal of Public Health* 29(2):267–72. doi: 10.1093/eurpub/cky215.
- Hiilamo, Aapo, Maria Reinholdt Jensen, and Åsmund Hermansen. 2024. "Associations between Adolescent Psychiatric Disorders and Adulthood Payment Problems: A Norwegian Register Study of Complete Birth Cohorts of 1995–1997." *J Epidemiol Community Health*. doi: 10.1136/jech-2024-222915.
- Hiilamo, Aapo, Markus Keski-Säntti, Sami Pirkola, Tea Lallukka, and Antti Kääriälä. 2022. "Psychiatric and Neurodevelopmental Diagnoses in Adolescence and Adulthood Over-Indebtedness among Finns Born in 1987." *European Journal of Public Health* 32(6):858–63. doi: 10.1093/eurpub/ckac126.

- Kempson, Elaine, and Christian Poppe. 2024. "The Low Self-Efficacy Trap: Why People with Vulnerabilities Experience Prolonged Periods with Payment Problems." *Frontiers in Behavioral Economics* 3. doi: 10.3389/frbhe.2024.1368877.
- Luotonen, N., V. Puttonen, and E. Rantapuska. 2022. "Ability, Educational Attainment, and Household Financial Distress." *Journal of Consumer Policy* 45(4):655–72. doi: 10.1007/s10603-022-09528-1.
- Mahony, Sorcha, and Larissa Pople. 2018. *Life in the Debt Trap: Stories of Children and Families Struggling with Debt*. Policy Press.
- Majamaa, K., A. R. Lehtinen, and K. Rantala. 2019. "Debt Judgments as a Reflection of Consumption-Related Debt Problems." *Journal of Consumer Policy* 42(2):223–44. doi: 10.1007/s10603-018-9402-3.
- OECD. n.d. "Household Debt." *OECD*. Retrieved January 2, 2025 (<https://www.oecd.org/en/data/indicators/household-debt.html>).
- Oksanen, Atte, Mikko Aaltonen, and Kati Rantala. 2015. "Social Determinants of Debt Problems in a Nordic Welfare State: A Finnish Register-Based Study." *Journal of Consumer Policy* 38(3):229–46. doi: 10.1007/s10603-015-9294-4.
- Parker, Marty, Milica Bucknall, Carol Jagger, and Ross Wilkie. 2020. "Population-Based Estimates of Healthy Working Life Expectancy in England at Age 50 Years: Analysis of Data from the English Longitudinal Study of Ageing." *The Lancet Public Health* 5(7):e395–403. doi: 10.1016/S2468-2667(20)30114-6.
- Patel, Ash, Nigel J. Balmer, and Pascoe Pleasence. 2012. "Debt and Disadvantage: The Experience of Unmanageable Debt and Financial Difficulty in England and Wales." *International Journal of Consumer Studies* 36(5):556–65. doi: 10.1111/j.1470-6431.2012.01121.x.
- Preston, Samuel, Patrick Heuveline, and Michel Guillot. 2000. *Demography: Measuring and Modeling Population Processes*. Wiley.
- Rhodes, Alec P., Rachel E. Dwyer, and Jason N. Houle. 2024. "Debt Collection Pressure and Mental Health: Evidence from a Cohort of U.S. Young Adults." *Journal of Health and Social Behavior* 00221465241268477. doi: 10.1177/00221465241268477.
- Richardson, Thomas, Peter Elliott, Ron Roberts, and Megan Jansen. 2017. "A Longitudinal Study of Financial Difficulties and Mental Health in a National Sample of British Undergraduate Students." *Community Mental Health Journal* 53(3):344–52. doi: 10.1007/s10597-016-0052-0.
- Richardson, Thomas, Peter Elliott, and Ronald Roberts. 2013. "The Relationship between Personal Unsecured Debt and Mental and Physical Health: A Systematic Review and Meta-Analysis." *Clinical Psychology Review* 33(8):1148–62. doi: 10.1016/j.cpr.2013.08.009.
- Richardson, Thomas, Megan Jansen, and Chris Fitch. 2018. "Financial Difficulties in Bipolar Disorder Part 1: Longitudinal Relationships with Mental Health." *Journal of Mental Health* 27(6):595–601. doi: 10.1080/09638237.2018.1521920.

- Rojas, Yerko. 2022. "Financial Indebtedness and Suicide: A 1-Year Follow-up Study of a Population Registered at the Swedish Enforcement Authority." *International Journal of Social Psychiatry* 68(7):1445–53. doi: 10.1177/00207640211036166.
- Rona-Tas, Akos, and Alya Guseva. 2018. "Consumer Credit in Comparative Perspective." *Annual Review of Sociology* 44(Volume 44, 2018):55–75. doi: 10.1146/annurev-soc-060116-053653.
- Roth, Paula. 2023. "Inequality, Relative Deprivation and Financial Distress: Evidence from Swedish Register Data." *The Review of Economics and Statistics* 1–45. doi: 10.1162/rest_a_01364.
- Russell, Helen, Christopher T. Whelan, and Bertrand Maitre. 2013. "Economic Vulnerability and Severity of Debt Problems: An Analysis of the Irish EU-SILC 2008." *European Sociological Review* 29(4):695–706. doi: 10.1093/esr/jcs048.
- SSB. 2017. "Norwegian Standard Classification of Education 2016 - Revised 2000." *ssb.no*. Retrieved November 22, 2024 (<https://www.ssb.no/en/utdanning/artikler-og-publikasjoner/norwegian-standard-classification-of-education-2016>).
- ssb. n.d. "Educational Attainment of the Population." *SSB*. Retrieved November 22, 2024 (<https://www.ssb.no/en/utdanning/utdanningsniva/statistikk/befolkningens-utdanningsniva>).
- Vandone, Daniela. 2009. "From Indebtedness to Over-Indebtedness." Pp. 69–97 in *Consumer Credit in Europe: Risks and Opportunities of a Dynamic Industry*, edited by D. Vandone. Heidelberg: Physica-Verlag HD.
- Vatne, Kjersti-Gro Lindquist, Haakon Solheim, Bjørn Helge. 2022. "Personer Med Lav Inntekt Og Uten Bolig Holder Mest Av Særlig Utsatt Forbruksgjeld." Retrieved January 2, 2025 (<https://www.norges-bank.no/bankplassen/arkiv/2022/personer-med-lav-inntekt-og-uten-bolig-holder-mest-av-sarlig-utsatt-forbruksgjeld/>).
- Wiedemann, Andreas. 2021. *Indebted Societies: Credit and Welfare in Rich Democracies*. Cambridge: Cambridge University Press.