The Debt Burden of Job Loss in a Nordic Welfare State

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Abstract

Using linked employer–employee and administrative debt-enforcement records, we analyze how job loss affects debt enforcement in Finland, where up to 50% of income may be garnished for 25 years. Job loss from plant closures and mass layoffs increases the average probability of debt enforcement by 8.5%, with effects persisting through the ninth year after displacement, even as earnings partially recover. Effects are particularly large for other private debts, including installment payments, and among workers with high pre-existing debt. We also document spillover effects on spouses and children.

Keywords: job loss, debt enforcement, personal bankruptcy, spillover effects
JEL codes: D14, J63, J65, K35, I38

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1 Introduction

Losing one's job can cause a persistent decline in income (Jacobson et al., 1993). Households can cushion the income loss through savings, borrowing, and social insurance (Andersen et al., 2023), yet may find themselves unable to service their debts and other expenditures. Debt enforcement and bankruptcy rules determine what happens to these unpaid obligations. In the United States, displacement raises bankruptcy filings (Keys, 2018; Braxton et al., 2024), and bankruptcy can discharge most unsecured debt (Exler and Tertilt, 2020), acting as a form of insurance (Mahoney, 2015).[1]

The Nordic countries are close to the opposite case. Income insurance is generous, but access to debt relief is limited (Heuer, 2013), and creditors can instead collect unpaid debts from the debtor's future income for many years. In such a system, households that fall behind on payments despite social insurance may face a prolonged financial burden after job loss. Danish studies document household adjustment after job loss (Andersen et al., 2023) and loan default after unemployment (Kreiner et al., 2020), but follow these responses for only a couple of years. Whether the strict institutions governing debt enforcement can cause a persistent debt burden is therefore an open question.

Finland provides a setting to study this. While the social safety net is generous compared to many countries (Barth et al., 2014), the debt enforcement system is not. Unpaid debts are collected by the National Enforcement Authority, which can garnish 30–50% of a debtor's net income for up to 25 years. Each year, courts confirm only 3,000–4,000 debt-adjustment programs, the Finnish form of personal bankruptcy, while about half a million people are in debt enforcement (Official Statistics of Finland, 2025). Among individuals of prime working age, 15% have debts in enforcement (Official Statistics of Finland, 2024a). Those who enter debt enforcement face a strict system: garnishment is disclosed to the employer, bank accounts can be monitored, assets seized, and a public credit record restricts access to borrowing and rental housing. The debts in enforcement accumulate interest and fees that can make repayment difficult. Thus, the two key institutions facing those with labor market shocks pull them in opposite directions.

In this paper we estimate the effect of involuntary job loss on debt enforcement using linked employer–employee records and administrative debt-enforcement records covering the entire Finnish population. We identify job loss through plant closures and mass layoffs and compare displaced workers with matched workers who were not displaced, in an event-study design that follows both groups from six years before to nine years after displacement. For

[1]The same trade-off appears for unemployment insurance. Indarte (2023) describes bankruptcy as implicit insurance against events such as job loss and illness; in a typical year it forgives $189 billion of US household debt, more than unemployment insurance paid out at its 2010 peak, $139 billion.

each person and year, the enforcement records show whether any debts are in enforcement, how much is owed, and what type of debt it is: taxes, fines, alimony, social and healthcare payments, or private debts. In addition to the focal worker, we link these records to the worker's spouse, children, and parents to analyze spillover effects.

Our analysis yields six main findings. First, the earnings loss is immediate, while debt enforcement rises over several years. Earnings fall by 24.3% relative to the pre-displacement mean in the year after displacement, and the loss narrows to 6.6% by the ninth year. The effect on the probability of being in debt enforcement is 0.43 percentage points (6.3%) in the first year, reaches 0.93 percentage points (13.6%) in the sixth year, and remains at 0.72 percentage points (10.5%) in the ninth. On average, displacement raises the probability of debt enforcement by 0.58 percentage points, or 8.5% of the pre-displacement mean. Second, the effect is considerably larger for workers with more debt and less education. Third, much of the increase comes from 'other private debts', a category that includes unpaid rent, installment purchases, and unpaid pension-insurance contributions.

Fourth, job loss also increases the probability of having large amounts of debt in enforcement. Displacement raises the probability of having more than 5,000 euros in enforcement by 0.19 percentage points (11.9%) and the probability of being in enforcement in two consecutive years by 0.38 percentage points (7.4%). Among workers in debt enforcement four years before displacement, the pooled estimate indicates a 3.3 percentage-point increase in the probability of subsequent enforcement. This corresponds to a 5.1% increase relative to the pre-displacement enforcement rate of 65% in this group. Fifth, the workers who lose their jobs are not insured by bankruptcy, as documented in the US. The estimated effects on both bankruptcy applications and on started debt-adjustment procedures are statistically insignificant and economically small in absolute units: we can rule out that the increase in started bankruptcy procedures would be larger than 0.020 percentage points, or 3.4% of the effect on debt enforcement. Finally, the effects reach other family members. Job loss raises the probability of debt enforcement by 0.34 percentage points for married spouses and by 0.46 percentage points for children of the workers who lost their jobs, both statistically significant.

Our results add to three literatures. The first documents the lasting labor-market costs of job displacement.[2] Ruhm (1991) finds wage losses four years after displacement, when the initial unemployment effects have largely faded. Jacobson et al. (1993) document long-run annual earnings losses of about 25% for high-tenure workers, and Stevens (1997) shows that repeated job losses explain much of the persistence in earnings losses six or more years

[2]The literature also documents effects on crime (Rege et al., 2019), disability pension (Rege et al., 2009), mortality (Sullivan and von Wachter, 2009), self-assessed health and mental health (Kuhn et al., 2009; Schaller and Stevens, 2015), and family formation and dissolution (Charles and Stephens, 2004; Huttunen and Kellokumpu, 2016).

after displacement. Finnish evidence also documents substantial and uneven earnings losses after displacement (Korkeamäki and Kyyrä, 2014; Verho, 2020). More recent work connects these losses to job security and liquidity. Figueiredo et al. (2026) find that displacement reduces access to permanent jobs for at least five years, and that eligibility for lump-sum transfers mitigates losses in job security and wages, especially among workers with little liquid wealth. We extend this literature by showing that displacement raises the probability of debt enforcement through the ninth year, even as earnings losses narrow.

The second literature studies how labor-market shocks affect household finances. We show that job loss can lead to persistent debt enforcement. In the United States, displacement increases bankruptcy filings (Keys, 2018) and defaults (Braxton et al., 2024), mortgage delinquency (Gerardi et al., 2018), and credit-market distress (Aaronson et al., 2019), but the rise in default is short-lived (Braxton et al., 2024). In Denmark, Andersen et al. (2023) study spending, saving, and other household adjustments after job loss, while Kreiner et al. (2020) examine loan default after unemployment. Both follow these responses for two years. Our nine-year follow-up measures formal debt enforcement, including obligations outside bank credit, and shows that the effect persists through the follow-up period. Ganong and Noel (2020) show that lowering scheduled mortgage payments reduces default even when total debt is unchanged. Less is known about debts that are never restructured, which is the typical case in Finland.[3]

The third literature studies how economic shocks spread within families. Gerardi et al. (2018) find no statistically significant effect of a spouse's unemployment on an individual's default risk, and Kreiner et al. (2020) find no significant link between a child's unemployment and a parent's default. We find that job loss raises the probability of debt enforcement for married spouses and for children. To our knowledge, no earlier study of job displacement has examined financial distress-related effects running from parents to children.

The results point to a gap in the protection that the Nordic welfare state provides. Social insurance limits the loss of disposable income, yet the probability of debt enforcement is still elevated in the ninth year, and displacement does not increase the use of debt relief. In the United States, where formal insurance is less complete, debt discharge covers part of what formal insurance does not (Mahoney, 2015). In Finland, the part of the loss that income insurance does not cover stays with the household as debt in enforcement. The long-run cost of job loss therefore depends on the rules for debt enforcement and debt relief as well as on income insurance.

[3]Nordic studies of debt relief find that court-ordered relief increases earnings, employment, and wealth for more than 25 years (Bruze et al., 2024), while the Swedish restructuring program, which forgives debt only after five years of partial repayment, has adverse effects on labor-market outcomes (Beuschlein, 2025).

The paper is structured as follows. Section 2 describes the Finnish social insurance, debt-enforcement, and debt-relief rules, and section 3 develops a conceptual framework linking job loss to debt enforcement. Section 4 describes the data and sample construction. Section 5 presents the empirical strategy and results, including robustness and heterogeneity analyses. Section 6 discusses the findings, and section 7 concludes.

2 Institutional Background and Debt Enforcement

Finland, alongside other Nordic countries, is considered a strong welfare state with an emphasis on social and economic equality, universal social programs and an extensive social safety net. Public healthcare is relatively affordable, with partial reimbursement for drug purchases, and nearly 90% of wage earners benefit from occupational healthcare. Following unemployment, individuals may qualify for various social security benefits. Those with a sufficient employment history are eligible for the basic unemployment allowance or, if affiliated with a voluntary unemployment fund, a higher, earnings-related unemployment benefit (lasting 300–400 days, depending on age and employment history in 2025).

The Finnish debt-enforcement system differs substantially from the institutional settings examined in most previous studies. Cross-country differences in insolvency and debt-collection regimes are often linked to broader views about unpaid debts and the appropriate balance between debtor protection and creditor rights (Niemi-Kiesilainen, 1999; Gerhardt, 2009). Heuer (2013) characterizes the U.S. and Canadian systems as a "market model", emphasizing relatively rapid debt discharge for debtors, whereas Nordic countries operate under a "mercy model", where access to debt relief is more restrictive and debt settlement authorities play a central role in the process. In Finland, debt collection relies heavily on wage garnishment and other enforcement measures, while access to debt restructuring remains limited. As a result, individuals may remain subject to enforcement proceedings for up to 25 years, creating a markedly different environment from the U.S. system of consumer bankruptcy.[4]

When an individual becomes delinquent on debt in Finland, the creditor has the option to initiate debt enforcement, typically engaging a private collection agency for debt recovery.[5] If

[4]Approximately 70% of all consumer bankruptcies in the U.S. are filed under Chapter 7 (Fresh Start), where all unsecured debt is discharged in exchange for all non-collateralized assets above an exemption level, with no claims on future income. In Chapter 13, the debtor retains their assets but commits to a structured repayment plan for 3–5 years (e.g., Keys, 2018; Exler and Tertilt, 2020).

[5]If the private invoicing party has not received a payment by the due date, either the creditor or a collection agency may send a reminder after 14 days. If the invoice remains unpaid after another 14 days, a demand for payment, or a first collection letter, is issued. A second collection letter is dispatched 14 days thereafter. Upon receiving these collection letters, individuals have the option to negotiate a payment plan with the creditor.

this proves unsuccessful, the enforcement process is set in motion, often instigated by a court order. Following the court decision, the National Enforcement Authority takes charge of the enforcement procedure.[6] While private debts require a court decision for enforcement, debts owed to the public sector, such as healthcare payments and unpaid taxes, can be enforced without a court order (National Enforcement Authority of Finland, 2026a). The primary objective of the enforcement process is to ensure that creditors receive, at the very least, a portion of their outstanding claims. The enforcement process leaves a credit registry entry that complicates matters for the debtor, such as renting an apartment.

In cases where debts are enforceable, monetary receivables, including earnings, pensions, and various social security benefits, can be subjected to garnishment. However, only the net pay or income exceeding the protected portions, determined by the number of dependents, is eligible for garnishment. As of 2025, the protected portion per calendar month is 976.80 euros for a single debtor, with an additional 285.60 euros per dependent (National Enforcement Authority of Finland, 2025a). Depending on the individual's protected portion level and income, approximately 30% up to 50% of the net pay or income is garnished, following calculation rules established by the National Enforcement Authority. For example, a single debtor with a net monthly income of 2,000 euros would face a total garnishment amount of 677 euros (33%).[7] Garnishment also incurs a cost to the debtor for the first two years of approximately 10% of the garnished amount, functioning as a type of additional tax (National Enforcement Authority of Finland, 2026b). Real property can also be seized and auctioned to settle debts, with permanent residences and assets essential for business production being seized last.

Enforcement actions conclude either when debts are fully repaid or when the debts under enforcement reach their expiration. The expiration time varies based on whether the debt is public or private, and on the creditor's efforts to collect the outstanding amount (National Enforcement Authority of Finland, 2026c). Public debts, such as tax, alimony, daycare, and public hospital bill debts, expire five years from their due date. Conversely, the expiration period for private debts can extend up to 25 years. In cases where there is a court order regarding the debt, it will expire 15 years after the court's decision (or 20 years if the creditor is a private individual or the debt stems from a crime). Without a court decision, private debts expire in 25 years from the due date if the creditor is a private individual, and in 20 years in other cases. For both types of private debts, with or without a court ruling,

[6]Finland is considered one of the countries in the EU (together with, e.g., Sweden and Denmark) where debt collection is highly regulated with low levels of abusive non-judicial debt collection practices (Stănescu, 2021).

[7]Figure A2 in the Appendix depicts the net income after garnishment at each net income level from 0 to 8,000 euros per month.

expiration can occur if no payments are made, and the creditor does not issue reminders within intervals of either 3 or 5 years.

Finnish legislation permits personal bankruptcy in the form of debt adjustment, closely resembling U.S. Chapter 13 bankruptcy. It involves dedicating a portion of future income beyond a specified threshold towards debt repayment for approximately 3–5 years, after which the remaining debts are forgiven. Unlike the U.S. system, entry into such a program is highly restricted; individuals with debts resulting from criminal activity, reckless behavior, or violations of business regulations are ineligible for debt adjustment (Oikeus.fi, 2026). Moreover, the limited awareness among Finnish citizens about the possibility of filing for personal bankruptcy, coupled with stringent access restrictions, results in only between 3,000–4,000 programs being confirmed by the court annually (Official Statistics of Finland, 2025), compared to around half a million individuals being in debt enforcement annually.

Approximately 10% of the total population have enforced debts, and this share has remained stable within the last 15 years. According to the annual statistics by the National Enforcement Authority of Finland (National Enforcement Authority of Finland, 2025b), 51% of new individual debtors in the enforcement process managed to pay their debts during the same calendar year when they became a customer of the enforcement system. Approximately 35% of debtors during the calendar year had debts of 1,000 euros or less in enforcement. About 67% had debts of 10,000 euros or less, and only 10% had large debts exceeding 50,000 euros. The mean value of enforced debts is approximately 1,500 euros. Of all collected debts, the garnishment of recurring income, i.e. salary, pension and business income, corresponds to around 49% of the collection result. Around 10% of collected debts were accumulated from the realization of assets. Finally, around one-third of all individuals in enforcement make payments on their debts through wage garnishment.

3 Conceptual Framework

When income falls, households cannot immediately reduce payments on existing debts, and not all consumption is adjustable in the short run. Unemployment insurance and other social insurance programs can replace a part of the lost income and may therefore prevent some households from becoming financially distressed (Gruber, 1997). Finland provides substantial social insurance through relatively long unemployment-benefit durations, other cash benefits, and public health insurance.

After displacement, households can reduce consumption, use up liquid assets, borrow, postpone payments, or seek financial support from family and other relatives. Borrowing can move the adjustment forward in time, while households with little liquidity might have to let

bills go unpaid. Consistent with this, research from the US shows that unconstrained workers borrow after layoff, whereas constrained workers default and reduce debt (Braxton et al., 2024). Scheduled payments matter separately from net wealth: reducing near-term mortgage payments lowers default even when long-run principal is unchanged (Ganong and Noel, 2020). The same earnings loss should therefore have larger financial effects when pre-existing debt is high or liquid buffers are small. Family resources, especially help from a spouse, can help replace the income lossess but shared budgets, obligations and loan guarantees can also transmit distress within the household.

A missed payment does not immediately show up in debt enforcement. Lower earnings can slow repayment of debts already in enforcement, while interest and fees add to the balance, prolonging enforcement even as earnings recover.

Personal bankruptcy can limit the financial consequences of income loss by allowing debts to be discharged (Mahoney, 2015). Access to personal bankruptcy is more restricted in Finland than in the United States (Oikeus.fi, 2026). These institutional differences change how a common shock may appear in administrative data. In the United States, job loss can produce an immediate bankruptcy filing; in Finland, the same initial strain may remain in enforcement while the debtor repays over time.

This simple framework offers some predictions, which help us organize the paper. After job loss, earnings should respond immediately, while debt enforcement may rise only after missed payments pass through collection. Effects should be larger among workers with substantial prior debt or limited buffers. If access to personal bankruptcy is limited, the debt enforcement can stay elevated for a long period. Shared resources and liabilities may cause the effects to spill over to relatives.

3.1 Descriptive Motivation

Figure 1 illustrates debt-enforcement prevalence among individuals aged 26–63 by age and whether they were unemployed during the previous two years. The probability of being in debt enforcement peaks during prime working years and decreases near retirement age. Through most prime working ages, individuals with recent unemployment are substantially more likely to be in debt enforcement than those without it—approximately 25% versus 10%. This descriptive pattern motivates the causal analysis below.

A small, nonrepresentative survey we conducted with the Guarantee Foundation offers complementary descriptive evidence. Nearly 70% of its 208 respondents cited job loss or low income as contributing to their debt problems (figure A1).

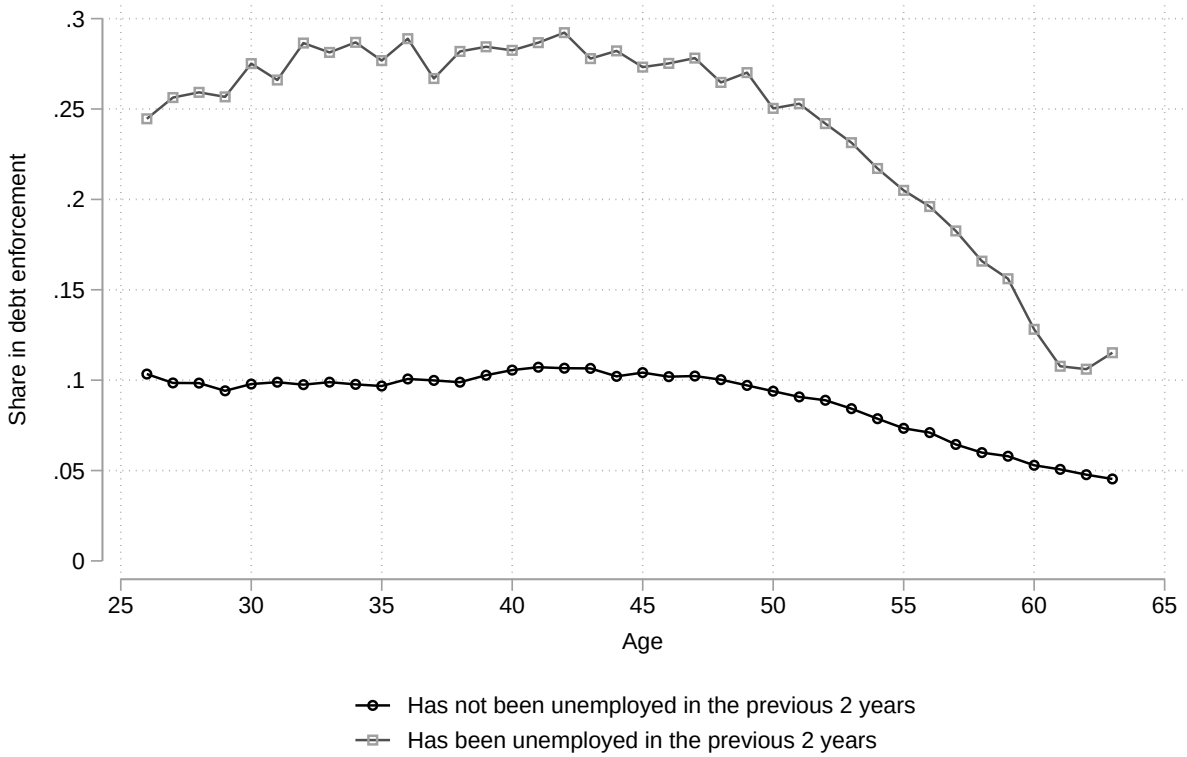


Figure 1: Debt Enforcement by Age and Recent Unemployment

Notes: The figure reports the prevalence of debt enforcement among individuals aged 26–63, separately by age and whether they were unemployed during the previous two years.

4 Data

4.1 Data Sources

We use administrative data compiled by Statistics Finland. The FOLK module provides background information for the entire population on wages, employment, other activities, and total debts. The Business Register provides firm and plant identifiers and industry classifications. These datasets are linked together through unique identification codes. We use the linked worker–plant records to construct plant employment counts and identify plant closures and mass layoffs. Our analysis covers the years 2007–2017 to identify layoffs, with data beyond this period used to evaluate pre-trends and effects on debt enforcement. Earnings outcomes are observed through 2018. We focus on the working-age population, specifically individuals aged 35–55 two years before displacement.

The matched employee–employer data are further linked with information on enforcement from the National Enforcement Authority of Finland. These register-based data provide monthly updates on outstanding debts, payments, and the specific type of debt undergoing enforcement. Debt types are categorized by legal classifications, though some debt types may not be explicitly identified. The debt types variable features 122 levels, which we aggregate into seven categories for our analysis. These categories encompass enforced debts related to taxes, social and healthcare payments, alimony, penal orders and fines, loans and insurance, real property payments, and other private debts (see Table A2 in the Appendix for more details). While the full dataset from the National Enforcement Authority covers the years 2008–2019, precise information on debt types is available only for the years 2008–2015.

4.2 Dependent Variables: Debt Enforcement

Our primary outcome is an indicator equal to one if an individual has any debts in enforcement in a given year. It measures the prevalence of enforcement, including small unpaid invoices, and does not distinguish new cases from recurrent or continuing ones. To distinguish larger balances and persistent enforcement, we use three additional outcomes. The first is an indicator variable signaling whether an individual has over 1,500 euros [8] in enforcement. To ensure comparability, the euro values are adjusted to 2016 prices using the GDP deflator. Second, to measure persistent enforcement, we use an indicator equal to one if an individual is in debt enforcement in both year $t-1$ and year t. This outcome is observed from 2009 through 2019. Third, we use an indicator for having more than 5,000 euros in enforcement.

[8] This is roughly the average amount of debt in enforcement in the general population (among those with enforced debts).

We measure personal bankruptcy[9] with two annual indicators: applying for personal bankruptcy, observed in 2008–2018, and the start of a personal bankruptcy procedure, observed in 2008–2019.

4.3 Involuntary Job Loss and Sample Construction

We follow the previous literature and identify displaced workers as individuals separated from their private-sector jobs following a plant closure or mass layoff, where at least 30% of the employees have been laid off. To address potential endogeneity concerns related to firm restructuring, we adopt a more restrictive definition of plant closure. Specifically, a plant closure is not considered genuine if a worker remains employed within the same firm after the closure, or if at least 50% of displaced workers from the same plant move to another firm the following year (Eriksson et al., 2018). This distinction allows us to differentiate genuine plant closures from potential firm mergers and other organizational changes.

The year of displacement is denoted by b (the base year). To define the pre-displacement sample, we consider wage earners working in year $b-1$ in plants with more than 20 but fewer than 7,000 employees.[10] The underlying assumption of the model is that displacement constitutes an exogenous labor market shock that is independent of the worker's own behavior. However, in very small plants, we acknowledge the possibility that workers themselves could influence the probability of displacement. We also impose an upper limit of 7,000 employees, as larger plants may represent outliers, exert disproportionate influence on the sample, or result from multiple plants being incorrectly classified as a single establishment. Accordingly, individuals included in the sample must have worked at the same plant for at least four years before year $b-1$, with positive earnings and year-end employment in each of the four preceding years and 12 months of employment in each of the last three. This criterion ensures that our sample comprises individuals with a strong and stable attachment to both the labor market and their employer, thereby reducing noise arising from short-term employment relationships. Although this restriction limits the representativeness of the sample relative to the broader workforce, it sharpens the treatment definition: we examine a sudden deterioration in labor market situation from a stable starting point rather than continued exposure to volatile earnings and uncertain employment prospects.

In our main analysis, we include job-to-job transitions in the sample, acknowledging that

[9]The Finnish legal term for this procedure is debt adjustment; see section 2.

[10]We limit our sample to plants that employ more than 20 workers prior to the layoff, following Huttunen et al. (2018) and Salvanes et al. (2024), among others. Previous studies have used thresholds as low as five employees (Huttunen and Kellokumpu, 2016) and as high as 50 employees (Schmieder et al., 2023). While we choose 20 as a compromise between sample representativeness and identification credibility, our results are robust to alternative thresholds.

displaced workers may not necessarily become unemployed or otherwise non-employed. Unless stated otherwise, all our estimates use this treatment definition.

Our control group comprises employees who are similar to treated individuals in pre-treatment characteristics, drawn from the large pool of individuals who are never displaced due to plant closure or mass layoff. For each treated individual, we construct a control group using only never-treated observations, thereby avoiding biases that arise in staggered difference-in-differences settings when already-treated units are used as controls (Callaway and Sant'Anna, 2021; Goodman-Bacon, 2021). Following previous literature (e.g., Schmieder et al., 2023), we stack these treated–control comparisons across cohorts. To implement this approach, we match up to three control units to each treated individual based on pre-treatment characteristics using coarsened exact matching (CEM). Matching variables include the year of the shock/placebo shock, age (two categories: 36–44 and 45–56 in year $b-1$), industry (coarsened), and level of education. Industry classification follows Statistics Finland's Standard Industrial Classification TOL 2008. These variables are chosen for their predictive power regarding earnings trajectories and debt enforcement, enhancing the suitability of the matched control group as a counterfactual for displaced workers. After the age restriction, the estimation sample contains 52,580 treated worker–cohort records and 157,740 control worker–cohort records in year $b-2$. We do not balance the panel in event time, implying that some individuals are not observed over the full event window used to estimate dynamic effects.

For family members, the outcome indicates whether the family member is in debt enforcement, and the sample consists of workers who have that family member. Married spouses are identified in year $b-2$ and cohabiting partners, who include married spouses, in year $b-1$; both are followed over the whole event window. Children of any age and parents come from the FOLK parent–child links, and the outcome equals one if any child, or either parent, is in debt enforcement.

4.4 Descriptive Statistics

Table 1 presents descriptive statistics for our sample, demonstrating the comparability between our treatment and control groups in both matched and non-matched variables in the year $b-2$. While not mandated by the identification assumptions, this alignment strengthens our confidence that the control group serves as a credible counterfactual to the treatment group. The individuals in our sample have an average age of 45, with approximately 64% being male[11] and 59–62% being married. Almost 50% have only secondary education, and

[11]Approximately 50% of women in Finland are employed in the public sector, resulting in a higher representation of men in our sample of displaced and non-displaced workers in the private sector.

the average working tenure in the same establishment is close to eight years.

The pre-displacement earnings average 45–46 thousand euros annually and total debts (such as mortgages) average 42–44 thousand euros. The ratio of total debt to annual earnings is between 127% and 145%, which is comparable with the statistics for the entire Finnish population (Official Statistics of Finland, 2024b). The proportion of workers who have debts enforced is approximately 6–7%, significantly below the Finnish average (10%). This suggests that many individuals with enforced debts lack a stable and strong attachment to the labor market. The average amount subject to enforcement is 460 euros for the control group and 670 euros for the treatment group.

Table 1: Descriptive Statistics Before Displacement

	Treated (1)	Control (2)
Demographic characteristics		
Age	45.21	45.24
Male	0.64	0.64
Married	0.59	0.62
Cohabiting	0.73	0.75
Number of children under age 18	0.90	0.93
Education level		
Primary education	0.15	0.15
Secondary education	0.49	0.49
Higher education	0.36	0.36
Work-related characteristics		
Tenure (years)	7.73	7.99
Annual earnings (thousand euros)	45.02	46.49
Debt variables		
Overall debt (thousand euros)	42.23	44.14
In debt enforcement	0.07	0.06
In debt enforcement, at least 1,500 euros	0.02	0.02
In debt enforcement, more than 5,000 euros	0.02	0.01
In debt enforcement for two consecutive years	0.05	0.04
Amount in debt enforcement (thousand euros)	0.67	0.46
Debt-to-income ratio	1.45	1.27
Establishment characteristics		
Establishment personnel under 100	0.47	0.44
Sales under 400 thousand euros	0.09	0.08
Observations	52,580	157,740

Notes: Columns 1 and 2 report means for treated workers and matched controls, respectively. Nominal values are adjusted to 2016 prices using the GDP deflator. Means are calculated in year $b-2$.

4.5 Specification

We examine the effect of job displacement on the probability of being in debt enforcement as follows:

$$Y_{it} = \alpha_i + \sum_{j=-6, j\neq -2}^{9} \delta_j \times I(t = b+j) \times Treat_i + \sum_{j=-6, j\neq -2}^{9} \gamma_j \times I(t = b+j) + \theta_t + \rho_{it} + \varepsilon_{it}. \quad (1)$$

where i denotes individual, and $Treat_i$ gets a value of one if individual i is in the treatment group, i.e. experienced job displacement in year b, and gets a value of zero for the control group. The coefficient of interest is the coefficient for event time I and the treatment status, δ_j. We follow individuals from six years before displacement through nine years after displacement. For different debt types, the event-study estimates run through the seventh year after displacement. We use event time $b-2$ as reference period. In equation (1), α_i denotes individual fixed effects, θ_t calendar year fixed effects, and ρ_{it} age fixed effects. Under the assumption that the control group and treatment group would in absence of treatment develop in parallel (conditionally on time and individual fixed effects), the coefficient δ_j identifies the causal effect of the shock. Error term ε_{it} is clustered at the individual level, as is standard in the plant closure designs (e.g., Andersen et al., 2023). The panel is unbalanced in event time, as some individuals are not observed for the entire estimation period.

Accordingly, the basic difference-in-differences (DD) model is estimated as follows:

$$y_{it} = \alpha_i + \beta treat_i + \gamma post_{it} + \delta treat_i \times post_{it} + \theta_t + \rho_{it} + \varepsilon_{it}. \quad (2)$$

In equation (2), $post_{it}$ is an indicator equal to 1 if individual unit observation belongs to the post-shock period, and parameter δ represents the average treatment effect over the years on the outcomes.

5 Results

5.1 Main Results

In this section, we present our primary findings on debt enforcement and earnings. All the effects in the figures are expressed as changes (%) from the pre-shock (period *b-2*) mean, although estimated in levels. Our event-study regression results are illustrated in Figure 2, and the average treatment effects on the treated over the post-displacement years are reported in Table 2. As an additional outcome, we also report the impact of job displacement on

subsequent earnings, which provides an important benchmark of broader economic costs of job loss. None of the pre-displacement estimates for the probability of debt enforcement is statistically significant, although there are small, statistically significant pre-displacement differences in earnings.

Using an indicator variable for being in debt enforcement, we find that job displacement increases the probability by 0.93 percentage points, or 13.6% relative to the pre-displacement mean, in year *b+6*. The effect persists, with displaced workers still having a 10.5% higher probability of being in debt enforcement in year *b+9*. The effects are statistically significant throughout years *b+1* to *b+9*. The effects on the probability of having at least 1,500 euros in enforcement and of being in enforcement for two consecutive years are also positive and statistically significant. The probability of having more than 5,000 euros in enforcement increases by 11.9% on average. Table 2 reports an average increase in the debt-enforcement probability of 0.58 percentage points, or 8.5%.

We posit that a crucial factor linking job displacement to debt enforcement is the loss of earnings. While we acknowledge the potential influence of health-related or social factors, we emphasize the significance of income loss as the primary channel. As illustrated in Figure 2, wage earnings fall by 24.3% in the year after job loss, consistent with previous research from the Nordic countries (e.g., Korkeamäki and Kyyrä, 2014; Verho, 2020; Bertheau et al., 2023). Although the negative wage effect is statistically significant and persistent, it diminishes over time. Nine years after displacement, wages remain 6.6% lower for displaced workers than for the control group. However, when considering disposable income, including social transfers minus taxes, the impact is considerably attenuated: disposable income falls by 10.5% in the year after job loss (Figure A3). This pattern suggests that the Nordic welfare state plays an important compensatory role, as income support and social insurance mechanisms partially offset the loss of earnings after job loss (see also Rabaté et al., 2025).

The results on the effect of job loss on debt enforcement are subjected to several robustness and sensitivity checks, including alternative estimation samples and model specifications (Table A1). First, following Keys (2018) for potential insights into mechanisms, we estimate the model conditional on being non-employed in the year after displacement (*b+1*). The average effects are larger for each outcome (Figure A4). These findings do not provide direct evidence on the causal effect of weak labor market attachment on debt enforcement. Rather, they indicate that this subgroup experiences both a larger decline in earnings and a more pronounced increase in the probability of debt enforcement.

Second, as emphasized by Sullivan and von Wachter (2009), the quasi-random event occurs at the firm level, necessitating stronger assumptions for the displacement variable to be considered exogenous. We therefore also estimate the effect of firm-level layoffs without

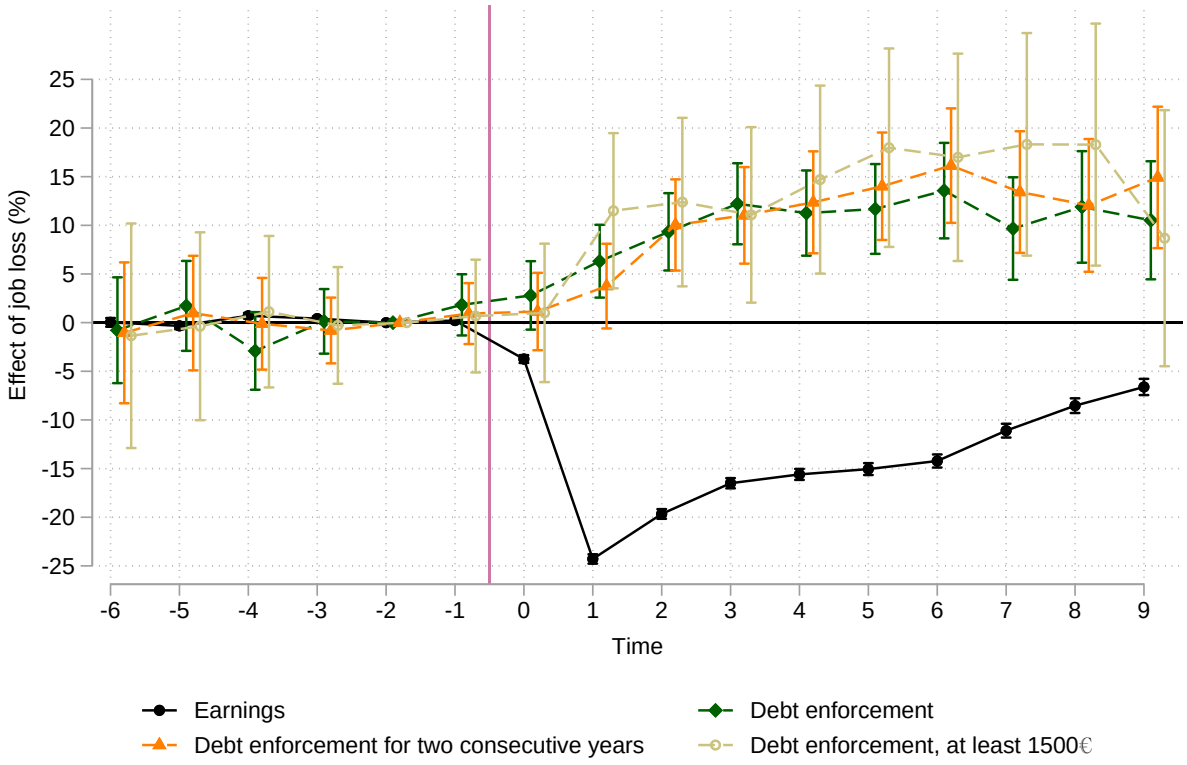


Figure 2: Effects of Job Loss on Earnings and Debt Enforcement

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement.

Table 2: Average Effects of Job Loss on Earnings and Debt Enforcement

	Earnings (1)	Debt enforcement (2)	Two consecutive years (3)	At least EUR 1,500 (4)	More than EUR 5,000 (5)
Post × treated	−6,828.7***	0.00581***	0.00384***	0.00222***	0.00185***
	(95.09)	(0.00109)	(0.00106)	(0.000748)	(0.000689)
Observations	1,963,567	2,118,760	1,999,500	2,118,760	2,118,760
Pre-treatment mean	45,017	0.0685	0.0516	0.0202	0.0156
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Age fixed effects	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes

Notes: Average DD estimates compare $b-6$ to $b-2$ with b to $b+9$; $b-1$ is excluded. Earnings cover 2008–2018, other outcomes 2008–2019 (consecutive enforcement: 2009–2019). Pre-treatment means are for treated workers at $b-2$. Standard errors in parentheses are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

conditioning on workers' separation from the firm. These estimates are qualitatively similar to those reported in Figure 2, though smaller in magnitude (Figure A5). This definition includes workers who stay at the firm; one pre-displacement enforcement estimate is also statistically significant. In addition, we vary the matching variables, exclude plants with fewer than 50 employees, and restrict the analysis to balanced panels (columns 2–5 of Table A1). The average effects remain statistically significant and consistent with our main findings.

5.2 Workers Already in Debt Enforcement

We examine whether job loss raises subsequent enforcement among workers in debt enforcement in year *b-4*. This sample contains only workers displaced in 2012 or later because enforcement records start in 2008. Job displacement increases their probability of being in debt enforcement by 3.3 percentage points, or 5.1% relative to the pre-displacement mean (Figure A6). This may reflect a continuing spell or a return to enforcement. Job loss has no statistically significant effect on the probability of having at least 1,500 euros or more than 5,000 euros in enforcement in this group.

5.3 Debt Types

Figure 3 presents our event-study regression results for each of the seven enforced debt types, while Table 3 reports the corresponding average treatment effects. Our data for detailed debt types cover the years from 2008 to 2015, and we track individuals for seven years after displacement. Other private debts are the only debt type with a statistically significant average effect: job displacement increases the probability of enforcement by 0.31 percentage points. This category includes unpaid rents, installment purchases, and claims for statutory earnings-related pension insurance (TyEL) contributions. The effect persists throughout the follow-up (Panel G of Figure 3).

For unpaid taxes, the annual estimates are significant in the second through sixth years after displacement, although the average effect is not (Panel C). Penal orders and fines also show increases in some years, but no statistically significant average effect. Taxes and fines can be enforced without a court judgment, whereas private claims generally require one (section 2). We find no significant post-displacement effects on loans and insurance, alimony, social and healthcare costs, or real property payments. The lack of an effect on healthcare-related debts is plausibly explained by Finland's generous and cost-effective healthcare system, although one pre-displacement estimate for this outcome is statistically significant.

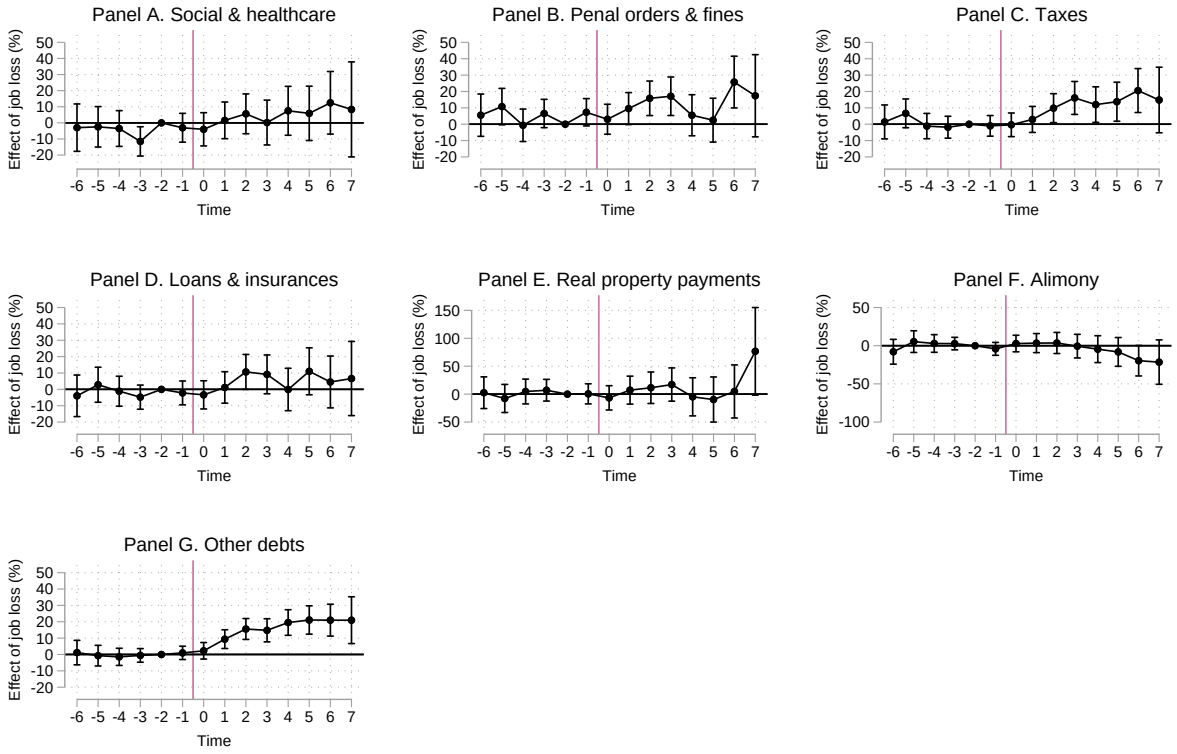


Figure 3: Effects of Job Loss on Debt Enforcement by Debt Type

Notes: Estimates are percentage changes from the pre-shock (b-2) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement. Detailed debt types are observed in 2008–2015; estimates run through year b+7.

Table 3: Average Effects of Job Loss by Type of Debt

	Social and health (1)	Fines (2)	Taxes (3)	Loans and insurance (4)	Real property payments (5)	Alimony (6)	Other private (7)
Post × treated	0.000280	0.000872	0.000813	0.000616	0.0000311	−0.00000802	0.00312***
	(0.000679)	(0.000785)	(0.000870)	(0.000767)	(0.000369)	(0.000545)	(0.00105)
Observations	1,379,248	1,379,248	1,379,248	1,379,248	1,379,248	1,379,248	1,379,248
Pre-treatment mean	0.0141	0.0207	0.0265	0.0182	0.00339	0.00914	0.0405
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each column reports the average difference-in-differences estimate for the probability of debt enforcement in the indicated category. The pre-treatment mean is calculated for treated workers at event time $b-2$. Standard errors, clustered at the individual level, are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.4 Heterogeneity Analyses

We conduct several heterogeneity analyses to examine how the effects vary across different individual groups. To this end, we add an interaction between a characteristic indicator (e.g., male versus female) and the treatment in Equations (1) and (2). The heterogeneity analyses are performed based on gender, education level (higher education versus other), marital status, and age group (under 45 versus 45 or older). Building on Keys (2018), we also compare workers whose total debt before displacement is above the median among displaced workers with those below the median. Figure 4 plots the differences in average effects between groups, while Figure A7 presents the event-study estimates. In Table 4, we report both the baseline and interaction estimates for each specification.

Column 2 of Table 4 displays the results by education level. Based on the highest completed degree, individuals were categorized into low education (primary or secondary education, ISCED levels 1–4) and high education (some tertiary education, ISCED levels 5A, 5B and 6). Job displacement increases the probability of debt enforcement by 0.83 percentage points over the post-treatment period for individuals with lower education levels, compared with an implied effect of 0.19 percentage points for highly educated workers. The difference is statistically significant. We find no statistically significant differences in the average effect by gender, marital status, or age.

The results also suggest larger effects among workers with higher pre-displacement debt (column 5 of Table 4). The implied effect is 0.85 percentage points for workers with above-median debt, compared with 0.36 percentage points for those below the median. However, workers with above-median debt differ in more than their debt, so this comparison does not isolate a mechanism. Moreover, the event-study estimates show pre-displacement differences between the groups, and none of the annual post-displacement differences is statistically significant. Part of the significant average difference may therefore reflect pre-displacement differences.

5.5 Extensions: Spillover Effects and Bankruptcy Procedure

We further explore the effects of job displacement on debt enforcement within a family. First, we examine whether an individual's job displacement increases the probability that their spouse is in debt enforcement, following Gerardi et al. (2018). Second, we study intergenerational effects by investigating the impact on an individual's parents and children. The event-study regression estimates are illustrated in Figure 5, while the average DD effects are reported in Table 5.

Panel A of Figure 5 illustrates the spillover effects on a spouse. Job displacement increases

Table 4: Heterogeneity in the Effect of Job Loss on Debt Enforcement

	Male (1)	Higher education (2)	Unmarried (3)	Under age 45 (4)	High debt (5)	High debt-to-income (6)	Enforcement at $b-4$ (7)
Post × treated	0.00397**	0.00832***	0.00532***	0.00658***	0.00361**	0.00319**	0.00618***
	(0.00164)	(0.00161)	(0.00126)	(0.00143)	(0.00155)	(0.00154)	(0.000946)
Post × treated × group	0.00290	−0.00643***	0.00196	−0.00150	0.00492**	0.00543**	0.0270***
	(0.00218)	(0.00202)	(0.00248)	(0.00219)	(0.00216)	(0.00215)	(0.00930)
Observations	2,118,760	2,118,760	2,118,760	2,118,760	2,118,760	2,118,459	1,282,267
Pre-treatment mean	0.0685	0.0685	0.0685	0.0685	0.0685	0.0685	0.0685
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The first row reports baseline-group effects; interactions report differences from these groups. Baseline groups are female, lower education, married, age 45 or older, below-median debt, below-median debt-to-income, and not in enforcement at $b-4$, respectively. Column 7 requires observed enforcement status at $b-4$. Pre-treatment means are for treated workers at $b-2$. Standard errors in parentheses are clustered at the individual level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

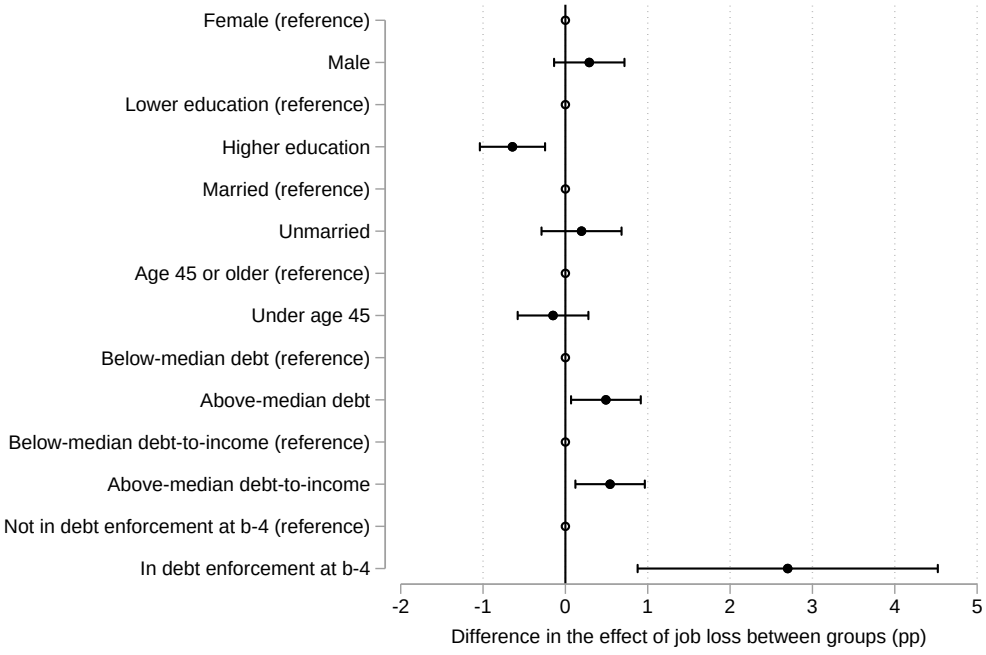


Figure 4: Differences in Average Debt Enforcement Effects Across Worker Groups

Notes: Interaction estimates from Table 4, in percentage points, with 95 percent confidence intervals. Hollow markers denote reference groups. Regressions include year, age and individual fixed effects. Standard errors are clustered at the individual level.

a married spouse's probability of debt enforcement by 0.34 percentage points on average (column 2 of Table 5). The average effect is statistically significant, while the estimate for cohabiting partners, a sample that also includes married spouses, is smaller and not statistically significant (column 3). We do not observe intergenerational effects on parents (Panel B). Some intergenerational effects run from parents to their children (Panel C): although most annual estimates are not statistically significant, the average DD effect is a statistically significant increase of 0.46 percentage points (column 4).

Finally, we link our results more closely to the literature from the United States, where job displacement increases bankruptcy filings (Keys, 2018; Braxton et al., 2024). We examine the effect of job displacement on personal bankruptcy procedure starts and applications. Figure 5 (Panel D) and Table 6 support an economically precise zero effect in absolute terms. For procedure starts, the approximate 95% confidence interval runs from -0.015 to $+0.020$ percentage points, and for applications from -0.025 to $+0.025$ percentage points. Relative changes appear larger only because baseline rates are very low. For instance, the upper confidence bound for procedure starts, 0.020 percentage points, is about 3.4% of the estimated 0.58 percentage-point increase in debt enforcement (Table 2). Thus, although job displacement increases the probability of debt enforcement, our estimates suggest little additional use of personal bankruptcy in response.

Table 5: Average Family Spillover Effects of Job Loss

	Either parent (1)	Married spouse (2)	Cohabiting partner (3)	Child (4)
Post × treated	−0.00122	0.00335***	0.00197	0.00456***
	(0.00104)	(0.00126)	(0.00121)	(0.00149)
Observations	1,592,362	1,298,857	1,579,824	1,643,246
Pre-treatment mean	0.0462	0.0569	0.0662	0.085
Year fixed effects	Yes	Yes	Yes	Yes
Age fixed effects	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes

Notes: Each column reports the average difference-in-differences estimate for debt enforcement among the indicated family members. Column 2 uses the married-spouse sample; column 3 uses the cohabiting-partner sample, which includes married spouses. The pre-treatment mean is calculated for treated workers at event time $b-2$. Standard errors, clustered at the displaced worker level, are in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table 6: Average Effects of Job Loss on Personal Bankruptcy Procedures

	Procedure started (1)	Bankruptcy application (2)
Post × treated	0.0000253	−0.000000308
	(0.0000872)	(0.000128)
Observations	2,118,760	1,963,567
Pre-treatment mean	0.000399	0.000799
Year fixed effects	Yes	Yes
Age fixed effects	Yes	Yes
Individual fixed effects	Yes	Yes

Notes: Average DD estimates for procedure starts (2008–2019) and applications (2008–2018). Pre-treatment means are for treated workers at $b-2$. Standard errors in parentheses are clustered at the individual level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

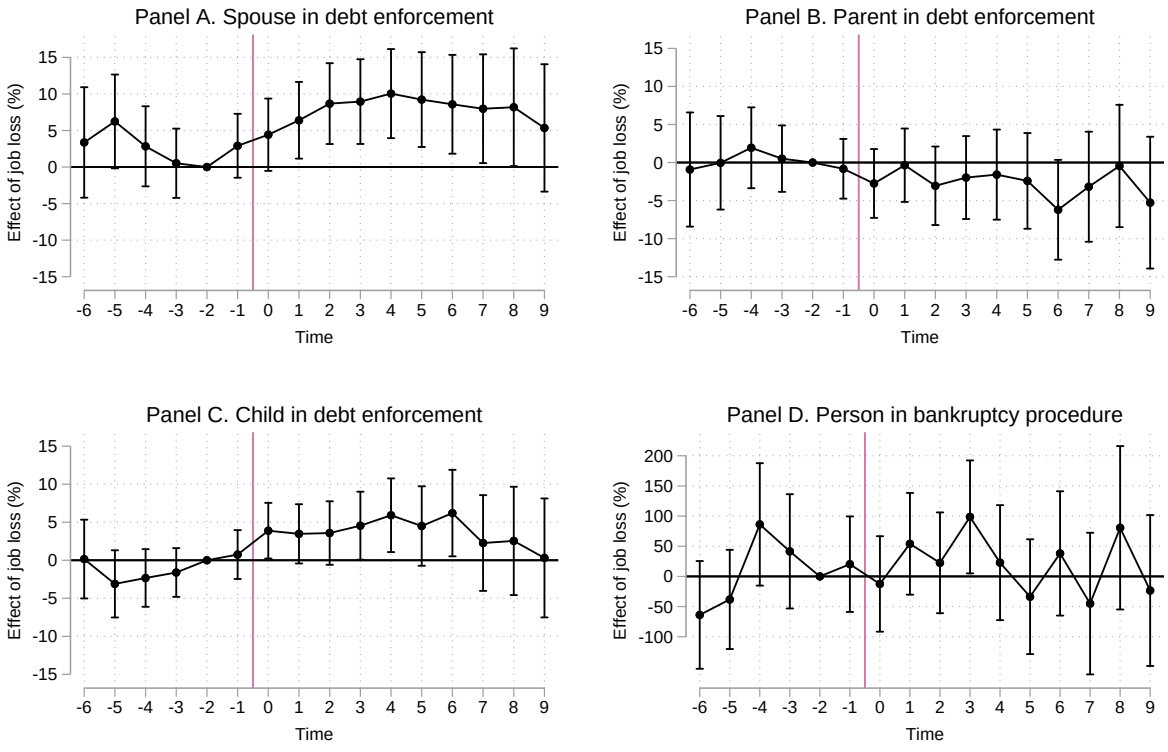


Figure 5: Effects of Job Loss on Family Debt Enforcement and Personal Bankruptcy

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement. Outcomes are debt enforcement among family members (Panels A–C) and personal bankruptcy procedure starts (Panel D).

6 Discussion

Around 15% of prime working-age individuals in Finland are subject to debt enforcement, making it a significant public issue. We find that a negative shock, in the form of exogenous job loss, increases the probability of being in debt enforcement by an average of 0.58 percentage points, or 8.5%, over the post-displacement years. These estimates concern private-sector workers aged 35–55 two years before displacement, with stable prior employment at the same plant. Following a displacement shock, the prevalence of debt enforcement rises over several years and remains elevated through the nine-year follow-up. The effects also extend to the indicators for larger enforcement balances and enforcement in consecutive years. This contrasts with the earnings effect, which is greatest in the first year following job loss and gradually diminishes towards the end of the follow-up period. We contrast these findings with previous comparable studies.

In the U.S., Aaronson et al. (2019) show that job loss following a mass layoff increases credit card delinquency and overdrafts. We find a persistent increase in enforcement for other private debts. Formal enforcement follows earlier stages of delinquency and collection (see section 2). Differences in outcomes, baseline prevalence, and follow-up horizons prevent a direct ranking of the Finnish and U.S. effect sizes. Aaronson et al. (2019) and Braxton et al. (2024) find that some individuals who face job loss in a mass layoff take on more debt. Braxton et al. (2024) show that around one-third of individuals borrow, while another one-third deleverage or default. These diverging behaviors could explain the increase in debt enforcement. When we examine the effect of displacement on personal bankruptcy, the estimates are economically small in absolute probability units in the Finnish context. This result stands in stark contrast to the systematic finding of a steep and immediate increase in bankruptcies following job loss in the U.S. (Keys, 2018; Braxton et al., 2024).

The institutional setting helps interpret this pattern. First, the outcomes differ: we observe formal debt enforcement, while U.S. studies have often focused on credit card delinquencies. Second, the Finnish institutional setting differs significantly from the U.S. context. While the Nordic welfare state provides substantial income transfers to the unemployed, potentially alleviating financial distress, it is relatively strict in allowing for bankruptcy. DeFusco et al. (2024) report that, by 2019, more than 1% of U.S. private-sector workers were subject to garnishment for delinquent debt, while the corresponding share in Finland is substantially higher. Our economically small estimate for personal bankruptcy after job loss suggests that a quick transition to bankruptcy is not an option available to most individuals under the Nordic model. The possibility of defaulting without fulfilling the entire debt obligation operates as a form of social insurance and could substitute for other social insurance policies

(Braxton et al., 2024).

Third, our longer follow-up period provides valuable insight into long-term debt dynamics. Unfortunately, we do not currently have similar evidence from other countries for comparison. Another key distinction between the U.S. and Finland is the source of debts. In the U.S., medical debt is a significant component of household debt (Domowitz and Sartain, 1999; Dobkin et al., 2018). We find no statistically significant effect on enforcement for unpaid social or healthcare bills in Finland. This difference may reflect Finland's affordable public healthcare system. Instead, the effects are concentrated in other private debts, and enforcement for unpaid taxes increases in the second through sixth years after displacement.

We also contribute to the literature by providing novel evidence on spillover effects within families. Gerardi et al. (2018) find no significant correlation between a spouse's exogenous unemployment and an individual's default risk. In contrast, we find that an individual's job loss increases the probability that their married spouse is in debt enforcement. Kreiner et al. (2020) document a strong intergenerational relationship in default propensities but do not find a statistically significant link between a child's unemployment and a parent's likelihood of default. To our knowledge, no prior studies of job displacement have examined intergenerational effects in the opposite direction. Our results suggest that an individual's job displacement also increases a child's probability of debt enforcement. Whether this is driven by reduced financial transfers from parents, leading to a decline in the child's income, remains an open question for future research.

Finally, our findings can also be viewed through the lens of theories of household defaulting behaviour. While so-called strategic-default models emphasize the incentives to apply for bankruptcy or other form of debt relief when doing so is financially useful, adverse-events models emphasize the role of shocks that reduce the debtor's abilities to meet existing financial obligations (Fay et al., 2002; Zhang et al., 2015).[12] Although we cannot directly test which theory predominates, the persistent increase in debt enforcement following a job loss is consistent with the latter view.

[12]If most bankruptcies result from adverse events rather than strategic behavior, more lenient default or bankruptcy legislation may be viewed as a form of social insurance against unforeseen shocks. Conversely, excessively strict enforcement procedures may weaken repayment incentives and also reduce debt recovery (Livshits et al., 2007). If defaults are instead driven primarily by strategic considerations, stricter bankruptcy legislation may deter opportunistic default and alleviate moral hazard.

7 Conclusion

This study examines how involuntary job loss affects the probability of debt enforcement using population-wide Finnish administrative data and a research design based on plant closures and mass layoffs. Finland combines extensive social insurance with a stringent enforcement process in which future earnings can be garnished and private claims can remain enforceable for decades. This setting shows how a temporary labor-market shock can lead to persistent debt enforcement even when the welfare state cushions the initial income loss.

Job displacement substantially increases the probability of being in debt enforcement, and the effect persists as earnings recover. The effects are larger among workers with lower education and with above-median pre-existing debt, and are concentrated in other private debts. Job loss also raises the probability of debt enforcement for married spouses and children. By contrast, job loss produces little movement into formal bankruptcy or debt restructuring in absolute probability units. Taken together, these results show that social insurance and debt relief protect different margins: income replacement softens the earnings shock, while the enforcement and restructuring systems shape the persistence of debt enforcement.

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Appendix

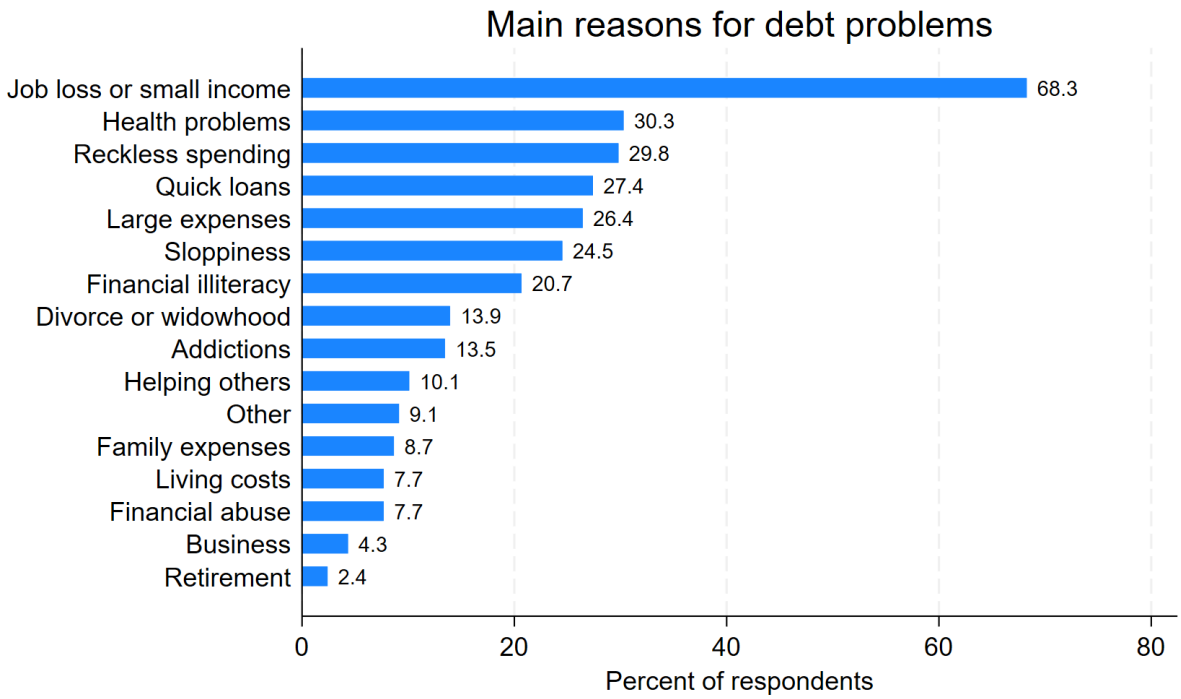


Figure A1: The Main Reasons for Debt Problems, Multiple Choices Allowed

Notes: The calculations are based on data on 208 respondents from the survey conducted by the Guarantee Foundation.

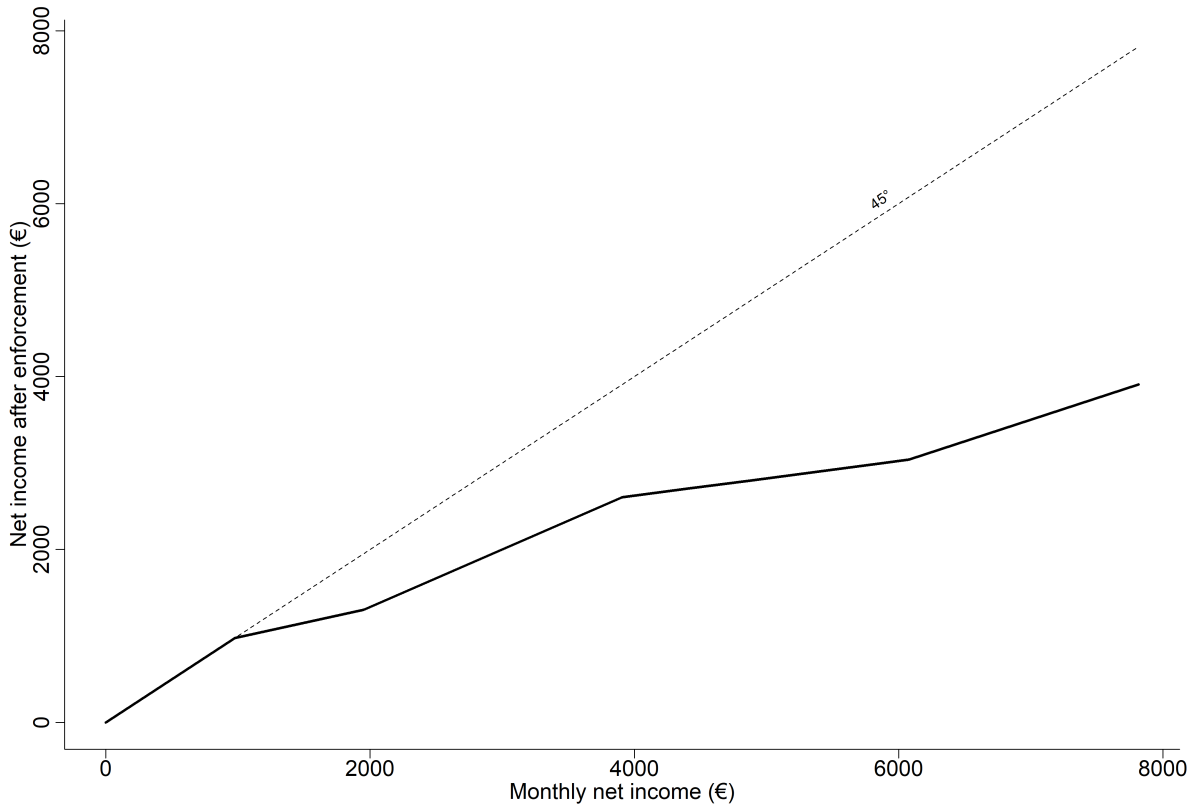


Figure A2: Net Monthly Income After Enforcement by Income Level

Notes: Authors' calculations for a debtor with no dependents under the 2025 rules of National Enforcement Authority Finland.

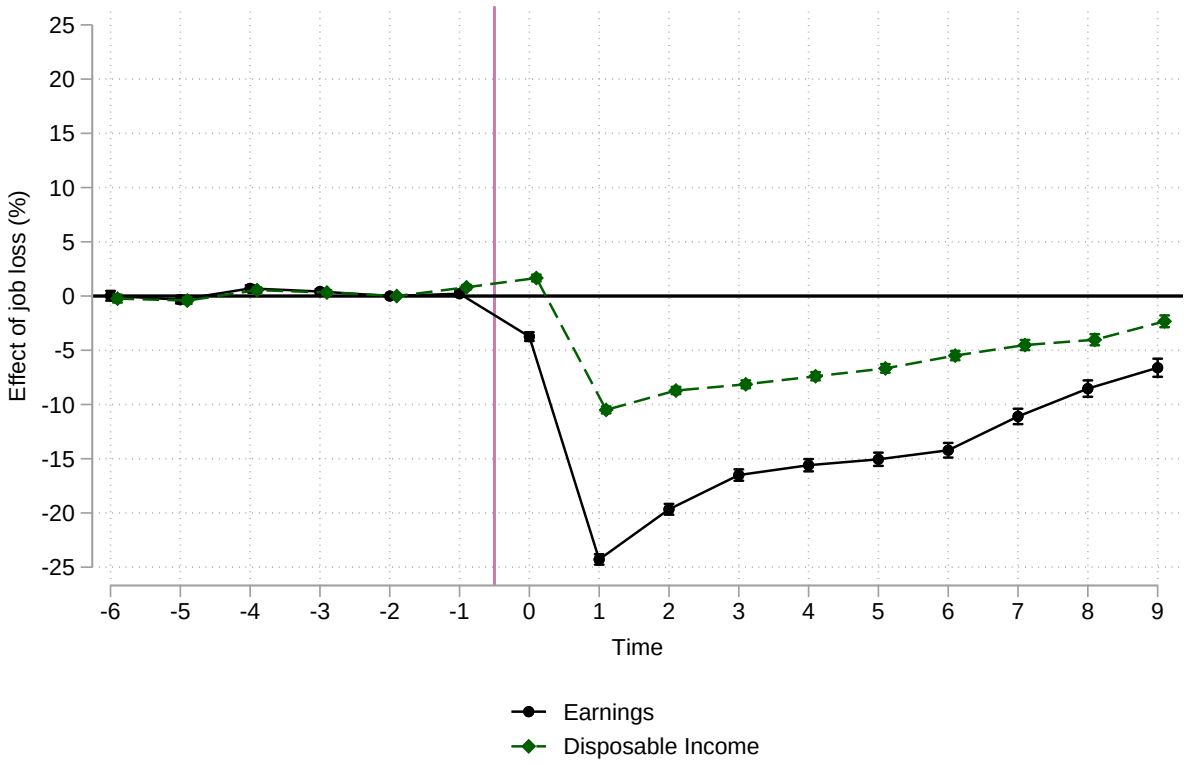


Figure A3: The Effect of Job Loss on Earnings and Disposable Income

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement.

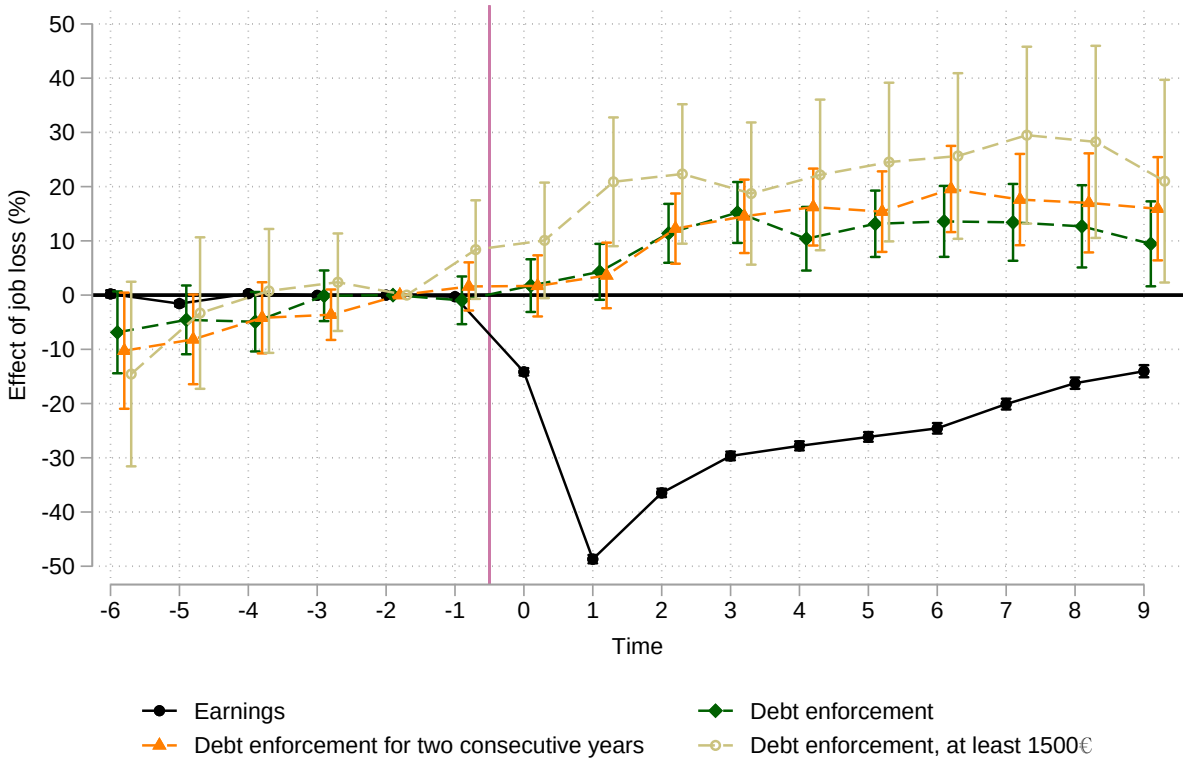


Figure A4: Effects of Job Loss Conditional on Non-Employment

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement. The sample is conditional on non-employment in year *b+1*.

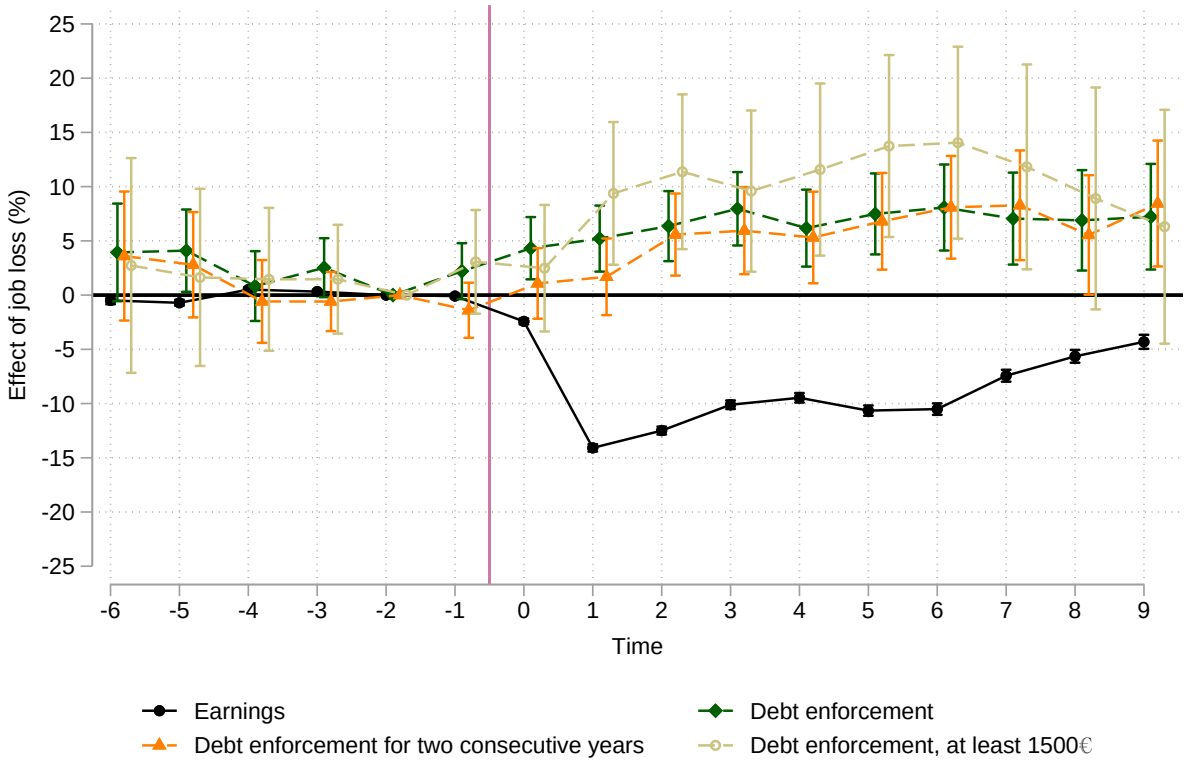


Figure A5: Effects of Firm-Level Layoff Exposure

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement. Treatment is a mass layoff at the worker's firm, regardless of worker separation.

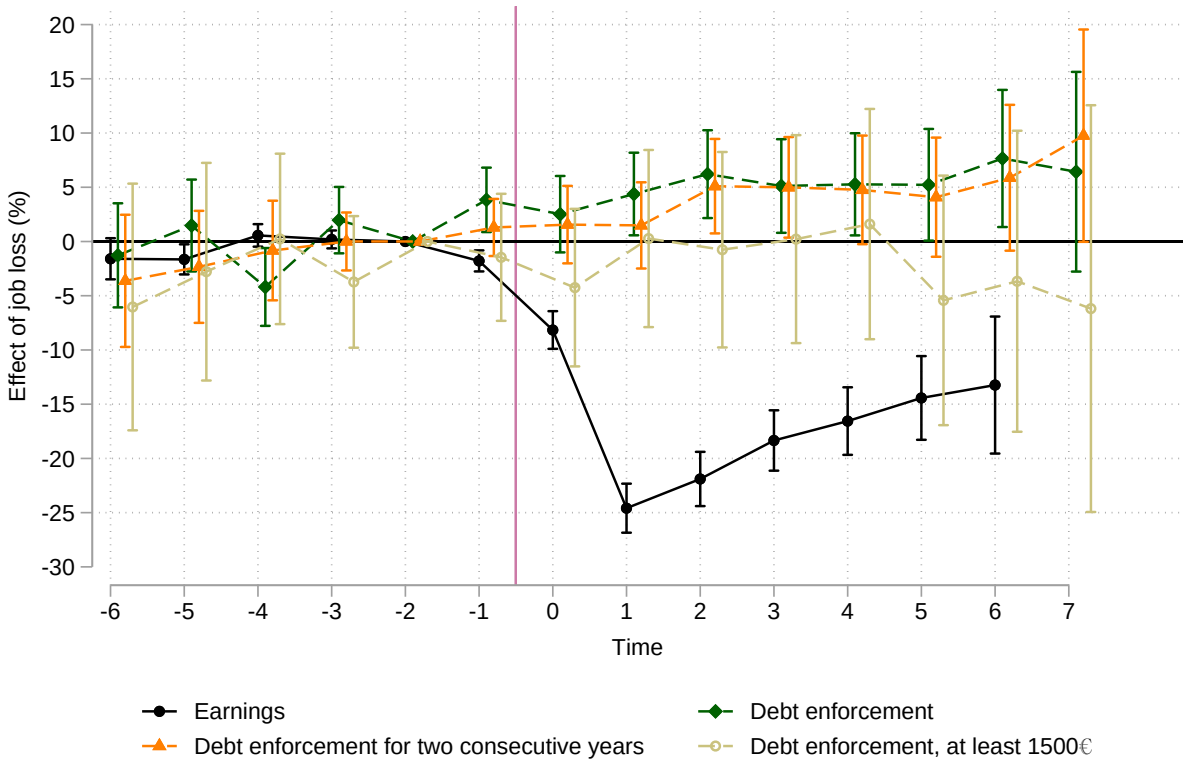


Figure A6: Effects of Job Loss Among Workers Already in Debt Enforcement

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement. Workers were in enforcement in year *b-4*. Due to availability of the outcomes, estimates run through *b+6* for earnings and *b+7* for enforcement outcomes.

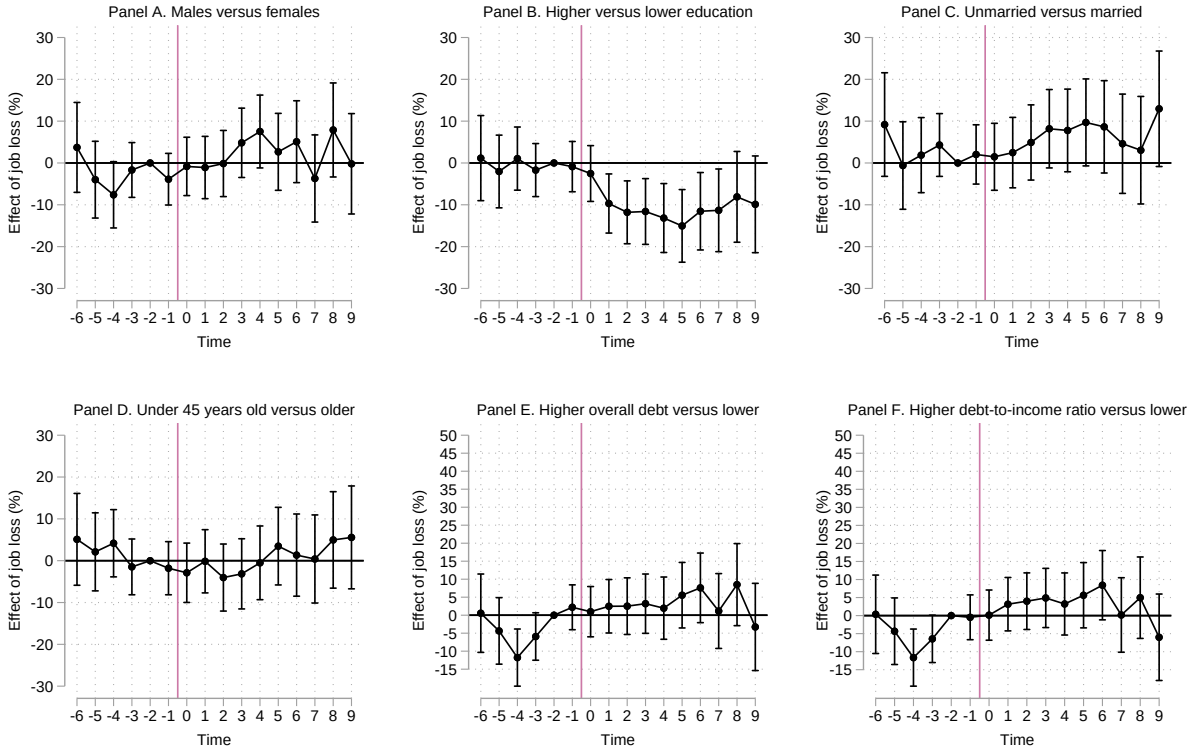


Figure A7: Differences in Debt Enforcement Effects Across Worker Groups

Notes: Estimates are percentage changes from the pre-shock (*b-2*) mean, with 95 percent confidence intervals. Regressions include year, age, event time and individual fixed effects. Standard errors are clustered at the individual level. The vertical line marks displacement. Coefficients are interactions between treatment and the group indicator named in each panel.

Table A1: Robustness Checks: Average Effects of Job Loss

	Main specification (1)	Fewer matching variables (2)	More matching variables (3)	Balanced panel, $b-4$ to $b+4$ (4)	Balanced panel, $b-3$ to $b+7$ (5)	Firm-level exposure (6)	Non-employed at $b+1$ (7)
Earnings							
Post × treated	−6,828.7***	−7,242.4***	−6,773.9***	−7,096.8***	−8,016.3***	−4,239.4***	−12,243.4***
	(95.09)	(119.56)	(95.50)	(104.46)	(159.69)	(72.37)	(135.71)
Pre-treatment mean	45,017	48,337	45,885	46,257	48,149	46,318	40,757
Debt enforcement							
Post × treated	0.00581***	0.00637***	0.00585***	0.00599***	0.00798***	0.00244***	0.00869***
	(0.00109)	(0.00127)	(0.00109)	(0.00121)	(0.00174)	(0.000889)	(0.00166)
Pre-treatment mean	0.0685	0.0621	0.0685	0.0668	0.0616	0.0676	0.0751
Debt enforcement for two consecutive years							
Post × treated	0.00384***	0.00434***	0.00401***	0.0034***	0.0067***	0.00129	0.00775***
	(0.00106)	(0.00123)	(0.00106)	(0.00114)	(0.00161)	(0.000858)	(0.00164)
Pre-treatment mean	0.0516	0.0471	0.0516	0.0495	0.0442	0.0511	0.0573
Debt enforcement, at least EUR 1,500							
Post × treated	0.00222***	0.00235***	0.00243***	0.00213***	0.00374***	0.00143**	0.00452***
	(0.000748)	(0.000861)	(0.000753)	(0.00082)	(0.00114)	(0.000593)	(0.00117)
Pre-treatment mean	0.0202	0.0186	0.0202	0.0187	0.0162	0.0192	0.0212
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Average DD estimates. Column 2 matches on displacement year, age and industry and excludes plants with fewer than 50 employees. Column 3 matches on age, sex, education, industry and tenure, allowing displacement years to differ by one year. Columns 4–5 use balanced panels over the indicated periods. Column 6 defines treatment by firm-level layoffs regardless of worker separation; column 7 conditions on non-employment at $b+1$. Pre-treatment means are for treated workers at $b-2$; columns 2–7 use 2008–2019, while column 1 earnings also include earlier years. Standard errors in parentheses are clustered at the individual level. * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

Table A2: Debt Types

	Debt types
Social and healthcare	Clinic and hospital payments, dental payments, childcare, home help service, and other social and health care payments
Taxes	Inheritance tax, transfer tax, VAT, withholding tax, outstanding tax, stamp duty, property tax, and other taxes
Penal orders and fines	Parking tickets, public transportation penalty fares, court and trial fares, on-the-spot fines, penalty payments, compensation for damage
Alimony	Alimony
Loans and insurances	Public mortgage, indemnity insurance, other insurances, traffic insurance, student loans, promissory note payments
Real property payments	Waste disposal payments, sewage payments, property toll payments
Other private debts	Customs, unpaid rents, instalment purchase payments, evictions, other debt collections, enforcements, debt provable in bankruptcy, TyEL pension-insurance contributions