Centre for Research and Analysis of Migration

UCL

Remittances behaviour of undocumented migrants

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Outline

- Motivation and literature review
- Data and sampling technique
- Descriptive evidence
- Specification and econometric issues
- Identification strategy
- Results and robustness checks
- Further results
- Conclusions

Motivation

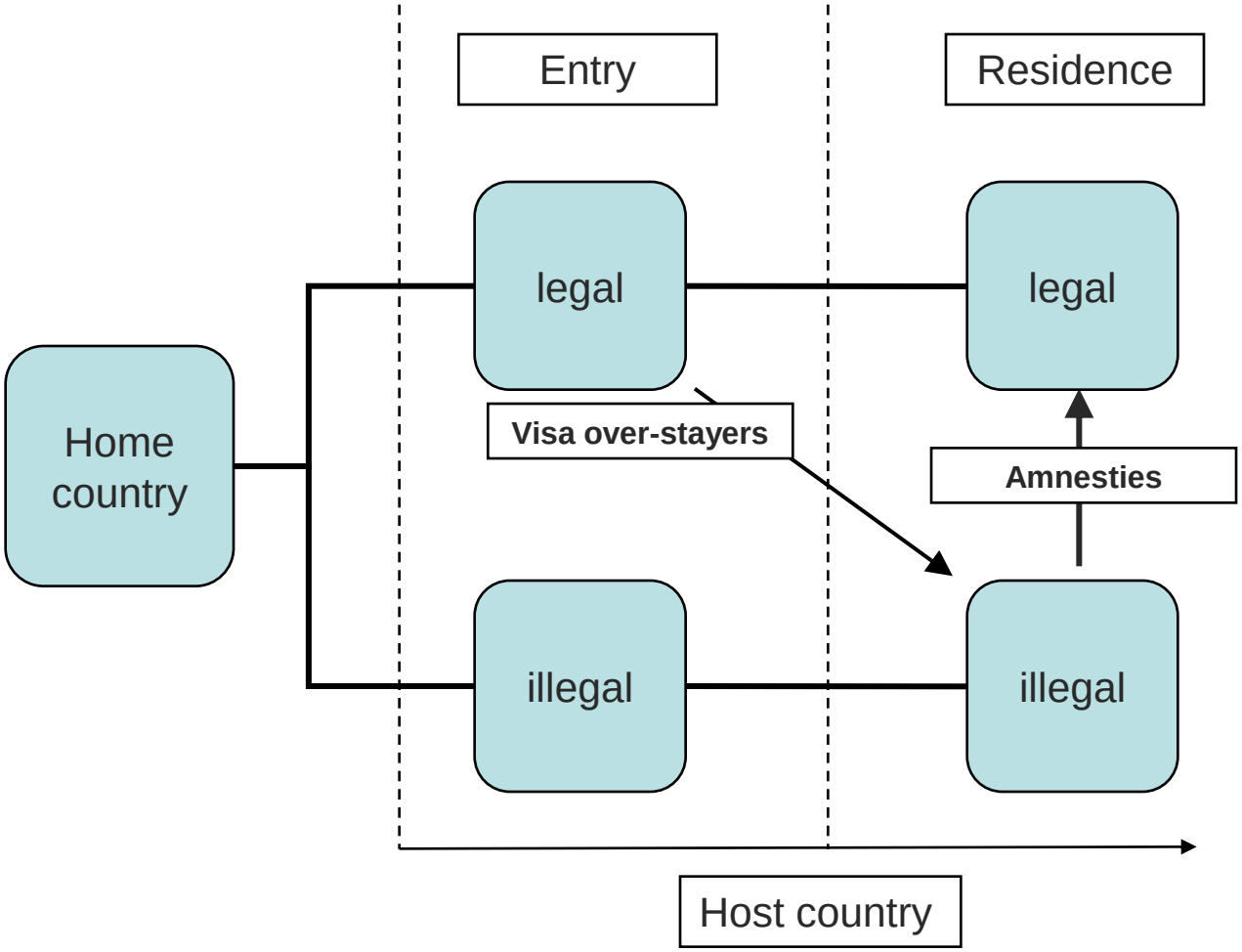
- Remittances are an important source of external funding for developing countries
  - Volume through formal channels: $240 billion
  - Remittances flows are second only to FDI, much higher than total international aid (Ratha, 2007)
  - Major factor in poverty reduction (Adams, WDev 2005)
  - More stable than private capital flows
  - Remittances are directed to households and individuals
- The adoption of immigration policies which affect immigrants' legal status is at the core of the public policy debate in several Western countries

Stocks of undocumented migrants

Country	Estimated stock	Year
US	12-13 million	2008
Austria	100 thousand	2003
Italy	350 thousand	2007
Germany	500 thousand	2004
Greece	250 thousand	2007
Spain	570 thousand	2008
UK	430 thousand	2001

Source: PEW Hispanic Center (US); Clandestino project (Undocumented migrants: counting the uncountable) (Europe)

Undocumented and undocumented migrants



Motivation and Literature review

- 4 main areas of research related to our paper:

1. Understanding remittances flows

   Lucas and Stark (JPE, 1985), Cox (JPE, 1987), Funkhouser (ReStat, 1995), Poirine (WDev, 1997), Agarwal and Horowitz (WDev, 2002), de la Briere et al. (JDE, 2002), Osili (JDE, 2005), Amuedo Dorantes (JPopEc 2006), Hanson (2007), Dustmann & Mestres (JDE, 2009)

2. Identifying the impact of legal status on migrants' outcomes (wage, employment, remittances, etc.)

   Rivera-Batiz (JPopEc, 1999), Kossoudji and Cobb-Clark (JOLE, 2002), Kaushal (JHR, 2006), Amuedo Dorantes et al. (AER, 2007), Amuedo Dorantes and Mazzolari (JDE, forthcoming)

Motivation and Literature review

3. Analyzing the effect of policy changes (migration policy) in destination countries on outcomes (remittances) in developing countries

4. Studying the relationship between weather, growth, conflict, income, etc.

Munshi (QJE, 2003), Miguel et al. (JPE, 2004), Miguel (RES, 2005), Maccini & Yang (NBER, 2008), Ciccone (mimeo), Brückner & Ciccone (mimeo)

Our paper…

- What is the impact of current legal status (residence) on economic behaviour of migrants in terms of remittances and consumption?
- Given that illegal migrants face enormous uncertainty (duration of permanence in host country, employment, income, accommodation, etc.), can we find any empirical evidence of higher levels of remittances and lower levels of consumption?
- How can we address the selection into legal status?

...our paper…

- Empirical analysis using data from an Italian survey that provides a large sample of both documented and undocumented migrants
- Rainfall shocks in the origin country at the time of migration as exogenous source of variation in current legal status
- Main finding: Undocumented migrants tend to remit more and consume less than documented migrants. Severe bias of the OLS estimates

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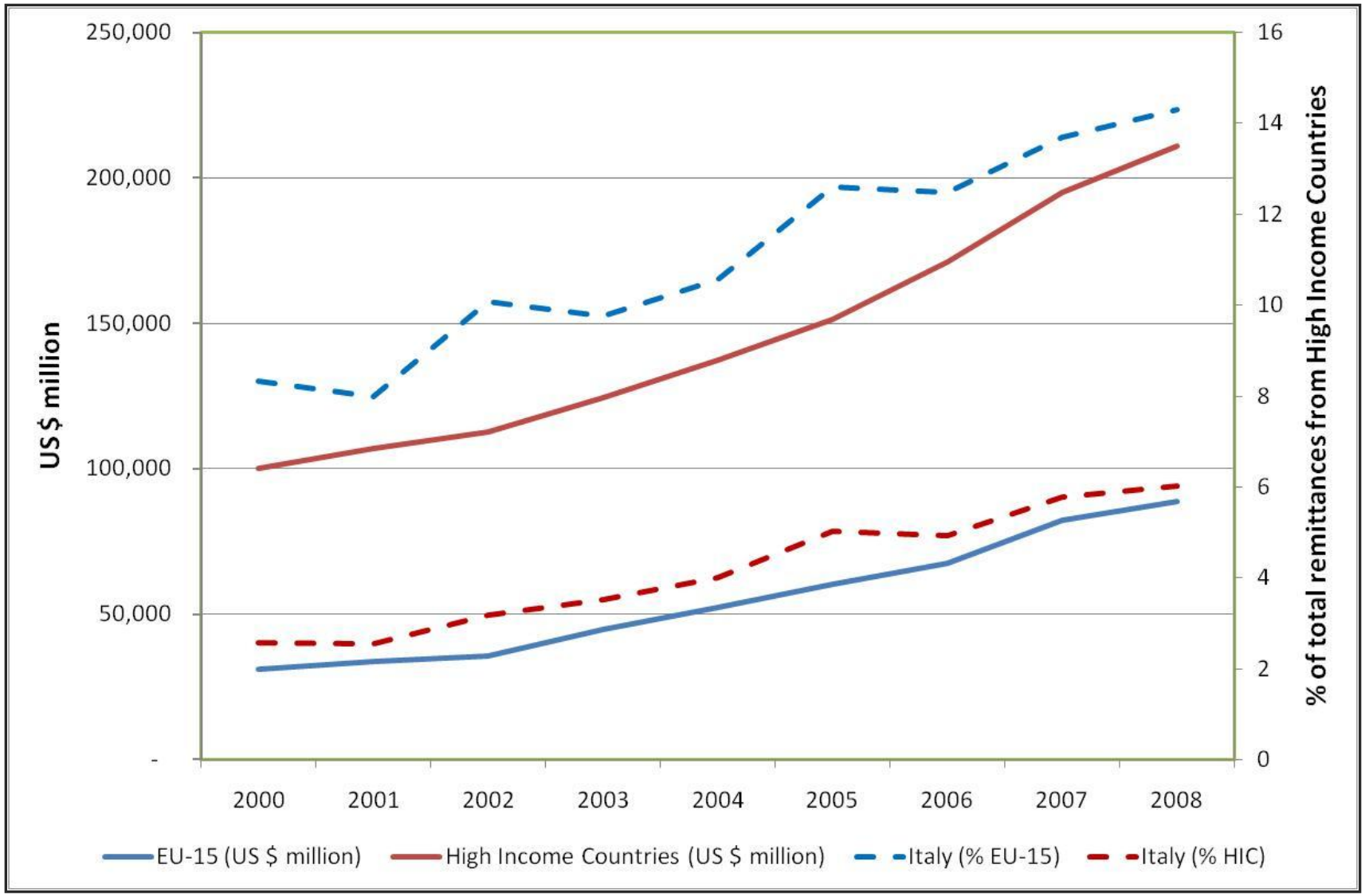
Data

- Data from ISMU Foundation (www.ismu.org):
  - Annual survey: 2001-2008
  - Repeated cross section
  - Sample size: 8 thousand migrants per year
  - Waves used: 2004-2006 (pooled)
  - Rich dataset (demographics, labour market, legal status, migratory experience, etc.)
  - One Italian region: Lombardy (Milan)
    - one of the largest, most populated and wealthiest regions of Italy
    - Italian region with the largest migrant population: 23% of the entire migrant population legally residing in Italy in 2005; 22% of the amnesty applications in the last amnesty (2002)
  - Large and representative sample of undocumented migrants (10/20% of the sample is undocumented)
  - Sampling methodology: Centre sampling technique

Remittances from Italy and the EU-15



Source: World Bank

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Documented and undocumented migrants

Variable		Documented		Undocumented	
		Mean	*Std. Dev.*	Mean	*Std. Dev.*
Age		33.63	7.71	31.68	8.44
Male		***55.37***	**0.50**	***60.49***	**0.49**
Single		***32.94***	**0.47**	***55.31***	**0.50**
Household:	*# household members (in Italy)*	2.33	1.44	1.46	0.95
	spouse abroad	***17.87***	**0.38**	***24.86***	**0.43**
	children abroad	***43.58***	**0.90**	***66.14***	**1.05**
YSM		**6.19**	**3.09**	**2.69**	**2.16**
Unemployed		*5.09*	0.22	*7.74*	0.27
Wage (euros)		980.87	526.51	851.19	500
Education:	*none*	*8.21*	0.27	*11.36*	0.32
	compulsory school	*35.17*	0.48	*32.55*	0.47
	secondary education	*41.33*	0.49	*45.17*	0.50
	tertiary education	*15.29*	0.36	*10.92*	0.31
Area of origin:	*Subsaharan Africa*	*13.23*	0.34	*10.66*	0.31
	East Asia (and Pacific)	*8.32*	0.28	*4.74*	0.21
	Eastern Eur. and Centr. Asia	***28.05***	**0.45**	***38.75***	**0.49**
	Latin America	***15.91***	**0.37**	***22.52***	**0.42**
	Middle East & North Africa	***23.58***	**0.42**	***17.39***	**0.38**
	South Asia	*10.92*	0.31	*5.95*	0.24
Observations		**9900**		**1394**	

Source: ISMU data

Documented and undocumented migrants

(monthly data)	Documented		Undocumented	
	Mean (euros)	std. dev.	Mean (euros)	std. dev.
Remittances	144.0	*165.5*	176.1	*184.4*
Remittances (only >0)	221.6	*157.9*	257.2	*169.7*
Consumption	791.1	*431.2*	543.0	*376.0*
Total income	935.1	*428.5*	719.1	*403.6*
		% of total income		
Remittances	0.13	*0.15*	0.20	*0.21*
Remittances (only >0)	0.21	*0.14*	0.3	*0.18*
Consumption	0.69	*0.24*	0.68	*0.27*
		% of households which:		
…remit	0.65	*0.48*	0.68	*0.46*
Observations	**9900**		**1394**	

Source: ISMU data

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Econometric model

- Econometric model:

$$Y_{icpt} = \alpha + \beta I_{icpt} + \gamma X_{icpt} + f_c + a_p + d_t + \varepsilon_{icp}$$

where:

i = individual migrant

c = country of origin

p = province of residence (interview) in Italy

t = year of interview

- Main sources of bias:
  - Unobservable characteristics that affect both the legal status and the remittance behaviour (e.g. risk aversion, impatience, etc.)
  - Selection into legal status: both at the entry and during the permanence in the destination country

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Illegal Vs Legal migration

- T = working life of an individual
- t_V = # of periods to obtain a visa to migrate legally
- illegal migration can be done immediately (waiting time is zero)
- w_{St} = expected wage in source country S (in period t)
- w_L = expected wage in host country H as a legal migrant (in period t)
- w_I = expected wage in host country H as an illegal migrant (in period t)
- $w_S < w_I < w_L$

$$\underbrace{\sum_{t=1}^{T} w_{St}}_{non\_migrating} \leq \max\left[\underbrace{\left(\sum_{t=1}^{t_v} w_{St} + \sum_{t=t_v}^{T} w_{Lt}\right)}_{legal\_migration}, \underbrace{\left(\sum_{t=1}^{T} w_{It}\right)}_{illegal\ migration}\right]_{migrating}$$

- A (transitory) negative income shocks in the source country S should increase the opportunity cost of waiting for the visa and make the illegal option relatively cheaper

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Rainfall shocks as IV

- Rainfall shocks in the origin country at the time of migration as exogenous sources of variation in current legal status (through the effect on entry legal status)
- Adverse weather conditions make documented migration costlier: opportunity cost of waiting for the visa increases

Rainfall shocks → LS at Entry → Current LS

- Monthly data (mm/month) from NASA, from 1979 onwards (Global Precipitation Climatology Project). Measures for each point where latitude and longitude degree lines cross, at 2.5 degree intervals
- Variable construction: Absolute deviation from the historical country mean. Average value, t and t-1 (t=year of migration)

Rainfall shocks as IV: exogeneity condition

- We look at how current legal status determines current economic behaviour (remittances, savings, consumption) in Italy (when interviewed)
- We use rainfall shocks at the time of migration (t and t-1) in the country of origin
- We assume that rainfall shocks are correlated with legal status but not with unobserved risk aversion

- We exploit variation in rainfall across countries and years of migration
- We use only individuals with ysm>1 (year of migration ≠ year of interview)
- We trigger the distribution of rainfall shocks to exclude natural disasters (which may have persistent effects on remittances and savings)
- We control for current rain in the country of origin

Our sample: country of origins

Country	Sample		Agriculture sector (1995-2005)	
	Observations	%	Employment share	GDP share
MOROCCO	1330	*11.8*	*44.9*	*15.8*
ALBANIA	1140	*10.1*	*66.2*	*30.7*
SENEGAL	758	*6.7*	-	*18.8*
ROMANIA	665	*5.9*	*38.2*	*15.5*
EGYPT	504	*4.5*	*30.1*	*16.5*
PERU	493	*4.4*	*4.0*	*8.3*
PAKISTAN	459	*4.1*	*45.4*	*25.0*
ECUADOR	453	*4*	*7.8*	*11.1*
INDIA	428	*3.8*	*66.7*	*23.9*
UKRAINE	406	*3.6*	*21.5*	*14.1*
TUNISIA	396	*3.5*	-	*12.2*
CHINA	388	*3.4*	*46.6*	*15.6*
COTE D'IVOIRE	283	*2.5*	-	*23.5*
MOLDOVA, REPUBLIC OF	247	*2.2*	*46.4*	*26.7*
NIGERIA	205	*1.8*	*2.9*	*29.6*
GHANA	191	*1.7*	*55.0*	*36.6*
Other 86 nationalities	2948	*26.1*	-	-
Total	11294	*100*		
Sample weighted avg			***37.4***	***19.1***
Italy			***5.5***	***2.8***
OECD countries			***4.2***	***1.9***

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Rainfall shocks as IV: first stage (LPM)

Dep. Var: Illegal status	ysm <=3	ysm <=5	ysm <=7	ysm <=9	ysm <=11
	1	2	3	4	5
mean rain shock in t and t-1	**0.328****	**0.220***	**0.292*****	**0.276*****	**0.259*****
(year of migration)	**[0.132]**	**[0.120]**	**[0.088]**	**[0.075]**	**[0.086]**
current rain shock	**0.017**	**-0.034**	**-0.044**	**-0.05**	**-0.043**
(year of interview)	**[0.095]**	**[0.062]**	**[0.042]**	**[0.036]**	**[0.035]**
other controls	yes	yes	yes	yes	yes
Observations	2755	5427	7523	9037	9995
R-squared	0.382	0.339	0.325	0.299	0.274
F-stat	**6.147**	**3.343**	**11.01**	**13.48**	**9.088**
IV: p-value F-stat	0.015	0.07	0.001	0.001	0.003
IV: pR2	0.429	0.319	0.071	0.018	0.01

• Other controls: # of members in the household in Italy, spouse abroad, # children abroad, ln (total hh income), gender, age, age sqr, ysm; dummies for housing, civil status, education, employment status, origin area, origin country, year and Italian provinces

• robust std errors in parentheses, clustered by country; ** significant at 5%, *** significant at 1%

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Randomness of rainfall shocks

- Rainfall shocks at the time of migration is correlated with current legal status but not with other (predetermined) observable characteristics
- Current rain is irrelevant

YSM<=13	Age		Male		Higher education		Single	
			LPM	LPM	LPM	LPM	LPM	LPM
	1	2	3	4	7	8	11	12
mean rain shock in t and t-1	0.56	0.58	0.049	0.05	-0.023	-0.024	-0.071	-0.07
(year of migration)	[1.424]	[1.427]	[0.050]	[0.049]	[0.055]	[0.055]	[0.067]	[0.067]
current rain shock		0.602		0.016		-0.027		0.028
(year of interview)		[0.729]		[0.030]		[0.052]		[0.034]
Year of arrival in Italy dummies	yes	yes	yes	yes	yes	yes	yes	yes
Country dummies	yes	yes	yes	yes	yes	yes	yes	yes
WB Area dummies	yes	yes	yes	yes	yes	yes	yes	yes
Observations	11294	11294	11294	11294	11294	11294	11294	11294
R-squared	0.16	0.16	0.147	0.147	0.082	0.082	0.082	0.082

Robust std errors in parentheses, clustered by country; ** significant at 5%, *** significant at 1%

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Results

- Results:
  - Probability of remitting
  - Level of remittances: ln(1+remittances)
  - Level of consumption: ln(consumption)

- OLS:
  - No differences in remittances and consumption behaviour

- IV:
  - Undocumented are more likely to remit, they remit more and they consume less.

Probability of remitting

Probability of remitting	LPM	IV	LPM	IV	LPM	IV
	ysm<=7		ysm<=9		ysm<=11	
Illegal status	**0.018**		**0.014**		**0.02**	
	[0.018]		**[0.017]**		**[0.017]**	
# of HH members in Italy	-0.065***		-0.061***		-0.059**	
	[0.009]		[0.008]		[0.009]	
spouse abroad	0.093***		0.095***		0.092***	
	[0.022]		[0.025]		[0.024]	
# children abroad	0.069***		0.072***		0.072***	
	[0.008]		[0.007]		[0.007]	
# children in Italy	-0.047***		-0.045***		-0.046**	
	[0.013]		[0.012]		[0.012]	
ln (total hh income)	0.308***		0.301***		0.305***	
	[0.021]		[0.020]		[0.019]	
male	-0.02		-0.016		-0.004	
	[0.015]		[0.015]		[0.013]	
age	0.013**		0.014***		0.016***	
	[0.006]		[0.005]		[0.005]	
age squared	-0.000**		-0.000***		-0.000**	
	[0.000]		[0.000]		[0.000]	
years since migration	0.008*		0.002		0.001	
	[0.004]		[0.002]		[0.002]	
current rain shock	0.009		-0.008		0.002	
	[0.047]		[0.049]		[0.042]	
other controls (dummies)	YES		YES		YES	
Observations	7523		9037		9995	
R-squared	0.313		0.301		0.294	
IV F-stat						
IV: p-value F-stat						
IV: pR2						

- Other controls: # dummies for housing, civil status, education, employment status, origin area, origin country, year and Italian provinces
- Robust std errors in parentheses, clustered by country; ** significant at 5%, *** significant at 1%

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Results: ln(1+remittances)

Ln(1+remittances)	LPM	IV	LPM	IV	LPM	IV
	ysm<=7		ysm<=9		ysm<=11	
	1	2	3	4	5	6
Illegal status	**0.131**		**0.112**		**0.149**	
	[0.103]		**[0.093]**		**[0.092]**	
Current rain shock	-0.008		-0.075		-0.007	
	[0.254]		[0.264]		[0.223]	
Other controls	YES		YES		YES	
Observations	7523		9037		9995	
R-squared	0.369		0.358		0.35	
IV F-stat						
IV: p-value F-stat						
IV: pR2						

• Other controls: # of members in the household in Italy, spouse abroad, # children abroad, ln (total hh income), gender, age, age sqr, ysm; dummies for housing, civil status, education, employment status, origin area, origin country, year and Italian provinces
• Robust std errors in parentheses, clustered by country; ** significant at 5%, *** significant at 1%

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Results: ln (consumption)

Ln(1+consumption)	LPM	IV	LPM	IV	LPM	IV
	ysm<=7		ysm<=9		ysm<=11	
	1		3		5	
Illegal status	**-0.018**		**-0.017**		**-0.019**	
	[0.021]		**[0.020]**		**[0.019]**	
Current rain shock	**-0.015**		**-0.025**		**-0.037**	
	[0.044]		**[0.038]**		**[0.034]**	
Other controls	YES		YES		YES	
Observations	7523		9037		9995	
R-squared	0.758		0.76		0.759	
IV F-stat						
IV: p-value F-stat						
IV: pR2						

- Other controls: # of members in the household in Italy, spouse abroad, # children abroad, ln (total hh income), gender, age, age sqr, ysm; dummies for housing, civil status, education, employment status, origin area, origin country, year and Italian provinces
- Robust std errors in parentheses, clustered by country; ** significant at 5%, *** significant at 1%

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Robustness checks

- Different specifications
- Different instruments
- Weighted and unweighted regressions
- Whole sample Vs only heads of household
- Different years of permanence

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Enforcement and economic behaviour

- Migrants were interviewed in different provinces (11) and different years (3)
- Exogenous measure of risk of deportations = # of migrants removed / estimated stock of illegals (from ISMU data) - we measure this probability in each province and each year

- Empirical prediction: an increase in the probability of deportation should imply:
  1. No effect for legal migrants
  2. Reduction in consumption and increase in remittances for illegal migrants

The risk of being illegal

	ysm <=3	ysm <=6	ysm <=9	ysm <=12
	LEGAL	LEGAL	LEGAL	LEGAL
	1	3	5	7
Prob Remittances	LPM	LPM	LPM	LPM
ln (Prob of deportation)	**-0.003**	**-0.009**	**-0.017**	**-0.013**
	[0.036]	**[0.022]**	**[0.019]**	**[0.017]**
Other controls	YES	YES	YES	YES
Observations	1862	5536	8053	9418
R-squared	0.377	0.312	0.295	0.286
ln Remittances	OLS	OLS	OLS	OLS
ln (Prob of deportation)	**-0.049**	**-0.033**	**-0.078**	**-0.062**
	[0.165]	**[0.107]**	**[0.091]**	**[0.084]**
Other controls	YES	YES	YES	YES
Observations	1862	5536	8053	9418
R-squared	0.427	0.368	0.353	0.344
ln Consumption	OLS	OLS	OLS	OLS
ln (Prob of deportation)	**-0.022**	**-0.011**	**-0.002**	**-0.002**
	[0.030]	**[0.014]**	**[0.011]**	**[0.009]**
Other controls	YES	YES	YES	YES
Observations	1862	5536	8053	9418
R-squared	0.722	0.672	0.684	0.689

• Other controls: # of members in the household in Italy, spouse abroad, # children abroad, ln (total hh income), gender, age, age sqr, ysm; dummies for housing, civil status, education, employment status, origin area, origin country, year and Italian provinces. Robust std errors, clustered by country; ** significant at 5%, *** significant at 1%

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Conclusions

- OLS estimates show no differences in remittances and consumption behaviour of undocumented migrants and
- When selection into legal status is taken into account, undocumented migrants behave differently with respect to their documented counterpart: they consume significantly less and remit much more
- Facing higher uncertainty, they seem to save (through remittances) for precautionary reasons
- Undocumented migrants react to changes in the enforcement intensity (while documented do not)

Thanks!

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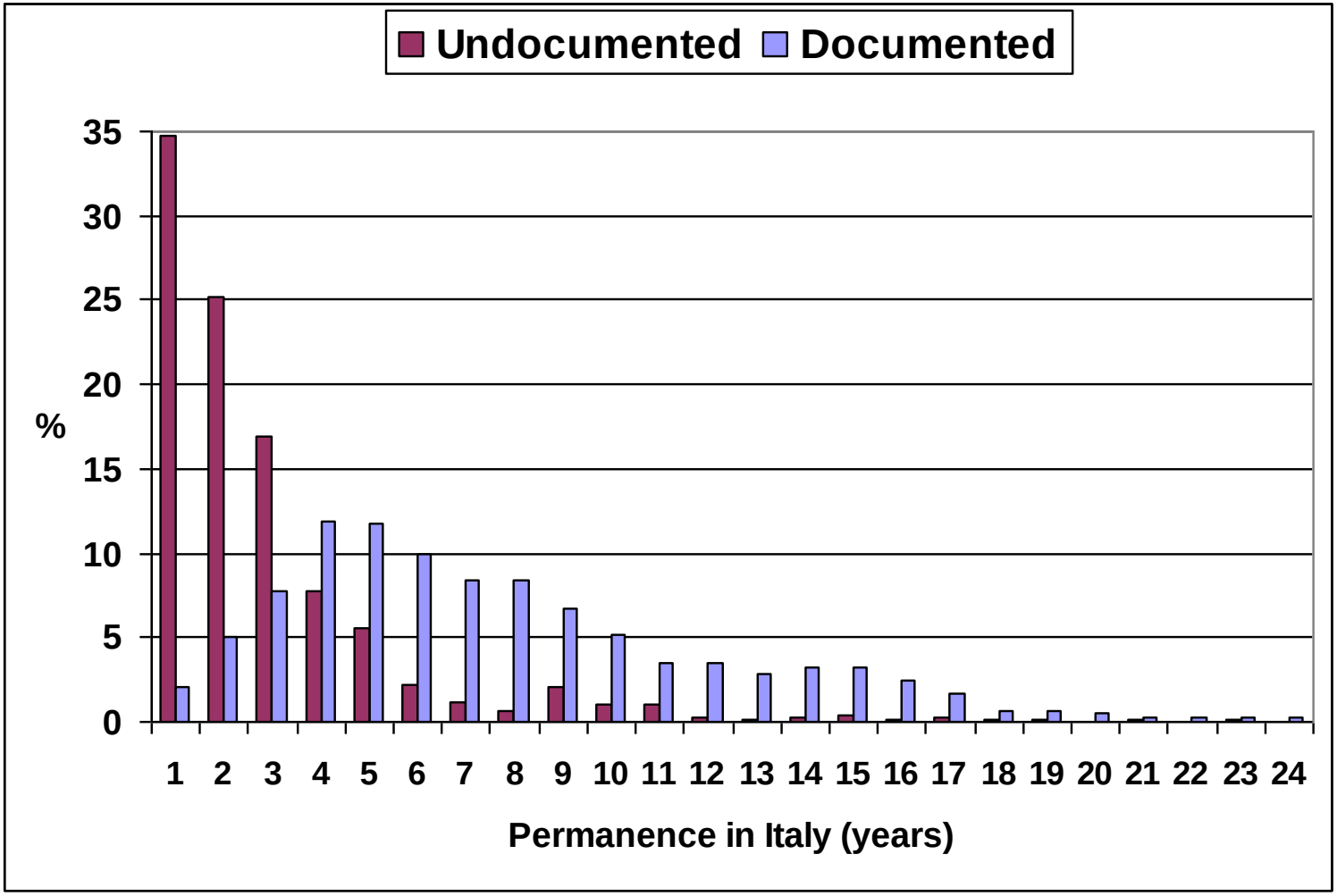
Centre sampling technique

- How can you obtain a random sample from a population whose size and composition are unknown?

- Undocumented migrants generally attend places which can be fairly easily identified by informed researchers: e.g. ethnic shops, NGOs, charitable institutions, churches, dormitories, refectories providing free meals, public spaces (parks, squares, etc.), etc.

- Idea:
  - assume you have a complete list of all the M centres visited by undocumented migrants
  - instead of randomly sampling n individuals from the unknown population of N (undocumented) migrants, one can randomly choose m centres (among the whole set of M) and then randomly sample the interviewees among those visiting the centre
  - Interviewees are also asked which of the M centres they usually attend
  - Each individual is given a weight which reflects their probability of inclusion in the sample:
    - decreasing in the number of centres she usually visits
    - increasing in the size and number of visitors the centre (where the individual is interviewed) usually receives

Undocumented vs Documented: permanence in Italy



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Illegal entry and illegal residence

Dep. Variable:	Probit Current illegal status			
Illegal entry	**0.169**	**0.167**	**0.147**	**0.154**
	[0.009]* **	**[0.009]*** **	**[0.008]*** **	**[0.009]*** **
ysm	-0.036	-0.035	-0.033	-0.03
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
(Illegal entry*ysm)	-0.012	-0.012	-0.01	-0.011
	[0.001]***	[0.001]***	[0.001]***	[0.001]***
year dummies	no	yes	yes	yes
residence	no	no	yes	yes
gender, age, education	no	no	yes	yes
origin area dummies	no	no	yes	yes
dummies	no	no	no	yes
Observations	**29370**	**29370**	**29370**	**29370**

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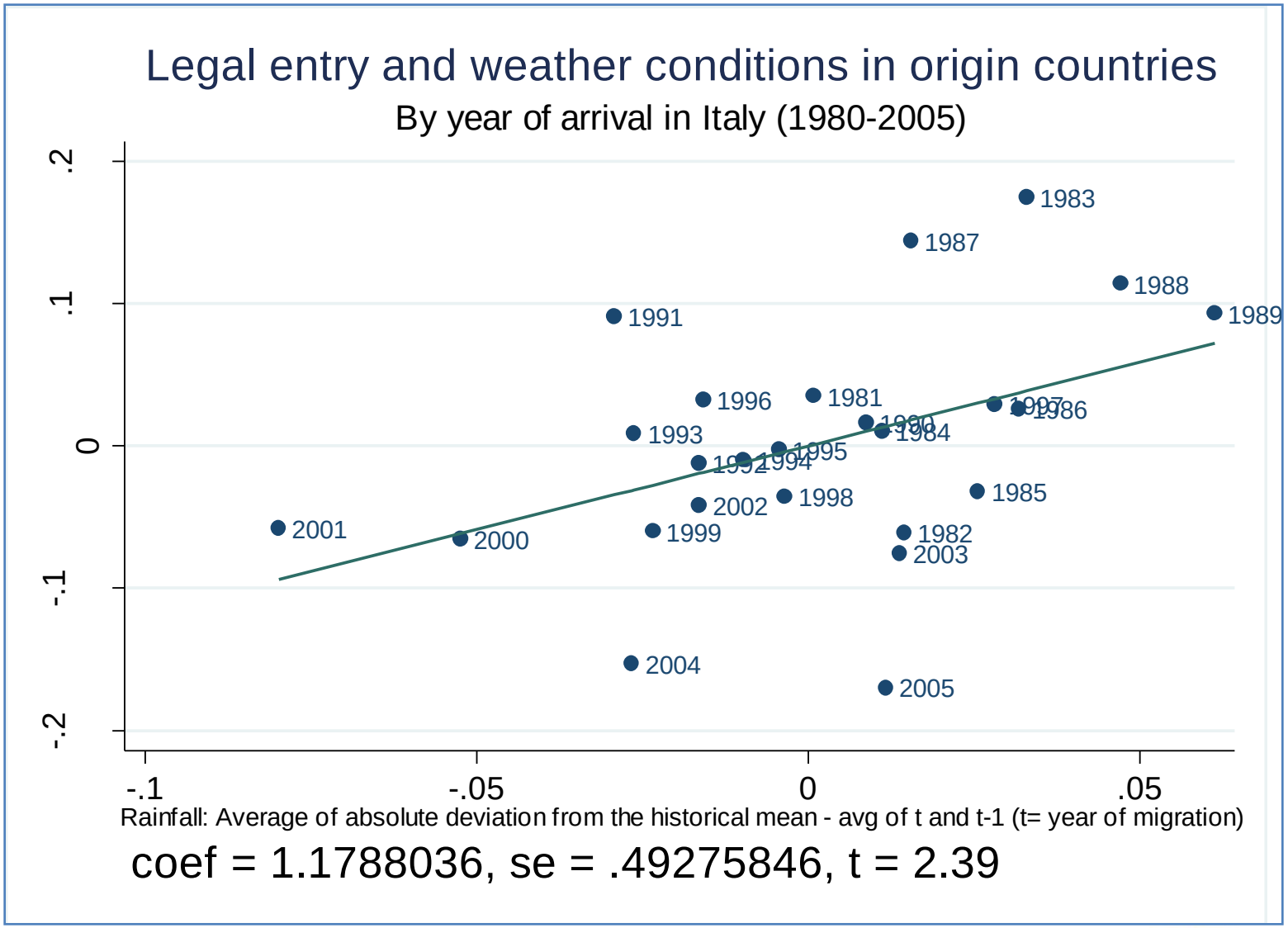
Rainfall shocks as IV: rank condition



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First stage: different geographical areas (LPM)

Dep. Var: Illegal status	1 ysm <=3	2 ysm <=7	3 ysm <=11	4 ysm <=15
IV * SubSaharan Africa	0.209	-0.087	0.031	0.242**
	[0.255]	[0.218]	[0.139]	[0.112]
IV * East Asia	1.263***	0.371***	0.128***	0.090***
	[0.466]	[0.111]	[0.039]	[0.032]
IV * Eastern Europe	0.153	0.223	0.158	0.241
	[0.208]	[0.309]	[0.264]	[0.265]
IV * Latin America	0.511***	0.398***	0.462***	0.511***
	[0.085]	[0.083]	[0.143]	[0.158]
IV * Middle East & North A	-0.292	0.324***	0.182***	0.061
	[0.317]	[0.093]	[0.028]	[0.064]
IV * South Asia	0.869**	0.065	0.288***	0.214***
	[0.356]	[0.191]	[0.065]	[0.064]
current rain shock	0.011	-0.052	-0.05	-0.028
	[0.093]	[0.041]	[0.035]	[0.028]
Other controls	Yes	Yes	Yes	Yes
Observations	2755	7523	9995	11419
R-squared	0.378	0.32	0.269	0.245
IV F-stat	8.013	8.549	17.62	6.267
IV: p-value F-stat	7.84E-07	2.35E-07	0	1.34E-05

• Other controls: # of members in the household in Italy, spouse abroad, # children abroad, ln (total hh income), gender, age, age sqr, ysm; dummies for housing, civil status, education, employment status, origin area, origin country, year and Italian provinces

• robust std errors in parentheses, clustered by country; significant at 10%,** significant at 5%, *** significant at 1%

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LATE effect

- The "ILLEGAL" treatment is likely to have heterogeneous effects

- LATE assumption:
  1. Z is uncorrelated with the unobservable characteristics of the individual and with her gain from participation
  2. $P [I_i (Z=1)] \neq P [I_i (Z=0)]$
  3. Monotonicity assumption: decision rule is a non-trivial monotonic fct of Z

- We identify the ATE for those who ended up being undocumented, but who would have been documented in absence of a weather shock

Quantifying the effects

- Main result: undocumented migrants consume 30-40%less and remit 4-5 times more than documented migrants

- Avg consumption: € 760 (doc.) - € 460 (undoc.)
- By consuming 30% less, undocumented migrants would save € 230-150
- Avg remittances: € 140 (doc.) - € 180 (undoc.); New level of remittances: € 370-330
- …which is 5 times a level of remittances of € 75-65 (almost 40% of the documented migrants remit € 50 or less)

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