

The Dynamics of Household Financial Hardship: Entry, Duration, Persistence and Recurrence

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Outline

- Introduction
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Introduction: Concepts

- *Financial hardship (FH)* is an experience of being unable to pay for essential needs in life (e.g., food, housing, utilities and medical care) because of insufficient monetary resources.
- Against a backdrop of rising living costs, greater income volatility, and increased reliance on household debt, hardship has become increasingly prevalent worldwide over recent decades (Pilkauskas, 2012; Bourova et al., 2019; Thomas, 2022).
- FH reflects the lived experience of financial stress; it is different from *poverty* and *financial fragility/vulnerability*.



Financial Hardship, Poverty, Financial Fragility: Distinctions

POVERTY

Income-Based Metric

A measure comparing household income against a defined threshold.

FINANCIAL HARDSHIP

Lived Experience

The physical deprivation of survival essentials.

FINANCIAL FRAGILITY

Coping Capacity

A prospective measure of the capacity to cope with unexpected expenses or sudden income shocks.

Poverty vs. Hardship

Hardship represents the lived experience of deprivation that income alone cannot capture (Butterworth et al., 2009).

Exiting poverty does not automatically lead to exiting hardship.

Hardship vs. Fragility

Hardship is measured by material deprivation, while fragility is a prospective measure of a household's buffer against possible shocks (Lusardi et al., 2011).

Introduction: Related literature

- Berthoud and Bryan (2011) evidence of association between hardship and poverty: a positive relation between low incomes and hardship over the long-term, although improving income does not necessarily lead to exit of hardship.
- Turunen and Hiilamo (2014): FH is associated with reduced wellbeing, poorer physical and mental health, and heightened long-term economic insecurity.
- Bourova et al. (2019): FH is linked to weakened social participation and lack of support network, which reduce the capacity to cope with adverse shocks.
- Brown et al. (2014): persistence in FH and interdependence of different types of hardship, using British household survey data.

Introduction: Related literature

- Berthoud & Bryan (2011) study FH in three groups: durables, daily living and financial strain. They observe different patterns of variation across the groups.
- Most studies treat hardship as a static state, focusing on providing descriptive statistics, or estimating the probability of hardship occurrence.
- Most studies use a single hardship indicator, or construct an aggregate indicator, to analyse each hardship indicator independently, overlooking possible differences and interactions.



Motivation

- The complexity and dynamics of hardship experience suggest that treating different forms of hardship as interchangeable and a static state can obscure the picture.
- We examine hardship as a dynamic experience, differentiate seven different forms of hardship, and study the landing, duration, persistence, and recurrence of hardship.
- Identify what household characteristics are important risk factors, and what characteristics offer protection to reduce the risk of experiencing hardship.



Sample

- From the annual Household, Income and Labour Dynamics in Australia (HILDA) Survey over the period 2001-2022:
 - 43,784 unique households
 - 178,331 household-year observations
 - 70,679 hardship events
 - 23,547 spells (from entry to exit)
- Two reasons for studying the Australian household sample.
 1. The HILDA survey has an annual longitudinal design, consistent hardship measures, and high re-interview rates. These features enable robust tracking of entry, persistence, recurrence, and exit from hardship while minimising attrition bias; making it is suitable for studying hardship dynamics.

Sample

2. Household living costs and household debts increased rapidly in Australia over the last couple of decades, with growing numbers of people have sought hardship grants to pay for basic utilities (ABS, 2026).
 - Aggregate household debts has risen from 88% to 112% of GDP, making Australia one of the world's most indebted countries (ranked the 2nd in IMF(2025)).
 - Household living costs increased by 94% from 2000 and 2024 (ABS, 2026)
 - In our sample, about one in five households experienced hardship at least once.



Data

- In the HILDA surveys, hardship is identified by self-reported answers to the question: “*Since January [last year], did any of the following happen to you because of a shortage of money?*”
 1. Could not pay electricity, gas, or telephone bills on time
 2. Could not pay the mortgage or rent on time
 3. Pawned or sold something
 4. Asked for help from a welfare or community organization
 5. Was unable to heat the home
 6. Asked for financial help from friends or family
 7. Went without meals



Data: Snapshot

First hardship	Events count	As % of total spells	Spell duration (year)
Any Hardship	23,547	100%	4.62
Bills unpaid	11,668	49.55%	3.52
Asked help	7,269	30.87%	4.05
Sold/Pawned	1,794	7.62%	4.35
Welfare help	928	3.94%	4.77
Rent/Mortgage	775	3.29%	3.67
No heat	694	2.95%	4.11
Without food	419	1.78%	4.01

Variable	Mean	SD
Any Hardship	0.204	0.403
Bills Unpaid	0.121	0.326
Rent/Mortgage Unpaid	0.059	0.236
Asked for Help	0.115	0.319
Went Without Food	0.039	0.194
Unable to Heat Home	0.032	0.175
Sold/Pawned	0.049	0.216
Welfare/Comm. Help	0.038	0.192

Recurrence	Events count
Entry 1	43,784
Entry 2	15,330
Entry 3 or more	11,565
Without food	70,679



Approach

- We adopt a multi-level competing risks survival models framework using Cox proportional hazard model to study FH:
 - The landing form: Which hardship occurs first most often?
 - Spell duration: What forms of hardship are faster to recover from? What forms are harder to recover from?
 - Persistence: Does current hardship experience affect the risk of hardship in the following year?
 - Recurrence: Does hardship history affect the risk profiles of repeated spell entries (re-entry after exiting one or more previous spells)?



Variables

- Dependent variable: 8 binary indicators including 7 individual forms plus an aggregate measure of *Any Hardship*
- Household characteristics:
 - employment, income, household size, hours worked
 - educational attainment indicators
 - age, gender, marital status
 - housing type: own outright, own with mortgage, private/public renting
 - serious adverse life events: redundancy, illness, death, violence victim, imprison



Methodology

- We use the Cox proportional hazards model and its variation, Andersen-Gill model, to estimate the effects of explanatory variables on hazard rate (HR), which is the probability that hardship occurs instantaneously at time t .
- A semi-parametric survival model, useful for survival analysis and event history analysis.
- Estimate the effects of risk factors without having to make assumptions about the underlying shape of the baseline hazard.
- Allows households to enter and exit the hazard set multiple times and compares hazard rates across different stages of the hardship process.



Methodology

- The baseline model: $h_i(t|X_i) = h_0(t) \cdot \exp(\beta X_i)$

h_i is the hazard rate of hardship entry for household i at time t , conditional on covariates X_i (explanatory variables),

h_0 is an unspecified baseline hazard

$\exp(\beta)$ gives the estimate for hazard ratio (HR):

- $HR > 1$ indicates elevated risk, while $HR < 1$ indicates protection.

Model feature	Logit/Probit	Cox PH
Models event occurrence	Yes	Yes
Models event timing	No	Yes
Uses only censored observations	No	Yes



Hazard ratios: landing analysis (Dependent: Any Hardship)

	Model 1	Model 2	Model 3	Model 4
Age	0.994*** (0.001)	0.994*** (0.001)	0.994*** (0.001)	0.994*** (0.001)
Female	1.083*** (0.016)	1.083*** (0.016)	1.083*** (0.016)	1.083*** (0.016)
Married	0.839*** (0.016)	0.840*** (0.016)	0.839*** (0.016)	0.840*** (0.016)
Employed	0.774 (0.262)	0.774 (0.262)	0.774 (0.262)	0.774 (0.262)
Log Income	0.924*** (0.007)	0.925*** (0.007)	0.924*** (0.007)	0.925*** (0.007)
Family Size	1.055*** (0.005)	1.055*** (0.005)	1.055*** (0.005)	1.055*** (0.005)

Hazard ratios: landing analysis (Dependent: Any Hardship)

	Model 1	Model 2	Model 3	Model 4
Hours Worked	0.998*** (0.001)	0.998*** (0.001)	0.998*** (0.001)	0.998*** (0.001)
Postgraduate	0.704*** (0.037)	0.712*** (0.038)	0.704*** (0.037)	0.712*** (0.038)
Graduate Diploma	0.810*** (0.036)	0.816*** (0.036)	0.810*** (0.036)	0.816*** (0.036)
Bachelor Degree	0.788*** (0.022)	0.792*** (0.022)	0.788*** (0.022)	0.792*** (0.022)
Diploma	0.956 (0.027)	0.957 (0.027)	0.956 (0.027)	0.957 (0.027)
Certificate	1.123*** (0.018)	1.122*** (0.018)	1.123*** (0.018)	1.122*** (0.018)

Hazard ratios: landing analysis (Dependent: Any Hardship)

	Model 1	Model 2	Model 3	Model 4
Year 12	0.995 (0.020)	0.996 (0.020)	0.995 (0.020)	0.996 (0.020)
Own with Mortgage	1.399*** (0.016)	1.399*** (0.016)	1.399*** (0.016)	1.399*** (0.016)
Renting (Public Housing)	2.152*** (0.162)	2.120*** (0.161)	2.152*** (0.162)	2.120*** (0.161)
Renting (Private)	1.160*** (0.045)	1.159** (0.045)	1.160*** (0.045)	1.159** (0.045)
Fired/Redundant	1.017	1.017	1.017	1.017

Hazard ratios: landing analysis (Dependent: Any Hardship)

	Model 1	Model 2	Model 3	Model 4
Serious Illness	0.984 (0.016)	0.982 (0.016)	0.984 (0.016)	0.982 (0.016)
Death in Family	1.096*** (0.010)	1.097*** (0.010)	1.096*** (0.010)	1.097*** (0.010)
Victim of Violence	1.042*** (0.012)	1.042*** (0.012)	1.042*** (0.012)	1.042*** (0.012)
Family Member in Jail	1.097*** (0.009)	1.097*** (0.009)	1.097*** (0.009)	1.097*** (0.009)



Hazard ratios: landing analysis (Dependent: Any Hardship)

	Model 1	Model 2	Model 3	Model 4
State FE	No	Yes	No	Yes
Year FE	No	No	Yes	Yes
No. of observations	32,250	32,250	32,250	32,250
No. of landing events	13,420	13,420	13,420	13,420
Log-likelihood	-128,586.19	-128,568.75	-128,586.19	-128,568.75
Pseudo R ²	0.574	0.574	0.574	0.574
LR Chi ²	1,611.3***	1,646.2***	1,611.3***	1,646.2***
C-index	0.618	0.619	0.618	0.619

Important risk factors (Any Hardship on landing)

- Factors increasing the risk of hardship:
 - Housing renting (public and private), ownership with mortgage
 - Adverse life events
 - Female household head
 - Big family size
- Factors reducing the risk of hardship:
 - Tertiary education
 - Marriage
 - Income



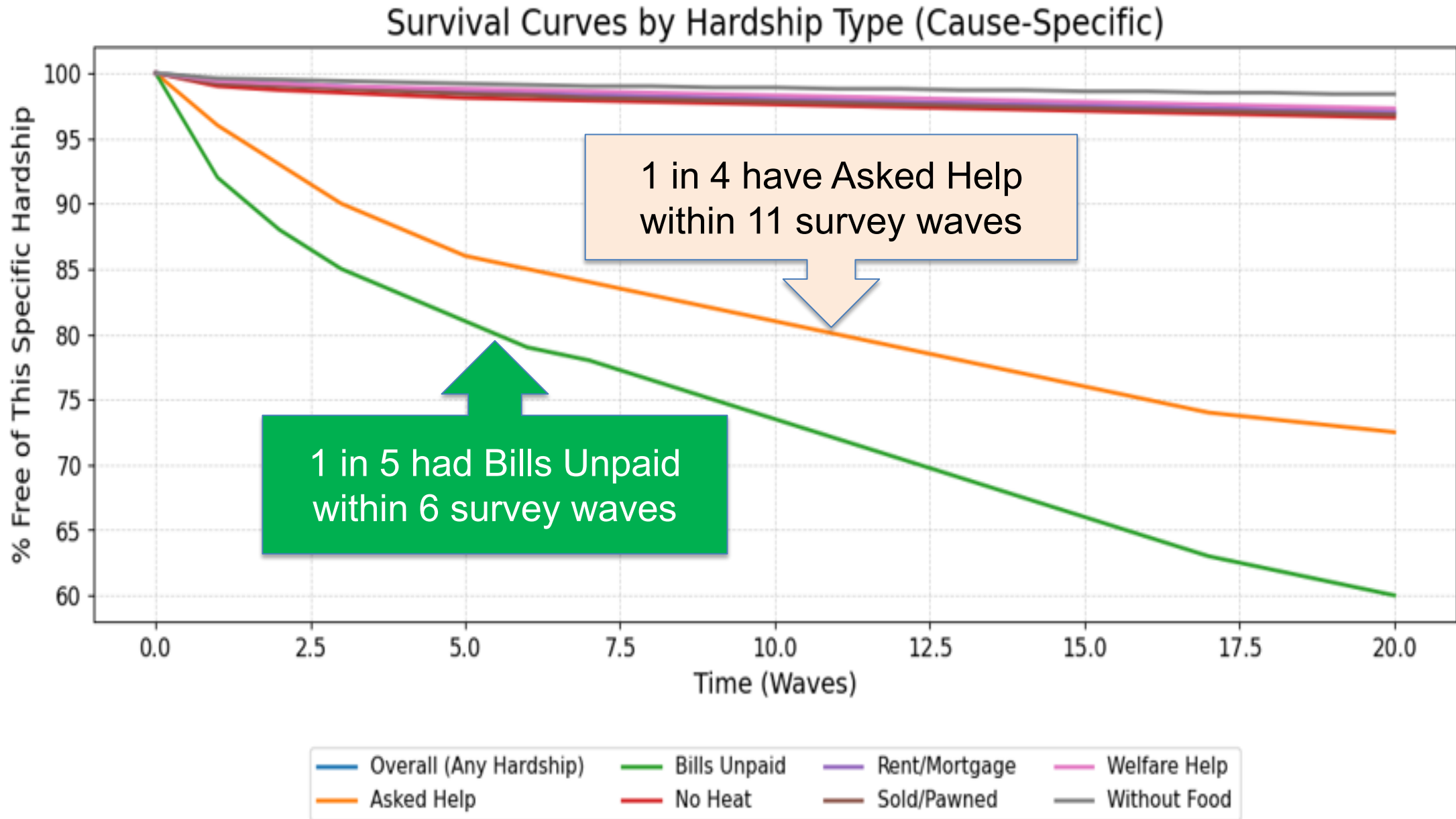
Distribution of hardship spells by landing form

First hardship	Spells count	As percent of total spells	Spell duration (survey wave)
Bills unpaid	11,668	49.55%	3.52
Asked help	7,269	30.87%	4.05
Sold/Pawned	1,794	7.62%	4.35
Welfare help	928	3.94%	4.77
Rent/Mortgage	775	3.29%	3.67
No heat	694	2.95%	4.11
Without food	419	1.78%	4.01
Total no. of obs.	23,547		

- The primary gateway: Inability to pay bills.
- The longest to recover from: Welfare help.



Risk profile by the form hardship at onset of spells



Cause-specific hazard ratios: landing analysis

	Bills Unpaid	Asked Help	Sold/ Pawned	Welfare Help	Rent/ Mortgage	No Heat	Without Food
Age	0.998* (0.001)	0.986*** (0.001)	0.999 (0.001)	1.000 (0.000)	1.002*** (0.000)	1.002*** (0.000)	0.999* (0.000)
Female	1.092*** (0.019)	1.077*** (0.019)	0.942*** (0.016)	1.009 (0.011)	1.019 (0.012)	1.006 (0.011)	0.981* (0.008)
Married	0.903*** (0.019)	0.821*** (0.018)	0.946*** (0.016)	0.962*** (0.011)	1.019 (0.012)	0.970** (0.010)	0.942*** (0.008)
Employed	0.881 (0.277)	0.694 (0.351)	1.149*** (0.029)	0.752 (0.333)	1.078*** (0.017)	1.043*** (0.011)	1.032*** (0.007)
Log Income	0.943*** (0.008)	0.945*** (0.009)	0.986 (0.009)	0.971*** (0.007)	0.991 (0.006)	0.978*** (0.007)	0.993* (0.003)
Family Size	1.066*** (0.006)	1.016** (0.006)	0.995 (0.005)	0.992* (0.004)	1.004 (0.004)	0.992** (0.003)	0.992** (0.003)

Cause-specific hazard ratios: landing analysis

Dep. variable	Bills Unpaid	Asked Help	Sold/ Pawned	Welfare Help	Rent/ Mortgage	No Heat	Without Food
Postgrad.	0.709*** (0.042)	0.877** (0.044)	0.910** (0.031)	0.984 (0.027)	0.937* (0.026)	0.989 (0.024)	0.964** (0.014)
Grad.	0.767*** (0.043)	0.960 (0.039)	0.965 (0.038)	0.972 (0.025)	0.947* (0.024)	1.046 (0.030)	0.975 (0.015)
Diploma	0.748*** (0.025)	0.998 (0.024)	0.942** (0.020)	0.969* (0.015)	0.973 (0.016)	0.953*** (0.011)	0.985 (0.011)
Bachelor Degree	0.931* (0.031)	0.990 (0.032)	1.035 (0.032)	1.012 (0.020)	1.029 (0.023)	1.007 (0.018)	0.980 (0.013)
Diploma	1.195*** (0.021)	0.981 (0.020)	1.055** (0.019)	1.003 (0.012)	1.040** (0.015)	1.032* (0.013)	1.007 (0.010)
Certificate	0.966 (0.024)	1.121*** (0.023)	0.988 (0.020)	0.993 (0.013)	0.982 (0.014)	0.995 (0.012)	1.018 (0.012)
Year 12							

Cause-specific hazard ratios: landing analysis

Dependent variable	Bills Unpaid	Asked Help	Sold/ Pawnd	Welfare Help
Own with Mortgage	1.422*** (0.019)	1.221*** (0.019)	1.025 (0.015)	1.029* (0.011)
Renting (Public Housing)	2.079** (0.236)	1.318 (0.260)	1.039 (0.238)	1.582 (0.365)
Renting (Private)	1.117* (0.054)	1.106 (0.054)	1.004 (0.048)	1.075 (0.041)

Dependent variable	Rent/ Mortgage	No Heat	Without Food
Own with Mortgage	1.032* (0.013)	1.002 (0.010)	1.036*** (0.009)
Renting (Public Housing)	0.884*** (0.026)	0.937*** (0.015)	1.681 (0.554)
Renting (Private)	0.942* (0.027)	1.025 (0.035)	0.992 (0.022)

Cause-specific hazard ratios: landing analysis

Dep. variable	Bills Unpaid	Asked Help	Sold/ Pawned	Welfare Help	Rent/ Mortgage	No Heat	Without Food
Fired/ Redundant	0.976* (0.011)	1.065*** (0.009)	1.080*** (0.008)	1.036*** (0.008)	1.036*** (0.008)	1.037*** (0.007)	1.045*** (0.006)
Serious Illness	0.991 (0.014)	1.033* (0.013)	1.061*** (0.010)	1.027** (0.009)	1.025** (0.009)	1.025** (0.008)	1.045*** (0.007)
Death in Family	1.025** (0.009)	1.082*** (0.008)	1.087*** (0.008)	1.040*** (0.008)	1.039*** (0.008)	1.037*** (0.007)	1.046*** (0.006)
Victim of Violence	1.003 (0.010)	1.063*** (0.010)	1.077*** (0.009)	1.041*** (0.008)	1.029** (0.009)	1.040*** (0.007)	1.045*** (0.006)
Family Member in Jail	1.028*** (0.008)	1.080*** (0.008)	1.084*** (0.008)	1.040*** (0.008)	1.038*** (0.008)	1.039*** (0.007)	1.046*** (0.006)



Cause-specific hazard ratios: Summary

- Education and housing factors significantly affect the risk of entering hardship in certain forms, but their influence on other forms of hardship at onset lacks support of statistical significance at the conventional levels.
- The effects of age, gender, family size, and job loss vary across hardship types, acting as either protective or risk factors depending on the form of hardship at onset.



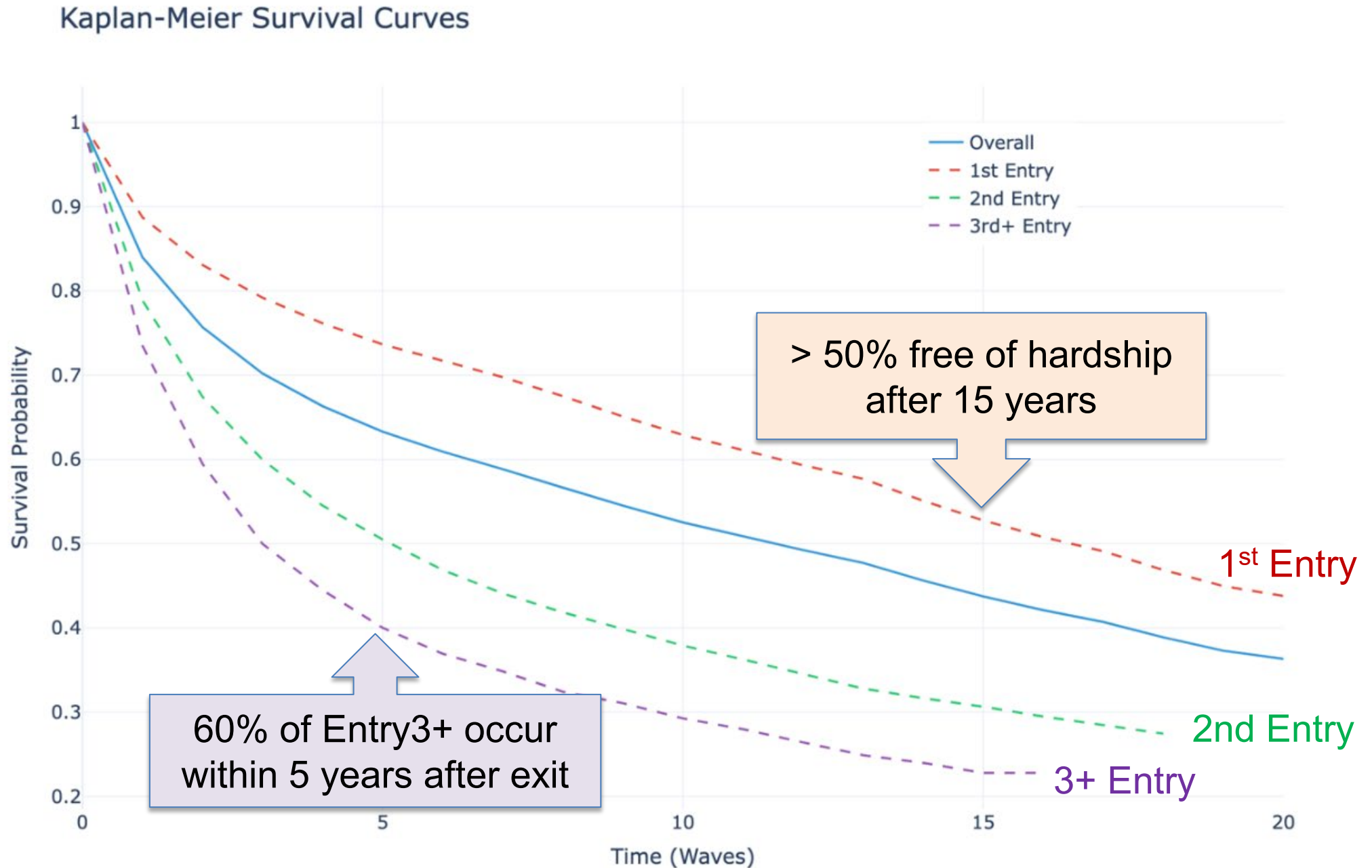
Evidence: Persistence analysis

From (t)	To No Hardship (t+1)	To Hardship (t+1)
Hardship	48.30%	51.70%
No Hardship	80.10%	19.90%

- 51.7% of those already in hardship at time t would continue to have hardship the following year (t+1).
- Only 19.9% of the households in no-hardship state at time t would experience hardship the following year (t+1).
- The current state in hardship increases the risk of hardship the next year 160% (19.9% to 51.7%).



Recurrence analysis: Risk profile by spell-order



Hazard ratios: Initial vs repeat spell entries

	Entry1	Entry2	Entry3+
Age	0.990*** (0.001)	0.996*** (0.001)	0.998 (0.001)
Female	1.074*** (0.020)	1.067* (0.026)	1.113*** (0.031)
Married	0.825*** (0.021)	0.894*** (0.028)	0.884*** (0.033)
Employed	0.613 (0.417)	0.545 (0.423)	1.283 (0.480)
Log Income	0.892*** (0.012)	0.951*** (0.011)	0.925*** (0.015)
Family Size	1.065*** (0.007)	1.039*** (0.009)	1.055*** (0.011)
Hours Worked	0.999 (0.001)	0.997** (0.001)	0.998 (0.001)
Postgraduate	0.675*** (0.049)	0.754*** (0.066)	0.758*** (0.073)
Graduate Diploma	0.793*** (0.044)	0.876* (0.063)	0.835* (0.073)

Hazard ratios: Initial vs repeat spell entries

	Entry1	Entry2	Entry3+
Graduate Diploma	0.793*** (0.044)	0.876* (0.063)	0.835* (0.073)
Bachelor Degree	0.767*** (0.027)	0.825*** (0.039)	0.841*** (0.046)
Diploma	0.912** (0.036)	1.000 (0.047)	0.978 (0.051)
Certificate	1.098*** (0.024)	1.146*** (0.031)	1.048 (0.034)
Year 12	0.971 (0.027)	1.023 (0.034)	0.949 (0.041)
Own with Mortgage	1.437*** (0.022)	1.294*** (0.027)	1.247*** (0.032)
Renting (Public Housing)	2.189*** (0.225)	2.030* (0.280)	2.362* (0.340)
Renting (Private)	1.202** (0.066)	1.146 (0.078)	0.958 (0.083)

Hazard ratios: Initial vs repeat spell entries

	Entry1	Entry2	Entry3+
Fired/Redundant	1.057*** (0.013)	0.911** (0.033)	0.880*** (0.036)
Serious Illness	0.979 (0.020)	0.964 (0.037)	0.941 (0.039)
Death in Family	1.094*** (0.011)	0.979 (0.027)	1.049 (0.029)
Victim of Violence	1.032* (0.015)	0.984 (0.033)	0.976 (0.035)
Family Member in Jail	1.100*** (0.010)	0.993 (0.025)	1.003 (0.028)
State FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	16,491	8,620	7,139
Events	6,107	4,062	3,251
C-index	0.645	0.598	0.592

Conclusions

- Bill-payment difficulty dominates onset of hardship spells, accounting for 49.6% of the first hardship episodes.
- Spells begin with asking welfare support generally take longer to exit than those start in less severe forms.
- Rent and mortgage burdens are dominant risk factors: households in public rental homes have more than twice the risk of experiencing hardship than those living in private homes without a mortgage.
- Education, income and marriage may reduce hardship risk.
- The effects of age, gender, family size and job security vary depending on form of hardship at onset.



Conclusions and Implications

- Prior hardship experience increases the risk of hardship in future.
- Job-loss and adverse life events increase the risk of initial hardship, while their effects diminish for repeat spells.
- The protective role of human capital and traditional social buffers, such as education, marriage and income, decline as households become entrenched in recurrent hardship spells.
- Our findings highlight the need for policy measures that support early identification and intervention, alongside efforts to address structural drivers of recurrent hardship which include housing affordability, education access, gender equality, and employment stability.