Trade and skill structure: First evidence from Slovenia

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Outline

- Motivation
- Aims
- Data
- Descriptive statistics
- Results
- Summary

Motivation

- Extensive evidence showing that exporting firms are superior relative to non-exporters
  - in terms of productivity, capital intensity, wages, and size
- Inconclusive evidence on where this "*exporter premia*" comes from (self-selection vs. learning)
- Similarly, is observed wage premia an artifact of firms' superior skill structure or just the actual "*trading premia*"?

Motivation (2)

Inconclusive evidence on firms' skill upgrading and trade:

- Pavcnik (2003) finds a positive relationship between skill upgrading and imported materials in Chilean firms,
- Fernandes and Sundaram (2008) find that higher export intensity leads to a decrease in the share of skilled workers in Indonesia,
  - while increasing imports of inputs improves the skill composition
- Hahn and Park (2010) find that exporting leads to an increase in the share of skilled workers in Korea
- Mion et al. (2010) show that Belgian manufacturing firms facing Chinese import competition reduce the employment growth and upgrade the skill composition

Motivation (2)

- Bustos (2011) reports that trade liberalization was associated with an increase in within-firm skill upgrading in Argentina
- Skaksen and Munch (2008) find that the exporter wage premium is increasing in skill-intensity of Danish firms
- Alcala and Hernandez (2009) find that Spanish exporters that sell to more remote destinations resort to skill upgrading
    - Skill premium increase with the distance to target market

Aims

We study skill and wage premia of trading firms in Slovenia

- Skill premium and trade status:
  - is skill premium increasing in trade complexity?
  - does switching the trade status result in higher premium?
  - do firms face skill upgrading after the switch (or vice versa)?

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- Skill premium and extensive margins
  - does skill premium increase with the extensive margins_
  - does expansion along the extensive margins require higher skill intensity?

Data

Matched employer - employee and trade datasets

- Transaction-level imports & exports data for Slovenia at CN-8 product-level,
  - manufacturing firms only
  - period 1994 - 2008
  - information on destination and origin country
- Matched with firm balance sheets (AJPES)
- Matched with labor force survey
  - period 1997 - 2008
- Matched with data on firm's multinational status

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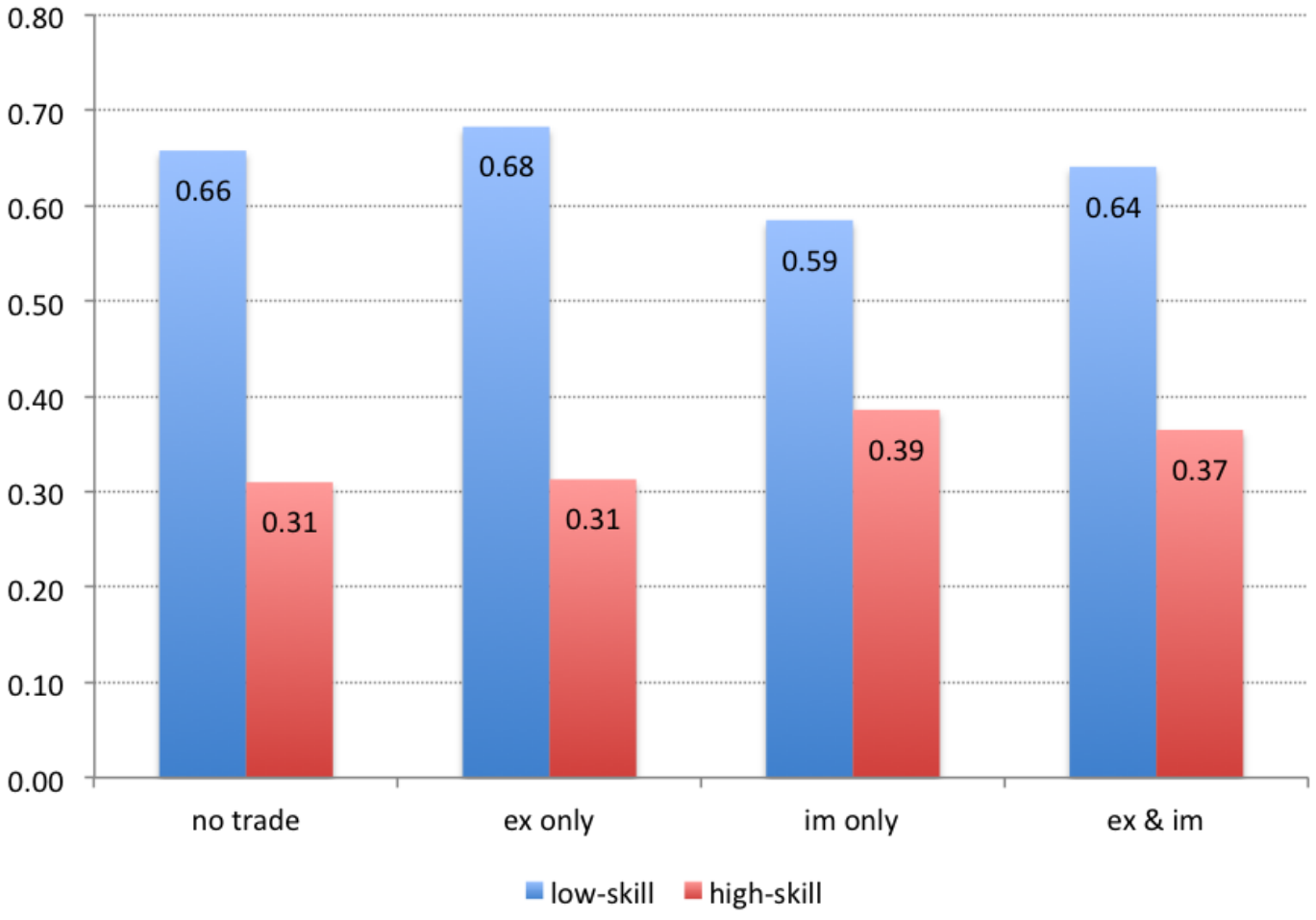
- deflated to 1994 using Nace-2 PPI and CPI (capital)

Number of exporters and importers in 1997-2008

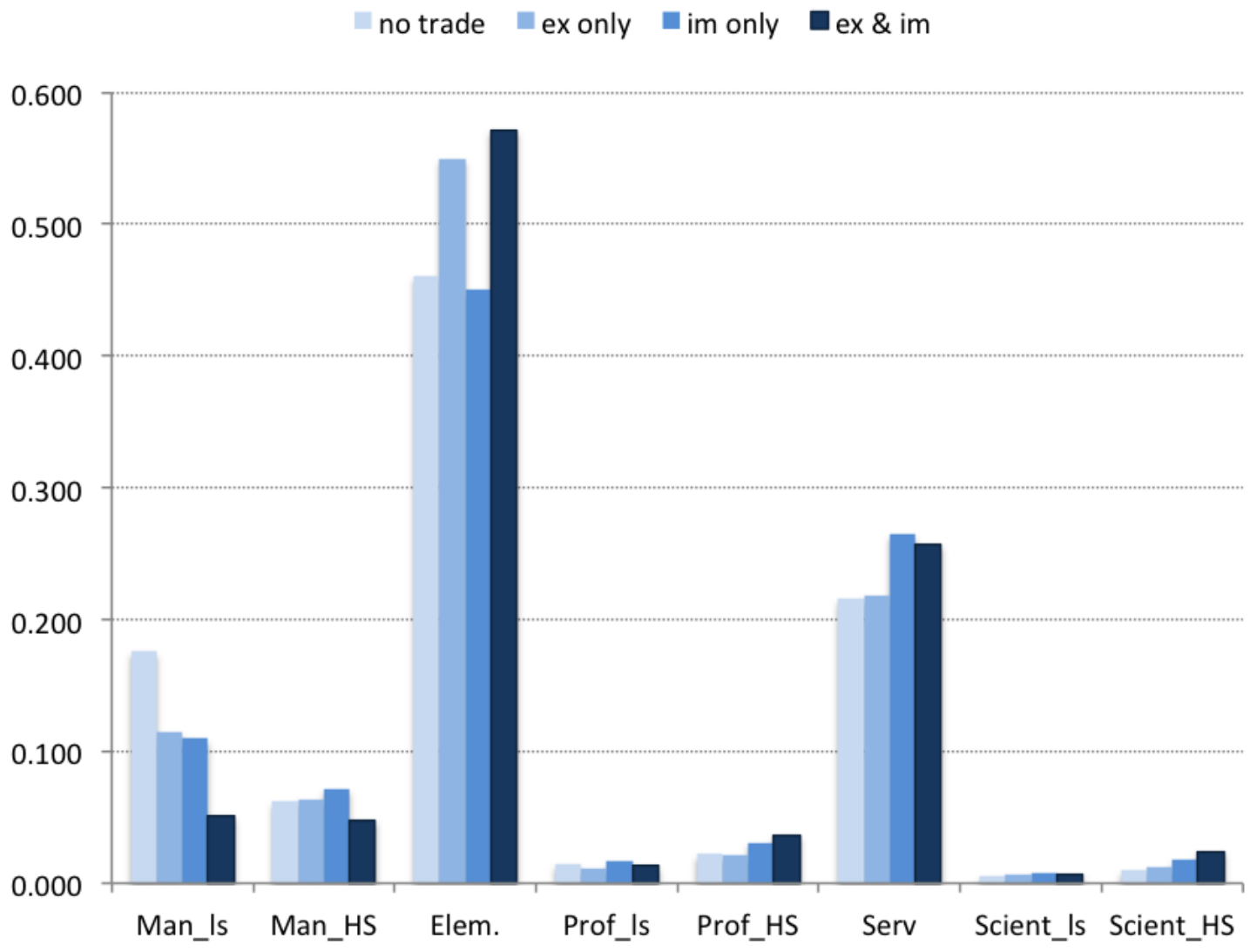
trade	1997	2000	2004	2008	Share (2008)
no trade	2,956	2,394	2,878	3,707	0.56
ex only	327	325	425	513	0.08
im only	1,187	987	709	667	0.10
ex-im	2,128	2,000	2,045	1,775	0.27
Total	6,598	5,706	6,057	6,662	1.00

Trade status and skill shares, average 1997-2008

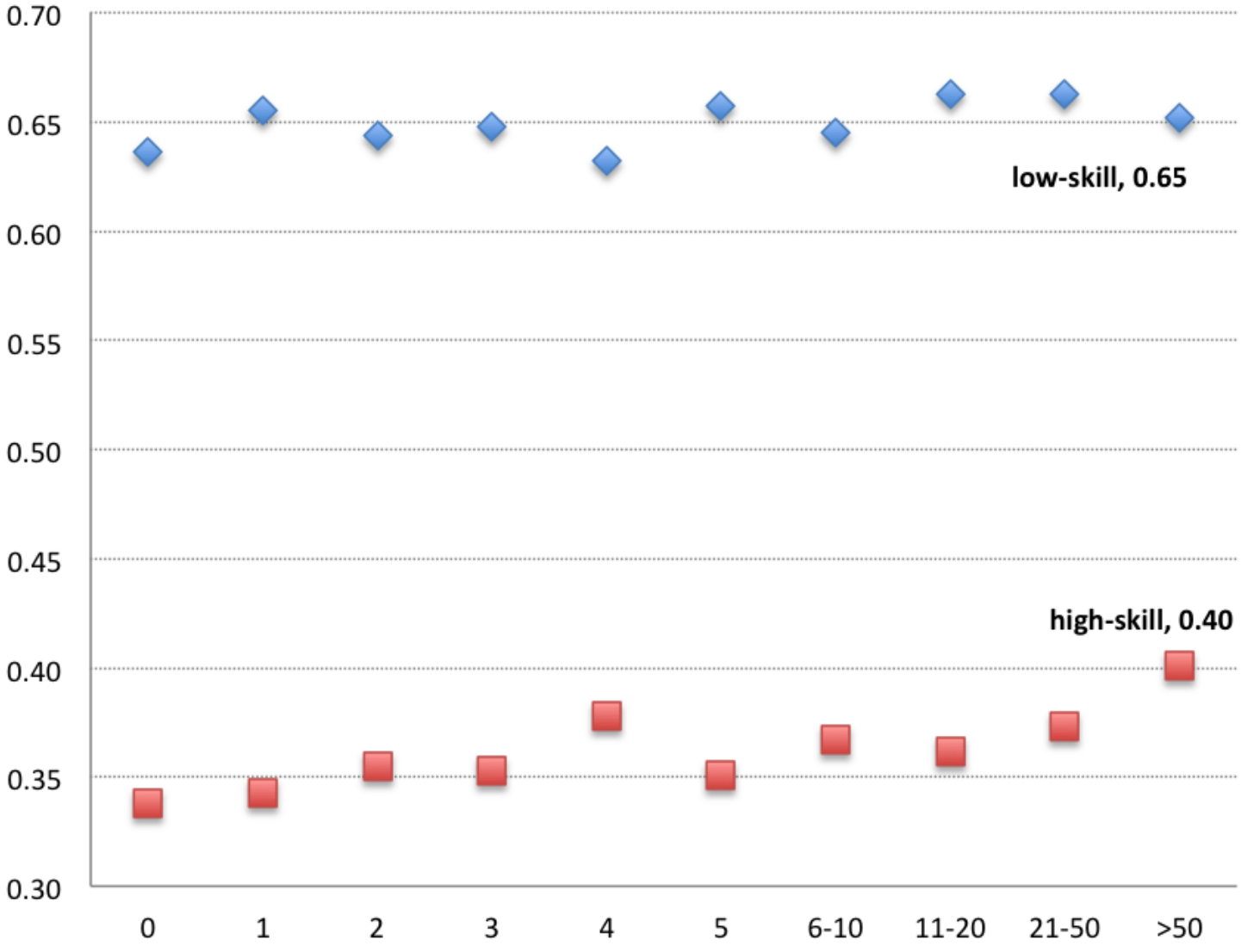


(low skill: $\leq$ 12y sch., high skill: $>$12y sch.)

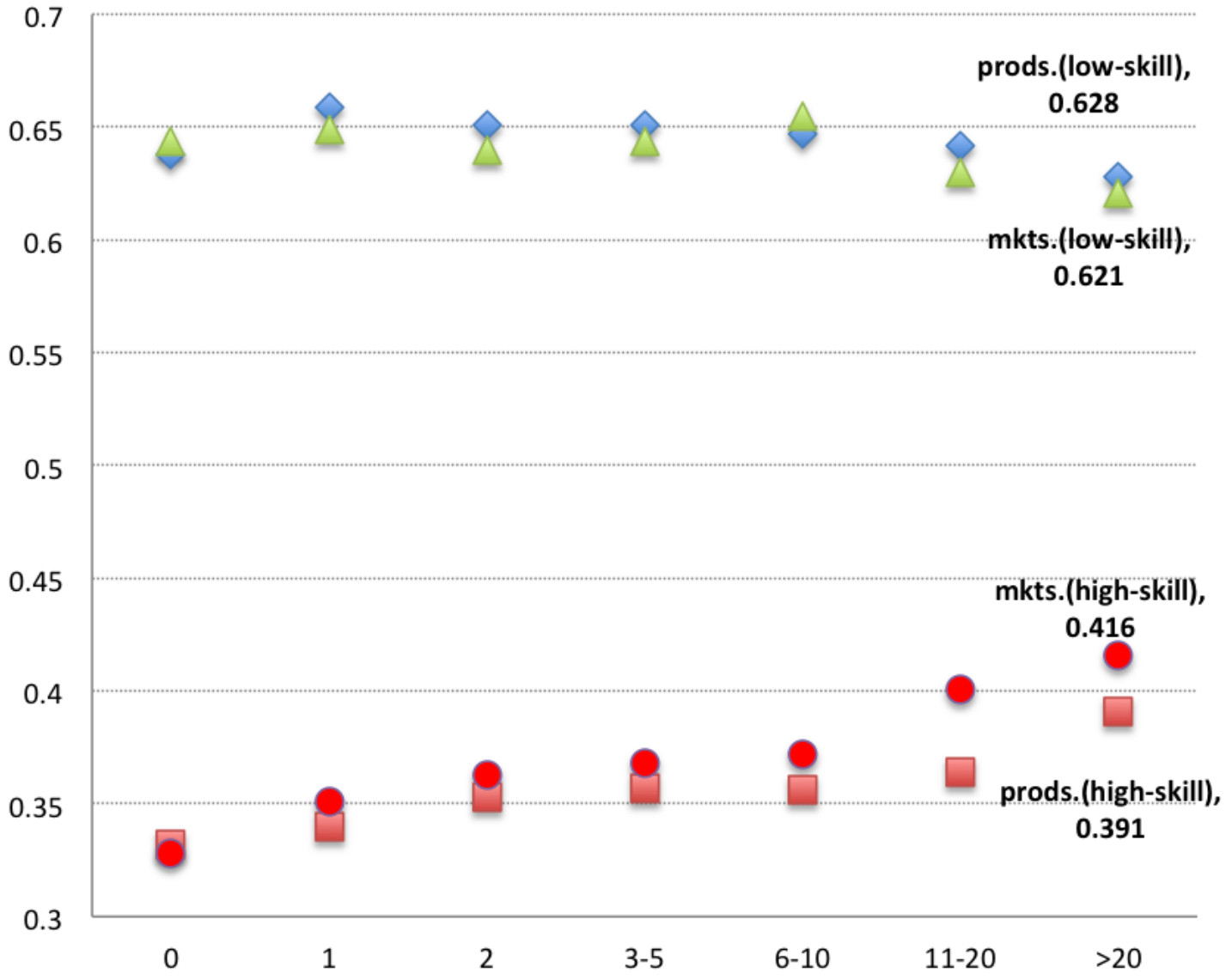
Trade status and skill shares by occupation, 1997-2008



Number of products exported and skill shares, 1997-2008



#products and #markets added in exports and skill shares



Skill and wage premia by trade status

Skill premia:

$$skill\_share_{it} = \alpha + \beta_1 ex_{it} + \beta_2 im_{it} + \beta_3 both_{it} + \gamma controls_{it} + \varepsilon_{it}$$

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Wage premia:

$$\ln(wage_{it}) = \alpha + \beta_1 ex_{it} + \beta_2 im_{it} + \beta_3 both_{it} + \gamma controls_{it} + \varepsilon_{it}$$

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- Controls: TFP (OP), size, inw.FDI, outw.FDI
- Industry and year fixed effects
- Period 1997-2008

Skill and wage premia by trade status

	(1) ls_share	(2) hs_share	(3) ls_wage	(4) hs_wage
ex only	-0.043***	0.053***	0.041***	0.047***
	[-9.69]	[12.24]	[4.74]	[3.59]
im only	-0.083***	0.075***	0.024***	0.019*
	[-21.06]	[19.96]	[3.11]	[1.91]
ex&im	-0.093***	0.108***	0.022***	0.070***
	[-27.18]	[32.44]	[3.32]	[7.80]
TFP (OP)	-0.042***	0.052***	0.246***	0.256***
	[-22.15]	[26.68]	[46.81]	[38.97]
size	-0.001	-0.003***	-0.006**	0.081***
	[-0.53]	[-3.56]	[-2.34]	[28.16]
inw.FDI	0.018***	-0.009**	0	0.045***
	[4.71]	[-2.16]	[0.04]	[5.30]
outw.FDI	-0.024***	0.053***	-0.007	-0.047***
	[-6.02]	[12.08]	[-0.90]	[-5.95]
Constant	0.100***	-0.096***	-0.016***	-0.117***
	[86.79]	[-86.51]	[-6.60]	[-28.40]
Obs.	44,195	44,195	44,180	32,508
R-sq.	0.077	0.106	0.177	0.262

- negative premia for low-skill, positive for high-skill
- skill and wage premia increasing in trade complexity

Skill and wage premia for trade starters (t=0)

	(1) ls_share	(2) hs_share	(3) ls_wage	(4) hs_wage
ex only	-0.014**	0.018***	-0.049***	-0.030*
	[-2.09]	[2.72]	[-3.70]	[-1.72]
im only	-0.008	0.010	-0.076***	-0.035
	[-0.98]	[1.28]	[-4.21]	[-1.47]
ex&im	0.020	-0.002	-0.168***	-0.187***
	[1.34]	[-0.11]	[-4.86]	[-4.16]
Obs.	27,689	27,689	27,678	17,883
R-sq.	0.066	0.077	0.155	0.207

- skill: negative premia for low-skill, positive for high-skill
- wage: always negative

Skill upgrading with trade?

Skill premia for trade starters:

$$skill_{it-\tau} = \alpha + \beta_1 X\_start_{it} + \beta_2 M\_start_{it} + \beta_3 XM\_start_{it} + \gamma controls_{it-}$$

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- Pre- and post-switch premia ($t-3 < \tau < t+3$)
- Controls: TFP (OP), size, inw.FDI, outw.FDI
- Industry and year fixed effects
- Period 1997-2008

Pre- and post-switch premia [*t-3, t+3*]

		ex only	im only	ex&im
low skill	t-3	-0.013	-0.011	-0.037
	t-2	-0.028***	-0.015	-0.034
	t-1	-0.013	-0.029***	-0.028
	0	-0.014**	-0.008	0.020
	t+1	-0.020**	0.005	0.022
	t+2	-0.017*	0.001	0.031*
	t+3	-0.020*	0.010	0.017
high skill	t-3	0.014	0.018	0.001
	t-2	0.030***	0.022*	0.025
	t-1	0.018**	0.035***	0.028
	0	0.018***	0.010	-0.002
	t+1	0.023***	-0.001	-0.000
	t+2	0.021**	0.008	-0.018
	t+3	0.019*	-0.001	-0.009

- persistent negative premia for low-skill and positive for high-skill
- no learning from switching trade status

Skill and trade expansion

Skill premia for adding new products / markets:

$$skill_{it} = \alpha + \beta_1 (\#D_g^j)_{it} + \gamma controls_{it-\tau} + \varepsilon_{it}$$

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- $\#D_g^j$ - dummy variables for # of added new products / markets
  - in exports and imports
- Controls: TFP (OP), size, inw.FDI, outw.FDI
  - lagged # prods&mkts., #POT prods
- Industry and year fixed effects
- Period 1997-2008

Skill premia and trade expansion

	low skill share				high skill share			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
#	#imp_prod	#exp_prod	#imp_mkts	#exp_mkts	#imp_prod	#exp_prod	#imp_mkts	#exp_mkts
0	0.072***	0.050***	0.047***	0.042***	-0.075***	-0.064***	-0.049***	-0.049***
	[23.09]	[15.97]	[16.30]	[14.64]	[-25.02]	[-20.85]	[-17.47]	[-17.42]
1	0.013**	0.018***	0.000	0.005	-0.013**	-0.020***	-0.002	-0.002
	[2.52]	[3.82]	[0.12]	[1.41]	[-2.55]	[-4.39]	[-0.63]	[-0.40]
2	0.016**	0.005	0.002	-0.007	-0.013**	-0.005	0.005	0.010**
	[2.50]	[0.83]	[0.40]	[-1.40]	[-2.05]	[-0.87]	[1.11]	[2.13]
2 - 5	0.008*	0.006	-0.013***	0.002	-0.010**	-0.003	0.018***	0.006
	[1.78]	[1.34]	[-3.17]	[0.52]	[-2.19]	[-0.66]	[4.30]	[1.36]
6 - 10	-0.010**	-0.007	-0.007	0.009	0.012**	0.011**	0.021***	0.006
	[-1.96]	[-1.49]	[-1.10]	[1.50]	[2.46]	[2.01]	[2.96]	[0.87]
11 - 20	-0.022***	-0.010*	-0.043***	-0.001	0.020***	0.013**	0.059***	0.015
	[-4.56]	[-1.76]	[-3.20]	[-0.14]	[4.07]	[2.32]	[3.98]	[1.22]
> 20	-0.021***	-0.024***	-0.063***	0.016	0.024***	0.037***	0.094***	0.015
	[-4.56]	[-4.13]	[-3.56]	[0.80]	[4.87]	[6.10]	[3.89]	[0.66]
Obs.	42,956	42,956	42,956	42,956	42,956	42,956	42,956	42,956
R-sq.	0.073	0.066	0.070	0.064	0.100	0.097	0.102	0.091

- high skill premia important for firms adding larger # prods. & mkts
- but not for #exports mkts.

Summary

- Skill premia is important for Slovenian traders
  - increasing in trade complexity
  - increasing in number of traded goods and markets served
- No skill upgrading from switching trade status,
- What about skill upgrading from trade expansion?
  - increasing in number of added products and markets,
  - no causality inferred
- Future work:
  - exploring causality between trade expansion and skill upgrading
  - trade liberalization and skill upgrading