

Exceptional exporter performance: Cause effect, or both?

Andrew B. Bernard and J. Bradford Jensen

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Dick Nuwamanya Kamuganga

Graduate Institute of International and Development Studies, Geneva

Introduction- Key Questions:

- ✓ Do good firms become exporters?
- ✓ Does exporting improve firm performance?

Motivation of the paper

- ✓ Informing policies that seek to promote growth through exporting
- ✓ Need to understand what happens to plants after they enter export market (for reasonable expectations on export promotion policies)
- ✓ Appropriate policies need to be supported by empirical evidence on plants` performance prior and subsequent to exporting.

Varying gains from exporting

- ✓ Higher pay for workers, better future employment prospects
- ✓ Firms` faster growth of shipments and productivity, diversification of risk, increased innovation, and
- ✓ Improved survival chances

2.0 How exceptional are they? (evidence for performance gap for a variety of plant attributes)

The following equation is estimated:

$$\ln X_i = \alpha + \beta \text{Export}_i + \gamma \text{Industry}_i + \theta \text{State}_i + \varepsilon_i$$

**Export_i is a dummy for current export status,
Industry_i and state_i are dummies for 4 dgt (SIC) industry and state
respectively**

**Export premium beta shows the average %age difference b/n
exporters and non exporters in the same industry**

Table 1
Exporter premia

1984 ^a	(a) All plants (%)	(b) Small plants (%)	(c) All firms (%)	(d) All plants (%)	(e) Small plants (%)	(f) All firms (%)
Total employment	77.6	50.7	102.3	–	–	–
Shipments	104.3	74.8	123.9	21.7	20.6	21.4
Value-added per worker	23.8	21.5	21.9	22.3	21.7	22.6
TFP	18.1	15.8	5.5	16.8	16.1	12.4
Non-production/total workers	5.1	5.2	4.6	4.7	4.9	5.3
Average wage	17.9	15.9	17.7	14.8	14.5	17.3
Production wage	18.8	16.2	19.0	16.0	15.3	18.3
Non-production wage	8.8	7.6	8.1	3.6	3.7	6.1
Capital per worker	19.0	11.8	21.8	17.5	13.5	19.2
Number of plants/firms	56 257	43 102	28 952	56 257	43 102	28 952
1987						
Total employment	95.2	64.7	100.4	–	–	–
Shipments	113.9	80.3	115.2	15.7	14.6	12.5
Value-added per worker	16.1	13.0	11.8	16.2	14.7	12.8
TFP	12.2	10.8	3.5	12.5	11.8	7.1
Non-production/total workers	3.0	3.3	3.3	3.2	3.4	3.5
Average wage	11.2	8.9	9.2	9.3	8.5	9.0
Production wage	9.2	6.2	6.2	7.2	6.0	6.3
Non-production wage	9.9	8.4	9.6	5.2	5.2	5.5
Capital per worker	12.8	6.8	6.7	10.1	7.2	4.9
Number of Plants/Firms	199 258	186 441	150 568	199 258	186 441	150 568
1992						
Total employment	88.1	66.3	92.5	–	–	–
Shipments	112.6	88.4	115.0	18.8	18.3	17.3
Value-added per worker	18.9	16.4	16.7	18.0	17.3	16.9
TFP	13.0	12.0	8.6	13.5	13.3	12.4
Non-production/total workers	3.3	3.8	3.6	3.5	3.8	3.6
Average wage	11.9	10.7	11.0	9.3	9.3	9.6
Production wage	9.0	7.2	7.0	6.6	6.2	16.9
Non-production wage	11.4	10.5	12.4	4.6	5.1	5.8
Capital per worker	20.2	14.4	13.5	13.6	11.9	8.8
Number of Plants/Firms	224 009	211 555	175 400	224 009	211 555	175 400

- ✓ The export premia are positive and significant for every characteristic for every group in all years
- ✓ For all plants and firms, total employment and total shipments are twice as large at exporters
- ✓ Even within small the sample of small plants, exporters are 50-66% larger than non-exporters
- ✓ Export premia for other characteristics are significant and stable across the groups and years
- ✓ Labour productivity is 12-24% at exporters while the difference in capital intensity ranges from 7-22%

3. How exporting might interact with firm structure and performance

3.1. Success begets exporting

- ✓ Good firms become exporters by overcoming additional costs of selling goods in foreign markets (transport, distributional channels, innovation costs etc)
- ✓ large, more productive firms are likely to become exporters

3.2 Exporting begets success (or failure)

- ✓ Exporting firms- withstand international competition, are expected to improve their “performance”, out perform domestic ones in sales, employment and productivity.**
- ✓ With desired attributes, exporting firm experiences increases in output, employment but not necessarily increases in productivity**

3.3 succeeding to export (causal relationship between firm exporting and its success)

- ✓ Firms performance improvements occur before exporting begins
- ✓ May be no differences between future exporters and future non-exporters several years before first foreign sales
- ✓ Provide evidence on the relative growth in the years before exporting (should not be interpreted as causality from exporting to success)

4. Do good firms become exporters?

- ✓ Evidence on ex-ante characteristics of firms

4.1 performance before entry

- ✓ Ex-ante plant characteristics and growth rates

- ✓ Sample - two sub-periods (1984-1988 & 1989-1992)

Table 2 (the differences in initial levels between future exporters and non-exporters)

Table 2

Ex-ante advantage in levels for future exporters 1984–1988, 1989–1992

	1984 Premia		1989 Premia	
	(a)	(b)	(c)	(d)
Total employment	20.74%		45.06%	
	(5.01)		(10.78)	
Shipments	27.21%	8.59%	54.59%	9.41%
	(5.94)	(3.20)	(11.51)	(4.21)
Value-added per worker	7.16%	8.42%	8.66%	8.72%
	(2.32)	(2.73)	(3.55)	(3.55)
TFP	6.01%	6.42%		
	(1.44)	(1.53)		
Average wage	3.36%	2.92%	4.41%	2.60%
	(2.68)	(2.33)	(4.10)	(2.44)
Non-production/total employment	0.67%	0.38%	0.73%	0.47%
	(1.04)	(0.60)	(1.34)	(0.86)
Production worker wage	2.49%	1.86%	2.79%	0.73%
	(1.75)	(1.31)	(2.43)	(0.64)
Non-production worker wage	2.32%	1.87%	5.07%	2.69%
	(1.08)	(0.87)	(3.36)	(1.79)

Plants are included if they did not export in any of the initial years (1984–1987, 1989–1991). Plants may or may not have exported in the final year. The numbers represent the premia for future exporters (1988, 1992) in the initial year, controlling for four digit (SIC) industry and state. Numbers in parentheses are *t*-statistics. Columns (b) and (d) also control for plant size.

- ✓ Firms that become exporters are 20%-40% percent larger in employment
- ✓ 27%-54% in shipments
- ✓ Have higher labour productivity (7%-8%)
- ✓ Pay higher wages (2%-4%)

Annual growth rate premia of future exporters

The following equation is estimated:

$$\% \Delta X_{T-1} = \frac{\ln X_{iT-1} - \ln X_{i0}}{T-1} = \alpha + \beta \text{EXPORT}_{iT} + \gamma \ln \text{Size}_{i0} + \delta D_i + \varepsilon_i.$$

Table 3

Ex-ante advantage in growth rates for future exporters 1984–1988, 1989–1992

	1984–1987	1984–1987	1989–1991	1989–1991
	Growth rates	Growth rates	Growth rates	Growth rates
Total employment	1.40%	2.14%	0.04%	3.06%
	(2.32)	(3.64)	(0.05)	(3.80)
Shipments	2.39%	2.68%	2.93%	5.27%
	(3.08)	(3.48)	(3.00)	(5.50)
Value-added per worker	1.80%	1.52%	2.40%	1.68%
	(1.57)	(1.32)	(2.03)	(1.42)
TFP	2.12%	2.18%		
	(1.40)	(1.44)		
Average wage	0.17%	0.00%	0.89	0.38
	(0.49)	(0.02)	(1.92)	(0.82)
Non-production/total employment	-0.30%	-0.27%	0.30%	0.19%
	(1.74)	(1.63)	(1.29)	(0.82)
Production worker wage	0.35%	0.25%	0.59%	0.23%
	(0.85)	(0.49)	(1.11)	(0.43)
Non-production worker wage	0.92%	0.86%	1.06%	0.65%
	(1.25)	(1.17)	(1.36)	(0.84)

4.2 Testing the causal relationship: The decision to export

- Authors estimate the linear probability models in the first differences, using as instruments, X_{it-2} , X_{it-3} , Y_{it-2} , and Y_{it-3} ,

$$\Delta Y_{it} = \beta \Delta X_{it-1} + N \Delta Y_{it-1} + \Delta \eta_{it}$$

Table 4
The decision to export^a

	First differences
Plant-level Variables ^b	
Total employment	0.104 ^d (0.046)
Wage	0.029 ^d (0.026)
Non-production/total Employment	-0.024 (0.037)
Productivity	0.012 ^e (0.007)
Changed product since last year	0.048 ^c (0.009)
Last changed product two years ago	0.014 ^d (0.007)
Exported last year	0.420 ^c (0.012)
Last exported two years ago	0.093 ^c (0.005)
Year dummies	
Industry dummies	
State dummies	
<i>N</i>	81 636

^a The results are for all plants from 1984–1992.

^b All plant characteristics are lagged one year.

^c Significant at the 1% level.

^d Significant at the 5% level.

^e Significant at the 10% level.

5. Does exporting improve performance? (direction of causality from exporting to firm performance)

5.1 Ex-ante exporter performance- various horizons

- The following eqn is estimated:

$$\begin{aligned}\% \Delta X_{iT} &= \frac{1}{T} (\ln X_{iT} - \ln X_{i0}) \\ &= \alpha + \beta \text{Export}_{i0} + \gamma \text{Size}_{i0} + \delta \text{Char.}_{i0} + \varepsilon_{iT}\end{aligned}$$

Table 5

Short run performance of exporters versus non-exporters (Annual Growth Rates)

	1984-92		1984-88		1989-92	
	without controls	with controls	without controls	with controls	without controls	with controls
Total employment	0.41%	2.33%	1.20%	2.07%	-0.91	2.52%
	(2.88)	(15.76)	(6.44)	(10.92)	(3.77)	(10.04)
Shipments	0.13%	1.49%	0.20%	0.98%	-0.54%	1.79%
	(0.75)	(8.04)	(1.20)	(4.02)	(1.86)	(5.81)
Value-added per worker	0.24%	-0.28%	-1.10%	-0.80%	0.74%	0.37%
	(1.00)	(1.15)	(3.51)	(2.30)	(2.03)	(0.95)
TFP			-2.35%	-0.97%		
			(4.97)	(1.95)		
Average wage	-0.47%	0.56%	-1.10%	0.11%	0.19%	0.79%
	(5.20)	(6.36)	(8.91)	(0.98)	(1.31)	(5.44)
Non-production/total employment	-0.19%	0.25%	-0.30%	0.21%	-0.03%	0.34%
	(4.22)	(5.47)	(5.92)	(3.42)	(0.45)	(4.61)
Production worker wage	-0.36%	0.73%	-1.20%	0.13%	0.55%	1.22%
	(3.48)	(6.93)	(8.21)	(0.91)	(3.40)	(7.37)
Non-production worker wage	-0.31%	0.08%	-0.20%	0.26%	-0.40%	-0.51%
	(1.99)	(0.55)	(1.19)	(1.16)	(1.67)	(2.06)

Table 6

Performance of exporters versus non-exporters over medium and long horizons (Average Annual Growth Rates)

	Medium run				Long run	
	1984–88		1989–92		1984–92	
	without controls	with controls	without controls	with controls	without controls	with controls
Total employment	0.18%	1.07%	-1.33%	1.04%	-0.36%	0.40%
	(1.19)	(6.95)	(6.47)	(4.90)	(2.95)	(3.31)
Shipments	-1.01%	-0.01%	-1.46%	0.34%	-0.96%	0.22%
	(5.54)	(0.06)	(5.68)	(1.26)	(6.61)	(1.50)
Value-added per worker	-1.00%	-0.81%	0.21%	-0.13%	-0.84%	-0.50%
	(4.69)	(3.65)	(0.76)	(0.47)	(3.72)	(3.13)
TFP	-1.92%	-1.09%			-0.84%	-0.50%
	(6.01)	(3.25)			(3.72)	(2.15)
Average wage	-1.46%	-0.41%	-0.07%	0.33%	-0.59%	-0.04%
	(16.62)	(5.15)	(0.66)	(3.36)	(10.84)	(0.87)
Non-production/total employment	-0.44%	-0.05%	-0.04%	0.11%	-0.16%	0.02%
	(9.80)	(1.36)	(0.71)	(1.94)	(5.41)	(0.70)
Production worker wage	-1.94%	-0.78%	0.13%	0.47%	-0.72%	-0.19%
	(18.38)	(7.74)	(1.08)	(3.82)	(11.03)	(2.99)
Non-production worker wage	-0.13%	0.31%	-0.59%	-0.31%	0.16%	0.16%
	(0.84)	(2.01)	(3.03)	(1.60)	(1.58)	(1.60)

5.2 Evidence on switching (Transitions in and out of exporting market)

Table 7

Switching in and out of exporting

	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92
% of all plants that stop exporting	8.5	5.4	7.1	5.9	6.7	4.8	4.7	5.3
% of all plants that start exporting	4.6	5.9	6.7	7.0	6.6	7.1	5.9	7.7
Total switchers	13.1	11.3	13.8	12.9	13.3	11.9	10.6	13.0

5.3 The big changes- entry and exit (and identifying potential benefits from exporting)

- Authors estimate a growth rate regression:

$$\% \Delta X_{iT} = \alpha + \beta_1 \text{Start}_{iT} + \beta_2 \text{Both}_{iT} + \beta_3 \text{Stop}_{iT} + \gamma \text{Size}_{i0} + \delta \text{Char}_{i0} + \varepsilon_{iT}$$

where

$$\text{Start}_{iT} = 1 \text{ if } (\text{Export}_{i0} = 0) * (\text{Export}_{iT} = 1)$$

$$\text{Both}_{iT} = 1 \text{ if } (\text{Export}_{i0} = 1) * (\text{Export}_{iT} = 1)$$

$$\text{Stop}_{iT} = 1 \text{ if } (\text{Export}_{i0} = 1) * (\text{Export}_{iT} = 0)$$

Table 8

Short run changes at starters stoppers, both, neither (Average Annual Growth Rates)

	Annual		
	Stop	Both	Start
Total employment	-1.03%	4.68%	5.64%
	(4.11)	(27.99)	(23.39)
Shipments	-3.25%	4.96%	9.11%
	(10.10)	(23.90)	(29.70)
Value-added per worker	-1.53%	0.79%	3.14%
	(3.56)	(2.89)	(7.67)
TFP	-2.18%	0.05%	2.78%
	(2.63)	(0.09)	(3.26)
Average wage	-0.30%	1.27%	2.07%
	(2.00)	(12.62)	(14.28)
Non-production/total employment	0.29%	0.37%	0.60%
	(3.79)	(7.34)	(8.06)
Production worker wage	0.07%	1.07%	0.72%
	(0.40)	(8.96)	(4.19)
Non-production worker wage	-0.75%	0.96%	2.85%
	(2.78)	(5.38)	(11.03)

Table 9

Medium-run changes at starters, stoppers, both, neither (Average Annual Growth Rates)

	1984–1988			1989–1992		
	Stop	Both	Start	Stop	Both	Start
Total employment	0.04%	2.72%	2.98%	-1.19%	3.23%	3.82%
	(0.20)	(14.73)	(12.98)	(3.60)	(13.88)	(14.81)
Shipments	-1.59%	2.41%	4.21%	-2.28%	3.53%	5.63%
	(5.89)	(10.64)	(15.01)	(5.69)	(12.24)	(17.65)
Value-added per worker	-1.54%	-0.09%	0.92%	-1.17%	0.60%	1.93%
	(4.79)	(0.33)	(2.76)	(2.46)	(1.79)	(5.20)
TFP	-1.67%	-0.70%	0.71%			
	(3.45)	(1.74)	(1.42)			
Average wage	-0.81%	-0.01%	0.61%	-0.00%	0.76%	1.02%
	(7.18)	(0.06)	(5.16)	(0.16)	(6.68)	(8.03)
Non-production/total employment	-0.09%	0.02%	0.13%	-0.00%	0.27%	0.28%
	(1.43)	(0.40)	(2.01)	(0.04)	(4.13)	(3.92)
Production worker wage	-1.22%	-0.42%	0.49%	0.02%	0.72%	0.63%
	(8.35)	(3.46)	(3.22)	(0.08)	(5.13)	(4.04)
Non-production worker wage	-0.17%	0.93%	1.12%	0.18%	-0.31%	0.58%
	(0.74)	(4.93)	(4.78)	(0.55)	(1.36)	(2.28)

Table 10

Long-run changes at starters, stoppers, both, neither (Average Annual Growth Rates)

	Annual		
	Stop	Both	Start
Total employment	-0.583%	2.08%	2.34%
	(3.24)	(14.26)	(14.97)
Shipments	-1.40%	2.08%	3.24%
	(6.31)	(11.50)	(16.77)
Value-added per worker	-0.63%	0.06%	0.87%
	(2.52)	(0.28)	(4.06)
TFP	-0.29%	-0.42%	0.62%
	(0.81)	(1.46)	(2.00)
Average wage	-0.21%	0.27%	0.49%
	(3.04)	(4.71)	(8.08)
Non-production/total employment	0.00%	0.13%	0.13%
	(0.03)	(3.68)	(3.39)
Production worker wage	-0.35%	0.07%	0.40%
	(3.76)	(0.95)	(4.87)
Non-production worker wage	0.14%	0.28%	0.32%
	(0.91)	(2.24)	(2.41)

Last measure of benefits of exporting on growth rates (performance of continuous exporters relative to plants that move in and out)

- The following equation is estimated:

$$\% \Delta X_{iT} = \alpha + \beta \text{Continuous}_{iT} + \gamma \text{Size}_{i0} + \delta \text{Char.} s_{i0} + \varepsilon_{iT} \quad (10)$$

where

$$\text{Continuous}_{iT} = 1 \text{ if } \text{Export}_{it} = 1 \quad \forall t \in [0, T] \quad (11)$$

Table 11
Gains from continuous exporting

	1984–88	1989–92
Total employment	0.83% (3.18)	1.52% (4.11)
Shipments	1.02% (3.45)	1.12% (2.45)
Value-added per worker	0.61% (1.42)	0.71% (1.00)
TFP	0.11% (0.17)	
Average wage	0.47% (3.97)	0.30% (1.62)
Non-production/total employment	0.01% (0.13)	0.05% (0.47)
Production worker wage	0.50% (3.06)	0.80% (2.98)
Non-production worker wage	0.15% (0.64)	–0.65% (1.63)

The sample includes only those plants that export in both the first and last year. Continuous plants export in all years.

5.4 Survival (most important potential benefit from exporting)

- The following probit is estimated:

$$S_{it} = \begin{cases} 1 & \text{if } \beta X_{it-1} + \gamma Y_{it-1} + \varepsilon_{it} > 0 \\ 0 & \text{otherwise} \end{cases}$$

Table 12

Exporting and plant survival

	Coefficient	Change in Probability ^a
Intercept	-1.674 ^a (0.195)	
Export dummy	0.256 ^a (0.011)	10.16%
Total employment	0.207 ^a (0.003)	11.88%
Average wage	0.291 ^a (0.009)	4.88%
Non-production/Total employment	-0.559 ^a (0.018)	-4.68%
Year dummies		
State dummies		
Industry dummies		

Numbers present the increase in the probability of plant survival from a one standard deviation increase in the variable (or a switch from 0–1 for the export dummy) evaluated at the means of the regressors for the year 1992.

^aSignificant at the 5% level.

Key findings of the paper

- ✓ Clearly good firms become exporters
- ✓ Both growth rates and levels of success measures are higher ex-ante for exporters
- ✓ The benefits of firm exporting are less clear.
- ✓ Employment growth and the probability of survival are both higher for exporters
- ✓ Productivity and wage growth is not superior particularly over longer horizons.