Test of Intra-Industry Trade Theories

The Grubel-Loyd Index

$$B_j = \frac{\left(X_j + M_j\right) - \left|X_j - M_j\right|}{X_j + M_j}$$

- $\left(X_j + M_j\right)$ is the gross bilateral trade value
- $\left|X_j - M_j\right|$ is the absolute value of intra-industry trade
- The index may vary between $0 \leq B_j \leq 1$ and may be writen as

$$B_j = 1 - \frac{\left|X_j - M_j\right|}{X_j + M_j}$$

Table 26.1 *Average levels of IIT at 3-digit level in the UK: selected years*

SITC	*1959*	*1964*	*1970*	*1977*	*1979*
2. Crude materials	0.18	0.19	0.36	0.40	0.38
3. Mineral fuels	0.30	0.35	0.26	0.58	0.74
4. Animal and vegetable oils	0.41	0.29	0.25	0.50	0.41
5. Chemicals	0.42	0.56	0.59	0.69	0.72
6. Manufactured goods	0.44	0.52	0.56	0.69	0.69
7. Machinery & transport equipment	0.38	0.51	0.60	0.69	0.70
8. Miscellaneous manufactured goods	0.66	0.75	0.79	0.80	0.75

Source: Greenaway and Milner (1986).

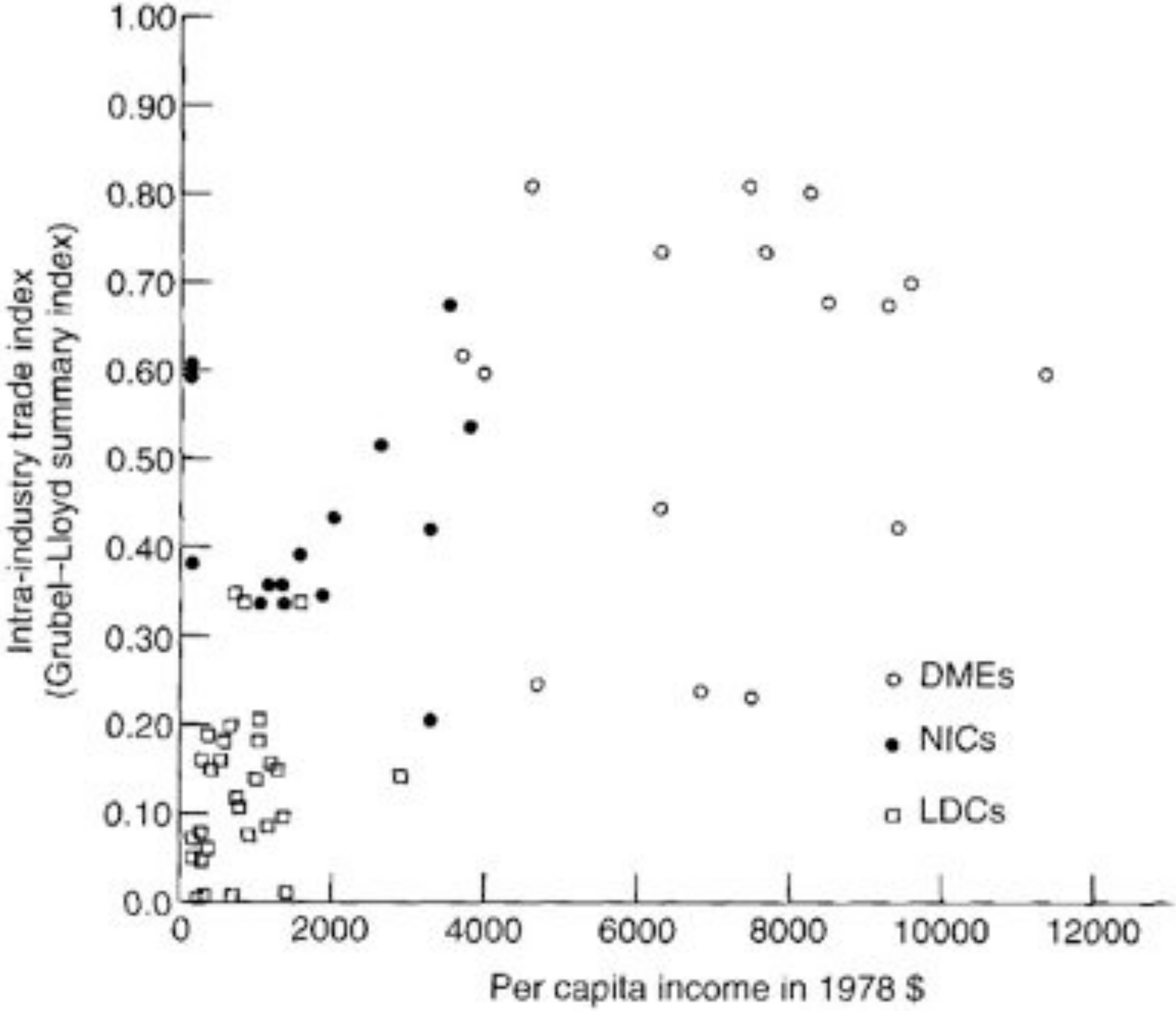

Figure 26.1

Source: Greenaway and Milner(1986); original: Havrylyshyn and Civan (1983).

Econometric Tests

- Loertscher-Wolter (1980)
    - IIT is important if average development is high
    - IIT is important when differences in economic development among countries are low
    - IIT is important if average markets dimension is high
    - IIT is important if differences in market dimension are limited
    - IIT is important when barrier to international trade are low

- IIT in an industry is important when product differentiation is high and there are significant barrier to entrance in production

- IIT in an industry is important if transaction costs are low (e.g: distance from the market - transportation costs))

- IIT in an industry is important if the industry definition is very general (high aggregation of goods)

Table 26.2 *Determinants of intra-industry trade OECD countries: cross-section, 1972–3*

Endogenous variables	*Estimated coefficients*	*F-values*	*Expected sign*
Country-specific variables			
Development stage differential	-0.106×10^{0}	47.95**	(−)
Average development stage	0.259×10^{-1}	1.68	(+)
Market size differential	-0.146×10^{-5}	82.71**	(−)
Average market size	0.296×10^{-5}	108.17**	(+)
Distance	-0.485×10^{-4}	44.52**	(−)
Customs Union dummy	0.382×10^{0}	64.89**	(+)
Language group dummy	0.171×10^{0}	6.43**	(+)
Border trade dummy	0.268×10^{0}	20.41**	(+)
Cultural group dummy	-0.423×10^{-2}	0.01	(+)
Industry-specific variables			
Product differentiation	0.733×10^{-3}	0.45	(+)
Scale economies	-0.311×10^{-1}	91.23**	(+)
Transaction costs	-0.225×10^{-3}	3.71**	(+)
Level of aggregation	0.137×10^{-1}	3.05**	(+)
Product group	0.112×10^{0}	5.56**	(+)
Constant term	-0.196×10^{1}		

Toh (1982)

Table 26.3 ***Cross-section regression results of intra-industry trade in US manufacturing industries, 1970 and 1971***

Independent variables	*1970*	*1971*	*Expected sign*
PV (product differentiation)	5.85	6.09	
	(2.45)**	(2.43)**	(+)
HYTI (trade intensity)	0.17	0.33	
	(1.35)	(2.23)*	(+)
LPR (length of production run)	299.2	246.3	
	(2.61)**	(2.67)**	(+)
USXSHR (world market share)	−0.32	−0.16	
	(1.81)*	(0.87)	(−)
IACR (share concentration ratio)	−0.077	−0.053	
	(4.16)**	(2.16)**	(−)
PC (product variety introduction)	0.0065	0.0075	
	(2.16)*	(2.14)*	(+)
MD (distance)	−0.0101	0.0089	
	(0.83)	(0.64)	(+)
TAR (tariffs)	0.206	0.619	
	(0.41)	(0.93)	(−)
NTB (non-tariff barriers)	−0.39	−0.19	
	(0.11)	(0.05)	(−)
Constant	38.15	6.98	
	(1.63)	(0.29)	
R^2	0.318	0.268	
	F = 5.30**	F = 4.416**	

The figures in parentheses are *t*-values.

**,* Significant respectively at the 1% and 5% levels.

Source: Toh (1982).

Greenaway-Milner (1984)

- They take into account the following explanatory variables:
  - Statistical aggregation effects(DG)
  - Specialization (SPC). Share of industry output of the bigger firm
  - Product differentiation by attributes (RD)
  - Market concentration ratio (CR)
  - Minimum efficiency size in production (economy of scale) (SE)

Table 26.4 *Cross-section regression results of intra-industry trade in UK manufacturing industries, 1977*

Independent variables	*Linear estimates*		*Log-linear estimates*		*Expected sign*
	B_j	C_j	$\ln B_j$	$\ln C_j$	
DG (aggregation effect)	0.17 (1.75)*	0.17 (1.52)	0.08 (2.00)*	0.11 (2.01)	(+)
SPC (specialisation)	−0.04 (−0.07)	−0.28 (−0.49)	0.82 (1.39)	0.78 (0.98)	(−)
AS (product differentiation by attributes)	0.77 (2.47)**	0.69 (1.94)*	0.06 (1.93)*	0.02 (0.35)	(+)
RD (product differentiation by technology)	1.43 (0.74)	0.15 (0.07)	−0.01 (−0.01)	0.01 (0.00)	(+)
$(RD)^2$	−0.01 (0.04)	0.48 (0.71)	0.01 (0.01)	−0.05 (−0.01)	(−)
CR (concentration ratio)	−0.56 (−2.56)**	−0.55 (−2.21)*	−0.07 (−0.67)	−0.07 (−0.51)	(−)
SE (minimum efficient scale of production)	−0.22 (−1.46)	−0.11 (−0.65)	−1.46 (−2.45)*	−0.15 (1.84)*	(−)
DR (overlapping tastes)	0.73 (2.35)*	0.51 (1.45)	0.54 (3.52)*	0.34 (1.62)	(+)
Constant	3.17 (0.17)	6.94 (1.38)	−0.55 (−0.49)	−0.29 (−0.19)	
R^2	0.38	0.20	0.55	0.24	
F	3.60**	2.31*	6.28**	2.55*	
n	37	37	37	37	

The figures in parentheses are *t*-values
**,* Significant respectively at the 1% and 5% levels.
Source: Greenaway and Milner (1984).

Hughes (1993)

- He takes the following variables:
  - product etherogeneity (HETNO)
  - R&D expenditure on added value (RDNO)
  - Share of skilled workers (SKPT)
  - Share of unskilled workers (MEMP)
  - Dimension of the firms (SCALE)
  - Market concentration (CR5)

Table 26.5 *Estimates of IIT from panel data, 1980–7*

Variables (independent)	France	Germany	Italy	Japan	UK	USA
RDNO	0.66	1.34	0.85	−0.79	0.35	−0.11
	(4.17)**	(8.80)**	(3.18)**	(−2.61)**	(1.88)*	(−0.53)
CR5	−0.37	−0.07	0.15	−0.35	−0.04	0.004
	(−7.53)**	(−1.25)	(2.06)*	(−4.22)**	(−0.62)	(0.06)
HETNO	0.02	−0.01	−0.001	−0.01	0.02	0.01
	(9.84)**	(−1.80)	(−0.14)	(−1.19)	(5.93)**	(2.73)
SCALE	−0.83	−0.26	−1.58	−0.74	−1.66	−1.44
	(−3.07)**	(−0.95)	(−4.54)**	(−1.58)	(−4.88)**	(−3.84)**
MEMP	0.30	0.54	−0.01	−0.65	0.13	−0.19
	(2.65)**	(4.23)**	(0.09)	(−3.45)**	(0.86)	(−1.07)
SKPT	2.18	0.02	2.39	−1.07	1.39	1.71
	(4.18)**	(0.04)	(2.87)**	(−0.86)	(1.93)*	(2.08)*
Constant	0.53	0.35	0.47	1.12	0.58	0.64
	(5.78)	(3.61)	(3.98)	(7.33)	(5.09)	(4.73)
R^2	0.44	0.11	0.18	0.15	0.21	0.12
n	544	544	544	544	544	544

The figures in parentheses are *t*-values. Standard errors are heteroscedastic-consistent estimates.

**,* Significant respectively at the 1% and 5% levels.

Source: Hughes (1993).