



spectrum **MANAGEMENT**  
for a **CONVERGING** world  
a case study on Guatemala



# the **Old** licensing regime

Radio spectrum allocated by the “Dirección General de Radiodifusión y Televisión Nacional”

- Set aside large blocks of bandwidth for private uses following the pattern of the FCC’s U.S. Table of Frequency Allocations

- Each block would be sliced into smaller portions and assigned to individual licensees

# old licensing regime

- Radio spectrum considered:  
scarce and “strategic”
- Nationalized by 1985 Constitution along with bodies of water, ocean and river front, subsurface
- No sales, no leasing of licenses
- “Free”

# the logic of the 1996 TELECOM reform

- More rational method of exploitation of the radio spectrum
- Responds to increasing demand pressures for alternate uses
- Why usufruct titles (TUFs)?
- Owners of usufruct titles can sell, rent, subdivide or consolidate their spectrum rights
- Ideally: Ownership with non-interference

**No. Orden:**

**No. Registro:**

**LA SUPERINTENDENCIA DE  
TELECOMUNICACIONES DE  
GUATEMALA**

Con base en el Artículo 57 del Decreto 94-96  
Otorga el Presente

**Título de Usufructo de Frecuencia**

**A:**

*Banda o Rango de Frecuencias* :

*Horario de Operación* :

*Potencia máxima efectiva de radiación* :

*Máxima intensidad de campo eléctrico o  
potencia máxima admisible en el contorno* :

*Fecha de Emisión* :

*Fecha de Vencimiento* :

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# radio spectrum **MANAGEMENT** after 1996

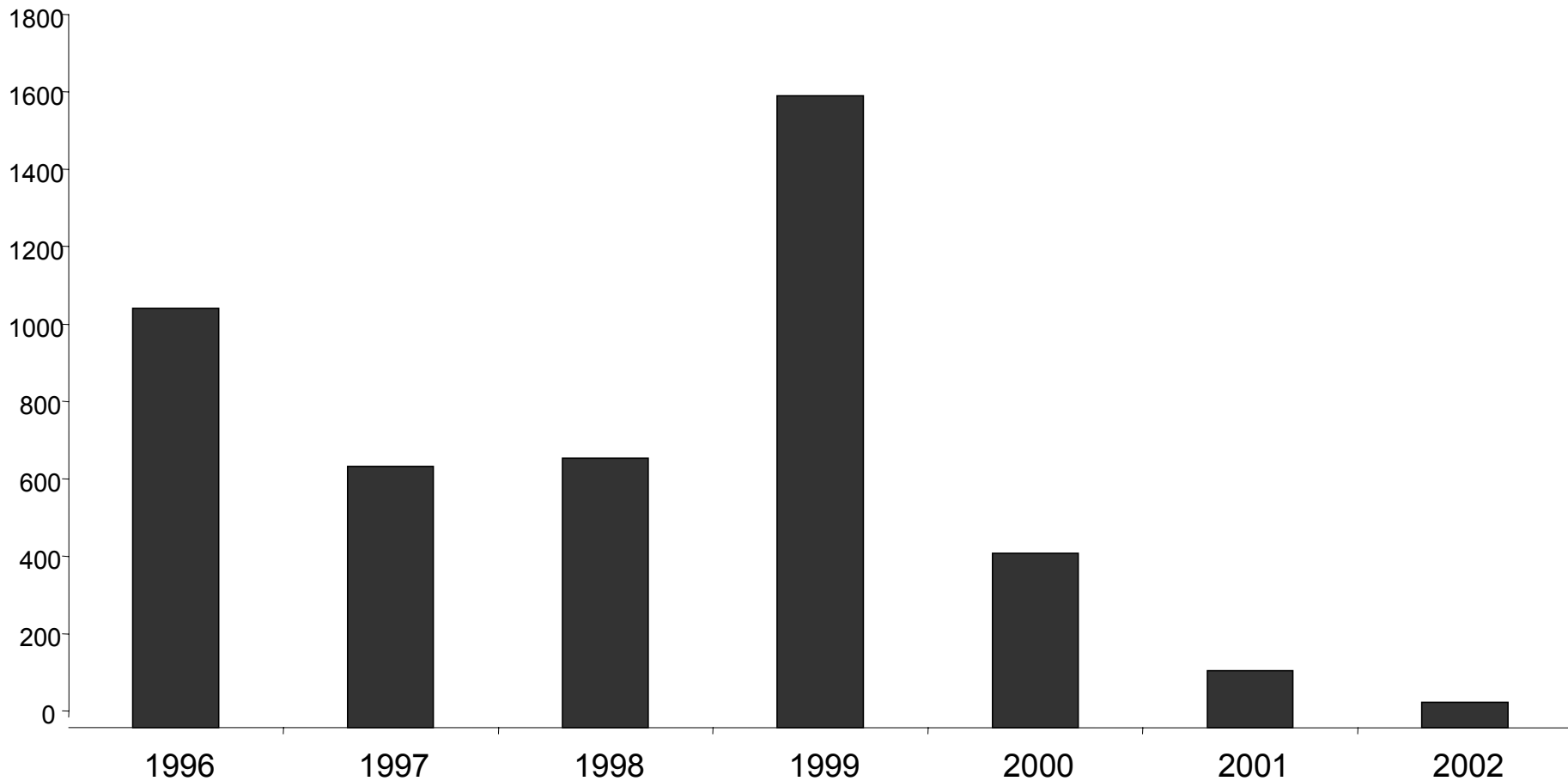
- Licensees received “equivalent term” TUFs
- Wide-ranging: All spectrum was moved into the market
- Bottom-up: Any person or company may request any spectrum band not currently assigned to other uses



# Creating radio spectrum markets...

TUFs Issued by SIT

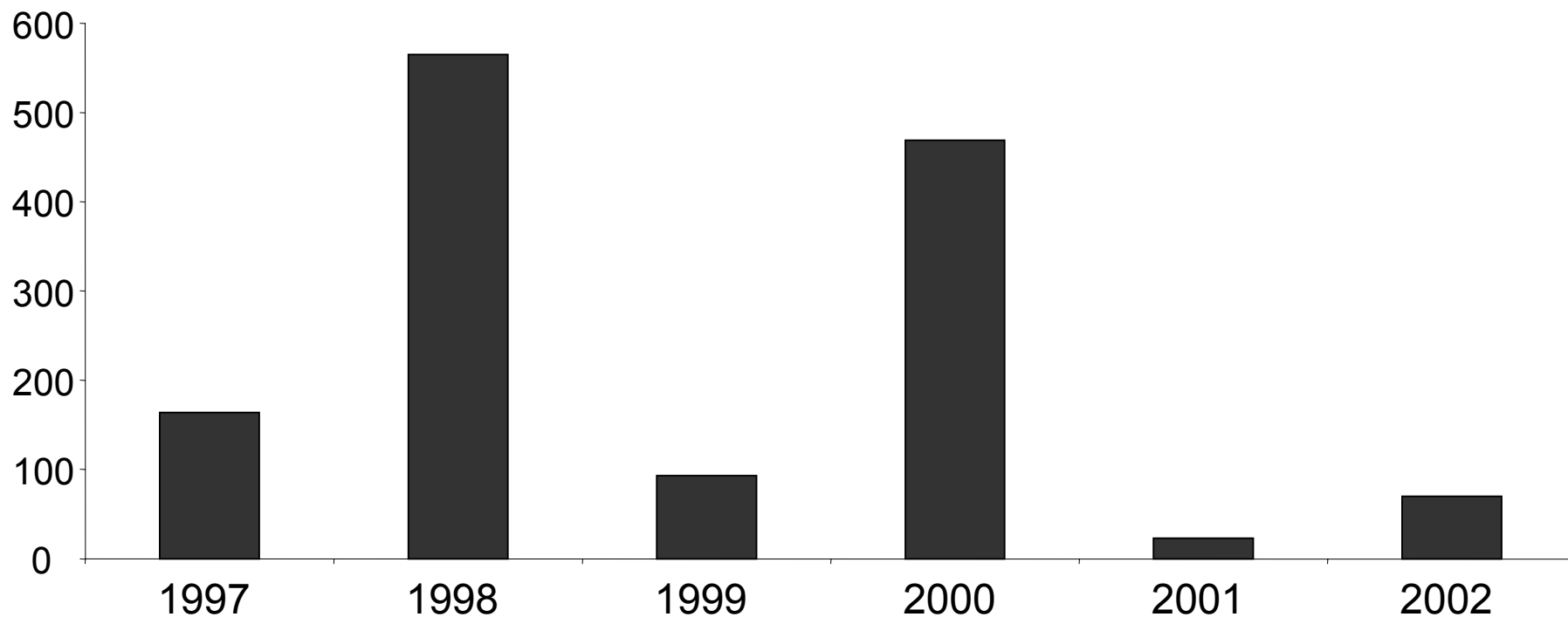
*by year end except for 19 SEP 2002*



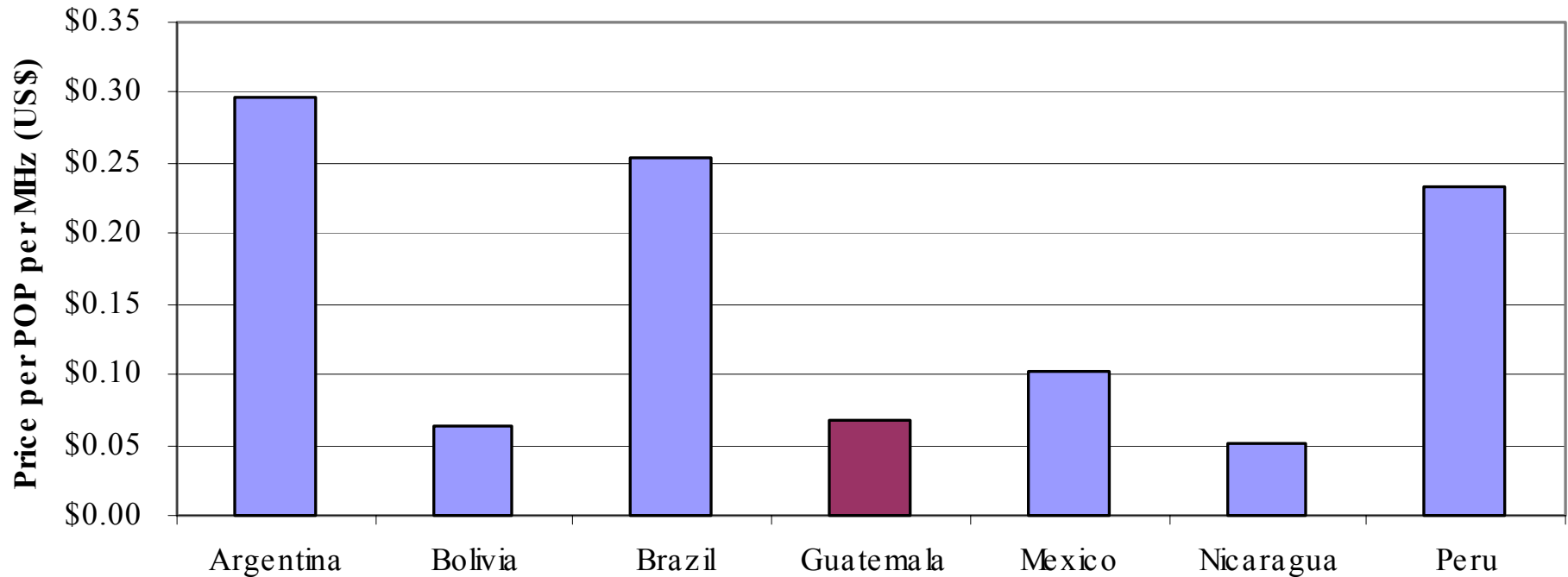


# The secondary market

*Total TUF endorsements  
by year end except for 19 SEP 2002*

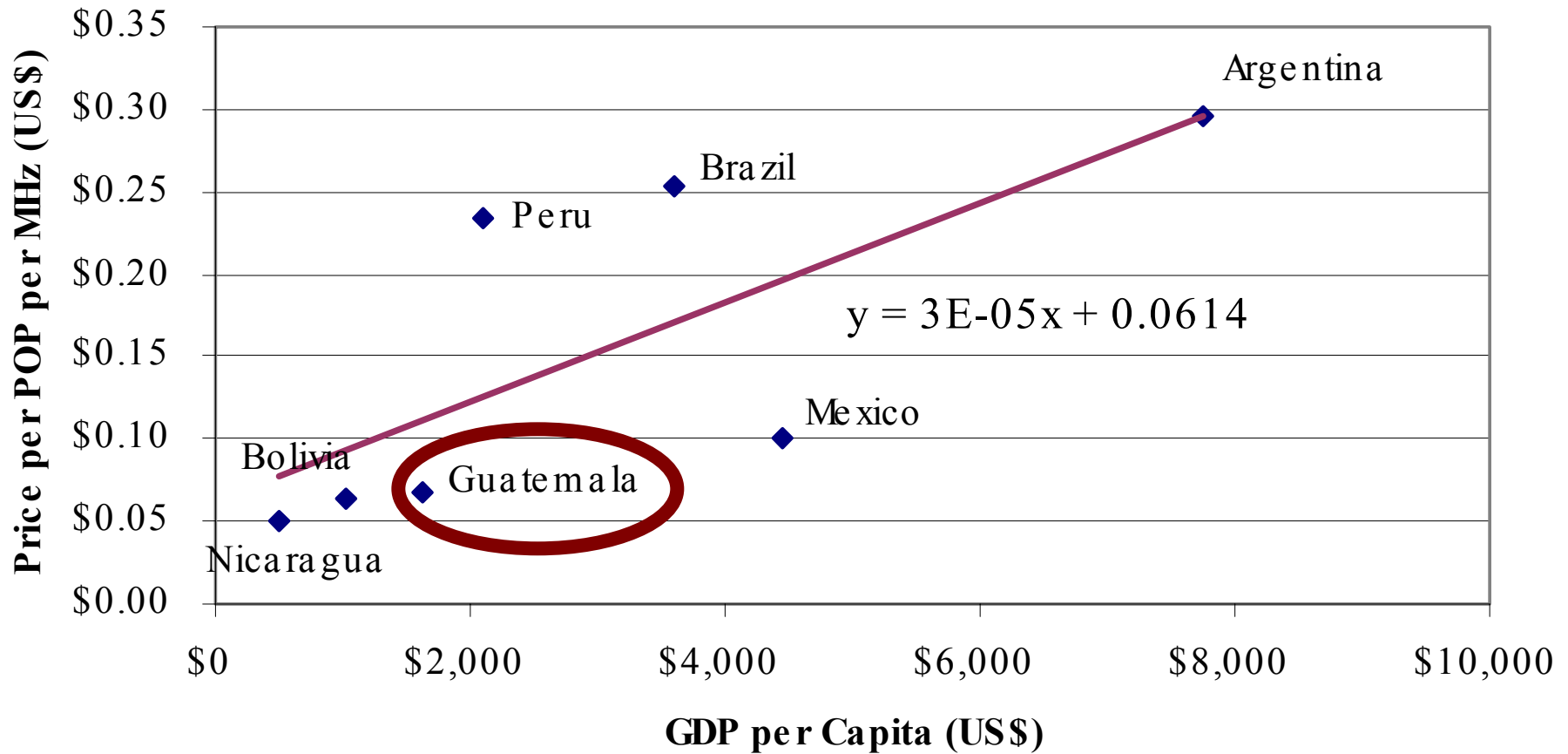


# License Pricing for Mobile Phone Operators



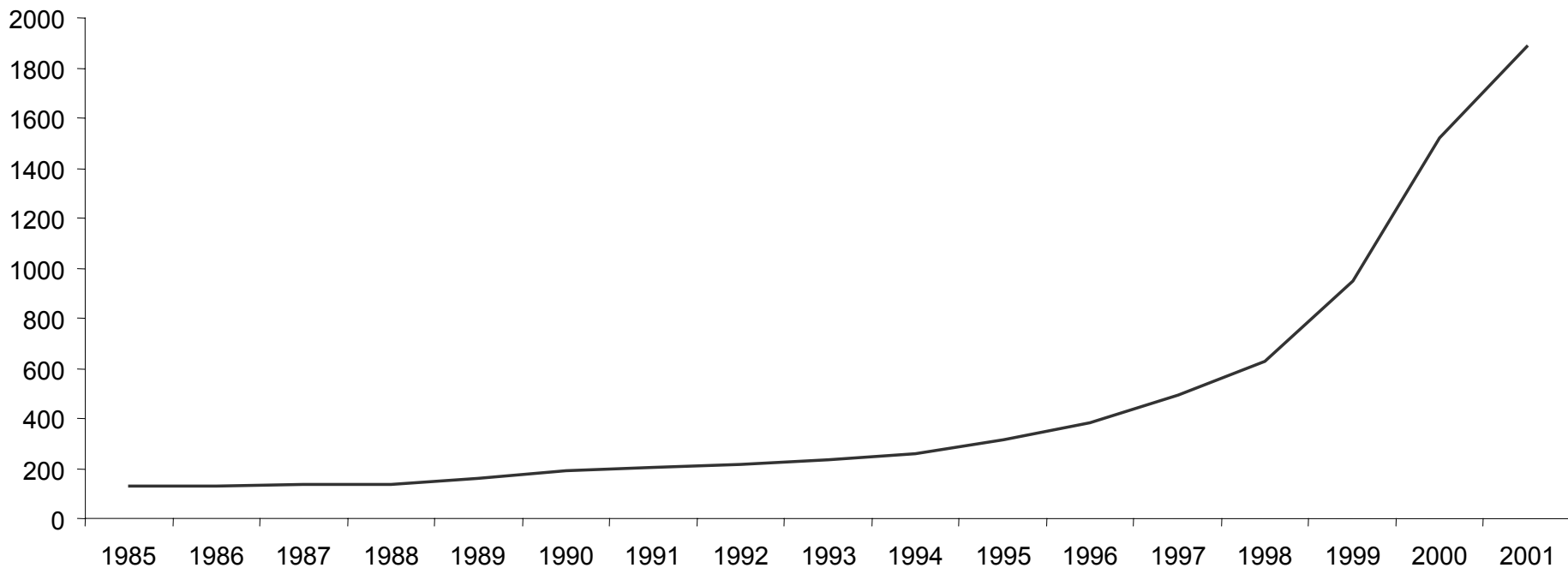
Source: Pyramid Research

# Wireless License Prices vs. GDP/capita



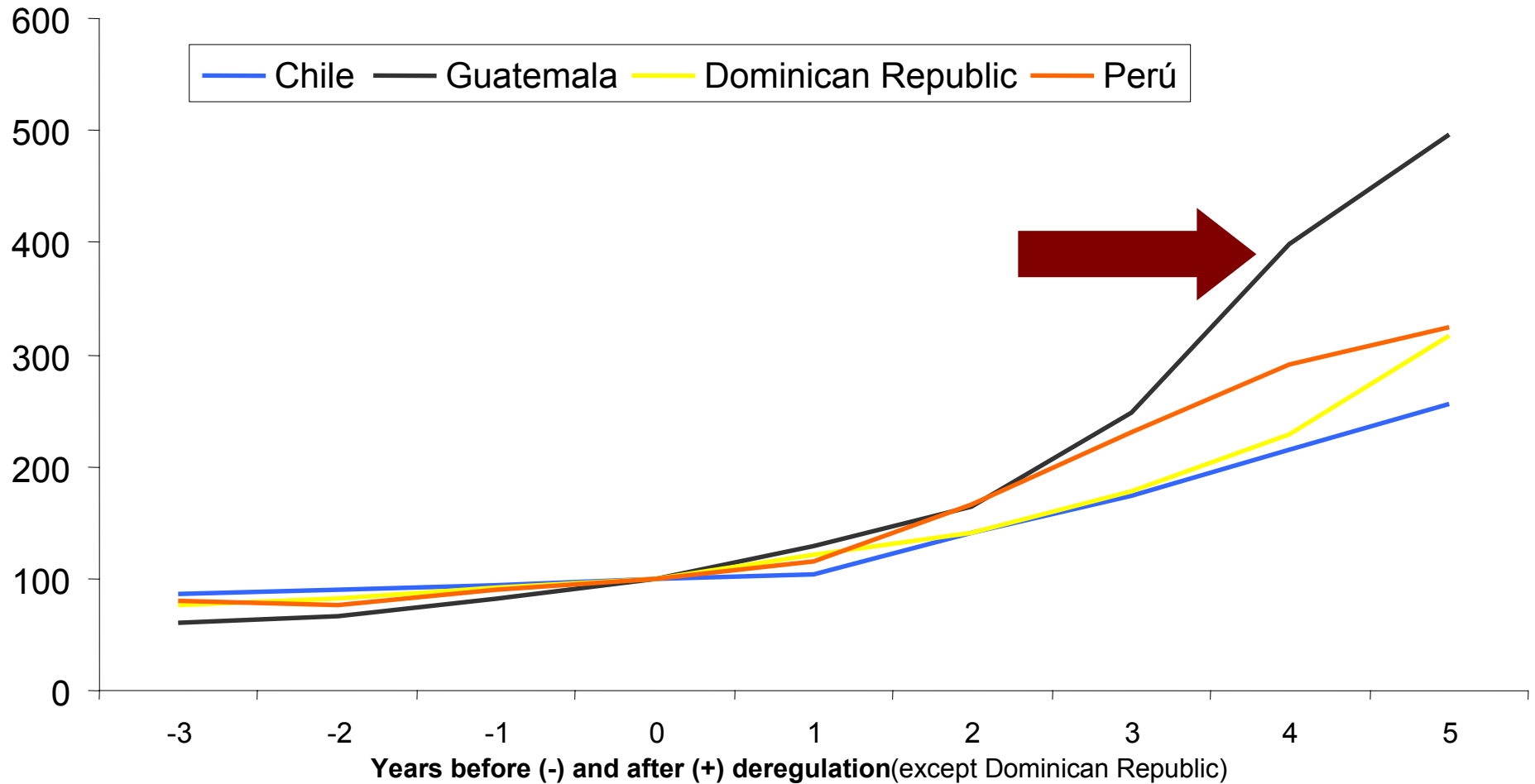
# Telephone subscribers in Guatemala

Thousands of (fixed and mobile) lines at year end

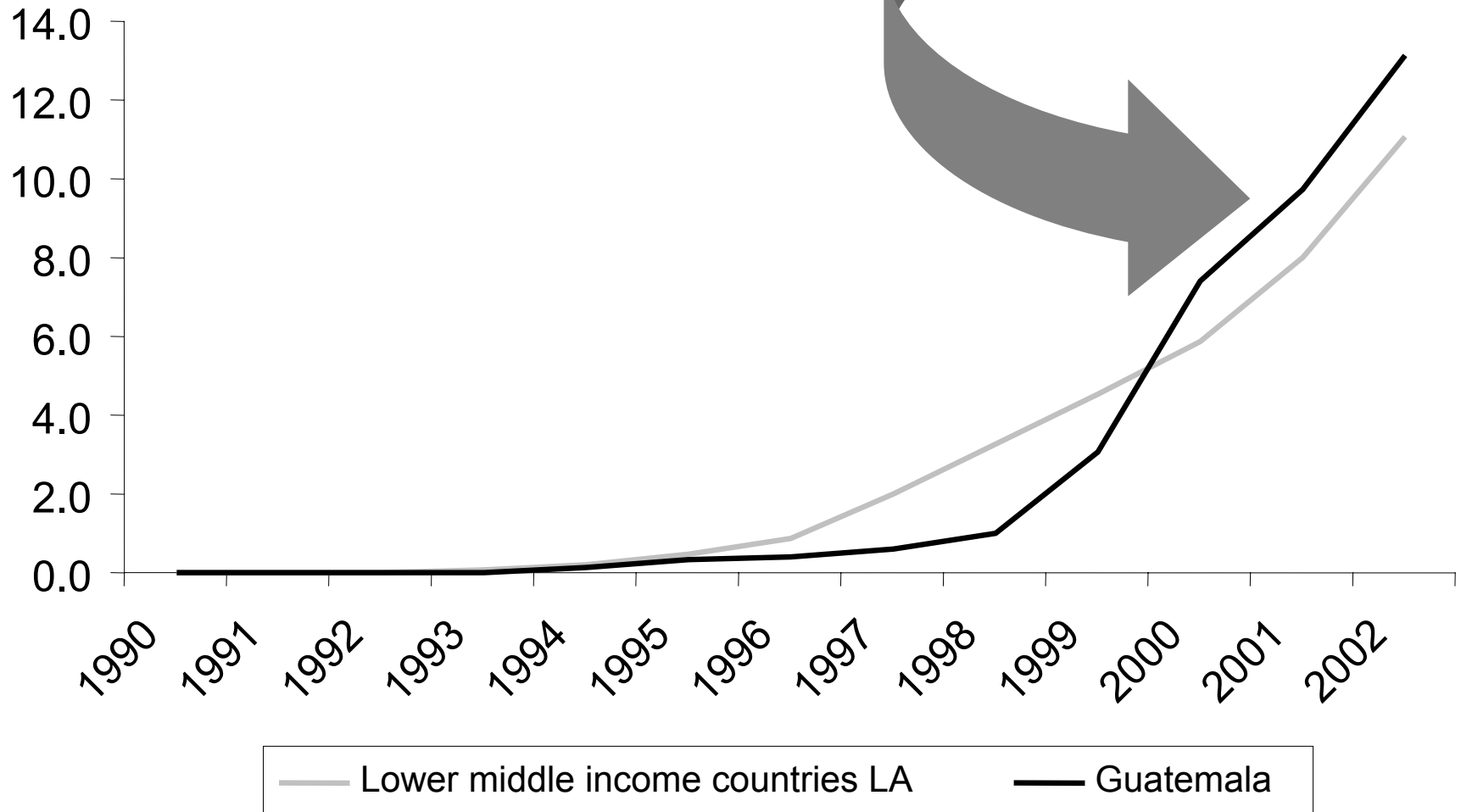


# Before and after the reform

Total telephone subscribers, year of deregulation = 100



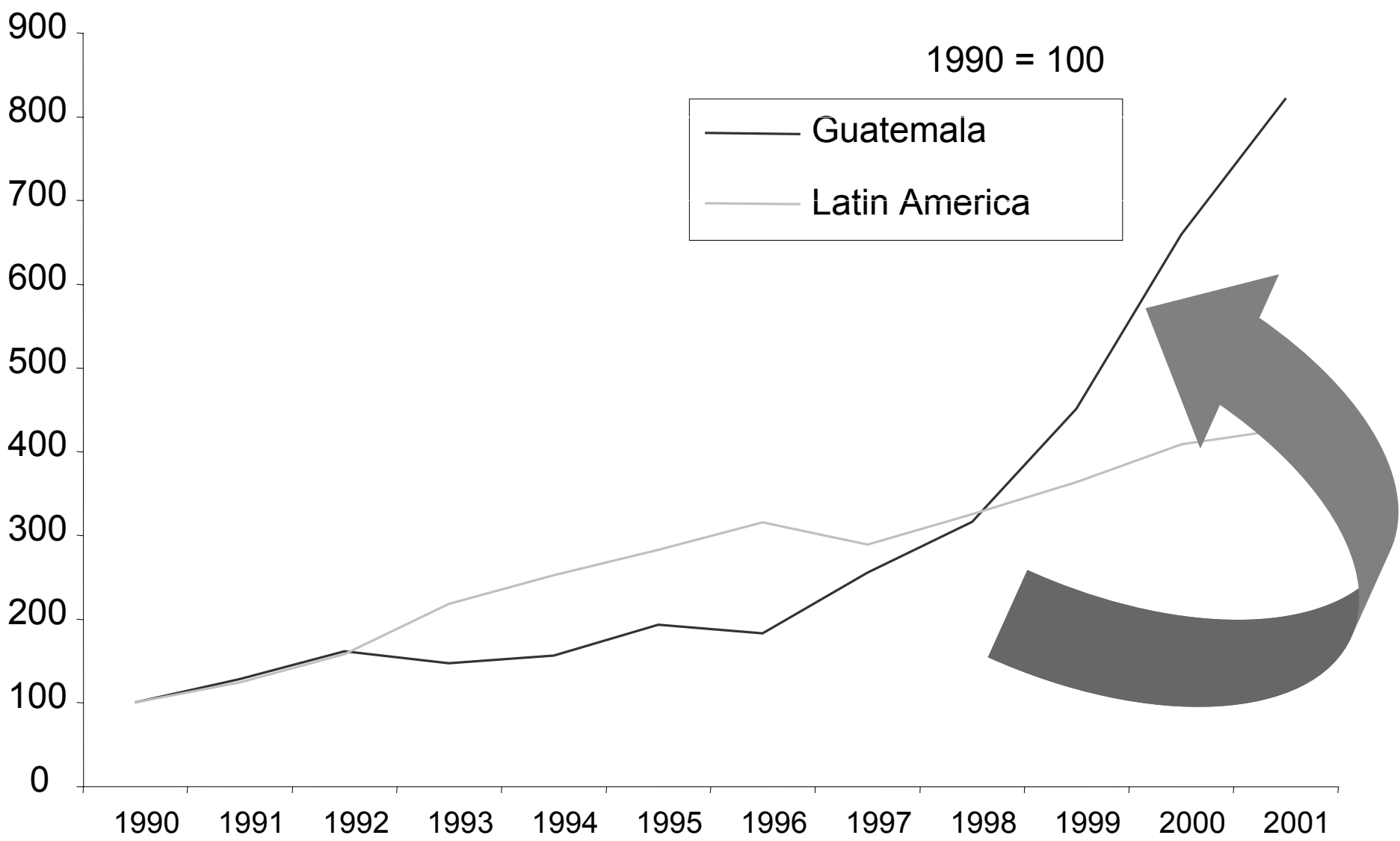
# Cellular mobile subscribers per 100 inhabitants



Source: ITU World Telecommunication Indicators 2003, SIT (Guatemala).

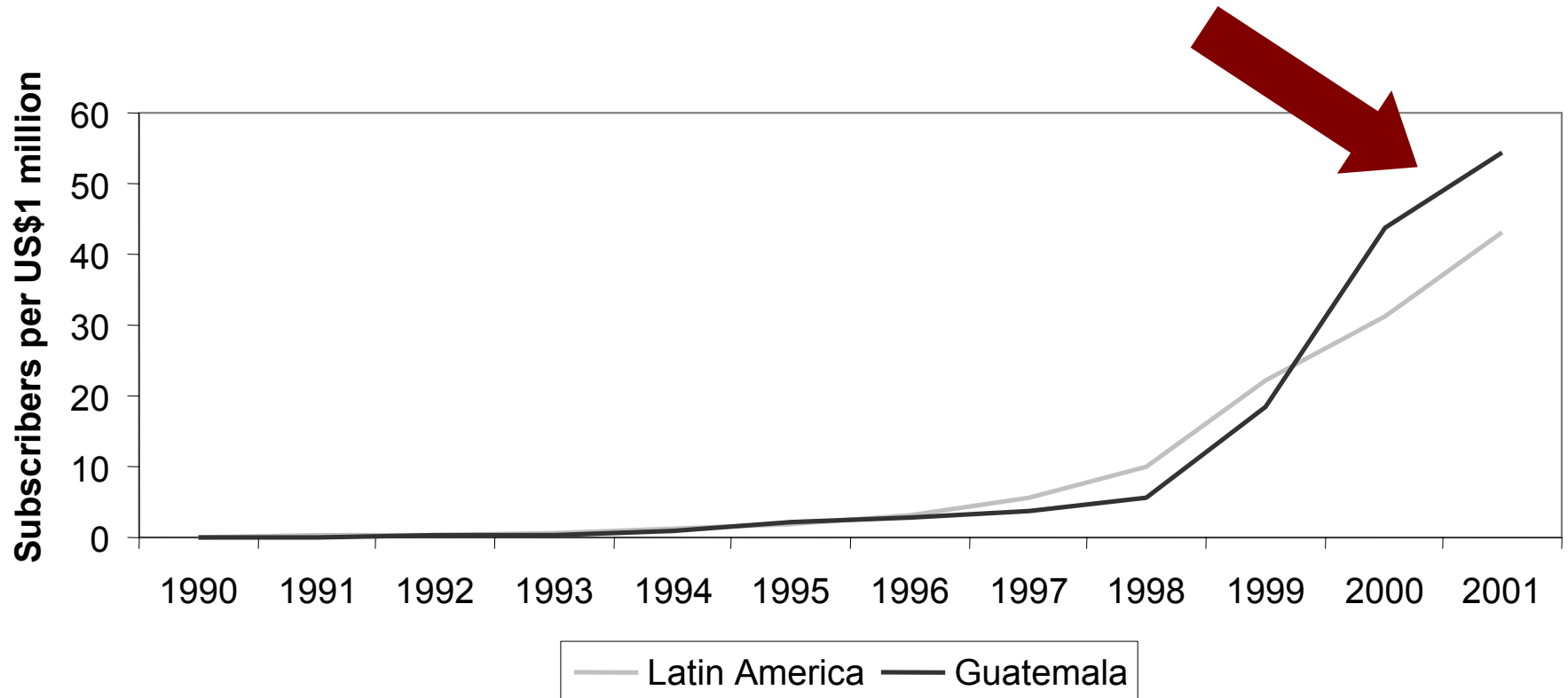
Note: Lower middle income countries include Belize, Bolivia, Colombia, Ecuador, El Salvador, Guyana, Honduras, Paraguay, and Peru.

# International outgoing telephone traffic



Source: International Telecommunication Union

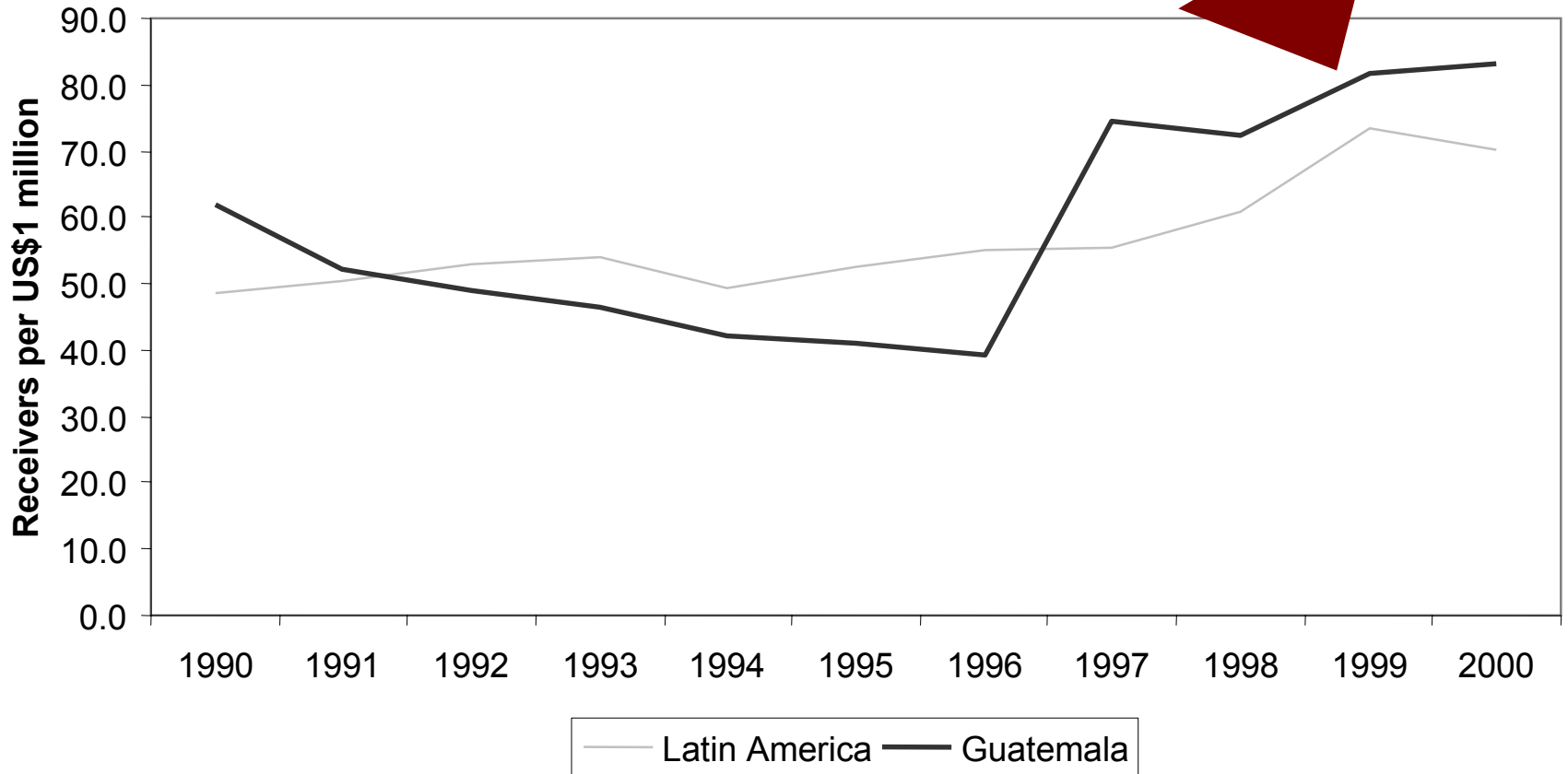
# Cellular mobile telephone subscribers/GDP



Source: International Telecommunication Union and World Development Indicators (World Bank)



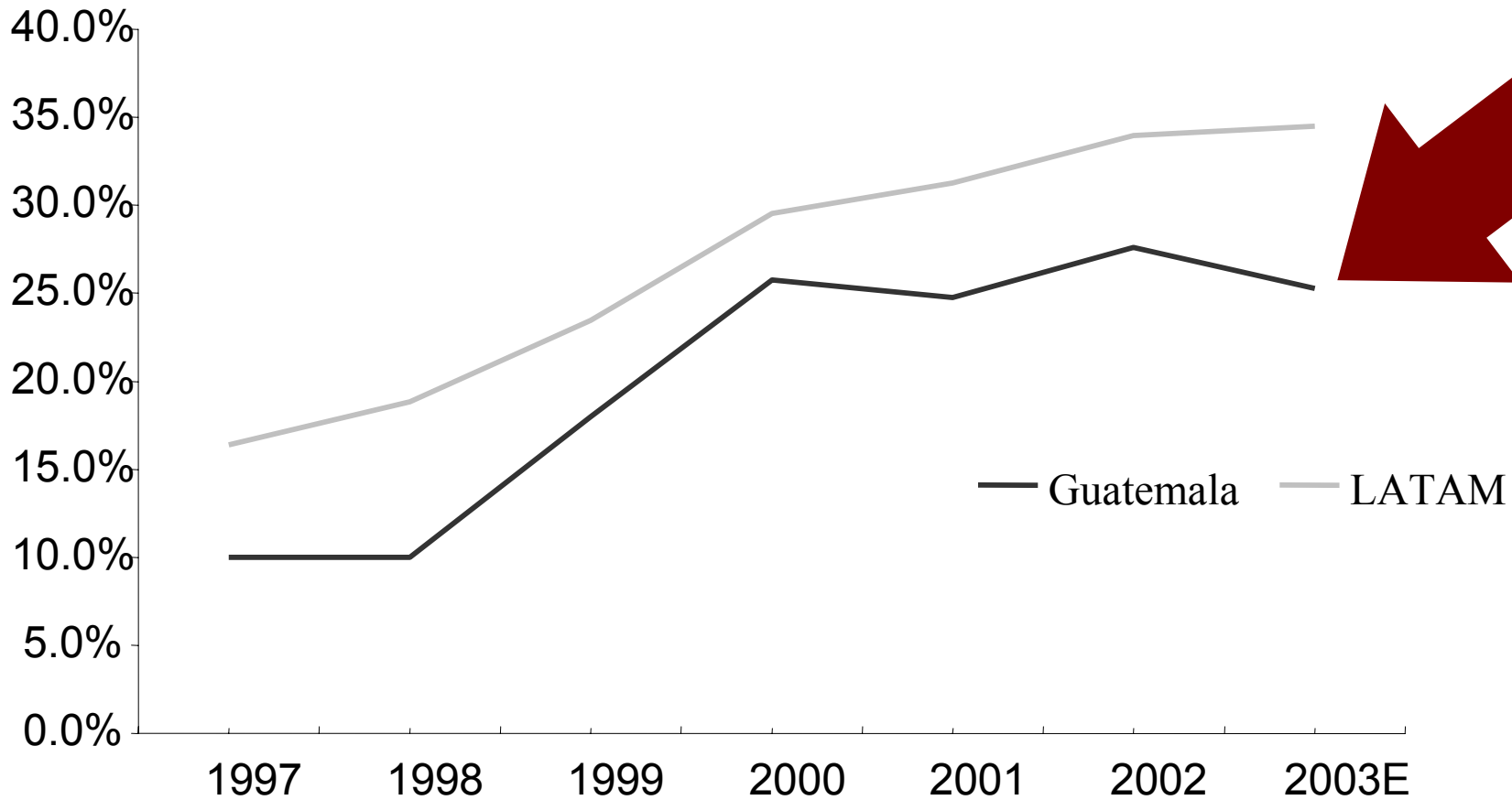
# Television receivers/GDP



Source: International Telecommunication Union and World Development Indicators (World Bank)

# Dropping service with one provider, signing up with another

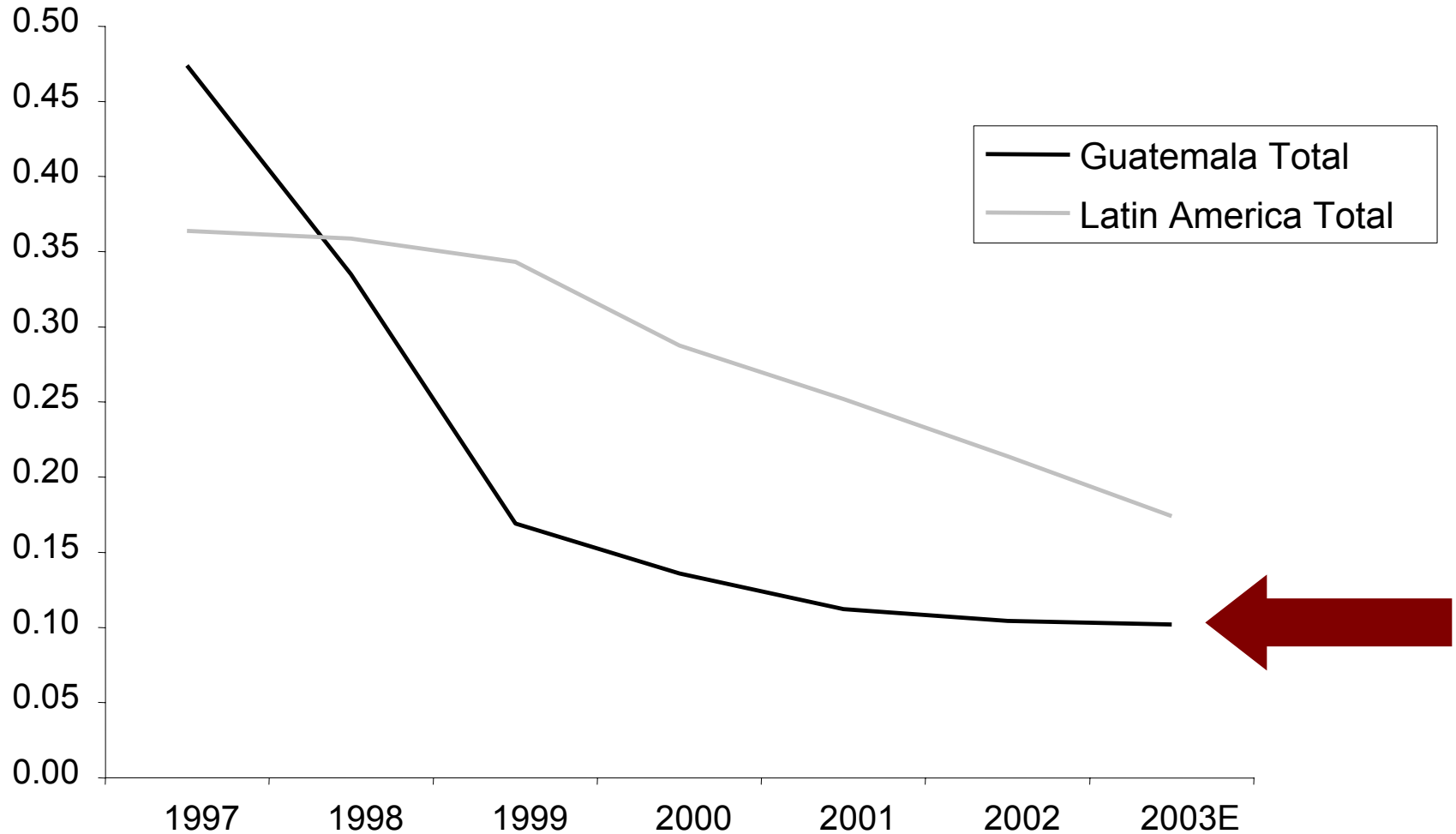
Annual churn rate, %



Source: Pyramid Research

# Mobile phone rates

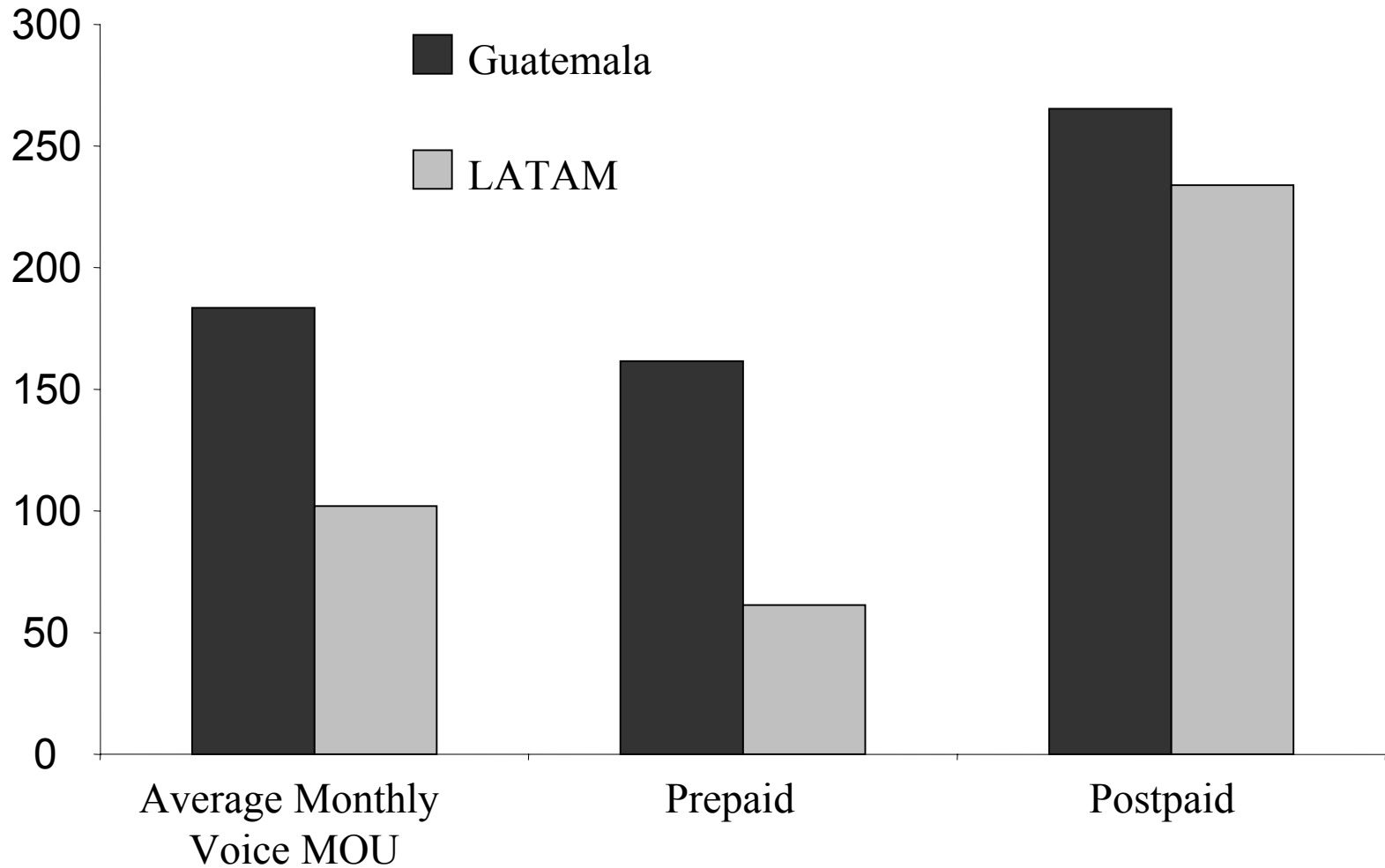
Average revenue per subscription per average voice minutes-of-use



Source: Pyramid Research

# Mobile phone usage

Average monthly voice minutes of use, 2002



Source: Pyramid Research

# RECOMMENDATIONS

- Place all or only part of the spectrum into the market?
- Ownership with non-interference or outright ownership?
- Conflict resolution via existing courts or the regulatory agency?
- Make the move to radio spectrum property rights win-win or win-lose?

# LOOKING FORWARD

The background of the slide is a dense, overlapping pattern of various coins. The top and bottom portions of the image are faded to a light gray, while the middle portion is in sharp focus, showing a variety of coins including pennies, nickels, dimes, and quarters in different colors and designs.

- Private markets work when scarcity an issue
- Commons work when scarcity not an issue
- Radio spectrum rights work either way

**END**

