

# ICT and the death of distance in international trade of flowers and wine

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# Introduction

## > a globalized dinner

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### **Globalization has happened** when

- I take my visitors from Australia
  - in my locally assembled car filled with Arab petrol
  - to a dinner
    - where we sit down at tables nicely decorated with flowers from Kenya
- to enjoy
- steak from Argentina
  - Zinfandel from California's Sierra Foothills
  - followed by
    - a desert of kiwi fruit
    - certified organic fair-trade coffee from Ecuador
    - and a Syrah port from the Barossa Valley

# Introduction

> untimely announcements?

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## ■ **The death of distance:**

"Distance will no longer determine  
the cost of communicating electronically"

(Francis Cairncross, 1997)

## ■ ***"The report of my death is an exaggeration"***

(Mark Twain 1897, commenting on reports of his demise)

# Introduction

## > motivation

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- Bhagwati hypothesis:  
"**Growth** is the *principal* ..– but not the only –.. *strategy* for raising the incomes, and hence consumption and living standards of the poor."  
(Bhagwati 2004, p. 54)

growth↑ → wealth ↑

- **Trade promotes growth** and the "modern evidence against inward-looking or import substitution trade strategy is really quite overwhelming."  
(Bhagwati 2004, p. 61)

trade↑ → growth↑

- if ICT promotes agricultural trade:

ICT↑ → ag trade↑ → ag growth↑ → ag wealth↑ (& rural poverty↓)

# Introduction

## > Questions & contents

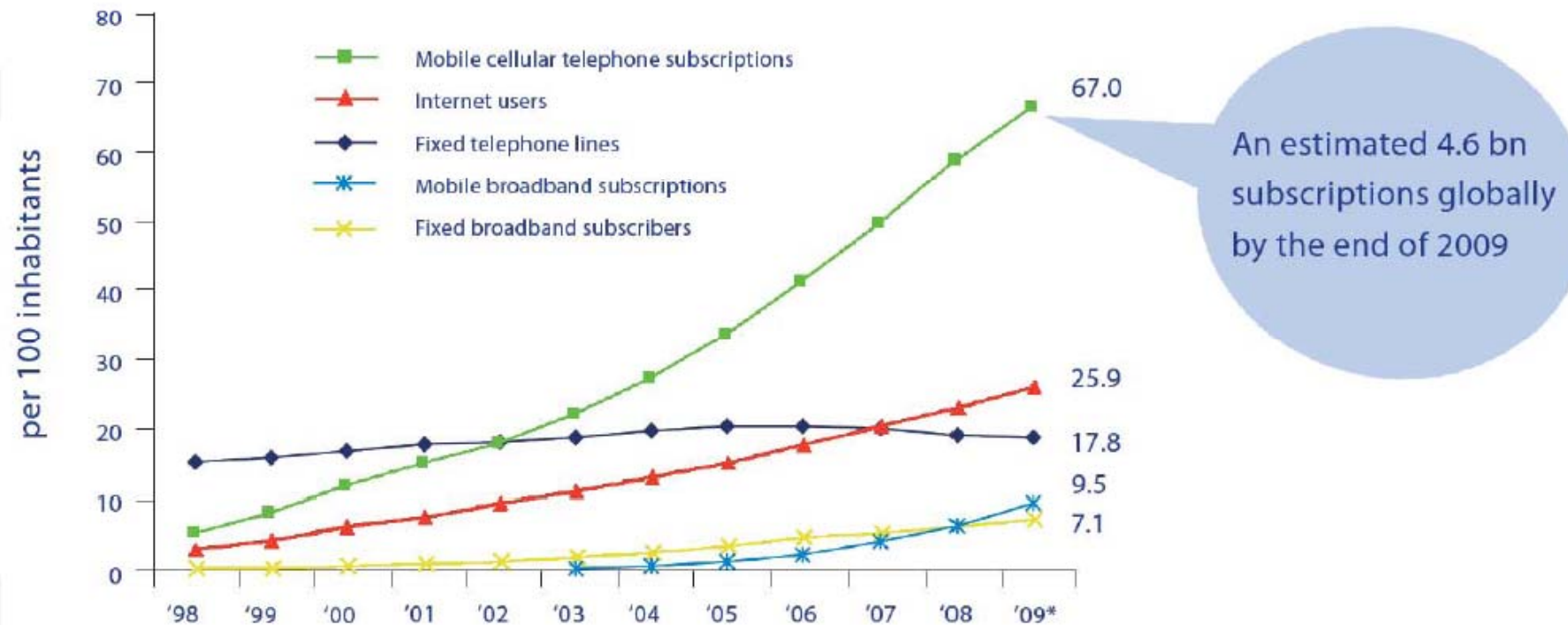
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### ■ Contents

1. Introduction
2. Distance, trade and ICT
3. Why flowers and wine?
4. Gravity estimation for flowers and wine
5. Conclusions and outlook

# Distance, trade, and ICT < why focus on ICT? – ICT trends

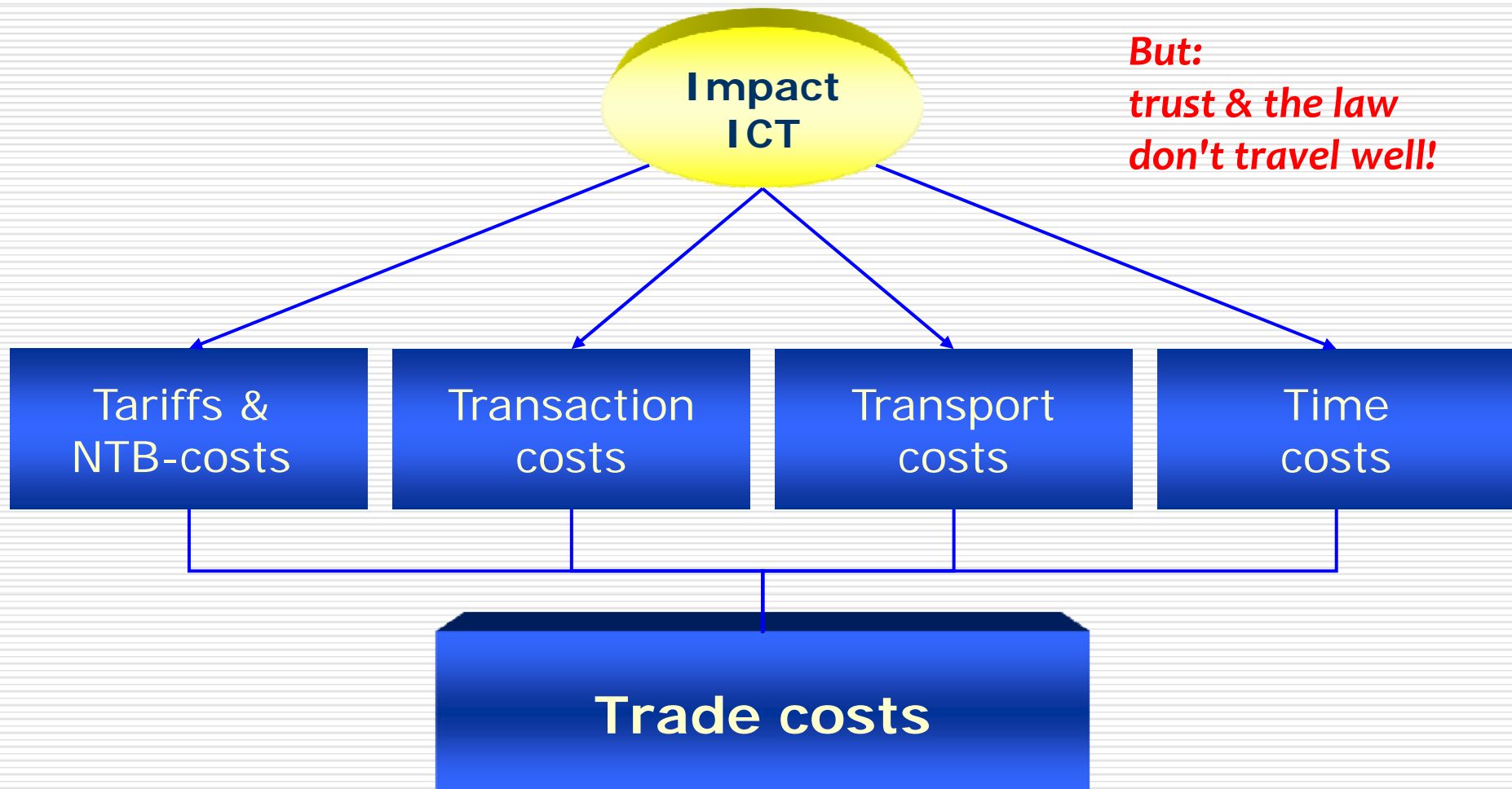
## A decade of ICT growth



Source: The World in 2009: *ICT Facts and Figures* ITU TELECOM WORLD 2009 Press Briefing 6 October 2009

# Distance, trade, and ICT > trade costs

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# Distance, trade, and ICT

## > why focus on ICT – freight

- "Air freight transport has ... become an integrated part of the modern supply chain."
  - Air freight:
    - 2% of international trade by volume
    - 40% of international trade by value
    - much of the freight is carried in the belly-holds of scheduled passenger aircraft
- (OECD 2010, p. 112)

### HRCI - Last 5 Years



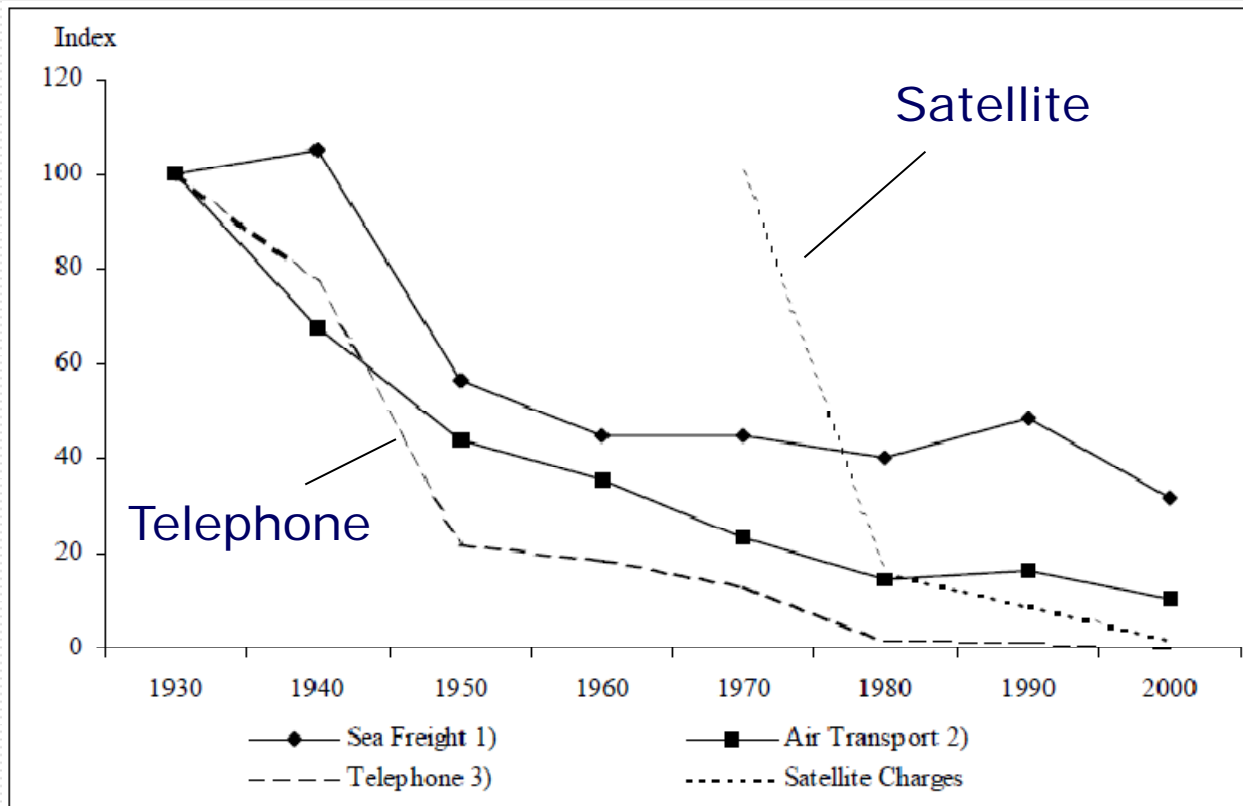
Source: Howe Robinson Marine Evaluation  
The Howe Robinson Containership Index (HRCI) represents the development of charter rates for container vessels from 510 TEU und 4.300 TEU.  
TEU: Twenty-foot Equivalent Unit  
Largest container vessel:  
Emma Mærsk, ~14.000 40-ft container  
[http://www.op-shipping.com/ueber\\_ops/howe\\_robinson\\_gruppe.php](http://www.op-shipping.com/ueber_ops/howe_robinson_gruppe.php)



# Distance, trade, and ICT

## > why focus on ICT – drop in ICT costs

Transport and communications costs, 1930–2000 (in 1990 \$US)



**Cooper's law:**  
Data transmission capacity of the radio spectrum doubles every 2½ years!

Note 1:

Average ocean freight and port charges per short ton of import and export cargo.

Note 2:

Average air transport revenue per passenger mile.

Note 3:

Cost of a three-minute telephone call from New York to London.

# Distance, trade, and ICT

## > why focus on ICT – earlier research

### Summary - earlier research

Author(s)	Year of publication	Period		Countries			IT			Product			
		from	to	Total	Developing countries	Bottom-Billion-	Fixed line telephone	Mobile telephone	Internet	Agriculture	Food	others	Rauch-categories <sup>(1)</sup>
Freund & Weinhold	2004	1995	1999	56					✓			✓	
Wheatley & Roe	2005	1996	2003	Trade partners of the USA					✓	✓	✓		
Bojnec & Fertö	2009	1995	2003	OECD-countries			✓	✓	✓	✓	✓		
Fink, Mattoo & Neagu	2005		1999	107			✓					✓	✓
Clarke & Wallsten	2004		2001	93	✓				✓			✓	
Clarke	2008	1999	2005	Eastern Europe; Central Asia					✓			✓	✓
Tang	2006	1975	2000	103 trade partners of the USA			✓	✓	✓			✓	✓

(1) Distinction following Rauch (1999) between homogeneous and differentiated good on the basis of whether goods are traded on commodity exchanges and whether reference prices are available.

1. ICT stimulates a country's exports
2. export stimulation is larger for heterogeneous than for homogeneous goods
3. internet stimulates exports from developing but not from developed countries
4. mobile phones stimulate international trade in all countries
5. no consensus on the differences in impact of ICT on imports and exports

# Why flowers & wine?

> contrasts flowers and wine

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## Cut flowers

- highly perishable
- air freight a must
- delivery to close markets
  - LA to NA
  - SSA to EU
  - SA, SEA, Aus to Japan, HK
- EU: > 50% passes through Dutch auction markets
- vertically integrated supply chains connect unsophisticated small farmers in SSA with highly sophisticated retail chains in EU
- market not closely monitored and poorly documented

## Wine

- storable, wide range of qualities
- shipping by sea & container
- world production: ~ 270 mio hl
- exports (without internal EU trade): 45 mio hl
- declining share of trade of Big 5 – F, I, E, D, P
  - 1981/85: 75% of world wine trade
  - 2001/05: 65% of wwt
- increasing share of Southern Hemisphere (Ar, Chile, SA, Aus, NZ)
  - 1981/85: 1.6% of wwt
  - 2001/05: 23% of wwt
- leading exporters: I, E, F, Aus, Chile, USA, Ar, SA D, P
- leading importers: D, UK, USA, Rus, F, NL, Ca, B, Sui, Dk

# Gravity equation < estimation

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## Estimation of the $\ln$ -gravity equation

$$\ln T_{ij} = \beta_0 \ln A + \beta_1 \ln Y_i + \beta_2 \ln Y_j - \beta_3 \ln D_{ij} + \delta_1 \ln Z_1 + \dots + \delta_L \ln Z_L + \varepsilon_{ij}$$

$T_{ij}$ : volume or value of trade between countries  $i$  and  $j$

$A$ : constant

$Y_i, Y_j$ : size of the economy of countries  $i$  and  $j$ , respectively (usually measured in terms of GDP)

$D_{ij}$ : distance between countries  $i$  and  $j$

$\mathbf{Z}$ : vector of explanatory (control) variables (e.g. telephone, mobile phone, and internet penetration)

### Things to consider:

1. cross section or panel data (cross section & time series)
2. OLS estimation

but: for  $T_{ijk} = 0$ ,  $\ln$  not defined (share of  $T = 0$  can be high)!

# Gravity estimation for flowers & wine > shared model variables

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- volume of trade ( $T_{ijt}$ )
- telephone mainlines per 100 inhabitants in exporting ( $LTELX_{it}$ ) and importing ( $LTELM_{jt}$ ) countries
- internet users per 100 inhabitants in exporting ( $LNETX_{it}$ ) and importing ( $LNETM_{jt}$ ) countries
- mobile phone subscribers per 100 inhabitants in exporting ( $LMOBX_{it}$ ) and importing ( $LMOB_{jt}$ ) countries
  
- distance ( $LDIST_{ij}$ ) and real fuel price ( $LFUEL_t$ )
- dummy variables for adjacent country ( $ADJ_{ij}$ ) and common language ( $LANG_{ij}$ )
- similarity index of economic size between the trading partners ( $LSIM_{ijt}$ )
- absolute difference in relative factor endowments between the trading partners in time  $t$  ( $LRFAC_{ijt}$ )

$$LSIM_{ijt} = \ln \left[ 1 - \left( \frac{GDP_{it}}{GDP_{it} + GDP_{jt}} \right)^2 - \left( \frac{GDP_{jt}}{GDP_{it} + GDP_{jt}} \right)^2 \right] \quad LRFAC_{ijt} = \left| \ln \left( \frac{GDP_{it}}{capita_{it}} \right) - \ln \left( \frac{GDP_{jt}}{capita_{jt}} \right) \right|$$

# Gravity estimation for flowers & wine

## > differences between the models

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### ■ Cut flowers (HS code 0603)

- period: 1995 – 2006
- 92 countries in total
- 58 exporting
- 64 importing
- ~  $\frac{3}{4}$  of total trade in cut flowers
- 10,421 observations

### ■ Wine

- period: 1995 – 2008
- 21 exporting countries
- 23 importing countries
- >  $\frac{3}{4}$  of total trade in wine
- 5,596 observations

# Gravity estimation for flowers & wine > qualitative results

ICT	Type of trade	A 1% change in ICT penetration leads to an x% change in trade	
		Cut flowers	Wine
All ICT	all	+	+
Fixed line telephone	exporter	+ 0.273	0
	importer	+ 0,128	0
Internet	exporter	0	+ 0.079
	importer	+ 0.051	+ 0.136
Mobile phone	exporter	+ 0.050	- 0.099
	importer	+ 0.077	+ 0.079

# Conclusions

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■ ICT↑ → ag trade↑

and therefore potentially: → ag growth↑ → ag wealth↑ (& rural poverty↓)

■ there is hope because of the mobile phone

■ restrictive ICT-regulation prevents trade and the creation of wealth

■ Outlook

- more ag and food products
- check trade data for consistency
- does the position in the trade network matter?



# Close

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Thanks for listening!