



UNIVERSITY OF EDINBURGH
Business School

CRC | Credit
Research
Centre



Household Credit Constraints in European Countries

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International comparisons

- Jappelli & Pagano 1989 *AER*
- Crook & Hochguertel WP (2013)
- Bacchetta & Gerlach 1997 *JME*

Micro Data

US

- Jappelli 1990 *QJE*
- Duca & Rosenthal 1993 *JFinInterm*
- Gropp, Schultz & White 1997 *QJE*
- Ferri & Simon 2002 UB WP
- Grant 2005 EUI WP
- Cox & Jappelli 1993 *JMCA*
- Crook 1996 & 2001 *App Fin Ec*
- Jappelli et al 1998 REStats
- Lyons 2003 JCA

Italy

- Fabri & Padula 2004 JBF
- Magri 2002 BoI WP

Australia

- La Cava & Simon BoA WP 2003

Permanent Income Hypothesis (PIH)

$$\begin{aligned} \underset{c_{t+j}}{\text{Max}} \quad V_t &= E_t \left[\sum_{j=0}^{\infty} \beta^j u(c_{t+j}, z_{t+j}) \right] & \beta &= (1 + \delta)^{-1} \\ \text{s.t.} \quad A_{t+j+1} &= A_{t+j} R_{t+j} + y_{t+j} - c_{t+j} & R &= (1 + r) \end{aligned}$$

$$\Rightarrow u'(c_t, z_t) = \beta R E_t u'(c_{t+1}, z_{t+1})$$

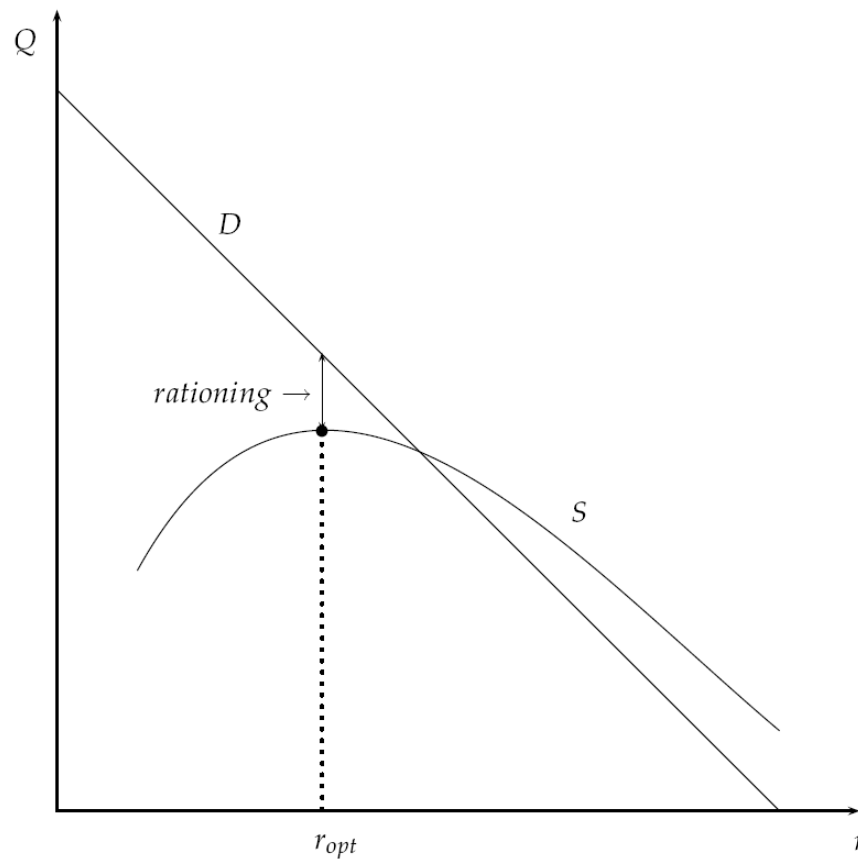
$$\sum_{j=0}^{\infty} \left(\frac{c_{t+j}}{(1+r)^j} \right) = A_t + \sum_{j=0}^{\infty} \left(\frac{y_{t+j}}{(1+r)^j} \right)$$

$$c_t = r(1+r)^{-1} A_t + r(1+r)^{-1} \sum_{j=0}^{\infty} (1+r)^{-j} E_t(y_{t+j})$$

$$S_t = - \sum_{j=1}^{\infty} (1+r)^{-j} E_t \Delta y_{t+j}$$

Credit Constraints

Figure 1: Stiglitz-Weiss Credit Rationing





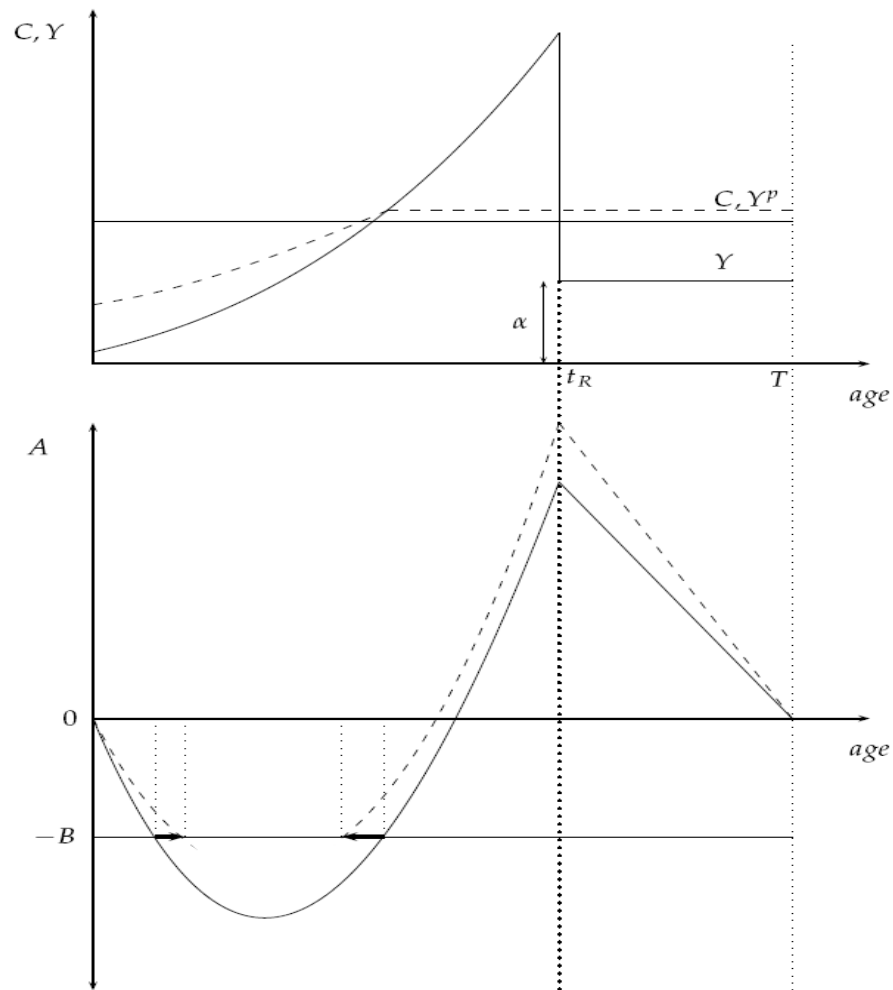
Credit Constraints 2

$$u'(c_t) = \max\{u'(x_t), \beta RE_t u'(c_{t+1})\} \quad \text{Deaton (1991)}$$

$$x_t = A_t + y_t$$

x = cash in hand

Stylised certainty equivalent Lifecycle model



$$u(c_t) = \frac{c_t^{1-\gamma}}{1-\gamma}$$

$$y_t = Y_t^p \varepsilon_t \quad \varepsilon \sim \Lambda(-0.5\sigma_\varepsilon^2, \sigma_\varepsilon) \quad Y_t^p = Y_{t-1}^p \eta_t \quad \eta \sim \Lambda(-0.5\sigma_\eta^2, \sigma_\eta)$$

		Benchmark (Table 1)				
		age 30	40	50	60	70
holds any debt	%	81.1	73.4	23.3	0.2	0.0
constrained	%	17.6	2.5	0.0	0.0	0.0
avg. debt/avg. income		0.197	0.235	0.041	0.000	0.000
indiv. debt/income (unconditional)	mean	0.207	0.267	0.058	0.001	0.000
	median	0.183	0.200	0.000	0.000	0.000
stddv		0.183	0.281	0.152	0.014	0.000
debt/income (if debt > 0)	mean	0.256	0.364	0.247	0.312	0.000
	median	0.233	0.312	0.185	0.312	0.000
stddv		0.170	0.269	0.230	0.018	0.000

Constrained means: cash on hand lower than 110% of consumption.



Eurosystem Household Finance and Consumption Survey (HFCS)

- Each participating country administers survey
- Blueprint questionnaire –but countries can vary and omit questions
- Target Population is all private households and current members
- Each country chooses sampling design ‘appropriate to its national conditions’
- ‘the aim is to achieve nationally representative samples adhering to standardised rules for representative probability samples’
- Missing values multiply imputed 5 times for all income, consumption and wealth variables, but not all others
- Probability sampling weights
- Surveys carried out over slightly different periods from 11/08-07/09 (Greece) to 09/10-07/11 (Germany)
- 15 countries: Austria, Belgium, Denmark, Germany, Greece, Spain, France, Cyprus, Luxembourg, Malta, Netherlands, Portugal, Slovakia, Slovenia, Finland.
- N=62,000 households



Credit Constraint Questions

hc1300 In the last **three years**, have you (or any member of your household) applied for a loan or other credit?

apcr: If applied for credit

hc1310 In the last **three years**, has any lender or creditor turned down any request you [or someone in your household] made for credit, or not given you as much credit as you applied for?

hc1320 (Were you/Was your household) later able to obtain the amount requested, by reapplying to the same institution or somewhere else?

discorej: If 1. applied and were rejected or 2. applied and gained only part or 3. were discouraged

discorej2: If 1. applied and were rejected or 2. applied and gained only part or 3. were discouraged and did not apply in the last 3 years

reporej: given applied, were turned down or did not get as much as applied for.

hc1400 In the last **three years**, did you (or another member of your household) consider applying for a loan or credit but then decided not to, thinking that the application would be rejected?

disc: If discouraged from applying for credit

Credit Constraints (% of Households) Evidence from full sample

	All	Belgium	Germany	Greece	Spain	France	Cyprus	Lux	Malta	NL	Austria	Portugal	Slovenia	Slovak	Italy (1 yr)	US (5yr)
Applied as % of all households	22.8	10.3	21.4	8.8	21.9	32.9	44.2	41.0	18.5	12.6	7.4	18.5	27.9	44.6	4.2	61.7
Rejected or reduced as % of those who applied	16.4	4.2	14.4	41.4	14.3	18.2	8.1	22.5	9.7	14.1	20.8	16.7	27.1	15.6	27.7	34.0
Discouraged as % of all households	6.1	4.6	5.7	3.3	6.4	8.6	4.8	4.2	2.6	0.7	3.1	4.3	15.8	12.2	na	na
Rejected or reduced or discouraged as % of all households	8.1	4.7	7.6	6.0	8.0	11.6	7.2	13.1	4.2	1.7	4.1	5.7	19.2	12.4	4.9	30.6

No data for Italy or for Finland in HFC

Source: HFC (2013) *Statistical reference Tables for the Household Finance and Consumption Survey* July 2013, Table H
Italy: Survey of Household Income and Wealth (SHIW) US: SCF

Mean Debt Balances Outstanding Implicate 1

Mean Debt Balances Outstanding per Household (Euro)

	All households					Conditional on holding debt				
	Mortgages	Overdrafts	Credit Cards	Non-collateralised	Total	Mortgages	Overdrafts	Credit Cards	Non-collateralised	Total
Austria	18,157	312	15	2,342	20,826	50,664	871	41	6,535	58,111
Belgium	27,377	146	100	2,933	30,556	69,899	324	223	6,525	67,971
Cyprus	61,090	2,257	511	7,249	71,107	93,613	3,458	783	11,108	108,926
Germany	23,398	581	29	2,761	26,769	49,428	1,227	61	5,833	56,549
Spain	28,181	217	123	4,141	32,662	56,369	433	246	8,283	65,331
Finland	26,163		na		na	43,737		Na		na
France	18,845	239	na		na	40,230	510	na		na
Greece	9,398	609	385	1,536	11,928	25,630	1,660	1,051	4,188	32,529
Italy	8,661	150	24	2,949	11,784	34,376	596	94	11,704	46,769
Luxemburg	73,588	519	92	7,504	81,704	126,316	891	158	12,881	140,246
Malta	9,218	553	198	2,212	12,179	27,085	1,626	582	6,501	35,794
Netherlands	69,609	1,303	85	11,922	82,918	106,613	1,995	139	18,259	126,997
Portugal	15,976	133	96	1,138	17,342	42,367	352	254	3,017	45,990
Slovenia	1,912	295	15	2,758	4,980	4,309	664	33	6,216	11,222
Slovakia	2,719	43	44	537	3,343	10,149	159	163	2,005	12,476

Probability of Making an Application for Credit in the Last 3 Years (universe: all households)

	All countries	Austria	Belgium	Germany	Spain	France	Greece	Portugal	Slovak R
net wealth (ln)	-.0061**	-.0021*	.0052*	-.0048**	-.0114**	-.0145**	-.0015	-.0064**	-.0170**
gross income (ln)	.0086**	.0272**	.0077	-.0611**	.0194	.0154**	.0066	.0389**	-.0680**
income-perm.inc (ln)	.0014*	-0.0003	.0003	.0007	.0010	.0011	.0003	.0005	.0070
age <30	.0027	.0058	.0010	.0061	.0167*	.0093*	.0044	.0010	-.0324**
age 30-39	-.0073**	-0.0007	-.0046*	-0.0049	-.0096**	-0.0040	-0.0023	.0389**	-.0160**
age 40-49	-.0029**	-.0053**	-.0021	-0.0059	-0.0032	-.0055**	-.0041	-.0052*	.0007
age 50-64	-.0039**	.0007	-.0069**	-0.0035	-.0037**	-.0069**	-0.0005	-.0044*	.0156**
age 65+	-.0150**	-0.0039	-.0043*	-.0111**	-.0076**	-.0186**	-.0075**	-.0109**	-.0308**
no kids 0-6yrs	.0329**	.0158	.0140	-0.0101	.0195	.0217*	.0062	.0158	.0269
no kids 7-13	.0155**	-.0149	-.0015	-.0184	.0187	.0019	.0018	.0031	.0088
no kids 14-15	.0227**	-.0089	-.0131	.0488	-.0129	-.0043	.0383	-0.0050	-.0783
no kids 16-19	.0271**	-.0185	.0098	.0221	.0457**	.0134	.0055	-.0523**	.0110
no kids >=20	.0294**	.0236*	.0029	-0.0035	.0476**	.0124			
edu 1 primary or less	.0105	.0829	-.0049	-0.0180	.0037	-.0624**	.0048	-.0514**	.3405
edu 3 upper secondary	.0485**	-.0051	-.0183	.0526	.0076	-.0060	.0074	-.0173	.0758
edu 5 tertiary	.0504**	.0076	-.0006	.0498	-.0083	-.0121	.0140	-.0064	.1009
unemployed	.0542**	.0119	.0007	.0170	.0261	.0591*	.0564	.0739	-.1507
retired	.0926**	-.0072	.1086**	.0102	.0316	.1407**	.0237	.0541	.0020
regular work	.1244**	.0115	.0637**	.0752**	.0417*	.1823**	.0277	.0497	-.0532
self-emp emples	.0095	.0064	-.0341	-.0150	.0168	.0216	.0367	-.0108	.2752**
self-emp no emples	-.0045	.0020	.0042	-.0075	-.0070	-.0177	.0285	.0072	.1920**
gender	.0192**	-.0106	.0070	.0096	-.0100	.0174&	-.0146	-.0032	-.0261
single	-.0543**	.0016	-.0143	-.0599*	-.0084	-.0891**	-.0431	-.0483*	-.0513
married/partner	-.0024	.0161	-.0157	.0215	.0102	.0110	.0114	.0044	.0507
born in country	-.0227*	-.0098	.0395*	.0316	na	na	na	-.0020	-.1065
N	41,444	2,341	2,071	3,256	6,110	14,668	2,828	4,296	2,022
Prob> chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Constant included. Age: as gradient splines. Excluded categories: edu2: lower secondary education; labour status (for countries): permanently disabled or student of compulsory military services or fulfilling domestic tasks or other not working for pay (if in regular work on sick or maternity leave and planning to return); employment status (for countries): employee or unpaid family worker; widowed or divorced. For income-permanent income: $\ln x = \ln(x+1)$ if $(x > 0)$; $\ln x = -1 \ln(-x+1)$ if $(x < 0)$



Probability was discouraged and did not apply in last 3 years (universe: all households)

disc

	All countries
net wealth (ln)	-0.0034
gross income (ln)	-0.0076
income-perm.inc (ln)	-0.0008
age <30	.0008
age 30-39	-0.0011
age 40-49	-0.0004
age 50-64	-0.0015
age 65+	-0.0015
no kids 0-6yrs	.0076
no kids 7-13	.0075
no kids 14-15	.0117
no kids 16-19	.0072
no kids >=20	.0093
edu 1 primary or less	.0160
edu 3 upper secondary	.0071
edu 5 tertiary	-0.0099
unemployed	.0297
retired	-0.0141
regular work	-0.0060
self-emp employees	.0033
self-emp no employees	.0118
gender	-0.0017
single	-0.0052
married/partner	-0.0206
born in country	-0.0143
N	40,400
Prob> chi2	0.0000

	All countries	Austria	Belgium	Germany	Spain	France	Greece	Portugal	Slovak R
net wealth (ln)	-.0048**			-.0039*	-.0041**	-.0043**	-.0102		
gross income (ln)	-.0147**			-.0746**	-.0672**	-.0157**	-.4305**		
income-perm.inc (ln)	.0001			.0008	-.0003	-.0042**	.0240**		
age <30	.0017			.0166	.0167	-.0048	-.0238		
age 30-39	1.01x10-5			-.0129*	-.0020	.0038	-.0172		
age 40-49	-.0014			.0066	.0015	-.0032	.0072		
age 50-64	-.0037*			.0008	-.0049	-.0021	-.0086		
age 65+	.0059**			.0275*	.0031	.0106**	-.0227		
no kids 0-6yrs	.0151*			.0168	-.0243	.0306**	.0383		
no kids 7-13	.0037			-.0158	-.0049	.0138	.1163		
no kids 14-15	.0039			.0490	.0075	.0007	.0574		
no kids 16-19	.0051			-.0780*	-.0007	.0247	.1639		
no kids >=20	.0016			.0241	.0122	.0049	.0509		
edu 1 primary or less	.0535**			.0921	.0370	.0985**	-.0879		
edu 3 upper secondary	-.0207			.0631	.0295	-.0065	-.0366		
edu 5 tertiary	-.0489**			.0830	.0619	-.0634**	.1628		
unemployed	-0.633			.2528*	.0765	.0463	-.0048		
retired	-0.1530			.0064	.0313	-.0854*	.0490		
regular work				.0745	-.0150	-.1029**	-.0333		
disabled	-.01846*								
no paid work	-0.1111								
self-emp employees	-.1157			.0936	.0306	.0932**	.2195		
self-emp no employees	-.0955			.0369	.1292*	.0891**	-.0817		
employee	-.1615								
gender	-.0037			.0285	.0508*	-.0184	.0597		
single	-.0033			-.0579	.0256	.0144**	-.2553		
married/partner	-.0390**			-.0497	-.0094	-.0555	-.1880		
born in country	-.0707**								
N	9.983			812	1,029	4,534	254		
Prob>chisq	0.0000			0.0000	0.000	0.0000	0.0000		

Probability that (applied and rejected or did not get as much) or was discouraged from applying (but did at sometime apply) (universe: all households)

discorej

	All countries	Austria	Belgium	Germany	Spain	France	Greece	Portugal	Slovak R
net wealth (ln)	-.0022	-.0029	-.0016	-.0035	-.0037	-.0068	-.0030	-.0040	-.0101
gross income (ln)	-.0112	-.0137	-.0006	-.0129	-.0094	-.0071	-.0127	-.0137	-.0430
income-perm.inc (ln)	-.0004	.0010	-.0005	-.0001	-.0007	-.0022	.0010	.0012	.0037
age <30	.0036	.0027	-.0003	.0044	.0012	.0045	.0009	-.0009	-.0089
age 30-39	-.0010	.0001	.0016	-.0024	-.0013	-.0013	-.0021	-.0030	-.0024
age 40-49	-.0013	-.0010	-.0027	.0005	-.0021	-.0016	.0001	-.0006	-.0050
age 50-64	-.0015	-.0003	-.0005	-.0011	.0007	-.0026	-.0030	-.0010	-.0020
age 65+	-.0018	-.0008	.00008	-.0039		-.0037	-.0072	-.0041	-.0362
no kids 0-6yrs	.0083	-.0246	.0022	.0084	-.0118	.0156	.0085	.0208	.0230
no kids 7-13	.0050	-.0015	-.0007	-.0006	-.0028	.0100	.0061	.0029	.0102
no kids 14-15	.0096	-.0174	-.0134	.0390	.0058	.0068	.0249	.0220	-.0036
no kids 16-19	.0074	.0036	.0109	-.0270	.0014	.0142	.0217	-.0034	.0249
no kids >=20	.0116	-.0002	.0061	.0117	.0057	.0272	.0027	.0134	.0067
edu 1 primary or less	.0400	.0852	-.0179	.0539	.0346	.0138	.0001	-.0151	-.0286
edu 3 upper secondary	.0133	.0052	-.0103	-.0022	.0101	-.0084	-.0098	-.0099	-.0933
edu 5 tertiary	.0009	.0128	-.0175	-.0008	-.0021	-.0392	.0120	-.0117	-.0583
unemployed	.0429	.0085	.0083	.0143	.0191	.0418	.0190	.0566	.0196
retired	-.0032	-.0213	-.0281	-.0270	-.0045	-.0207	.0244	.0129	-.0260
regular work	.0144	-.0106	-.0061	.0015	-.0121	-.0180	.0094	.0158	-.0023
self-emp emples	.0053	-.0135	-.0044	.0422	.0129	.0271	.0189	-.0044	.0324
self-emp no emples	.0125	.0051	.0058	.0246	.0253	.0359	.0273	.0137	.0026
gender	-.0024	-.0011	.0048	.0111	.0042	-.0070	-.0075	-.0057	.0070
single	-.0061	-.0049	-.0061	-.0240	-.0047	-.0046	-.0342	-.0062	.0117
married/partner	-.0160	-.0079	-.0096	-.0344	-.0195	-.0210	-.0144	.0020	-.0170
born in country									
	56,728	2341	2074	3526	6110	14,669	2828	4300	2022
Prob> chi2		.0000	.0000	.0000	.0000	.0000	0.0000	0.0000	0.0000

Probability applied and (rejected or gained only part of amount applied for) or was discouraged and never applied (in 3 years) (universe: all households)

(discorej2)

	All countries	Austria	Belgium	Germany	Spain	France	Greece	Portugal	Slovak R
net wealth (ln)	-.0019**	-.0028**	-.0015**	-.0032**	-.0036**	-.0049**	-.0030**	-.0035**	
gross income (ln)	-.0091**	-.0137	-.0004	-.0173**	-.0093**	-.0070**	-.0144	-.0146**	
income-perm.inc (ln)	-.0002*	.0010	-.0003	.0004	-.0007*	-.0019**	.0012	.0014**	
age <30	.0032**	.0026	-.0010	.0046*	.0019	.0019	.0010	-.0014	
age 30-39	-.0004	4.02x10-5	.0022	-.0030	-.0017	-.0003	-.0020	-.0024	
age 40-49	-.0012**	-.0008	-.0026*	.0007	-.0016	-.0014	-.0002	-.0006	
age 50-64	-.0013**	-.0008	-.0002	-.0012	-.0023**	-.0019*	-.0027	-.0010	
age 65+	-.0014**	-.0009	.0008	-.0040*	.0007	-.0030**	-.0065*	-.0034**	
no kids 0-6yrs	.0070**	-.0231	.0033	.0032	-.0108	.0140**	.0088	.0175**	
no kids 7-13	.0035*	-.0014	.0004	-.0025	-.0028	.0084*	.0040	.0022	
no kids 14-15	.0069*	-.0162	-.0110	.0333**	.0070	.0078	.0126	.0136	
no kids 16-19	.0065**	.0034	.0113*	-.0224*	.0024	.0116*	.0219*	-.0040	
no kids >=20	.0096**	.0008	.0051	.0097	.0052	.0250**	.0034	.0128**	
edu 1 primary or less	.0299**	.0834	-.0174*	.0090	.0349**	.0174	-.0006	-.0133	
edu 3 upper secondary	.0087**	.0037	-.0062	-.0030	.0088	-.0043	-.0092	-.0089	
edu 5 tertiary	-.0016	.0074	-.0122	-.0047	-.0016	-.0329**	.0128	-.0159	
unemployed	.0076	.0145	.0127	.0155	.0199	.0408**	.0192	.0423*	
retired	-.0278	-.0120	-.0252	-.0201	-.0048	-.0203	.0165	.0100	
regular work		-.0048	-.0033	.0058	-.0139	-.0200*	.0097	.0168	
disabled	-.0204								
no paid work	-.0219								
self-emp emples	-.0052	-.0118	-.0024	.0478*	.0145	.0348**	.0207	-.0068	
self-emp no emples	-.0001	.0055	.0074	.0240	.0279	.0390**	.0276*	.0064	
employee	-.0125								
gender	.0016	-.0015	.0031	.0130*	.0043	-.0059	-.0054	-.0073	
single	-.0042	-.0038	-.0044	-.0236*	-.0033**	-.0024	-.0339**	-.0055	
married/partner	-.0139**	-.0070	-.0121	-.0314**	-.0183	-.0213**	-.0140	.0012	
born in country	-.0011								
N	56,728	2,341	2,074	3,256	6,110	14,669	2,828	4,300	
Prob>chisq	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	

Conclusions

- Of the countries considered the proportions of households that are credit constrained are **highest** in Slovakia, Slovenia, Luxembourg and France are **lowest** in the Netherlands, Belgium and Austria.
- The data is not consistent with the PIH.
- Those most likely to apply are

Those most likely to be discouraged are households with/are: lower wealth, lower income, older (within every age range), with more kids (in every age range of child), with less education, widowed or divorced, self employed with no employees.

- The probability of being credit constrained is negatively related to
 - wealth,
 - income,
 - being older (if above 30),
 - being single or married/with partner (rather than widowed or divorced)

positively related to

having more kids regardless of their ages,
having primary or upper secondary education (rather than lower secondary),
being unemployed or in regular work (but not an employee),