

Escaping Violent Death: Access to Credit and Female Mortality

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Research Question

- ▶ **Stylized facts**
 - ▶ Violent death top three cause (20%) of death for individuals aged 15-60
 - ▶ One in three women experience physical domestic violence during their lifetime (Devries et al. 2013)
- ▶ **Typical solutions for reducing violence against women:** education, healthcare, legal institutions, policing, jobs, etc.
 - ▶ Nevertheless, little evidence on the frictions behind violent death of women (Angelucci and Heath 2020)
- ▶ **This paper:** Does access to credit (and mobility) affect mortality?
 - ▶ Ambiguous predictions (next)
 - ▶ *Status quo*: RCTs document modest or no effects of extending credit on low-income households

Financial Access, Mobility, and Mortality

- ▶ *Reduction* in mortality:
 - ▶ **Finance-growth nexus:** should lead to long-term health improvements
 - ▶ **Physical mobility:** move to better area/avoid dangerous areas/improve transportation
 - ▶ **Domestic violence:**
 - ▶ Relax household budget constraint (Buller et al. 2018)
 - ▶ Improve women's bargaining power (e.g. Manser and Brown 1980, Pollak 2005)
 - ▶ Getting a job reduces exposure to an abusive partner (Dugan et al. 1999)
- ▶ *Increase* in mortality:
 - ▶ **Domestic violence:** more resources to women might threaten male dominance (backlash theories) (Akerlof and Kranton 2000, Angelucci 2008, Bertrand et al 2015)
 - ▶ **Stress:** debt obligations cause stress and anxiety
 - ▶ **Physical mobility:** motorcycle is a dangerous mode of transportation

Empirical Challenges

- ▶ **Credit constraints:**

- ▶ Hard to identify and measure credit constraints at the individual level
- ▶ Relaxed endogenously: macro-economic shocks, changes in labor market opportunities, etc.

- ▶ **Endogeneity of mobility:**

- ▶ *Omitted variable bias*: healthier individuals more likely to acquire a vehicle
- ▶ *Reverse causality*: better health leads to higher mobility

This Paper

- ▶ Exploit randomized timing of access to vehicle financing (motorcycle) through a credit product: *Consortio*
 - ▶ Random timing in the allocation through credit lotteries

- ▶ We measure the effects on:
 - ▶ Mortality
 - ▶ Causes of death
 - ▶ Location of death
 - ▶ Time of death

Consortios: Overview

- ▶ Group lending mechanism to acquire durable goods
 - ▶ We focus on motorcycles here
- ▶ Mechanism
 - ▶ Participants contribute *identical* monthly payments for the duration of a *Consortio*
 - ▶ Good allocated to a participant once sufficient funds available
 - ▶ Allocation through lotteries and auctions
 - ▶ Payments continue after ‘winning’ the good
 - ▶ Ultimately, everyone (who does not default) receives the good

Consortios: Overview

- ▶ Typically organized by a bank or a financial arm of a manufacturer
 - ▶ Virtually no screening of participants
 - ▶ No social connections required
 - ▶ No geographical restrictions

- ▶ Monthly payments
 - ▶ Save towards goods (i.e. installments)
 - ▶ Cover administrative fees
 - ▶ Establish reserve fund to cover losses from defaults (i.e. risk premium)

Consortios: Market Size in 2015

- ▶ **Motorcycles:**
 - ▶ 33% of motorcycle sales (50% of motorcycle financing)
 - ▶ 1,070,000 motorcycles
 - ▶ 2.2 billion USD in credit
 - ▶ During 2009-2016, more than 10 million participants [6.6% of working age population]

Data

- ▶ Death records from mortality information system at the Ministry of Health
 - ▶ Date and time
 - ▶ Location
 - ▶ Specific causes (both internal and external)
- ▶ Data on consorcios from Central Bank of Brazil
 - ▶ Administrators and participants
 - ▶ Lottery dates and winners
- ▶ Family characteristics from social benefits system (Cadastro Unico)

Descriptives: Participant Characteristics

Individual Characteristics (means)	Formally Employed	Consortios
Formal Employment Share	1.00	0.54
Salary	1596	1494
Age	34.69	35.01
Male	0.59	0.69
University Education	0.15	0.11
Agriculture & Fishing	0.04	0.05
Construction	0.07	0.09
Government	0.16	0.21
Health & Education	0.06	0.05
Hotel & Transport	0.09	0.08
Manufacturing	0.15	0.15
Real Estate & Finance	0.16	0.12
Repairs	0.20	0.28

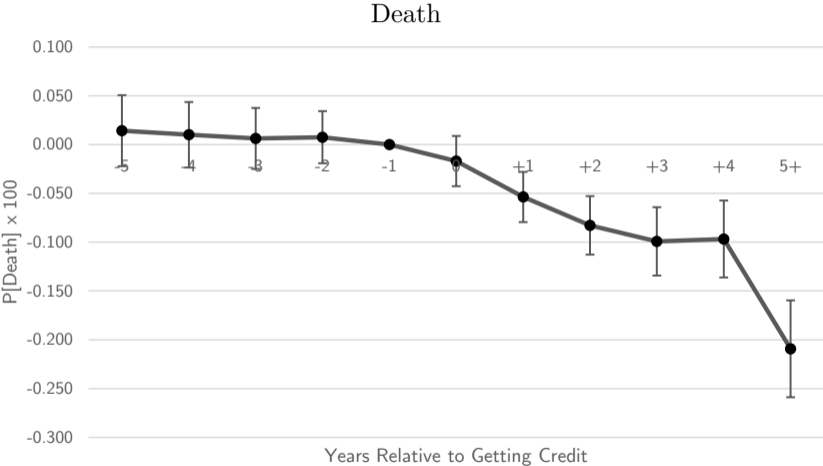
Empirical Specification

► **Specification:**

$$Death_{it} = \alpha_i + \alpha_{gt} + \delta \cdot win_{it} + \epsilon_{it}$$

- win_{it} : one from the month when individual i wins the good via *lottery*
- α_i : individual fixed effects
- α_{gt} : consorcio group-time fixed effects (within group comparison)

Mortality *Declines* with Access to Credit



Mortality Declines due to *External* Causes

Dependent variable:	Death	External	Internal
Mean:	0.16%	0.06%	0.09%
<i>win_{it}</i>	-0.070*** (0.030)	-0.060*** (0.020)	-0.020 (0.020)
Individual FE	yes	yes	yes
Group-time FE	yes	yes	yes
Observations	44,912,112	44,912,112	44,912,112
R2	0.88	0.87	0.49

- **Bottom line:** access to credit reduces death, primarily through *external* causes

Treatment effect: ~44% decline in mortality

NB: the average participant is 35 years old

Violent Deaths Decline with Access to Credit

Dependent variable:	Death Type				
	Accident	Work Accident	Suicide	Homicide	Other
Mean:	0.05%	0.01%	0.003%	0.03%	0.01%
<i>win_{it}</i>	-0.030** (0.002)	-0.010 (0.003)	-0.004* (0.002)	-0.020** (0.010)	-0.010 (0.003)
Individual FE	yes	yes	yes	yes	yes
Group-time FE	yes	yes	yes	yes	yes
Observations	44,912,112	44,912,112	44,912,112	44,912,112	44,912,112
R2	0.37	0.36	0.36	0.36	0.36

► **Bottom line:** effects driven by reduction in violent causes (homicide, suicide, accidents)

Traffic Accidents Decline

Dependent variable:	Traffic	Non-Traffic	Type of Traffic Accident				
			Pedestrian	Cyclist	Motorcycle	Car	Heavy Transport
Mean:	0.050%	0.006%	0.003%	0.001%	0.002%	0.010%	0.001%
win_{it}	-0.002** (0.011)	-0.007 (0.004)	-0.003** (0.002)	-0.001** (0.001)	-0.012* (0.007)	0.0001 (0.001)	-0.001 (0.001)
Individual FE	yes	yes	yes	yes	yes	yes	yes
Group-time FE	yes	yes	yes	yes	yes	yes	yes
Observations	44,912,112	44,912,112	44,912,112	44,912,112	44,912,112	44,912,112	44,912,112
R2	0.36	0.35	0.35	0.36	0.36	0.36	0.36

► **Bottom line:** *traffic* accidents decline

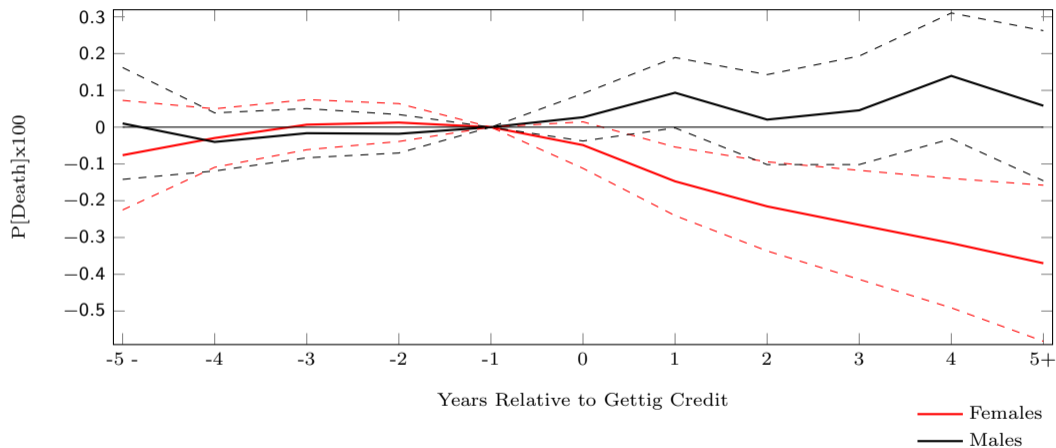
Specifically with ‘vulnerable’ modes of transportation

Suggests improvement in the mode of transportation

Time and Location of Death

- ▶ **Time of Death:** declines primarily in evening (6pm-10pm) and night (10pm-6am)
- ▶ **Location of Death:**
 - ▶ Homicides at *home* decline (consistent with theories of domestic violence)
 - ▶ Accidents in *public space* decline (consistent improved mode of commuting)
 - ▶ Suicides in *public space* decline

Mortality Declines for *Women*



► **Bottom line:** mortality declines for *women*

Mortality Declines for *Women*

Dependent variable:	Death	Internal	Death Type			
		Death	Accident	Work Accident	Suicide	Homicide
Mean:	0.16%	0.09%	0.05%	0.01%	0.01%	0.03%
<i>win_{it}</i>	-0.006 (0.022)	-0.009 (0.008)	0.009 (0.014)	-0.002 (0.005)	-0.004 (0.003)	0.0002 (0.009)
<i>win_{it} * female_i</i>	-0.240*** (0.027)	0.001 (0.014)	-0.124*** (0.014)	-0.009 (0.003)	-0.006** (0.003)	-0.077*** (0.009)
Individual FE	yes	yes	yes	yes	yes	yes
Group-time FE	yes	yes	yes	yes	yes	yes
Observations	44,912,112	44,912,112	44,912,112	44,912,112	44,912,112	44,912,112
R2	0.36	0.35	0.35	0.36	0.36	0.36

Conclusion

- ▶ **Access to credit (and mobility) *reduces* mortality risk**
 - ▶ By 44% relative to the unconditional mean of 0.2%
 - ▶ Results exclusively driven by *women*
- ▶ Effects driven by *external* (e.g., homicide) rather than by *internal* (e.g., illness) causes
 - ▶ Homicide, suicide, and traffic accidents decrease
- ▶ **Mechanisms.** Results mainly consistent with:
 - ▶ Lower domestic violence
 - ▶ Improved mode of transportation
- ▶ **Contribution:** credit constraints prevent vulnerable minorities from evading violent death