

The use of micro data in empirical research in Slovenia:

Application to the study of the effects of trade, innovation and financial constraints on firm performance

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Outline

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Type of research using microdata for Slovenia

- ▶ Past decade has witnessed an increased and extensive use of microdata for Slovenia in empirical research:
 - ▶ FDI and spillovers,
 - ▶ self-selection or learning by exporting
 - ▶ substitution/complementarity between exports and FDI
 - ▶ ownership and firm performance
 - ▶ management pay-offs
 - ▶ innovation and firm performance
 - ▶ causal link between trade and innovation
 - ▶ expansion patterns of new exporters
 - ▶ exports and financial constraints
 - ▶ micro-simulation studies of tax and transfer reforms
 - ▶ rate of return to schooling
 - ▶ ...
 - ▶ etc.

Microdata available in Slovenia

- ▶ Firm accounting data - Agency for Public Evidence (AJPES)
 - ▶ Annual firm balance sheets (1994-2008), all firms
 - ▶ information on employment, domestic sales, labor and material costs, physical capital, assets, liabilities, etc.
- ▶ Innovation data - Statistical office (SORS)
 - ▶ CIS1, CIS2, CIS3 (6 bi-annual panels, 1996-2006), covering also micro and small firms
- ▶ Industrial production survey (IPS) - Statistical office (SORS)
 - ▶ Annual data at firm-product level (1995-2008), mostly medium and large firms (cut-off point at 20 empl.)
- ▶ Transaction-level data on trade - Customs Office (CORS)
 - ▶ Annual data on firm-product imports & exports flows (1995-2008) by destinations, all firms
 - ▶ 8-digit CNTP products (10,000+ products)

Microdata available in Slovenia, cont'd

- ▶ Transaction-level data on all foreign transactions - Bank of Slovenia (BS)
 - ▶ all firm transactions related to trade and inward/outward investments (1994-2002)
- ▶ Firm ownership data
 - ▶ FDI (1994-2008) - Bank of Slovenia (BS)
 - ▶ domestic ownership types (1994-2008) - Public clearing house (KDD)
- ▶ Employer-employee dataset (1994-2008) - Statistical office (SORS)
 - ▶ complete education and employment record for Slovenian population

Access to the microdata

- ▶ First years
 - ▶ data on disposal for external use
 - ▶ contracts on confidentiality
- ▶ Recent years
 - ▶ access to the data in the safe room at SORS (authorized researchers, contracts)
 - ▶ private investment into computer facilities and software
 - ▶ research results (output tables) received via e-mail after screening
- ▶ Very recently...
 - ▶ on-line access granted to authorized researchers
 - ▶ research results (output tables) received via e-mail after screening

Research papers

- ▶ Damijan, P.J., S. Polanec, J. Prasnikar, 2004, Self-selection, Export Market Heterogeneity and Productivity Improvements: Firm Level Evidence from Slovenia. LICOS Discussion paper, No. 148.
- ▶ Damijan, P.J, C. Kostevc (2006), Learning-by-Exporting: Continuous Productivity Improvements or Capacity Utilization Effects? Evidence from Slovenian Firms, Review of World Economics, 142 (3): 599-614.
- ▶ Damijan, P.J., S. Polanec, J. Prasnikar (2007), Outward FDI and Productivity: Micro-evidence from Slovenia, The World Economy, 30 (1): 135-155.
- ▶ Damijan, P.J., J. De Sousa, O. Lamotte (2009), Does international openness affect productivity of local firms? Evidence from Southeastern Europe. Economics of Transition, 17 (3): 559-586.
- ▶ Damijan, J.P., C. Kostevc, M. Rojec (2009), Does Innovation Help the Good or the Poor Performing Firms? LICOS Discussion Paper No. 230/2009.
- ▶ Damijan, J.P., C. Kostevc, S. Polanec (2010), From innovation to exporting or vice versa? The World Economy (forthcoming).
- ▶ Damijan, J.P., C. Kostevc, S. Polanec (2009), Export expansion pattern, UL, Mimeo.
- ▶ Damijan, J.P., C. Kostevc, (2009), Financial constraints and non-monotonic export intensity, UL, Mimeo.

Research case #1: Innovation and firm performance

- ▶ Damijan, J.P., C. Kostevc, M. Rojec (2008), Innovation and Firms' Productivity Growth in Slovenia: Sensitivity of Results to Sectoral Heterogeneity and to Estimation Method. LICOS Discussion Paper No. 203/2008.
- ▶ Damijan, J.P., C. Kostevc, M. Rojec (2009), Does Innovation Help the Good or the Poor Performing Firms? LICOS Discussion Paper No. 230/2009.

Motivation

- ▶ Link between higher productivity level and higher innovative activity is supported in the data [Crepon et al. (1998), Mohnen et al. (2006)]
- ▶ No conclusive evidence so far that innovation promotes firm productivity growth
 - ▶ Recent studies find that process innovation (labor displacement effects), rather than product innovation positively affects productivity growth [Griffith et al (2006), Parisi et al. (2006)].
 - ▶ Harrison et al. (2005) and Hall et al. (2007), demonstrate that due to increased demand product innovation may result in employment growth, and therefore in lower productivity
 - ▶ Damijan et al (2008) find no conclusive evidence for both types of innovation for Slovenia

Research issue

- ▶ This paper rather studies whether innovation impacts growth differently for different subsets of firms
 - ▶ Is innovation benefitting more good or bad performing firms?
 - ▶ Convergence in productivity among manufacturing firms?

Data

- ▶ Innovation data:
 - ▶ CIS1, CIS2, CIS3 (4 bi-annual panels, 1996-2002), covering also micro and small firms
- ▶ Accounting data
 - ▶ Annual firm balance sheets (1996-2002), all firms
- ▶ Total of 1,400 (1996) - 2,500 (2002) firms

Descriptives

Characteristics of the dataset

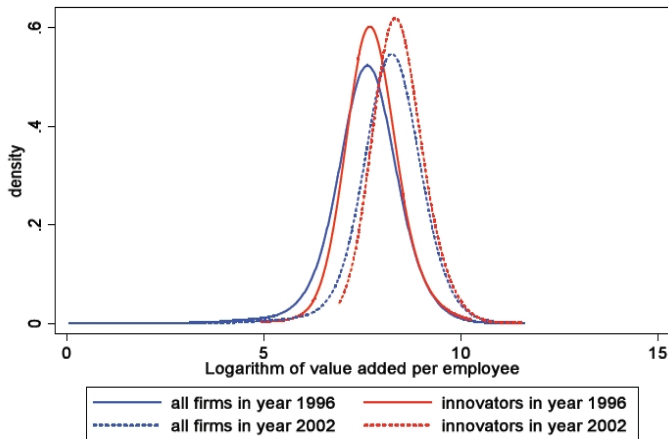
	N	INOV _{t-2} ¹	Employ- ment	R&D/ Sales ²	Exports/ Sales	IFDI ³
Innovative firms						
1996	316	-	346.7	0.016	0.439	0.388
1998	409	0.643	312.9	0.016	0.431	0.397
2000	533	0.554	278.5	0.060	0.381	0.368
2002	527	0.694	283.6	0.065	0.437	0.364
Non-Innovative firms						
1996	1138	-	122.8	0.00026	0.257	0.254
1998	1368	0.095	96.5	0.00003	0.273	0.237
2000	1985	0.122	68.5	0.00021	0.216	0.201
2002	2037	0.113	67.5	0.00015	0.228	0.215

Notes: 1/ Past innovation activity, lagged one period; 2/ R&D expenditures as a share of sales; 3/ Foreign ownership.

Source: Statistical office of Slovenia; author's calculations.

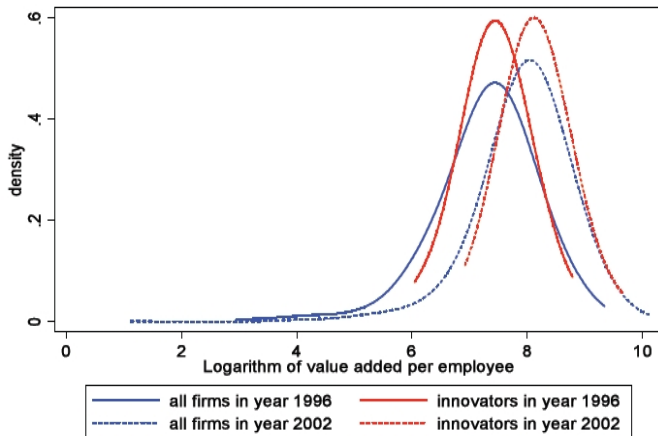
Descriptives

Distribution of value added per employee of innovating firms and all firms in 1996 and 2002



Descriptives

Distribution of changes in value added per employee of first 3 deciles of innovating firms and all firms in 1996 and 2002



Empirical model

$$y_{it} = \lambda + \alpha k_{it} + \beta l_{it} + \gamma \ln ov_{it} + \phi[X_{it}, X_{it}^{EU}, X_{it}^{YU}] \quad (1) \\ + \theta F_{it} + \delta T + \sigma S + \eta_i + u_{it}$$

(1) is estimated in log first differences, hence η_i is wiped out

Empirical strategy

- ▶ First, (1) estimated with OLS by deciles of $\Delta VA/e$
- ▶ Second, quantile regression estimations with $\Delta VA/e$
 - ▶ by deciles of $\Delta VA/e$
- ▶ Third, robustness check: quantile regression with ΔTFP
 - ▶ by deciles of ΔTFP
 - ▶ with TFP estimated with OLS and LP
- ▶ Quantile regression is more efficient to OLS
 - ▶ absolute deviations from 'mean' (instead of sum squares)
 - ▶ it estimates the median of specified quantiles (instead of the mean)
 - ▶ hence, QReg is more robust to large outliers

OLS Results with dVA/e

	Pooled	1st decile	2nd decile	3rd decile	4th decile	5th decile	6th decile	7th decile	8th decile	9th decile	10th decile
Product & process innov.	0.015 [0.015]	0.299 [0.252]	0.102 [0.089]	-0.003 [0.047]	-0.041 [0.034]	0.014 [0.035]	-0.052 [0.044]	-0.012 [0.029]	0.105 [0.046]**	0.012 [0.039]	-0.039 [0.035]
Product innov.	0.017 [0.015]	0.339 [0.278]	0.107 [0.090]	0.001 [0.048]	-0.034 [0.035]	0.020 [0.036]	-0.064 [0.043]	-0.005 [0.029]	0.089 [0.044]**	0.002 [0.039]	-0.025 [0.038]
Process innov.	0.024 [0.016]	0.423 [0.420]	-0.001 [0.097]	0.010 [0.041]	-0.046 [0.036]	-0.002 [0.037]	-0.006 [0.039]	0.009 [0.028]	0.096 [0.047]**	0.057 [0.031]*	-0.016 [0.030]
Observations	5889	216	394	630	679	740	729	731	652	604	514

Notes: Results of estimating the model (1) by using three different types of innovation indicator. In order to save space, the regression results for all right-hand-side variables and regression statistics are suppressed from the table. Full results can be obtained from the authors upon request. Time and sector dummies included. Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

QReg Results dVA/e

	1st decile	2nd decile	3rd decile	4th decile	5th decile	6th decile	7th decile	8th decile	9th decile	No.obs.
Product & process innov.	0.068 [0.021]***	0.046 [0.014]***	0.030 [0.011]***	0.020 [0.008]**	0.006 [0.008]	-0.011 [0.008]	-0.021 [0.011]*	-0.033 [0.014]**	-0.061 [0.023]***	5889
Product innov.	0.070 [0.021]***	0.049 [0.014]***	0.034 [0.011]***	0.021 [0.009]**	0.005 [0.009]	-0.008 [0.009]	-0.019 [0.011]*	-0.031 [0.014]**	-0.058 [0.024]**	5889
Process innov.	0.103 [0.023]***	0.042 [0.015]***	0.031 [0.012]**	0.019 [0.009]**	0.008 [0.010]	-0.006 [0.011]	-0.013 [0.013]	-0.033 [0.015]**	-0.068 [0.025]***	5889

Notes: Results of estimating the model (1) by using three different types of innovation indicator. Full results can be obtained from the authors upon request. Time and sector dummies included. Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

QReg Results with dTFP

	1st decile	2nd decile	3rd decile	4th decile	5th decile	6th decile	7th decile	8th decile	9th decile	No.obs.
TFP based on OLS	0.079 [0.023]***	0.040 [0.012]***	0.018 [0.011]	0.021 [0.009]**	0.006 [0.009]	-0.009 [0.010]	-0.020 [0.010]*	-0.032 [0.014]**	-0.080 [0.022]***	5430
TFP based on Levinsohn-Petrin	0.032 [0.008]***	0.014 [0.005]***	0.007 [0.004]*	0.005 [0.004]	0.003 [0.003]	-0.003 [0.003]	-0.008 [0.003]**	-0.016 [0.005]***	-0.028 [0.007]***	5430

Notes: Results of estimating the model (2) by using the indicator of product and process innovation. Full results can be obtained from the authors upon request. Time and sector dummies included. Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Conclusions

- ▶ Response of productivity growth to successful innovation is not found to be heterogeneous with respect to the type of innovation
- ▶ Instead, we find that innovation effects on productivity growth change across the distribution of firms
 - ▶ innovation benefits slower growing firms only,
 - ▶ while fastest growing firms may not extract any additional benefits from innovation
- ▶ This evidence demonstrates how innovation can shift the distributions of firms according to productivity over time
 - ▶ Innovation is shown to aid the slowest growing firms
 - ▶ and thus facilitate the observed convergence of firms in terms of productivity

Research case #2: Causal link between trade and innovation

- ▶ Damijan, J.P., C. Kostevc, S. Polanec (2010), From innovation to exporting or vice versa? The World Economy (forthcoming).

Background

- ▶ Empirical studies document large productivity premia of new exporters compared to non-exporters
 - ▶ implying that the decision to start exporting is determined by factors that affect productivity of firms before they start exporting.
- ▶ theoretical models on firm dynamics [Jovanovic (1982), Hopenhayn (1992), Melitz (2003)], however,
 - ▶ do not provide a convincing explanation of what generates this firm heterogeneity,
 - ▶ typically assume productivity is exogenous to the firm (as it is typically drawn from a distribution of productivities)
 - ▶ after making the draw, there is no way for a firm to change its life path - its survival or death.

- ▶ We believe that firm productivity and export decisions are closely related to innovation activity:
 - ▶ product innovation may play a more important role in the decision to start exporting,
 - ▶ while successful exporting may drive process innovation,
 - ▶ suggesting that the causality between innovation and exporting may run in both directions.
- ▶ We investigate the bi-directional causal relationship between firm innovation and export activity by using detailed microdata (1996-2002) from
 - ▶ (1) innovation surveys,
 - ▶ (2) industrial production surveys,
 - ▶ (3) trade data, and
 - ▶ (4) financial data for Slovenian firms

**Table 2: Share of exporters depending on innovative activity
by years**

year	innovators share of exporters	non-innovators share of exporters
1996	87,4%	49,9%
1998	79,6%	50,5%
2000	87,0%	54,4%
2002	86,5%	72,4%

Source: SORS and AJPES; authors' calculations

Table 3: Share of innovators depending on export status

year	exporters share of innovators	non-exporters share of innovators
1996	28, 1%	5, 3%
1998	29, 8%	9, 9%
2000	26, 5%	10, 1%
2002	23, 4%	11, 1%

Source: SORS and AJPES; authors' calculations

Matching and average treatment effects

- ▶ Are changes in either exporting (innovation) patterns related to innovating (exporting) status
 - ▶ exporting equation
 - ▶ does past innovation make a firm to start exporting

$$Prob(Exp_t = 1 | Exp_{t-2} = 0) = f(Inov_{t-2}) \quad (2)$$

- ▶ innovation equation
- ▶ does past exporting status make a firm to start innovating

$$Prob(Inov_t = 1 | Inov_{t-2} = 0) = f(Exp_{t-2}) \quad (3)$$

Results with CIS data

Pooled ATT effects of lagged innovation (lagged export status) on the change in export status (change in innovation)

Product innovation						
	export equation			innovation equation		
	ATT	SE ^a	obs. ^b	ATT	SE ^a	obs. ^b
nn matching	0.015	0.014	265 (172)	-0.014	0.057	437 (33)
nn matching ^c	0.015	0.013	265 (172)	-0.014	0.046	437 (33)
kernel match.	-0.022	0.015	265 (722)	-0.020	0.038	437 (45)
r match.(r = 0.2)	-0.024*	0.013	265 (722)	0.013	0.030	331 (45)

Process innovation						
	export equation			innovation equation		
	ATT	SE ^a	obs. ^b	ATT	SE ^a	obs. ^b
nn matching	-0.001	0.016	245 (168)	0.016*	0.008	437 (33)
nn matching ^c	-0.001	0.017	245 (168)	0.016*	0.009	437 (33)
kernel match.	-0.030*	0.020	245 (168)	0.016*	0.010	437 (33)
r match.(r = 0.2)	-0.032**	0.013	245 (756)	0.046***	0.008	326 (45)

Robustness check: Industrial production (IP) data

- ▶ Industrial production survey data enables to directly test the impact of exporting on number of products and on TFP growth
- ▶ Matching exporting and non-exporting firms (by industry) based on the following propensity score specification

$$Prob(Exp_t = 1 | Exp_{t-1} = 0) = f(\log TFP_{t-1}, \log k_{t-1}, \log l_{t-1}, \log N_{t-1})$$

- ▶ we then use the matched pairs of exporters and non-exporters to evaluate whether lagged exporting status is associated with an increase in the number of products and an increase in the TFP growth
 - ▶ here, an increase in a number of products provides direct evidence of product innovation,
 - ▶ while an increase in the TFP provides indirect evidence of process innovations.

Results with (IP) data - dProducts

Table: ATT effects for number of products

<i>Nearest neighbor matching</i>					
Time span	Treated	Controls	ATT	Std.Err.	t-stat
t+1/t	165	118	0.083*	0.044	1.872
t+2/t	165	108	0.067	0.051	1.303
t+3/t	165	98	0.051	0.056	0.907

<i>Kernel matching</i>					
Time span	Treated	Controls	ATT	Std.Err.	t-stat
t+1/t	165	615	0.036	0.033	1.096
t+2/t	165	615	0.067*	0.035	1.900
t+3/t	165	615	0.018	0.051	0.354

Source: SORS, Slovenian Customs Office and own calculations.

Notes: Standard errors for kernel matching are based on bootstrapping.

Results with IP data - dTFP

Table: ATT effects for total factor productivity

<i>Nearest neighbor matching</i>					
Time span	Treated	Controls	ATT	Std.Err.	t-stat
t+1/t	165	131	0.140***	0.042	3.352
t+2/t	165	130	0.156***	0.070	2.220
t+3/t	165	132	0.239***	0.067	3.562

<i>Kernel matching</i>					
Time span	Treated	Controls	ATT	Std.Err.	t-stat
t+1/t	165	615	0.110***	0.035	3.145
t+2/t	165	615	0.097*	0.060	1.625
t+3/t	165	615	0.168***	0.046	3.670

Source: SORS, Slovenian Customs Office and own calculations.

Notes: Standard errors for kernel matching are based on bootstrapping.

Research case #3: Export expansion pattern

- ▶ Damijan, J.P., C. Kostevc, S. Polanec (2009), Export expansion pattern, UL, Mimeo.

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- ▶ **Research issues**

- ▶ How fast do new exporters expand along the intensive and extensive margin?
- ▶ Extensive margin: #destinations and #products
- ▶ Impact of size, skills, TFP, financial constraints

Current trends in trade theory

- ▶ The empirical evidence on heterogeneity between exporters and non-exporters inspired the development of theories that could account for
 - ▶ selection (Melitz, 2003; Bernard, Eaton, Kortum and Jensen, 2003; Baldwin and Harrigan, 2007) into exporting markets
 - ▶ productivity improvements (Constantini and Melitz, 2008) in response to liberalization
- ▶ Subsequent extensions to:
 - ▶ multiproduct setting: more productive firms should export greater number of products to greater number of countries (e.g. Bernard et al., 2008; Nocke and Yeaple, 2009; Melitz, Ottaviano and Mayer, 2009)
 - ▶ financing constraints (Chaney, 2005) to introduce additional variable that explains the decision to export
- ▶ However, all these models are essentially static:
 - ▶ they assume instantaneous adjustment of margins of exports to productivity

Studies with information on disaggregated trade flows give new insights on trade structure.

- ▶ Eaton, Kortum and Kramarz (2004) find
 - ▶ number of firms that export to multiple markets declines
 - ▶ median number of exporting markets is 1
- ▶ Eaton, Kortum and Kramarz (2006, 2008) study hierarchy of markets for French firms
 - ▶ larger firms export to more markets
- ▶ Bernard, Redding and Schott (2006) and Bernard et al. (2007) study dynamics of products
 - ▶ 40.4 percent of firms export only one product to one market, whereas 11.9 percent of firms export five or more products to five or more markets
 - ▶ significant turnover of products
- ▶ Eaton et al. (2007) study Colombian new exporters
 - ▶ new exporters tend to be small; typically start with one market;
 - ▶ high exit rates; survivors tend to expand gradually

Population of Slovenian manufacturing firms, 1994-2003

Accounting data

- ▶ Agency for Public Evidence
- ▶ information on employment, domestic sales, labor and material costs, physical capital, assets, liabilities

Employer-employee data

- ▶ Slovenian Statistical Office
- ▶ information on qualification of employees (skills)

Trade flows data

- ▶ Slovenian Customs Office
- ▶ information on volumes of exports (LCU, USD, EUR), unit values and quantities of individual shipments disaggregated by
 - ▶ 8-digit CNTP products (10,828 products in 1995 and 10,511 products in 2003)
 - ▶ all destinations

Expansion along intensive vs. extensive margin (new exporters)

	Intensive margin		Extensive margin					
	Volume per market		No. of products		No. of markets			
year+	ratio*	cv**	mean	median	cv**	mean	median	cv**
1	1.0	4.0	2.9	1	1.6	1.3	1	0.8
2	1.9	3.4	4.8	2	1.6	1.7	1	1.0
3	1.9	2.7	5.6	3	1.6	1.9	1	1.0
4	2.4	3.2	6.2	3	1.8	2.2	1	1.0
5	2.3	2.6	7.1	3	2.0	2.5	2	1.1
6	2.0	2.2	8.0	3	2.3	2.7	2	1.1
7	2.5	1.9	9.3	4	2.1	3.0	2	1.0
8	3.4	1.8	11.7	4	1.9	3.6	3	0.8
9	3.8	1.7	17.3	7	1.7	4.1	3	0.9

Source: SORS and own calculations.

Notes: +Technical time, i.e. 1 indicates first year of exporting, etc.

Joint distribution of number of products and markets, t=1

Cohorts of 1996-1998 new exporters, all NE

No. of Products	No. of Foreign markets										Total
	1	2	3	4	5	6	7	8	9	10+	
1	41.9	0.7									42.6
2	10.4	5.5	1.0								17.0
3	6.9	3.5	0.7								11.1
4	5.2	2.1	2.1								9.3
5	0.7	1.0	0.3	0.3	0.3						2.8
6	0.3	1.0		0.7							2.1
7	0.7	0.7	0.3								1.7
8	0.3					0.3					0.7
9	0.7										0.7
10	0.3	0.3	0.7		0.3						1.7
11	0.3					0.3					0.7
12	0.7					0.3					1.0
13	1.4			0.3			0.3				2.1
14											0.0
15	0.7					0.3					1.0
16			0.3								0.3
17	0.3										0.3
18	0.3										0.3
19	0.3	0.3									0.7
20+	0.3	0.3		0.7		0.3	0.3	1.0		0.7	3.8
Total	72.0	15.6	5.5	2.1	0.7	1.7	0.7	1.0	0.0	0.7	100.0

Joint distribution of number of products and markets, t=6

Cohorts of 1996-1998 new exporters, continuing NE

No. of Products	No. of Foreign markets										Total
	1	2	3	4	5	6	7	8	9	10+	
1	17.5	1.8			0.9						20.2
2	7.9	6.1	0.9								14.9
3	5.3	5.3	2.6	1.8	0.9						15.8
4	3.5	1.8	1.8		0.9						7.9
5	0.9		0.9				0.9				2.6
6	0.9			0.9							1.8
7	0.9	1.8			0.9						3.5
8	1.8		1.8	1.8							5.3
9		0.9	0.9								1.8
10			0.9	0.9						0.9	2.6
11											0.0
12	0.9					0.9					1.8
13			0.9								0.9
14	0.9		0.9								1.8
15											0.0
16											
17											0.0
18						0.9					0.9
19				0.9							0.9
20+				0.0	0.9					0.0	0.9
Total	40.4	17.5	11.4	6.1	4.4	1.8	0.9	0.0		0.9	100.0

Expansion dynamics and survival

Dynamics of Products

Dependent Variable: Log Number of Exported Products						
Est. Method Variable	All Exporting Firms			New Exporting Firms		
	OLS (1)	OP (2)	OP AS (3)	OLS (4)	OP (5)	OP AS (6)
Log Products (t-1)	0.859** (0.011)	0.856** (0.011)	0.855** (0.011)	0.733** (0.047)	0.741** (0.048)	0.740** (0.048)
Log Markets (t-1)	0.122** (0.014)	0.116** (0.014)	0.116** (0.014)	0.193** (0.070)	0.210** (0.072)	0.205** (0.071)
Log Skilled Employees (t-1)	0.0566** (0.012)	0.0588** (0.011)	0.0566** (0.011)	0.123** (0.043)	0.117** (0.043)	0.113** (0.043)
Log Unskilled Employees (t-1)	-0.00309 (0.0088)	-0.00299 (0.0086)	-0.000775 (0.0086)	0.0399 (0.036)	0.0372 (0.037)	0.0417 (0.036)
Log TFP (t-1)	0.276 (0.17)	0.0422** (0.012)	0.133** (0.034)	1.518 (0.87)	0.0674 (0.073)	0.162 (0.20)
Log Capital Intensity (t-1)	0.00625 (0.0070)	0.00877 (0.0068)	0.00817 (0.0068)	0.0274 (0.029)	0.0190 (0.029)	0.0179 (0.029)
Debt-Assets Ratio (t-1)	0.123** (0.034)	0.134** (0.033)	0.134** (0.033)	0.0911 (0.17)	0.0663 (0.18)	0.0558 (0.18)
Foreign (t-1)	0.119** (0.025)	0.114** (0.025)	0.115** (0.025)	-0.0202 (0.23)	0.00898 (0.23)	0.00962 (0.23)
lambda	0.943** (0.075)	0.919** (0.073)	0.922** (0.073)	0.648** (0.22)	0.739** (0.22)	0.720** (0.22)
Constant	-0.118 (0.063)	-0.671** (0.18)	-0.168** (0.062)	-0.632 (0.36)	-1.465 (1.17)	-0.587 (0.37)
Observations	15990	15990	15990	847	847	847
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
chi2	19043	20116	20001	646.0	658.1	654.1

Robust standard errors in parentheses

** p < 0.01, * p < 0.05

Expansion dynamics and survival

Dynamics of Exporting Markets

Dependent Variable: Probability of Survival in Exporting Markets						
Est. Method Variable	All Exporting Firms			New Exporting Firms		
	OLS (1)	OP (2)	OP AS (3)	OLS (4)	OP (5)	OP AS (6)
Log Products (t-1)	0.493** (0.030)	0.491** (0.030)	0.491** (0.030)	0.460** (0.035)	0.453** (0.035)	0.457** (0.034)
Log Markets (t-1)	0.528** (0.051)	0.525** (0.051)	0.525** (0.051)	0.638** (0.16)	0.647** (0.16)	0.633** (0.16)
Log Skilled Employees (t-1)	-0.0150 (0.031)	-0.0124 (0.031)	-0.0193 (0.031)	0.0355 (0.032)	0.0290 (0.032)	0.0144 (0.032)
Log Unskilled Employees (t-1)	0.0269 (0.026)	0.0186 (0.026)	0.0247 (0.026)	0.0539 (0.064)	0.0253 (0.065)	0.0465 (0.064)
Log TFP (t-1)	0.119 (0.55)	0.124** (0.039)	0.361** (0.11)	4.240* (1.67)	0.399** (0.12)	0.977** (0.33)
Log Capital Intensity (t-1)	0.0280 (0.020)	0.0360 (0.020)	0.0332 (0.020)	0.0513 (0.055)	0.0405 (0.053)	0.0302 (0.053)
Debt-Assets Ratio (t-1)	0.114 (0.10)	0.159 (0.10)	0.152 (0.10)	0.184 (0.31)	0.374 (0.32)	0.303 (0.31)
Foreign (t-1)	0.547** (0.15)	0.545** (0.15)	0.543** (0.15)	0.217 (0.57)	0.163 (0.59)	0.196 (0.59)
Constant	-0.0865 (0.16)	-1.786** (0.57)	-0.274 (0.17)	-1.349** (0.46)	-6.789** (1.78)	-1.705** (0.48)
Observations	15990	15990	15990	847	847	847
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

** p < 0.01, * p < 0.05

Research case #4: Exports and financial constraints

- ▶ Damijan, J.P., C. Kostevc, (2009), Financial constraints and non-monotonic export intensity, UL, Mimeo.

Evidence so far

- ▶ Export expansion pattern
 - ▶ new exporters expand very slowly
 - ▶ financial constraints do not seem to hamper the expansion pattern
- ▶ Financial constraints as a barrier to exporting
 - ▶ Greenaway et al (2007) - financially constrained UK manufacturing firms are less likely to export.
 - ▶ Bellone et al (2008) - less financially constrained Italian manufacturing firms will more likely to start exporting earlier,
 - ▶ but exporting does not improve financial health of exporters.

Research issues

- ▶ Does liquidity constraint hamper expansion along the intensive margin?
- ▶ Does size matter?
- ▶ After controlling for size, are new exporters more constrained than the established ones?

Data

- ▶ Trade data
 - ▶ Slovenian Customs Office
 - ▶ information on volumes of exports manuf. firms, 2000-2008
- ▶ Accounting data
 - ▶ Agency for Public Evidence
 - ▶ annual firm balance sheets (2000-2008), manuf. firms
 - ▶ information on employment, domestic sales, labor, assets, liabilities

Summary

Implications from exporting-innovation literature

- ▶ Product innovation is important to dress up for exporting
- ▶ Process innovation becomes important at a later stage when volumes of exports increase sufficiently
- ▶ Efficiency gains from exporting accrue only to medium and large new exporters
- ▶ ... hence, policy measures should target
 - ▶ enhancing firm innovation capabilities, and
 - ▶ assisting micro and small exporters

Further evidence from firm-product export data for Slovenia

- ▶ In the first year of exporting:
 - ▶ 76 % of new exporters start serving only 1 market (46 % only 1 product)
 - ▶ 82 % of new exporters contained within the dimension 2 mkts x 4 prods
- ▶ After 9 years of exporting:
 - ▶ 32 % of surviving exporters still serving only 1 market (22 % only 1 product)
 - ▶ 44 % of surv. exporters still contained within the dimension 4 mkts x 4 prods
 - ▶ ... but 30 % of them making it to more than 5 mkts and more than 15 prods
- ▶ Clear pattern of expansion of exports over 9 years of exporting:
 - ▶ firms expand predominantly across the intensive margin (an increase by 4x)
 - ▶ median exporter increases #prods from 1 to 7
 - ▶ ... but increases #mkts only from 1 to 3

Policy implications

- ▶ huge heterogeneity among new exporters
 - ▶ 50 % of new exporters cease exporting after the first year
 - ▶ most of surviving exporters expand very slowly
 - ▶ some, however, are performing much better (medium and large new exporters)
- ▶ new exporters are facing several types of uncertainty
 - ▶ (in addition to uncertainty about firm-level ability and product - specific expertise)
 - ▶ uncertainty about demand in foreign markets
- ▶ exporting is costly
 - ▶ general entry cost to start exporting
 - ▶ market-specific entry cost
 - ▶ product-specific entry cost
 - ▶ mkt-specific cost seem to be higher than prod-specific entry cost

Policy measures

- ▶ General scheme for promotion of innovation
 - ▶ R&D subsidies
 - ▶ Tax credits for R&D expenditures?
 - ▶ Specific scheme for micro and small firms?
 - ▶ Sector-specific schemes?
 - ▶ Promotion of R&D cooperation between universities and businesses
- ▶ Promotion of entrepreneurship
 - ▶ Making of entrepreneurs from innovators
 - ▶ Promotion of venture capital financing
- ▶ Promotion of exporters
 - ▶ Training schemes for new exporters
 - ▶ General market-specific info made available generally
 - ▶ Reducing financial constraints
 - ▶ as bank loans do not work efficiently, do we need a state financial promotion small and medium exporters?
 - ▶ Promotion of industry- and product-specific clusters?
- ▶ Do we – by doing this - kill the selection issue?