# Turkey and the world: a look into the past and future

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# Outline

- From The Great Divergence to The Great Convergence
- The anatomy and consequences of The Great Convergence
  - Implications for Turkey
- The dynamics behind the Great Divergence
  - An analysis of Turkey

# The Great Divergence

- When Adam Smith wrote his book, the richest country in the world was 4 times richer than the poorest country
- According to the World Development Indicators (2009) published by the World Bank, the poorest countries in the world in the world in 2008 were:

| | | US$ per capita | |
|---|---|---|---|
| | | At market prices | PPP |
| Poorest | Congo, Dem. Rep. | 99 | 297 |
| | Burundi | 111 | 354 |
| | Guinea-Bissau | 128 | 497 |
| | Eritrea | 147 | 584 |
| X 4 | Haiti | 410 | 1088 |
| | Guinea | 417 | 1113 |
| | Bangladesh | 462 | 1233 |
| | Kenya | 464 | 1470 |
| X 4 | Cape Verde | 1632 | 3239 |
| | Turkmenistan | 1705 | 6138 |
| | Ecuador | 1746 | 7402 |
| | Morocco | 1770 | 4056 |
| X 4 | Turkey | 5240 | 12263 |
| | Chile | 6229 | 13370 |
| | Mexico | 6591 | 13407 |
| | Croatia | 6796 | 17219 |
| | Czech Republic | 7632 | 23341 |

US$ per capita

| | At market prices | PPP |
|---|---|---|
| Australia | 24401 | 33369 |
| Belgium | 25055 | 33520 |
| Germany | 25420 | 33665 |
| Canada | 26143 | 36039 |

X 4

| | | |
|---|---|---|
| Hong Kong, China | 34587 | 40599 |
| Switzerland | 37789 | 37780 |
| United States | 38206 | 43179 |
| Japan | 40481 | 31484 |
| Norway | 42684 | 49711 |

The richest

The US is 387 times richer (or 145 at PPP) than the DR Congo

# The great divergence

Rich countries grew faster. Poor countries grew more slowly

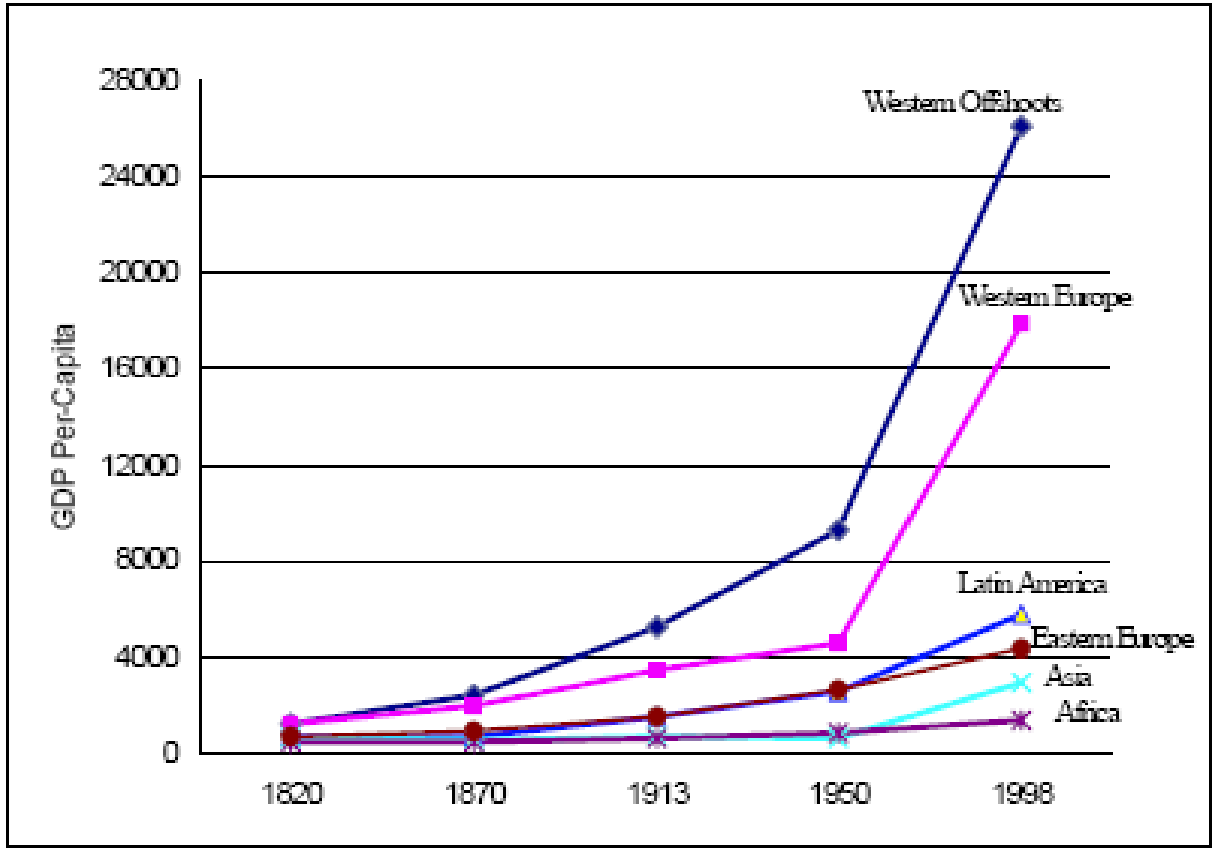
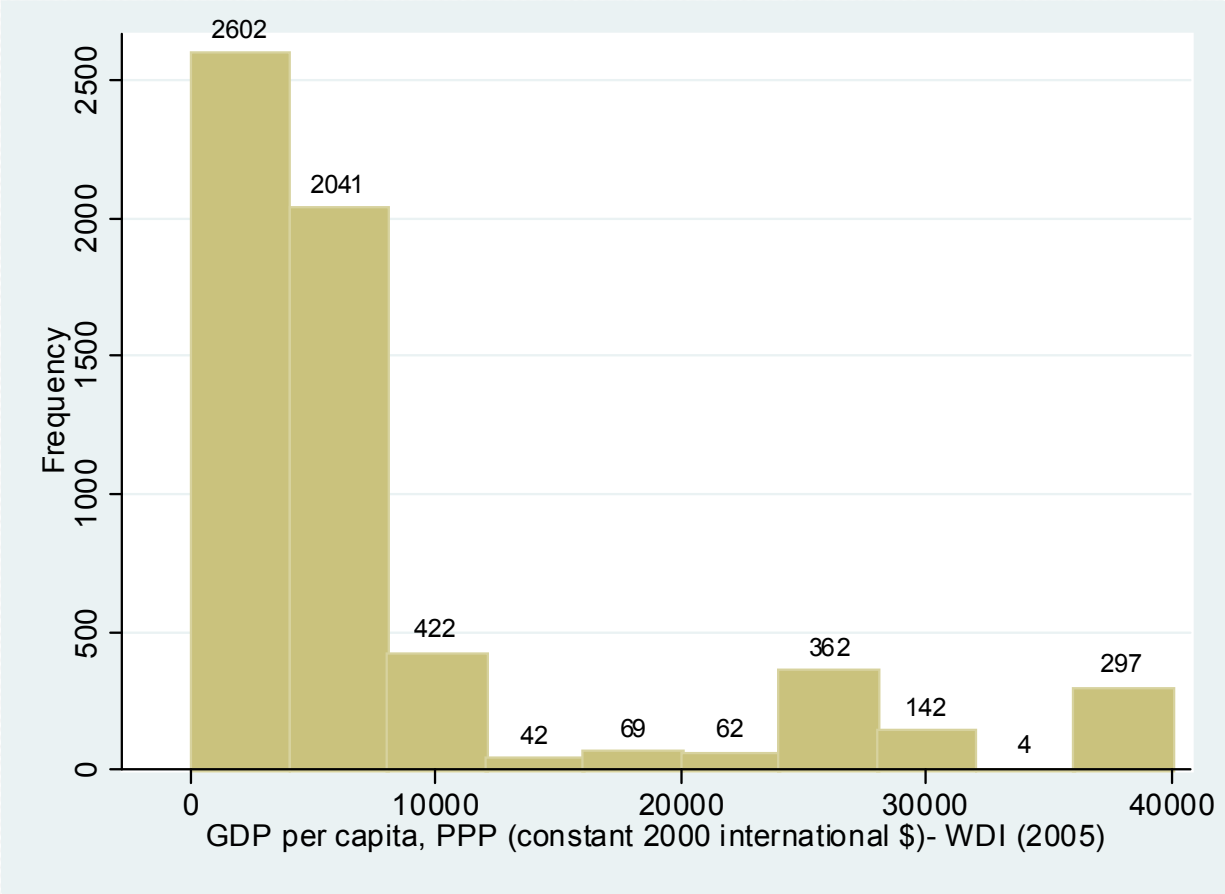



Figure 2.32. The Great Divergence
Source: Maddison (2001)

# The distribution of per capita income across countries in 2004



**Germany**: The Melander family of Bargteheide
Food expenditure for one week: 375.39 Euros or $500.07

**Mexico:** The Casales family of Cuernavaca
Food expenditure for one week: 1,862.78 Mexican Pesos or $189.09

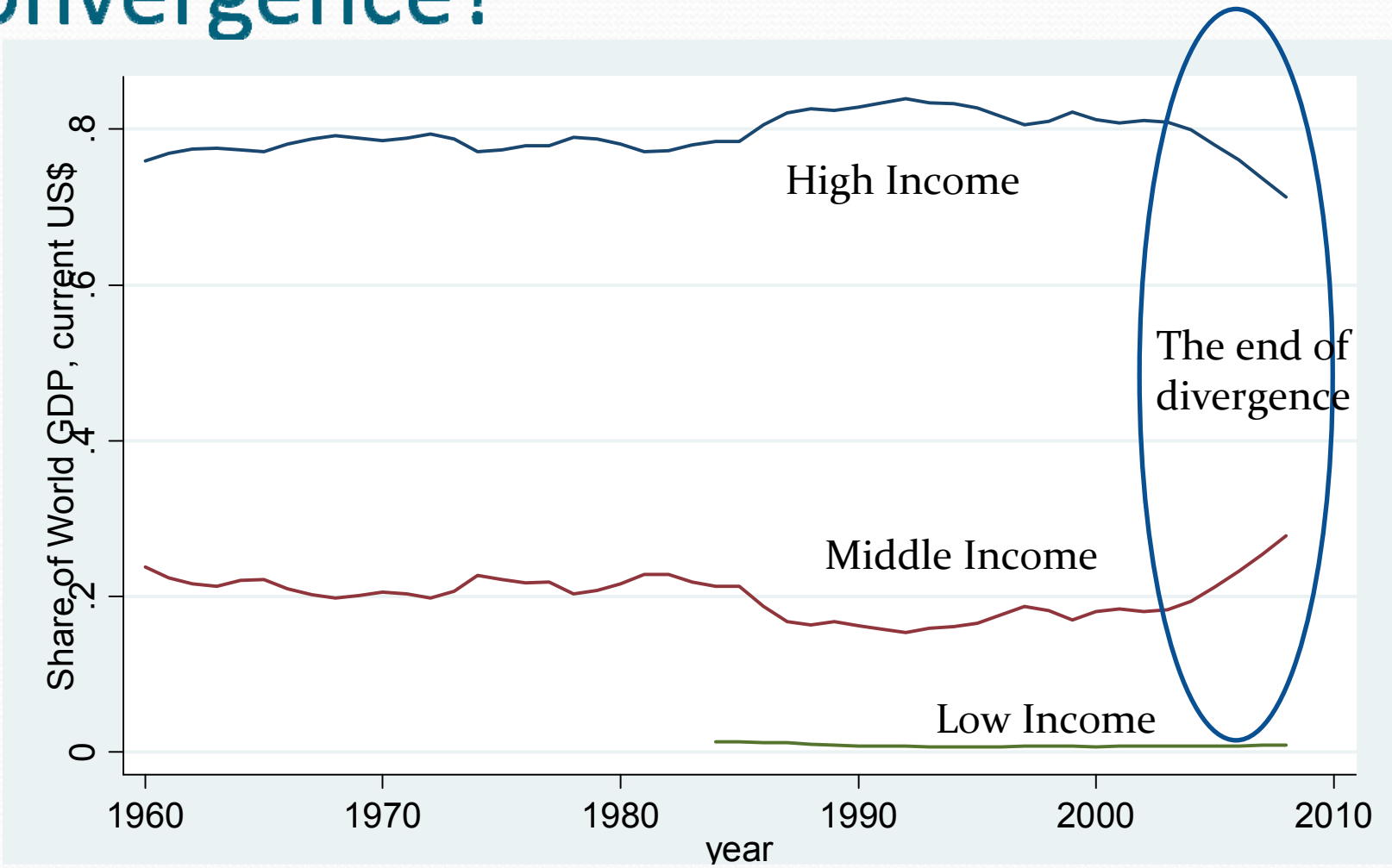
**Poland:** The Sobczynscy family of Konstancin-Jeziorna
Food expenditure for one week: 582.48 Zlotys or $151.2

**Egypt:** The Ahmed family of Cairo
Food expenditure for one week: 387.85 Egyptian Pounds or $68.53

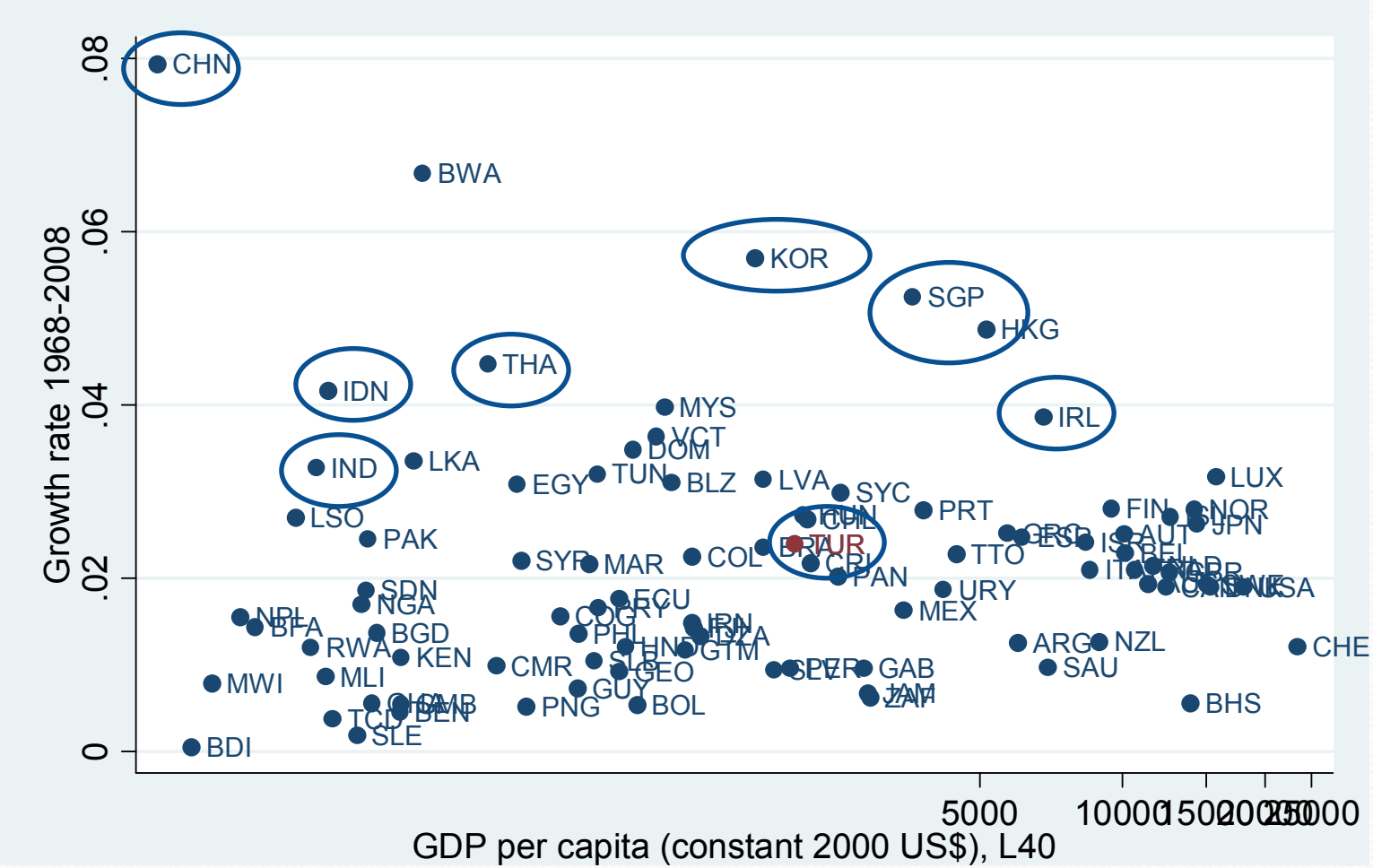
**Ecuador:** The Ayme family of Tingo
Food expenditure for one week: $31.55

**Chad:** The Aboubakar family of Breidjing Camp
Food expenditure for one week: 685 CFA Francs or $1.23

# The beginning of the Great Convergence?



# Growth over the past 40 years

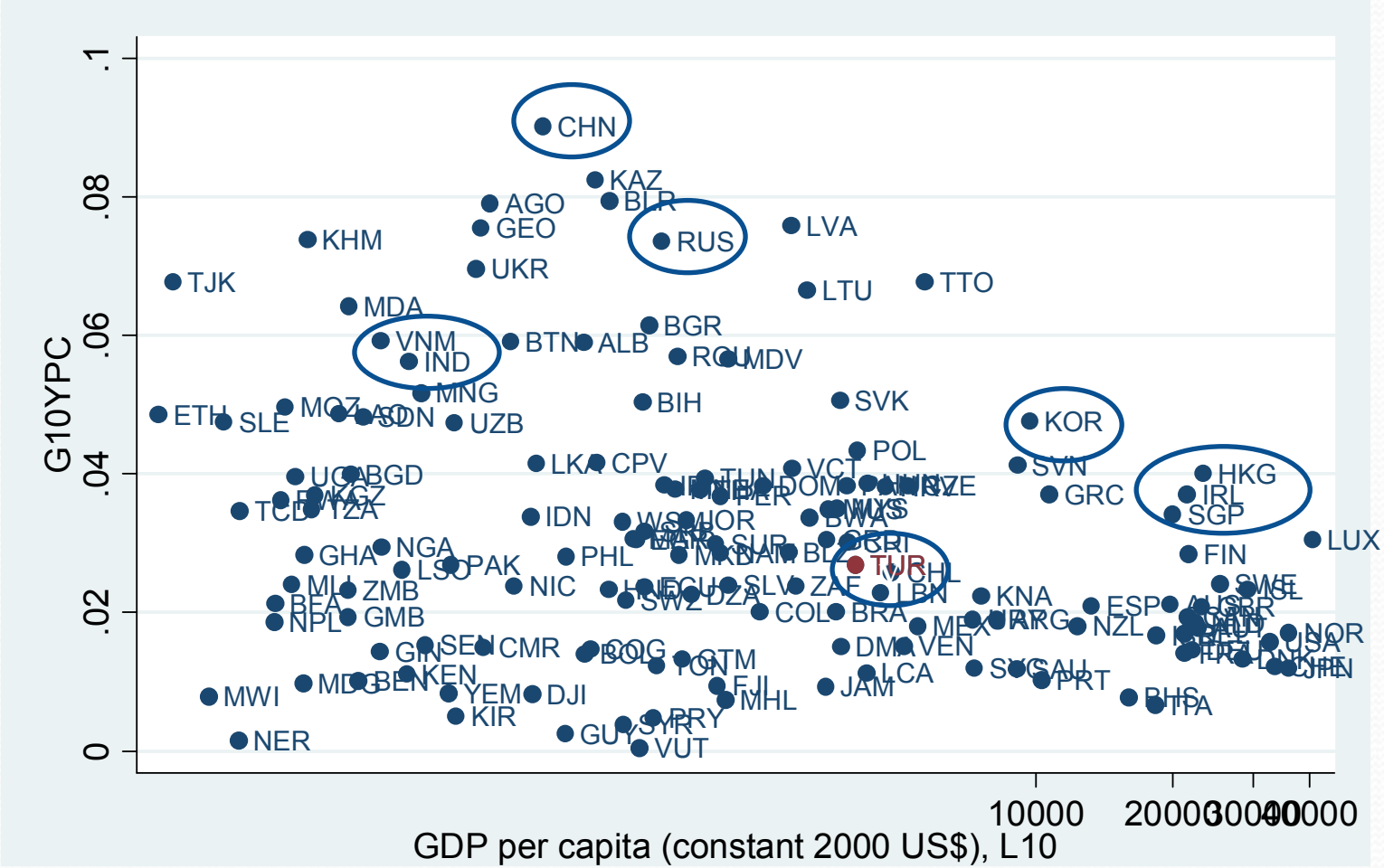


# What do the different growth rates mean?

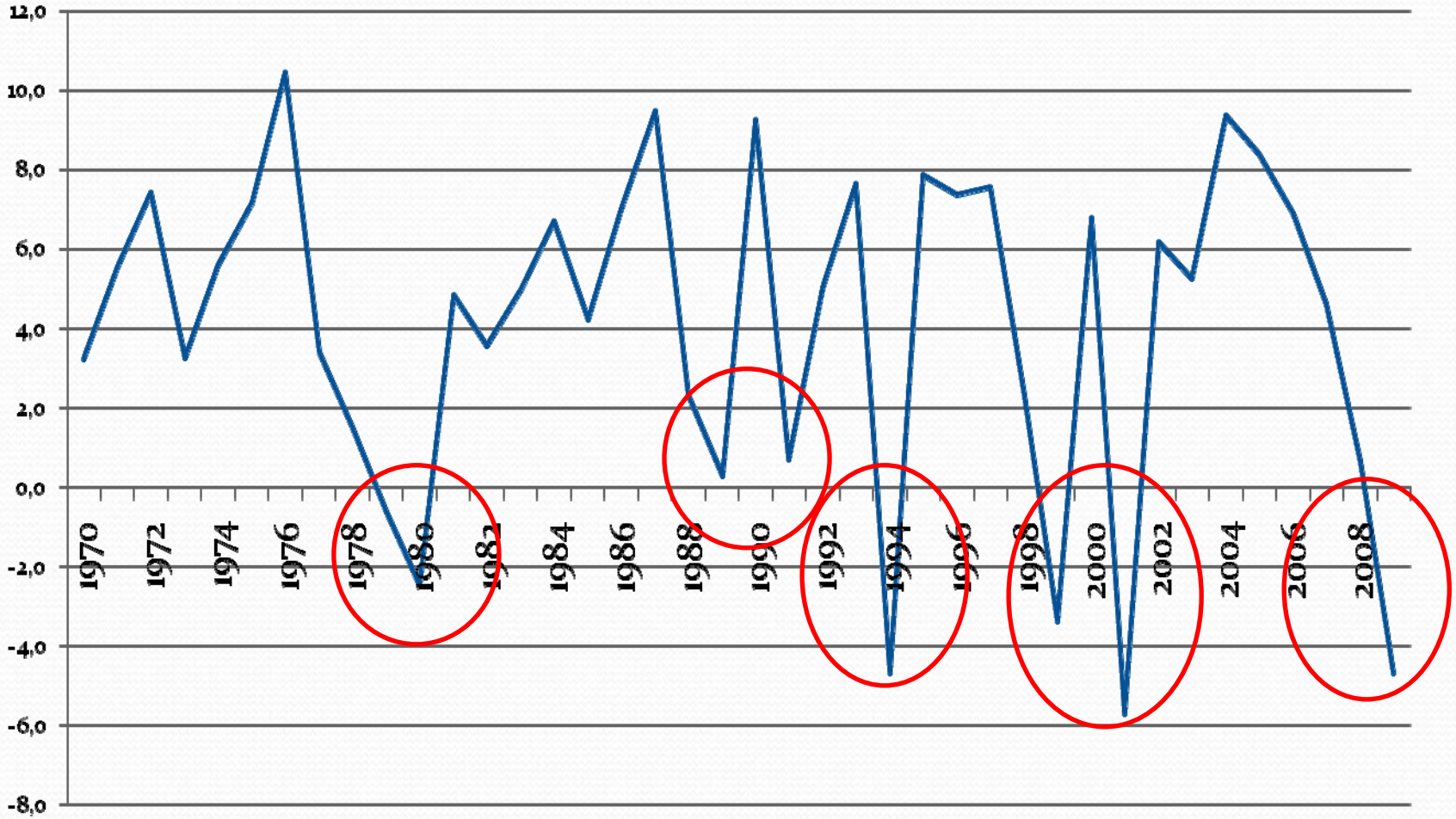
| Rate of growth | Time to double income | % increase Child - parent | Grandchild/ grandparent |
|---|---|---|---|
| 0.5 | 138.0 | 13% | 1.28 |
| 1 | 69.0 | 28% | 1.64 |
| 2 | 34.5 | 64% | 2.69 |
| 3 | 23.0 | 109% | 4.38 |
| 4 | 17.3 | 167% | 7.11 |
| 5 | 13.8 | 239% | 11.47 |
| 6 | 11.5 | 329% | 18.42 |
| 7 | 9.9 | 443% | 29.46 |
| 8 | 8.6 | 585% | 46.90 |

Assuming that each generation is 25 years apart

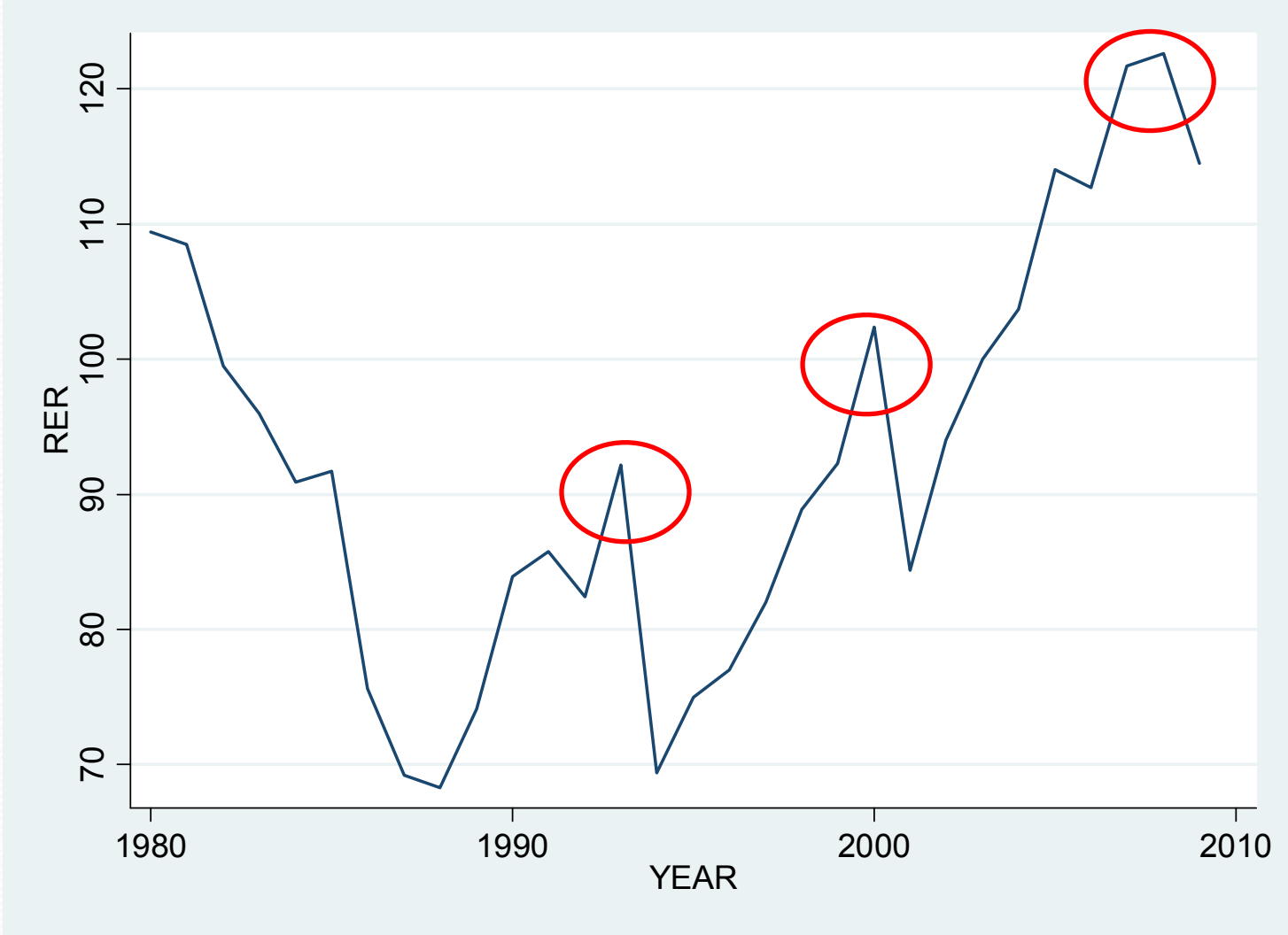
# Growth over the past 10 years



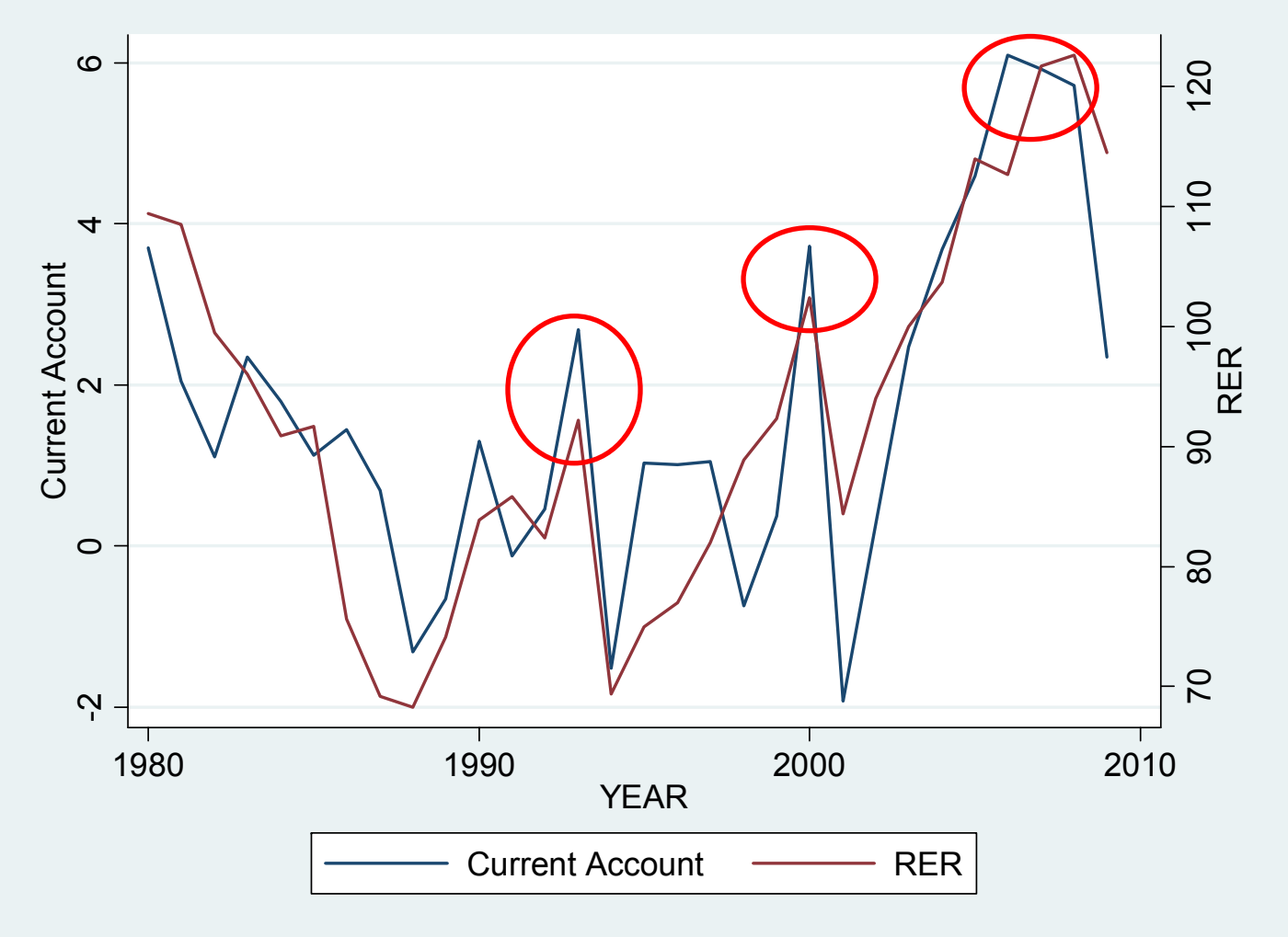
# Turkey's growth has been very volatile



# The real exchange rate in Turkey



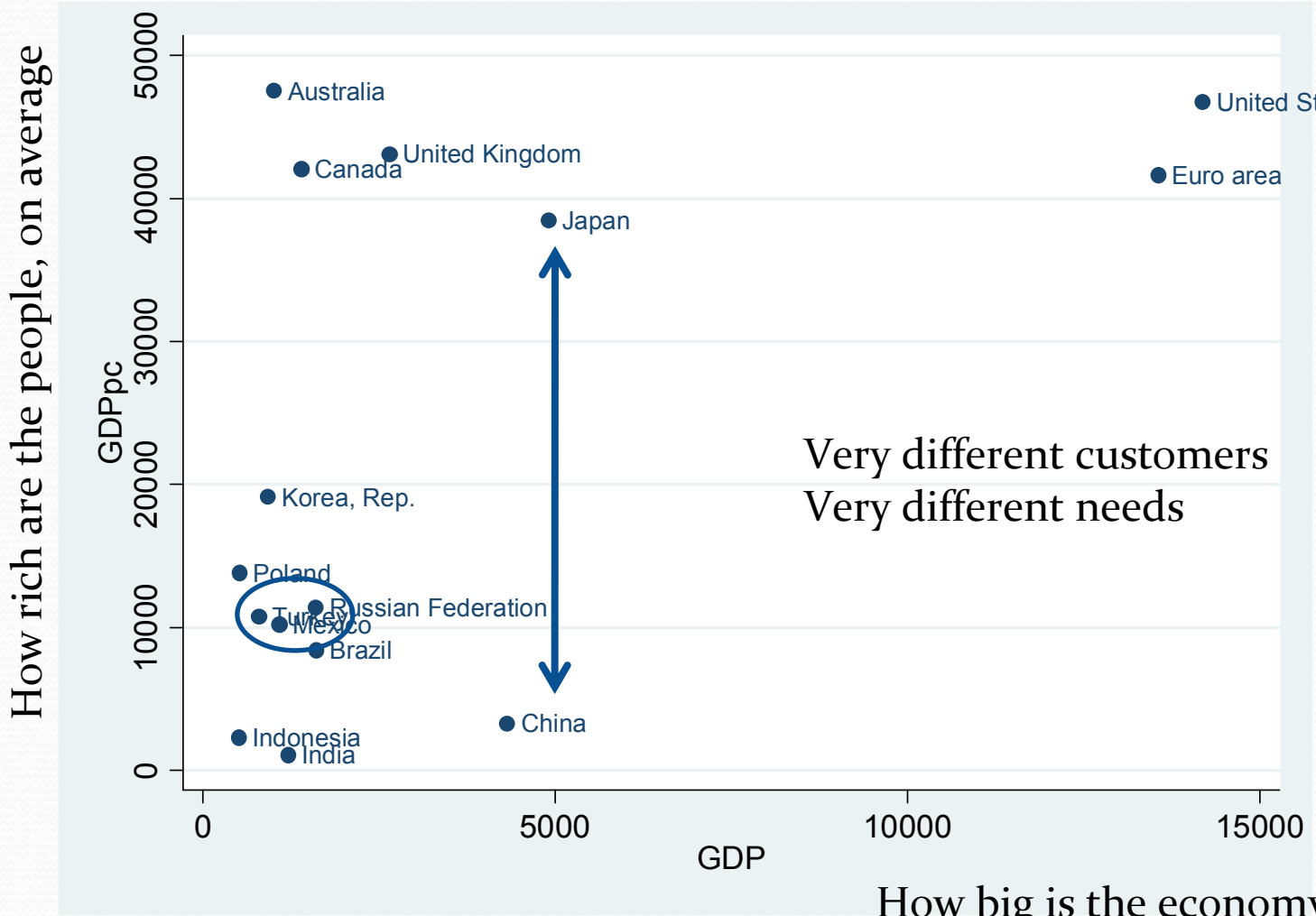
# Appreciation precedes current account reversals and crises



# More economies are growing faster

And they are becoming much bigger

# The world's largest economies

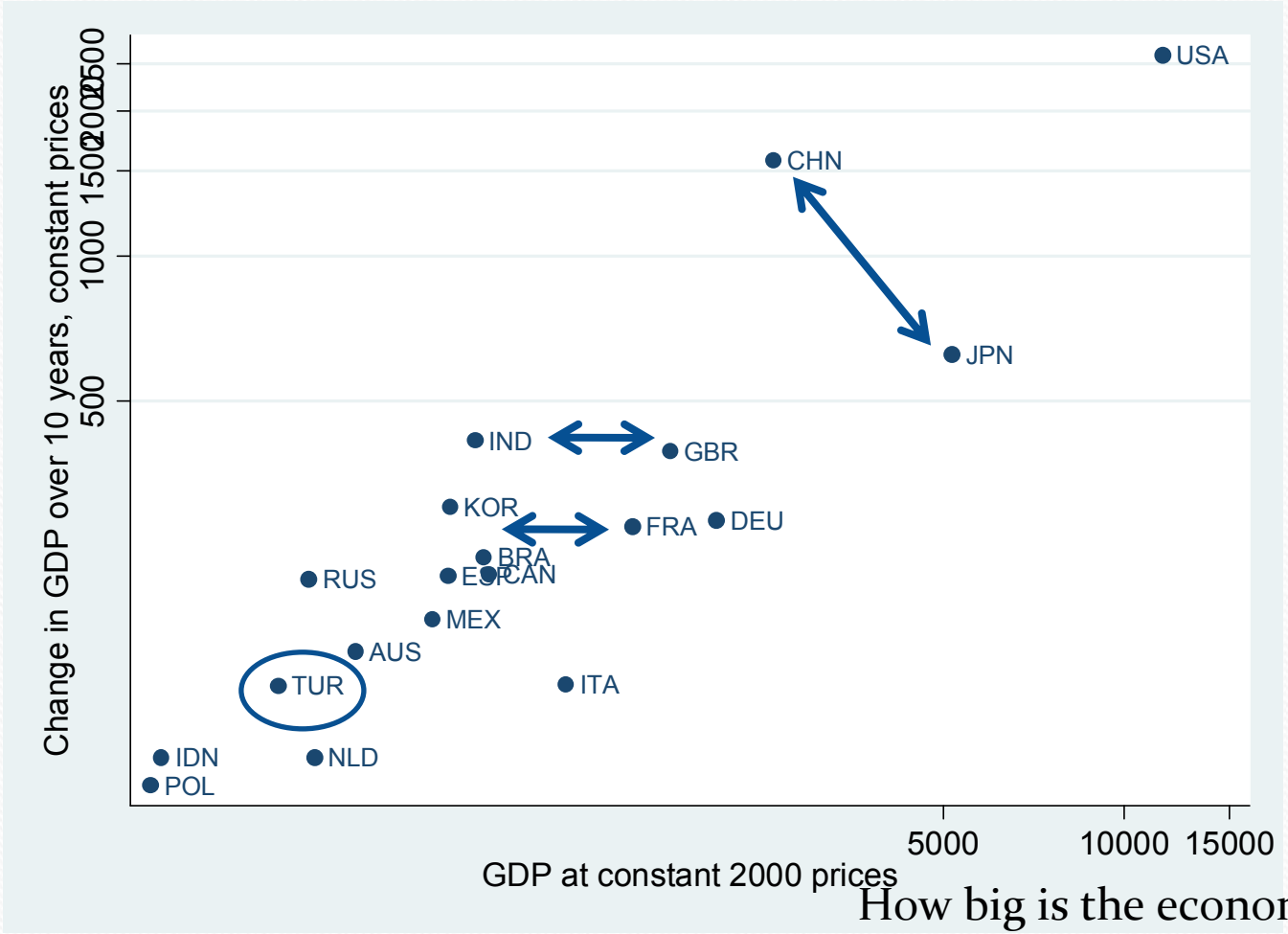



Very different customers
Very different needs

How big is the economy?

# Who is big, who contributes to world growth 1998-2008

How much did it contribute to world growth?

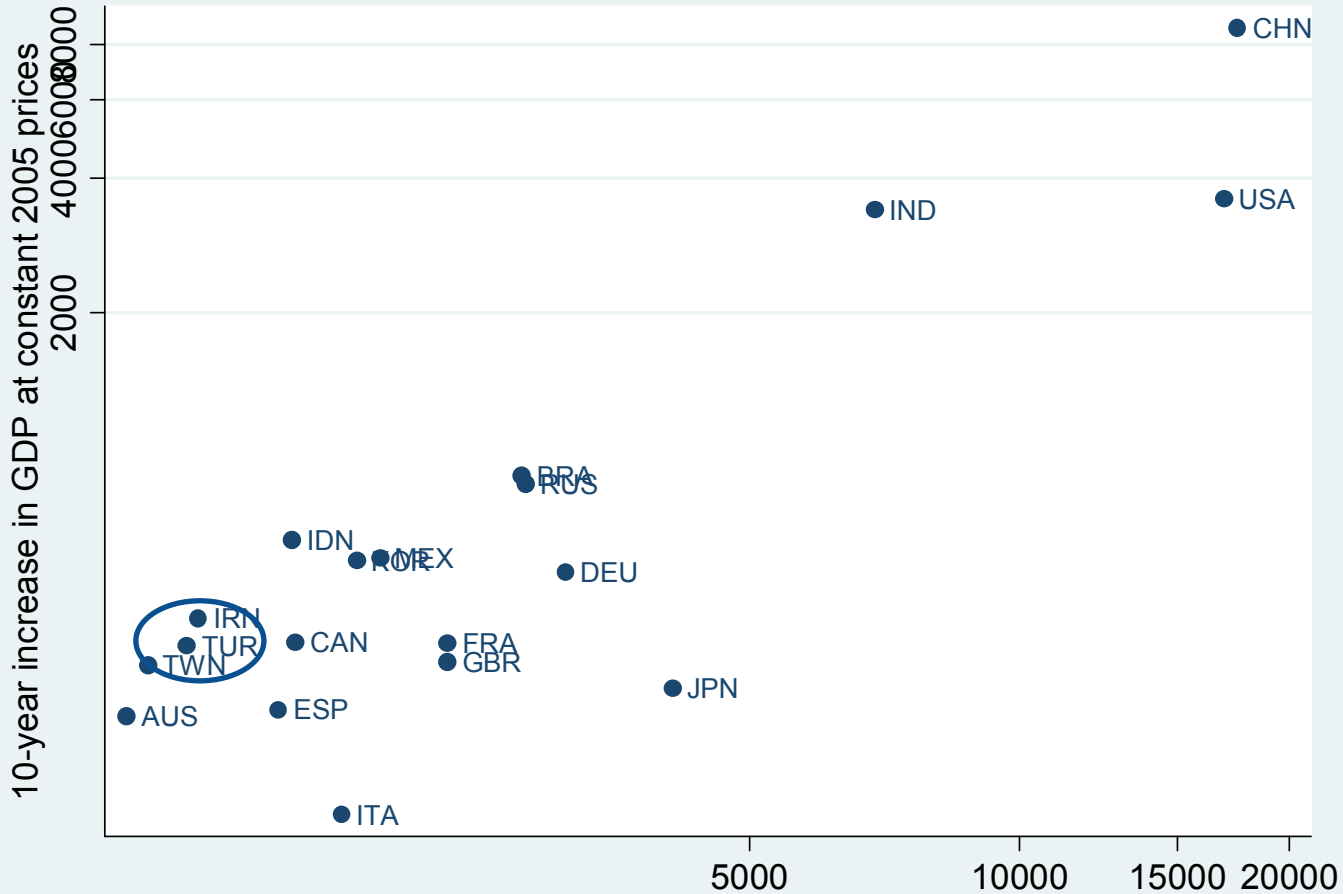



How big is the economy?

Source: World Development Indicators, World Bank

# Who will be big, who will have grown by 2020

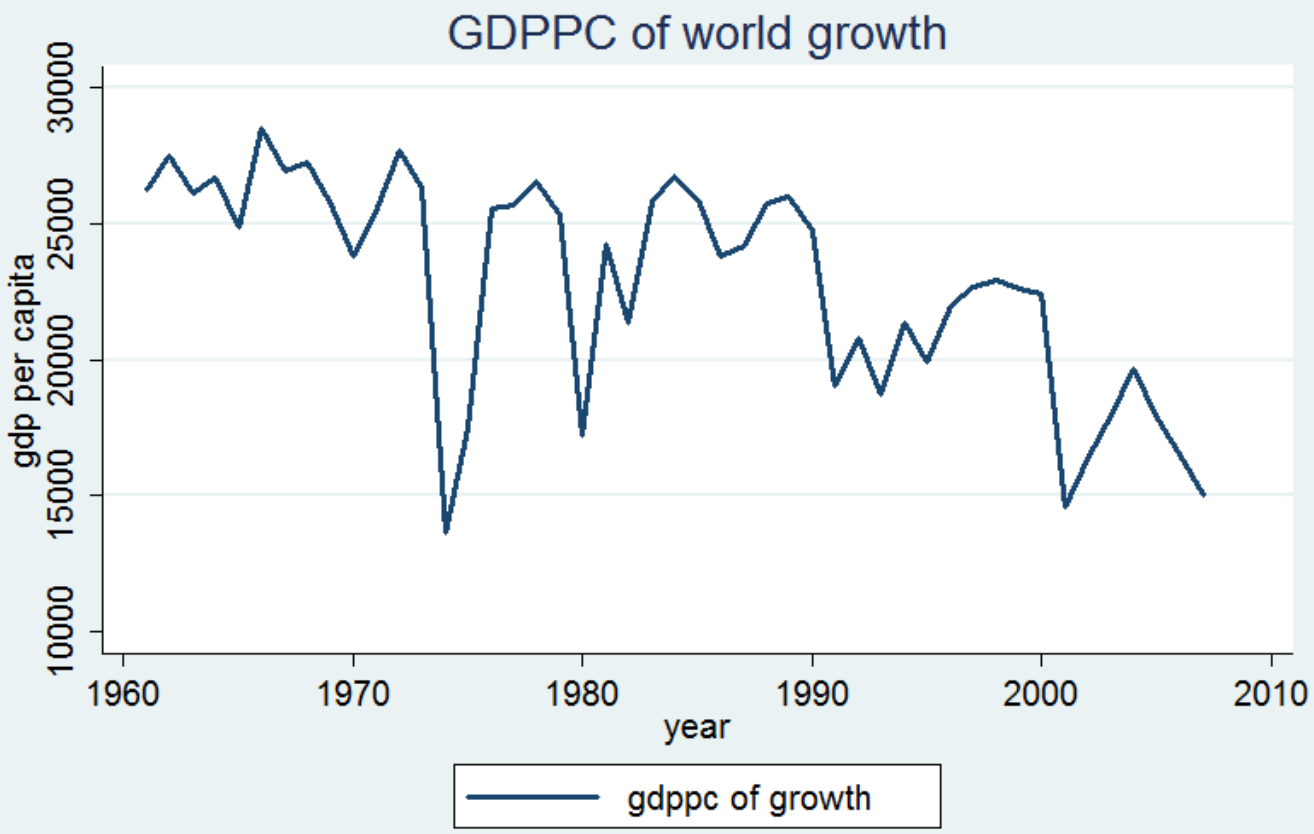
How much will it contribute to world growth?




How big will the economy be?

Source: Calculations based on projections by the Economist Intelligence Unit

# The income per capita of world growth: The contributors to growth are poorer

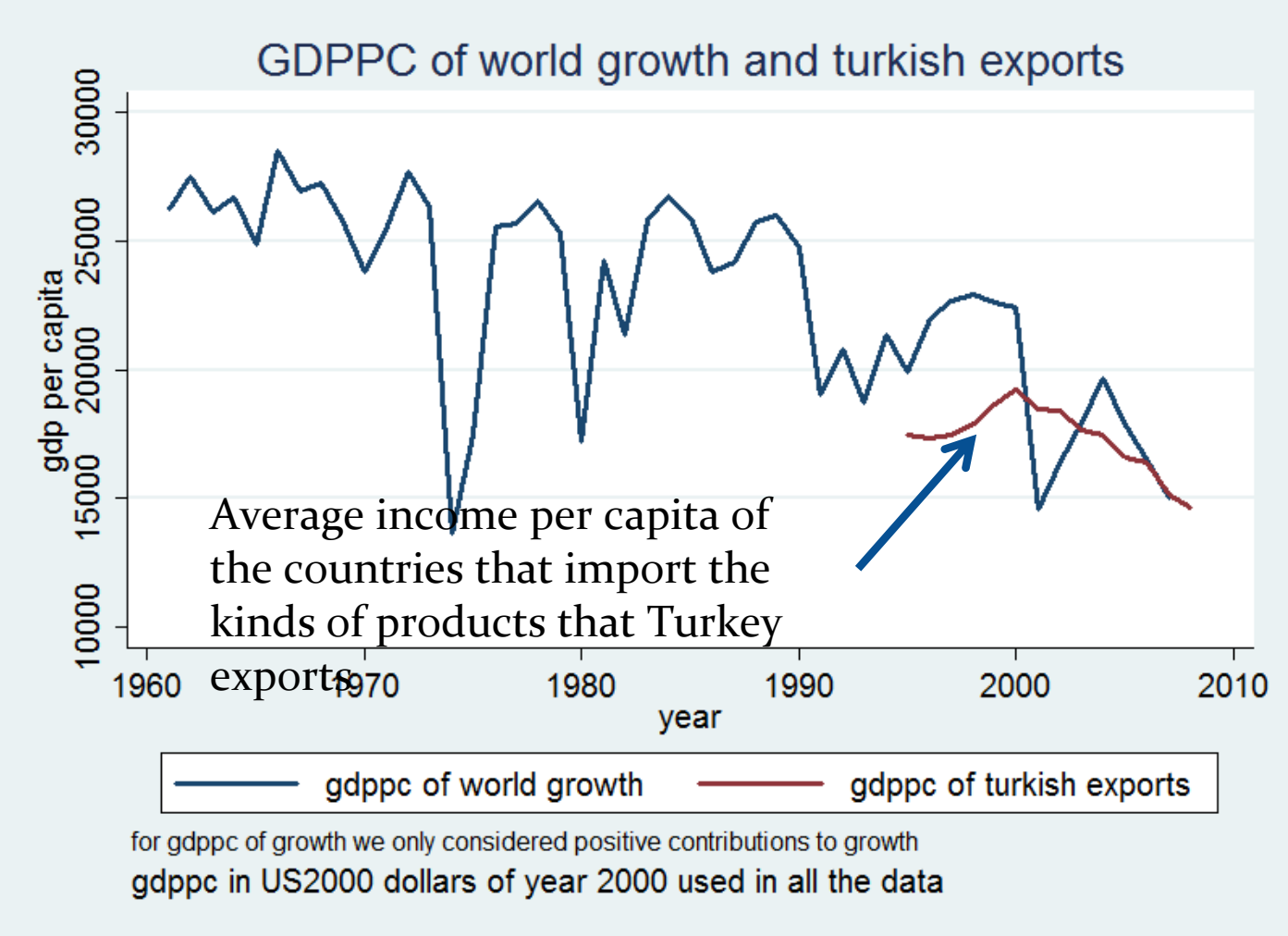



for gdppc of growth we only considered positive contributions to growth

gdppc in US2000 dollars of year 2000 used in all the data

# Is Turkey poised to benefit?

# How rich are the countries that import the products that Turkey exports?



# Turkeys is diversifying its export destinations

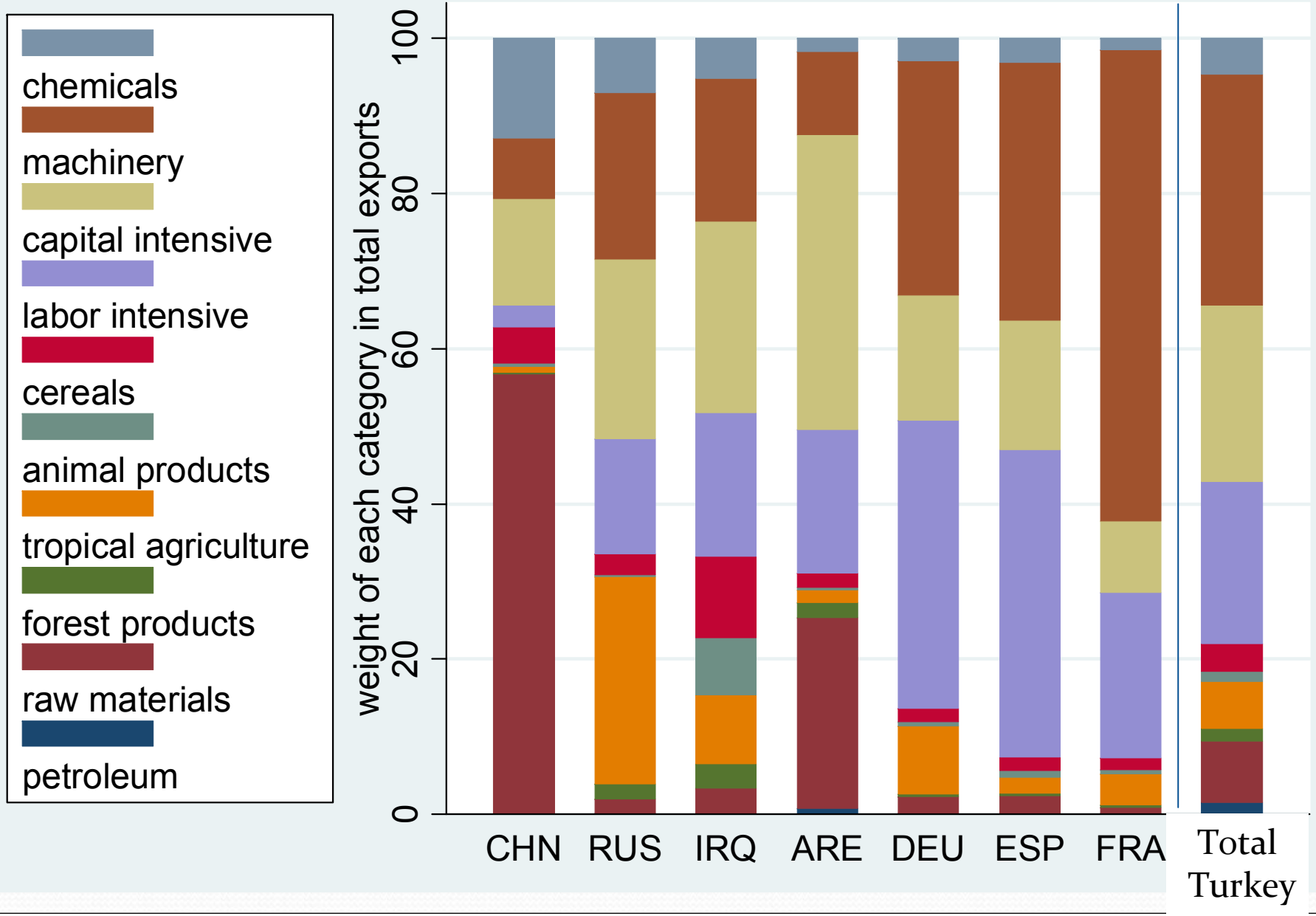
# Destination Countries that grew the most in rank 1995-2009

Largest changes in rank that got into the top 50 in 2009
(more than 400 million exports in 2009 or 0.3% of total exports in 2009)

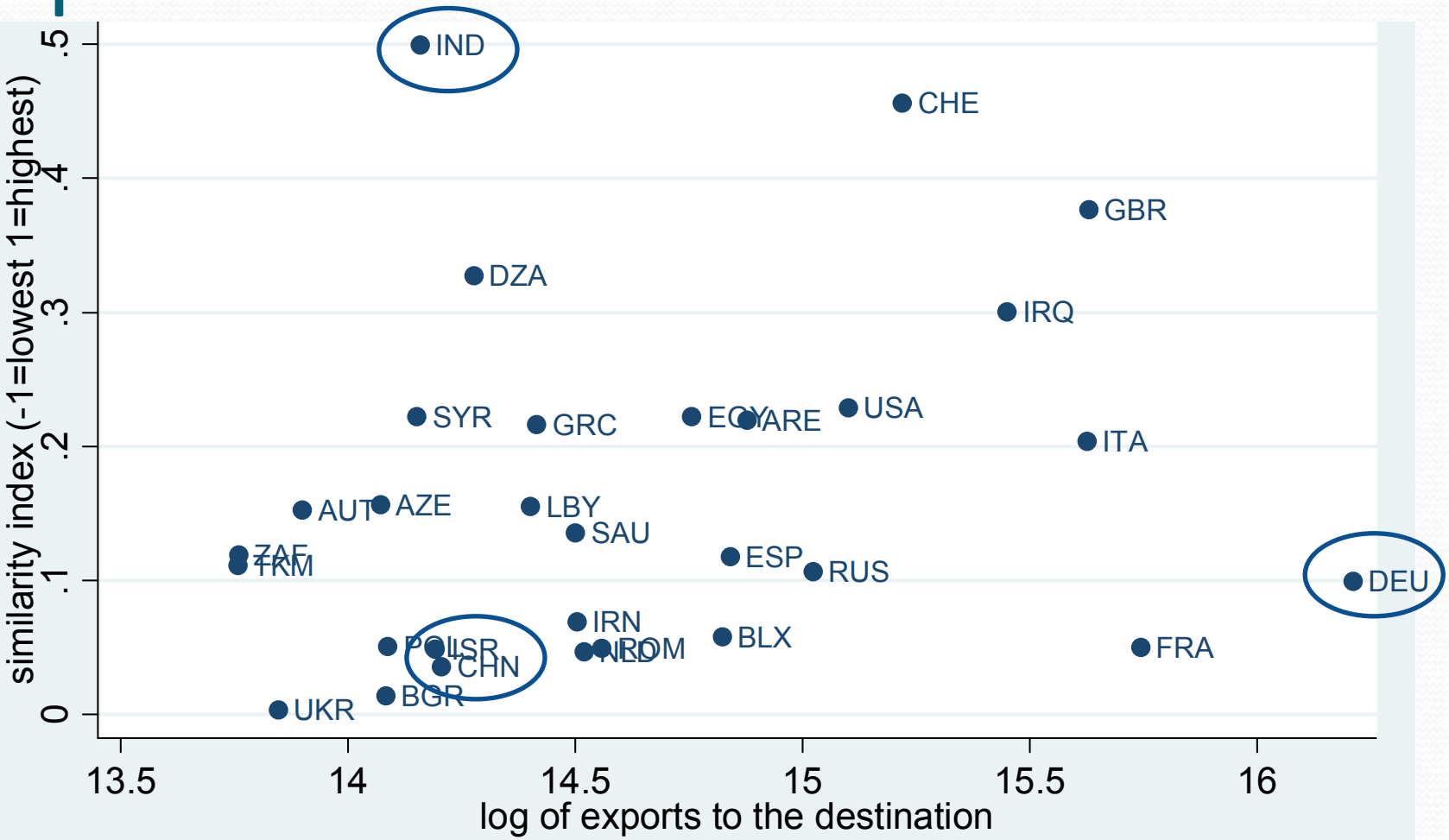
| Group | country | rank 95 | rank 09 | change in ranking | value 2009 (million) | 2009% |
|---|---|---|---|---|---|---|
| MENA | Iraq | 37 | 5 | +32 | 5125.3 | 4.7% |
| BRIC | India | 56 | 22 | +34 | 1409.6 | 1.3% |
| | Turkmenistan | 60 | 30 | +30 | 943.6 | 0.9% |
| CIVETS | South Africa | 55 | 29 | +26 | 945.5 | 0.9% |
| CIVETS | Indonesia | 62 | 40 | +22 | 586.5 | 0.5% |
| EU | Malta | 63 | 41 | +22 | 567.0 | 0.5% |
| BRIC | China | 40 | 20 | +20 | 1477.1 | 1.4% |
| MENA | UAE | 26 | 9 | +17 | 2891.8 | 2.7% |
| BRIC | Brasil | 65 | 49 | +16 | 408.3 | 0.4% |
| | Georgia | 53 | 37 | +16 | 664.3 | 0.6% |
| MENA | Sudan | 67 | 52 | +15 | 373.2 | 0.3% |
| MENA | Morocco | 48 | 33 | +15 | 712.6 | 0.7% |

# Export basket comparison - 2009

key destinations - using leamer categories



# Similarity between Turkey's exports and countries' imports vs. exports




note: simindex constructed using weights

# Implications

- The Great Convergence implies a positive future scenario for Turkey
- …but it will involve changes
- Europe will not be as important as a source of growth for Turkey
- …other countries will represent much larger markets
- …but not all are equally suitable as partners, given today's export mix (e.g. India vs. China).

# Rich countries do not just produce more per capita

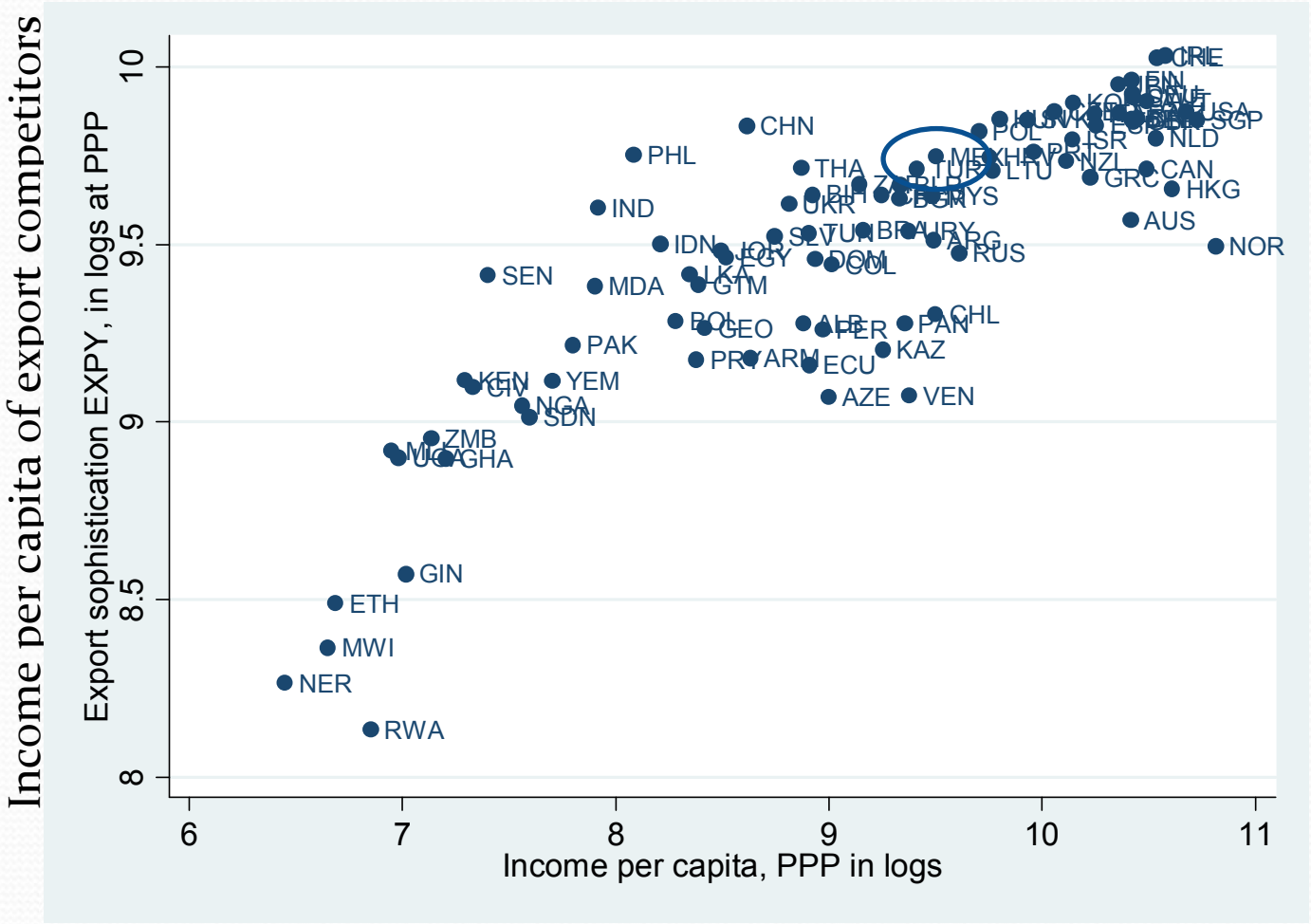
They produce different products

Nikon
D200
感謝キャン
D200をご購入の方にクリスタル
プレゼン
お早めに!
D200
D200
CASHIER
Nikon
Nikon
D70s
D70S
Yodobashi-Camera

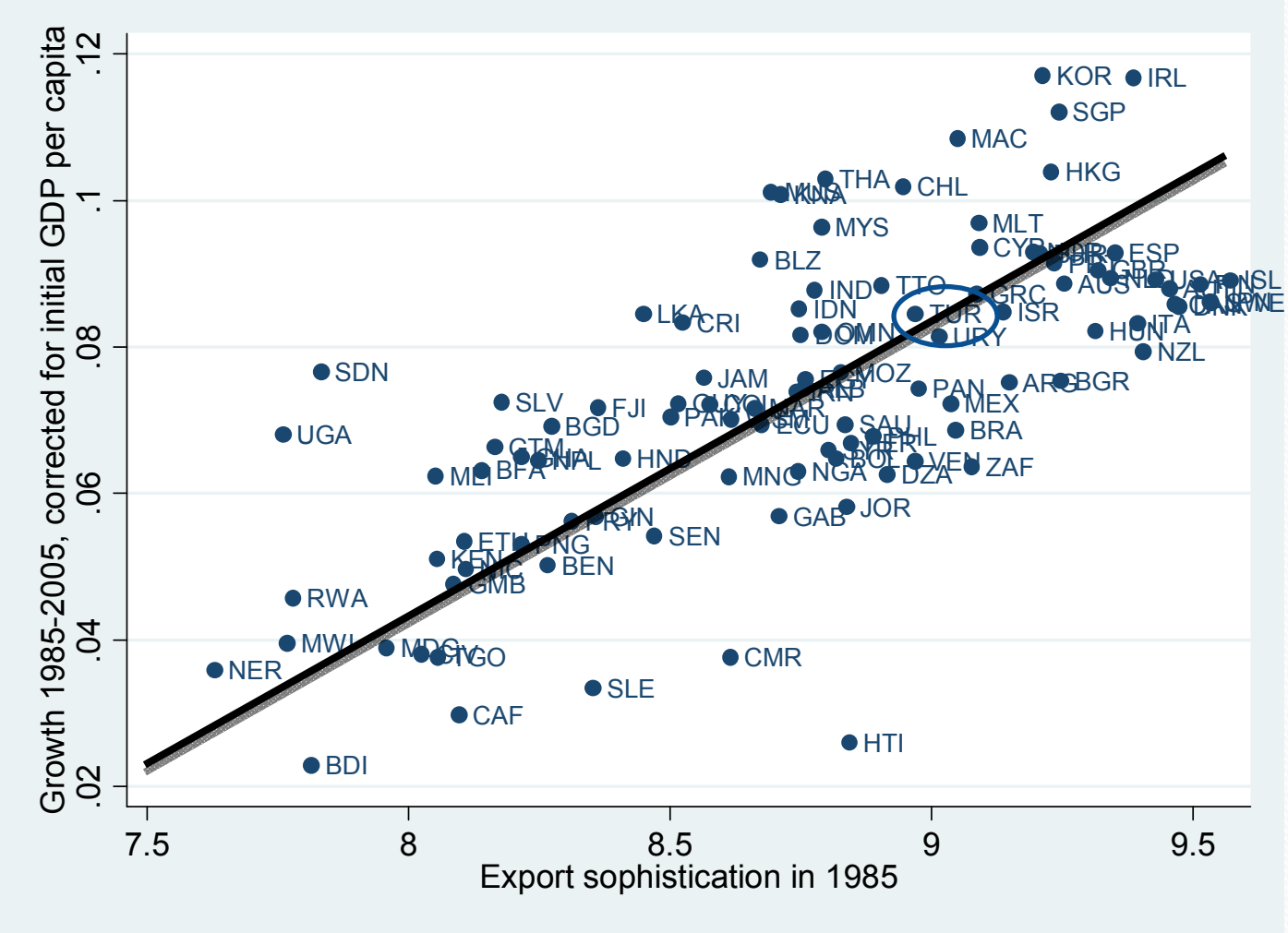
# What makes rich and poor countries different?

- Countries differ in the variety of the capabilities they have
- Rich countries make more complex products that require many capabilities
- Poor countries make simple products that reflect the few capabilities they have

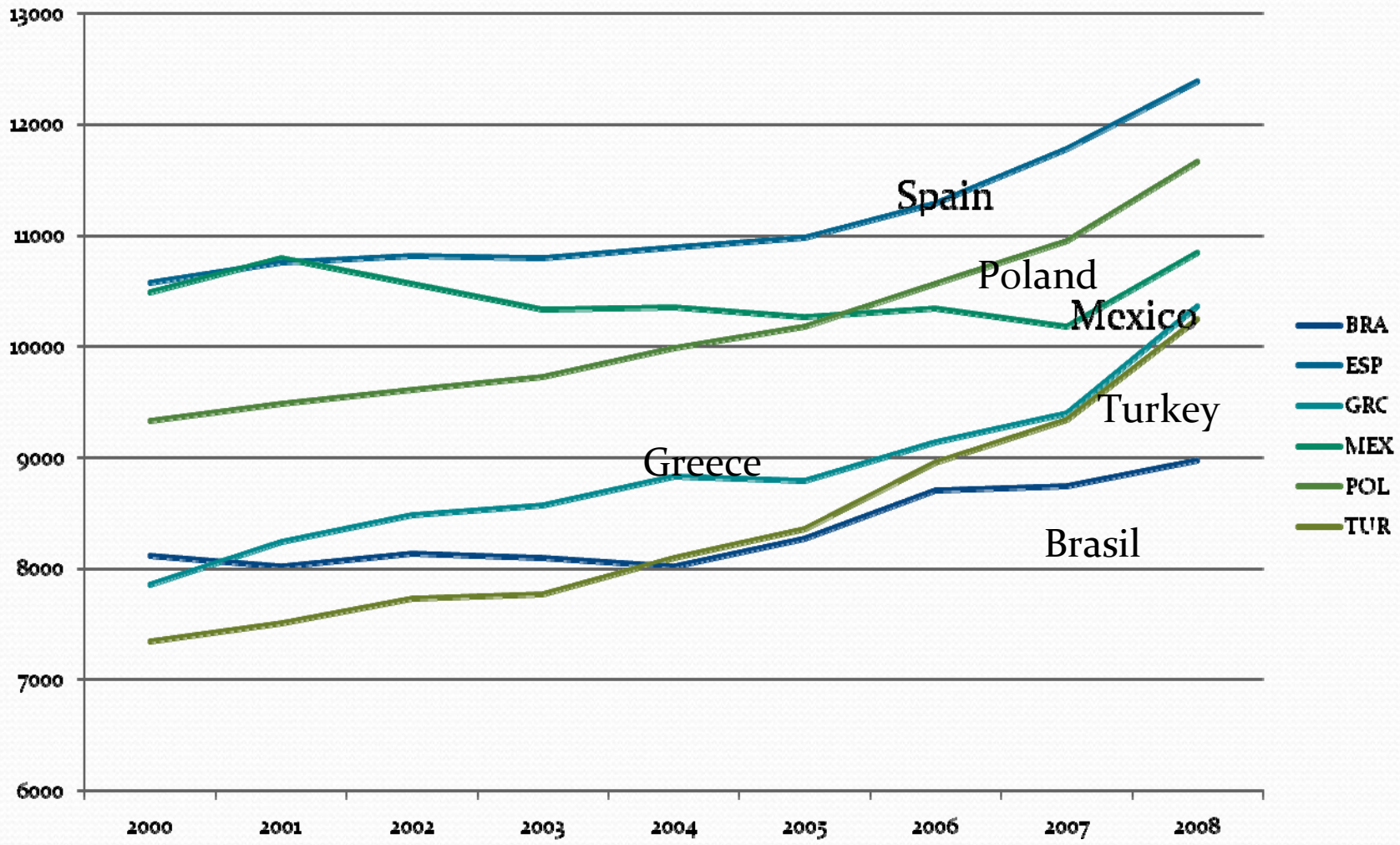
# Rich countries export rich-country goods, poor countries…



# Countries converge to the level of income of their competitors



# The evolution of export sophistication



# The most sophisticated products

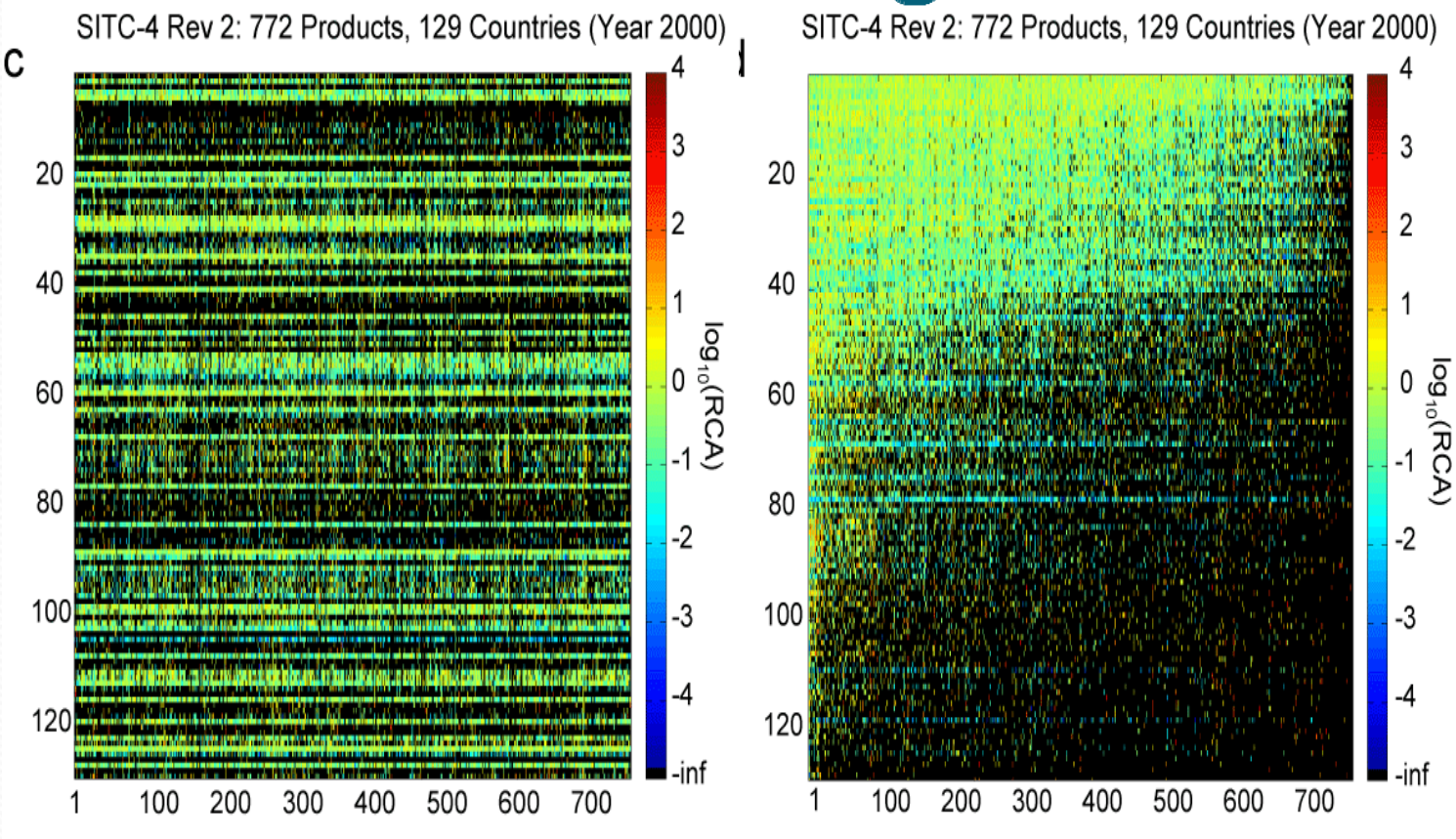
| Product | Sophistica | Exports | RCA | World_Ex | Market sh |
|---|---|---|---|---|---|
| Tyre cord fabric of high tenacity manmade yarn | 36390 | 163 | 6.8 | 2555 | 6% |
| Angles, shapes and sections of iron or non-alloy stee | 29091 | 1401 | 6.3 | 23858 | 6% |
| Parts and accessories of weapons | 28261 | 26 | 1.8 | 1568 | 2% |
| Safety glass (toughened, tempered, laminated) | 22680 | 163 | 1.9 | 9020 | 2% |
| Machines for processing textile fibres | 21342 | 56 | 1.8 | 3303 | 2% |
| Acrylic polymers in primary forms | 20562 | 129 | 1.2 | 11325 | 1% |
| Weaving machines (looms) | 20318 | 25 | 2.0 | 1308 | 2% |
| Machine-tools (metal, carbides, etc), no metal remova | 20074 | 20 | 1.0 | 2057 | 1% |
| Industrial, laboratory electric furnaces, ovens, etc | 19754 | 54 | 1.0 | 5623 | 1% |
| Milking machines and dairy machinery | 19359 | 21 | 1.2 | 1897 | 1% |
| Veg alkaloids, their salts, ethers, esters and derivs | 19121 | 43 | 1.0 | 4319 | 1% |
| Machine-tools for shaping metals, nes | 18916 | 28 | 1.0 | 2856 | 1% |
| Moulds for metals (except ingot), plastic, rubber, et | 18508 | 150 | 1.1 | 14056 | 1% |
| Womens, girls overcoats, etc, knit or crochet | 18339 | 51 | 3.3 | 1664 | 3% |
| Clothing accessories or parts nes, knit or crochet | 18330 | 36 | 1.9 | 2014 | 2% |
| Copper pipe and tube fittings | 18017 | 67 | 1.8 | 4000 | 2% |

# The most vulnerable

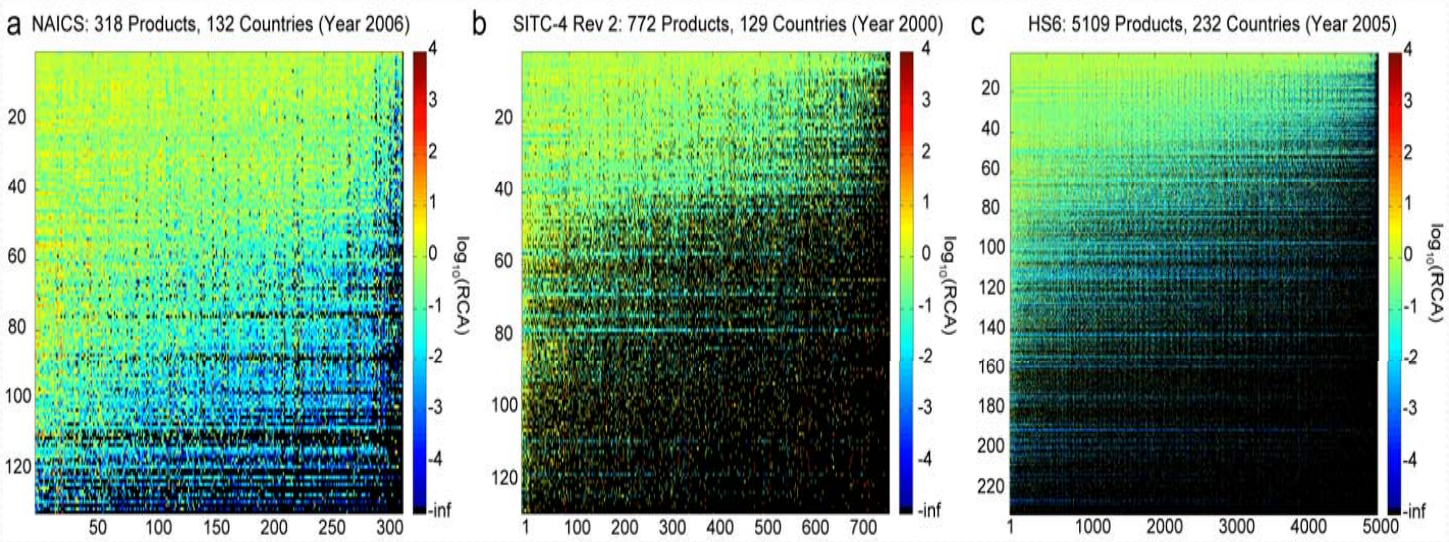
| Product | prody | exports | pRCA | World_Exports | Market sh |
|---|---|---|---|---|---|
| Bed, table, toilet and kitchen linens | 3177 | 1234 | 8.5 | 15497 | 8% |
| Insulated wire and cable, optical fibre cable | 4603 | 2088 | 2.6 | 85047 | 2% |
| Nuts except coconut, brazil & cashew, fresh or dried | 4621 | 904 | 14.0 | 6886 | 13% |
| Semi-finished products of iron or non-alloy steel | 5062 | 1972 | 4.7 | 44613 | 4% |
| Citrus fruit, fresh or dried | 5137 | 576 | 6.3 | 9692 | 6% |
| knit or crochet fabric, nes | 6050 | 1051 | 6.6 | 16985 | 6% |
| Panty hose, tights, hosiery nes, knit or crochet | 6212 | 872 | 8.7 | 10725 | 8% |
| Worked monumental, building stone, articles thereof | 6851 | 939 | 9.5 | 10484 | 9% |
| Grapes, fresh or dried | 6898 | 519 | 8.7 | 6359 | 8% |
| T-shirts, singlets and other vests, knit or crochet | 7056 | 2905 | 10.6 | 29253 | 10% |
| Carpets, woven, not tufted, flocked | 7347 | 845 | 27.9 | 3224 | 26% |
| Fruit, nut, edible plant parts nes, prepared/preserve | 7353 | 561 | 6.0 | 9983 | 6% |

# How to make more sophisticated products?

# The hidden structure in the comparative advantage of nations



# The hidden structure in the comparative advantage of nations



# What does this mean?

- Some countries make few things, while others make many things
- Some products are made by many countries, other products are made by few countries
- Countries that make few products, make products made by many countries
- Countries that make many products, also make products made by few other countries
- The world does not specialize

## Countries

## Products

# The Problem is Symmetric

**Diversification**

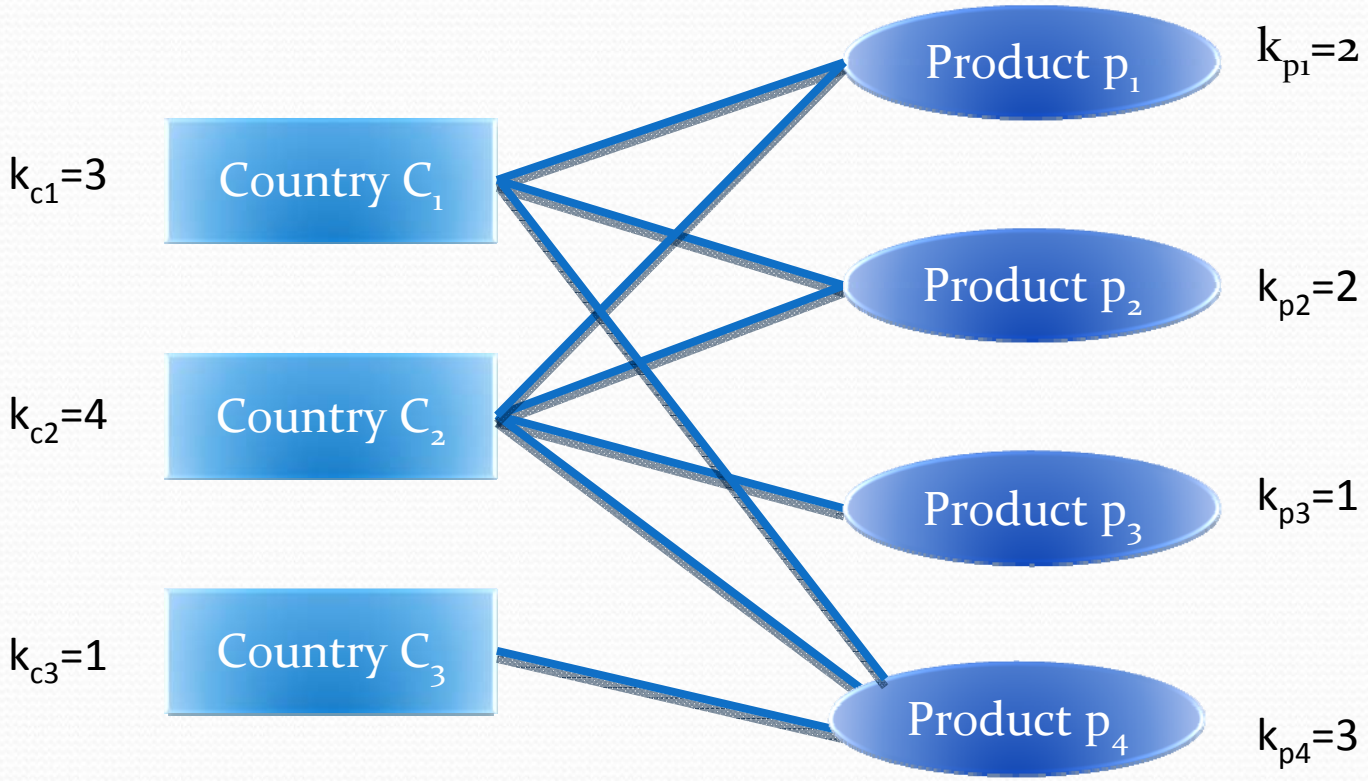
Degree (Countries)

$$k_c = \sum_p M_{cp}$$

**Ubiquity**

Degree (Products)

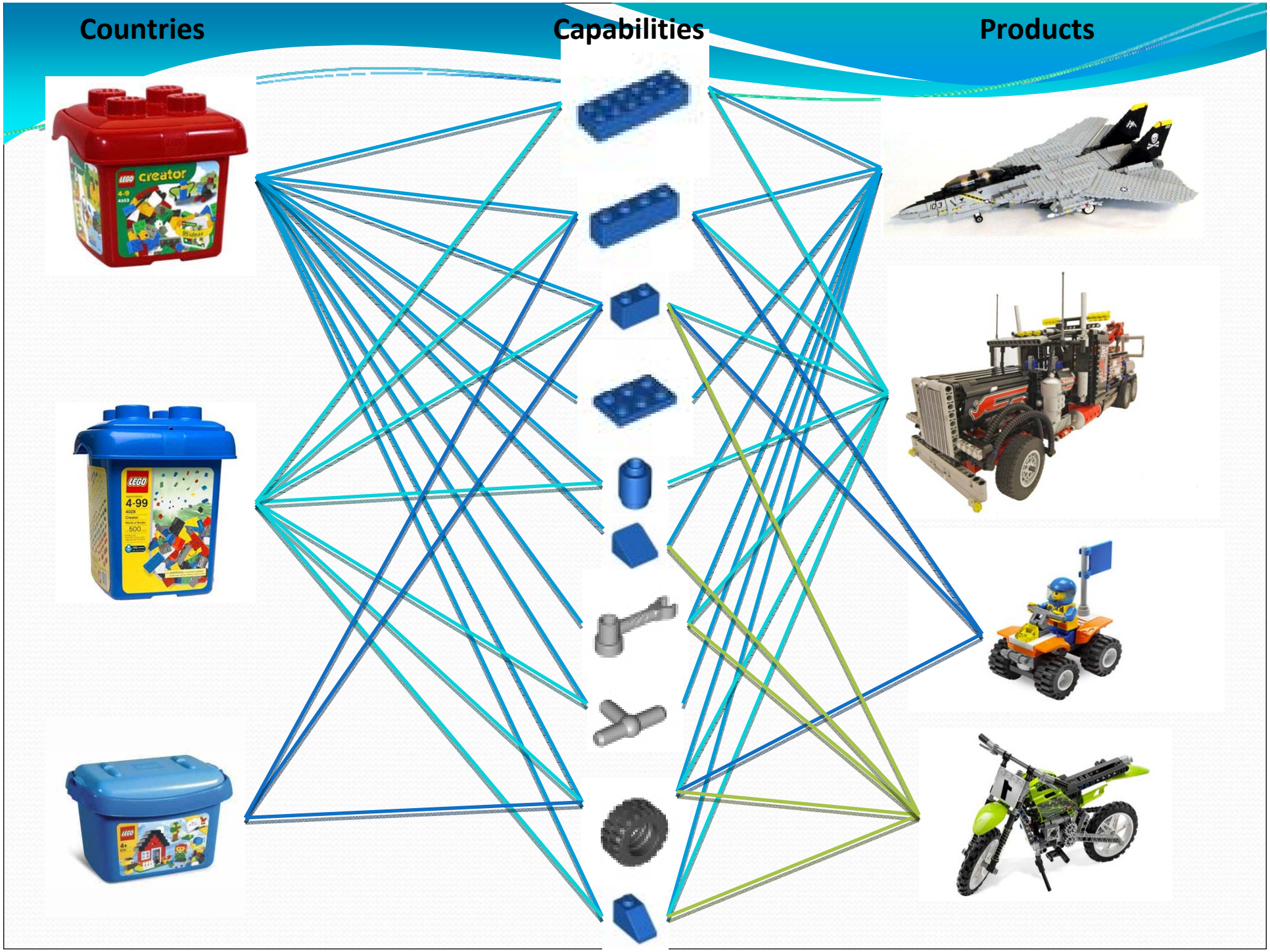
$$k_p = \sum_c M_{cp}$$




Hidalgo CA, Hausmann R *Proc. Natl. Acad Sci.* (2009) 106(26):10570-10575

## Countries

## Products


Countries
Capabilities
Products
LEGO creator
LEGO
4-99

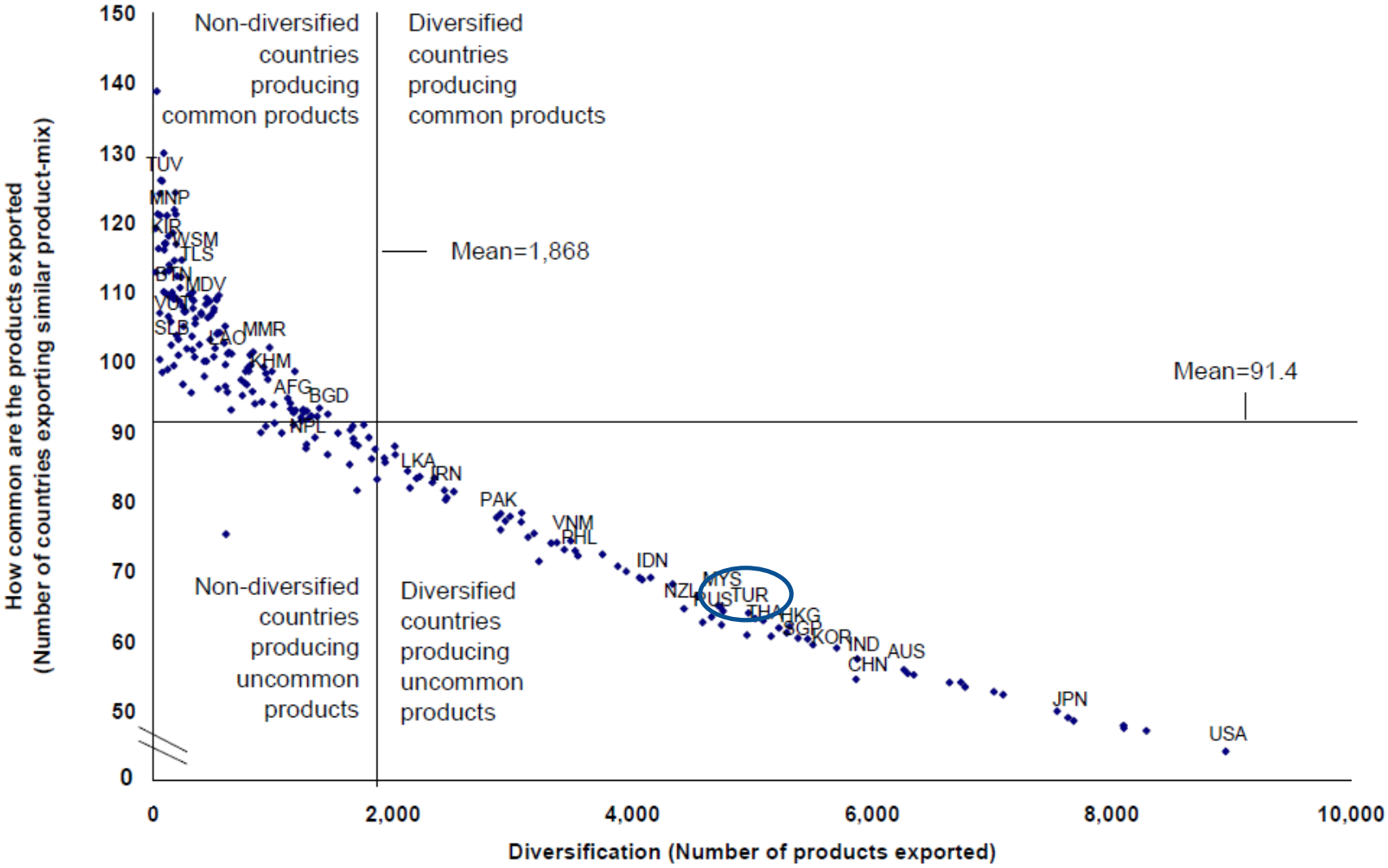
# Intuition

- Countries differ in the diversity of their capabilities
- Products require different sets of capabilities
- Countries that have more capabilities will be able to make more products
  - They would be more diversified
- Products that require more capabilities will be made by fewer countries
  - Products will be less ubiquitous

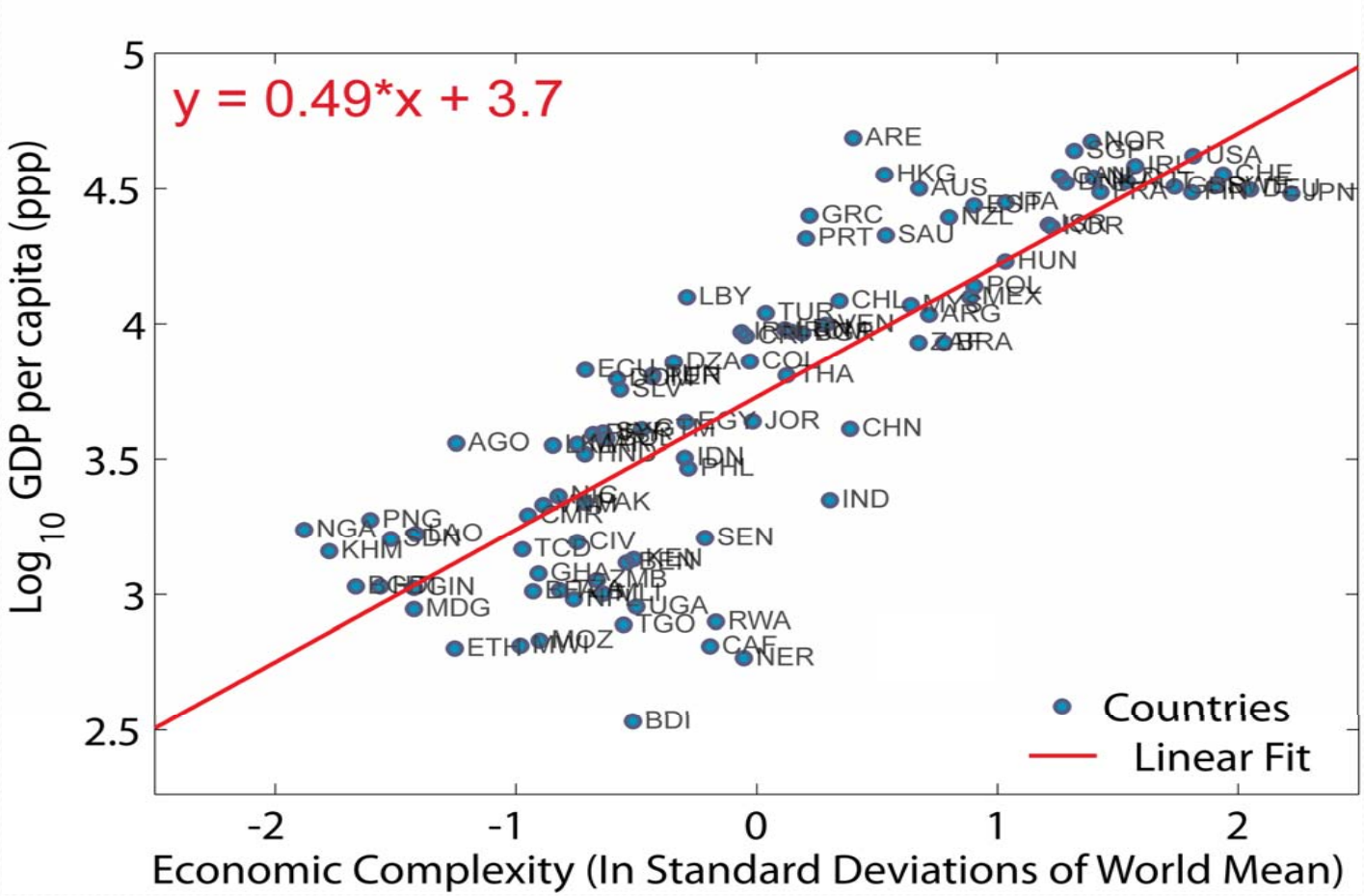
# Intuition (cont'd)

- Countries that have more capabilities will be able to make products that require more capabilities
  - i.e. products that are less ubiquitous
- Hence, countries that have more capabilities will be more diversified and will make less ubiquitous products
- Diversification of countries and ubiquity of products are negatively correlated
  - They are indirect measures of the capability set of countries

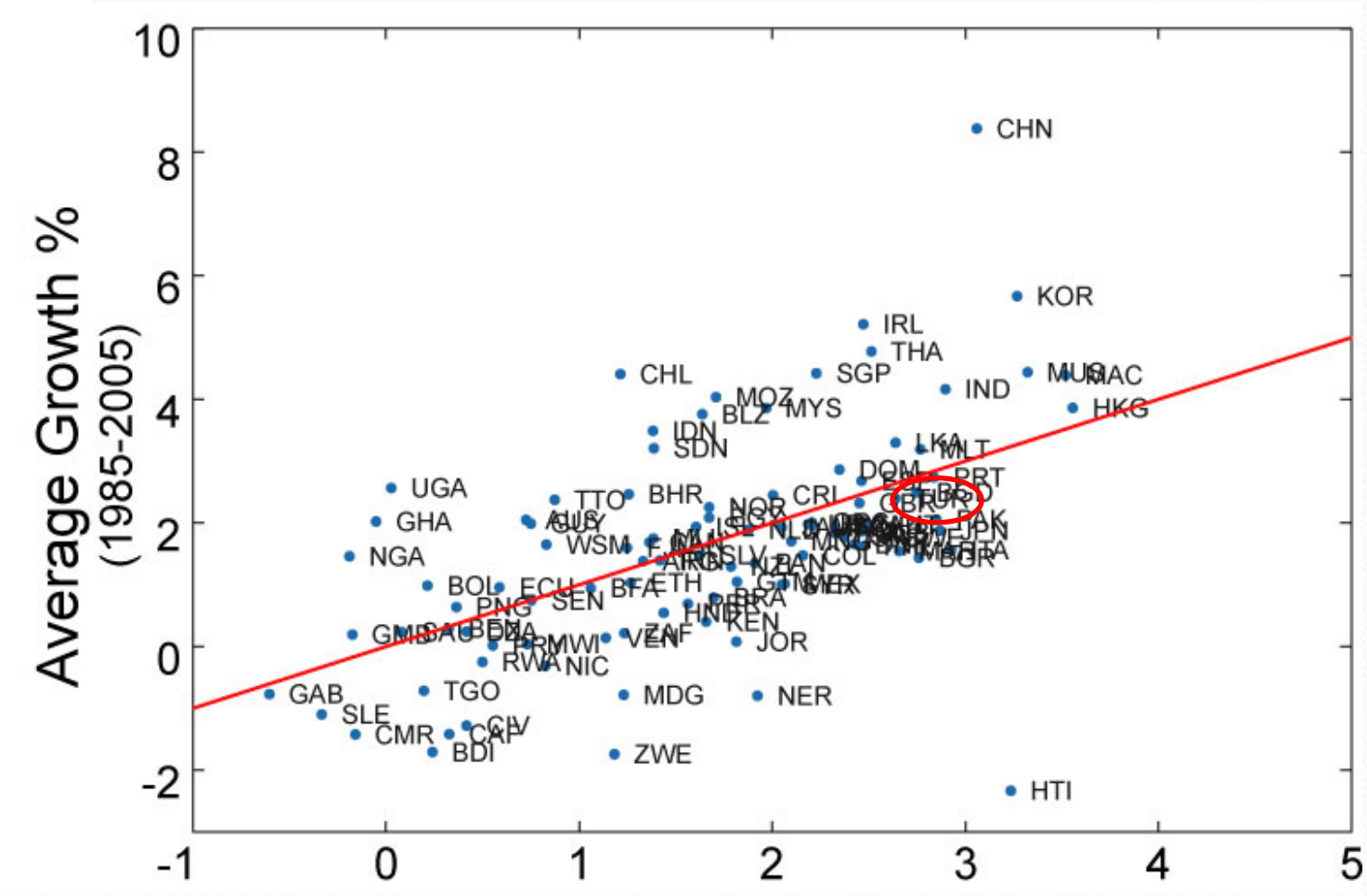
# Diversification and ubiquity - 2009



# Economic complexity explains income per capita



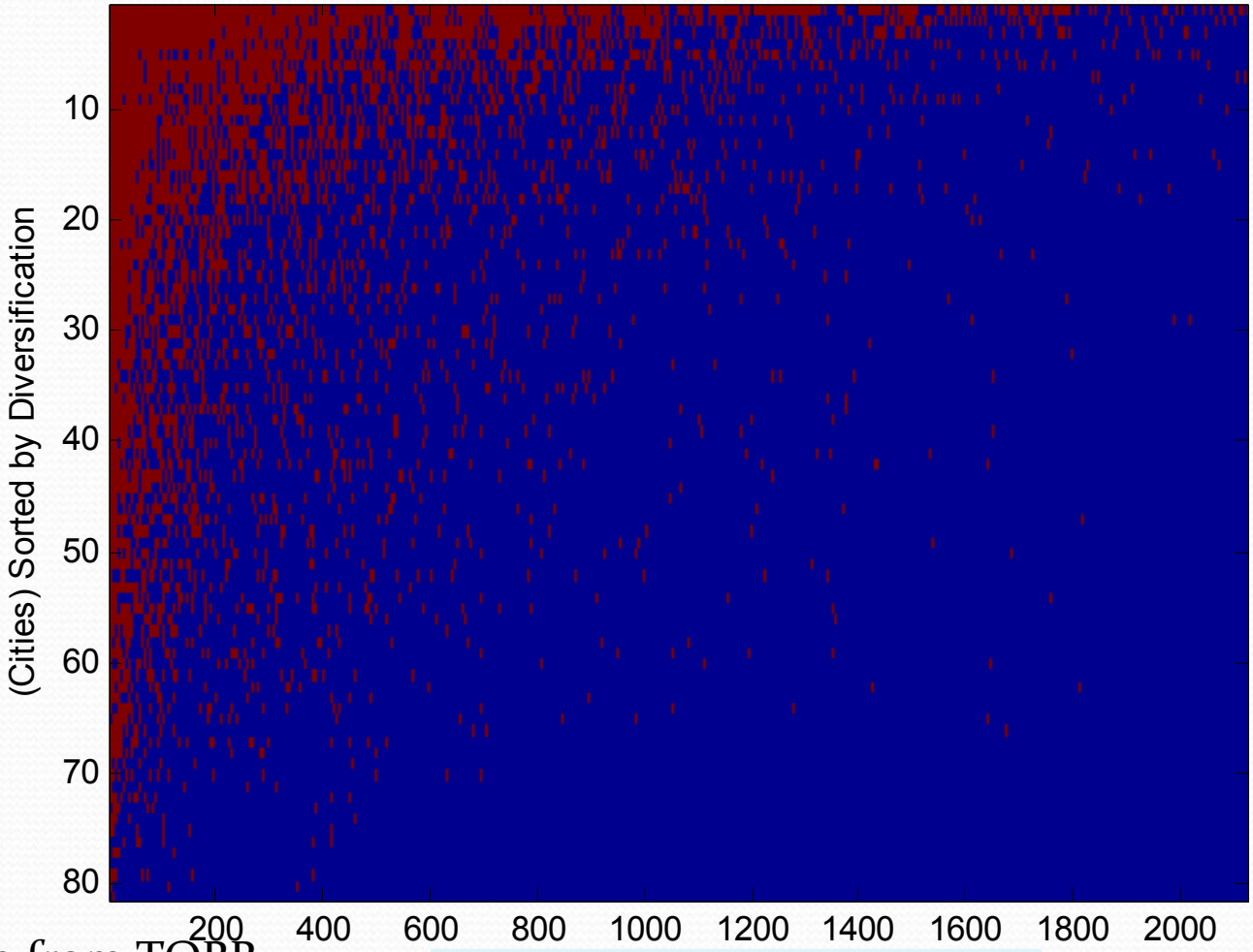
# Deviations explain future growth




Complexity in 1985, controlling for initial GDP per capita

Hidalgo CA, Hausmann R *Proc. Natl. Acad Sci.* (2009) 106(26):10570-10575

# Let us look inside Turkey

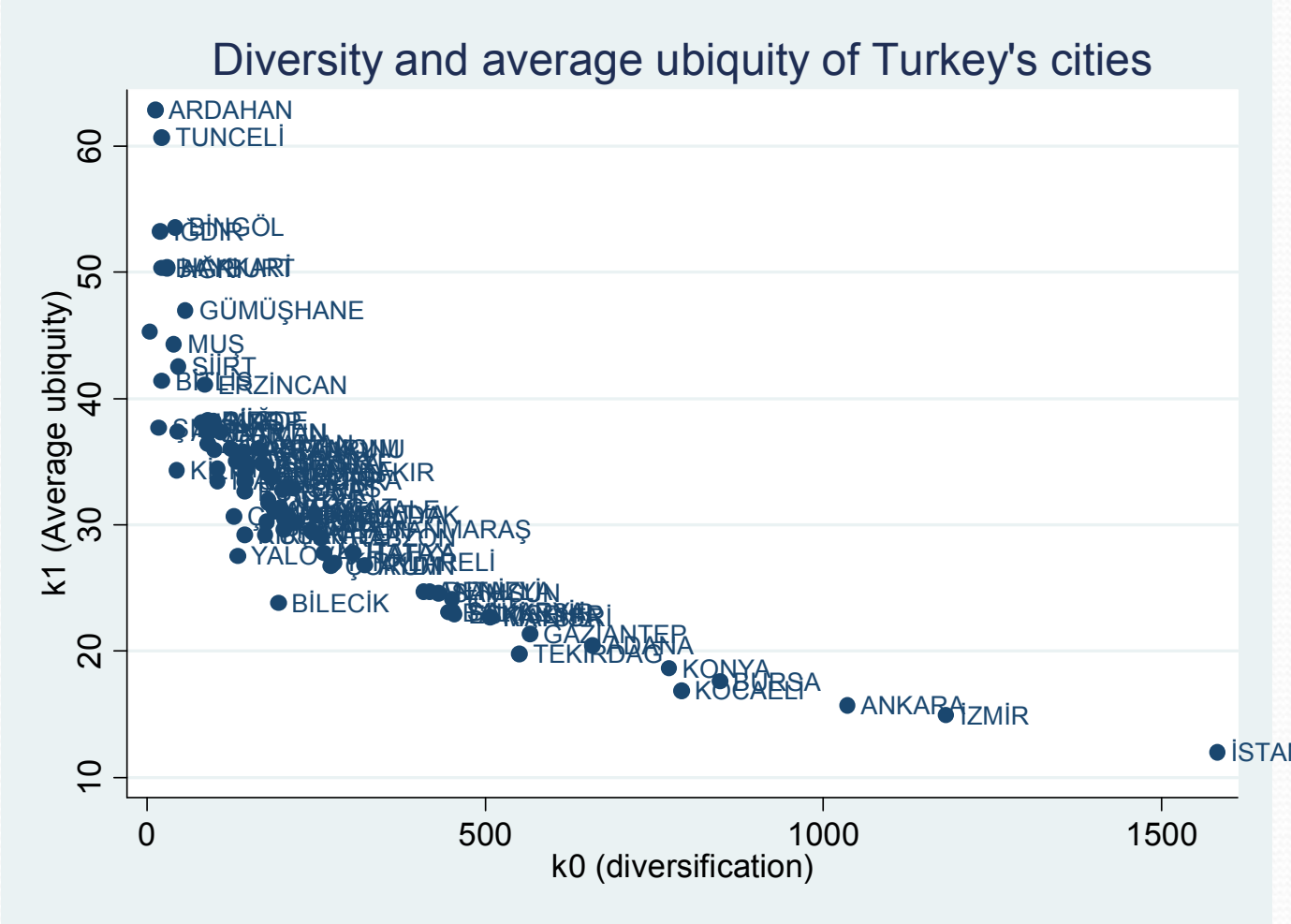



Products: sorted by ubiquity

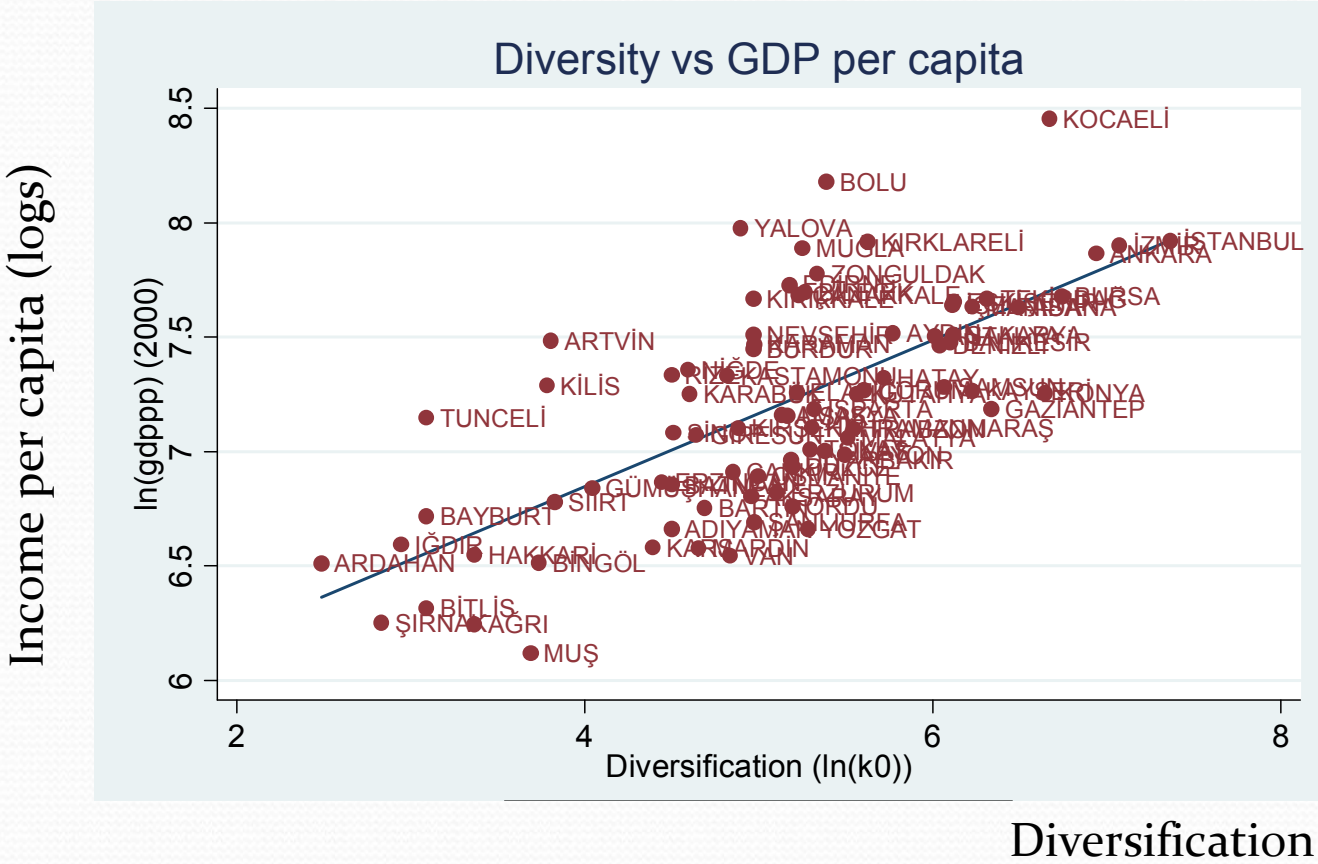
Source: data from TOBB

Ozan Acar

# Diversity vs ubiquity

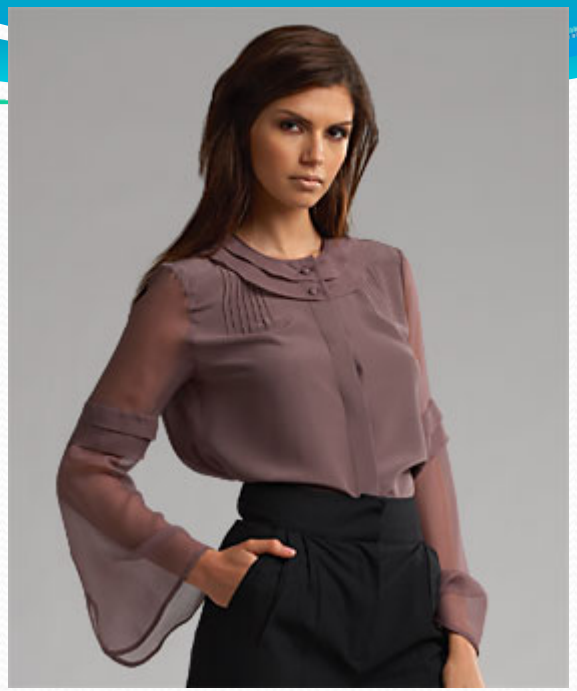


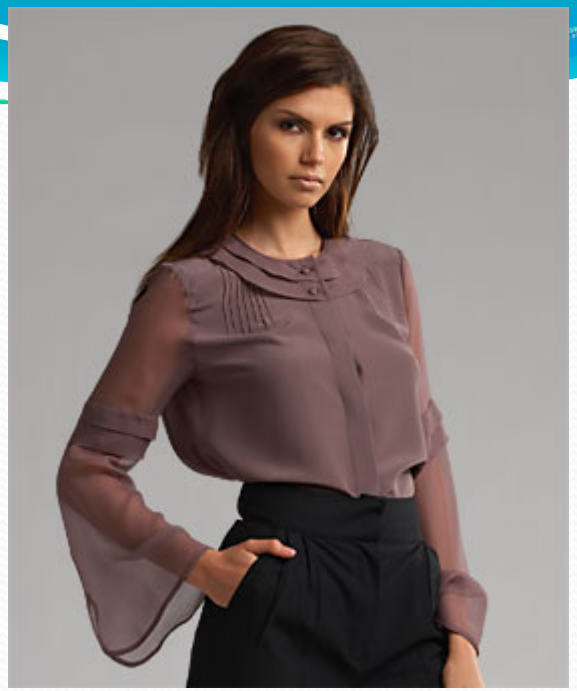
# Diversity explains GDP per capita within Turkey

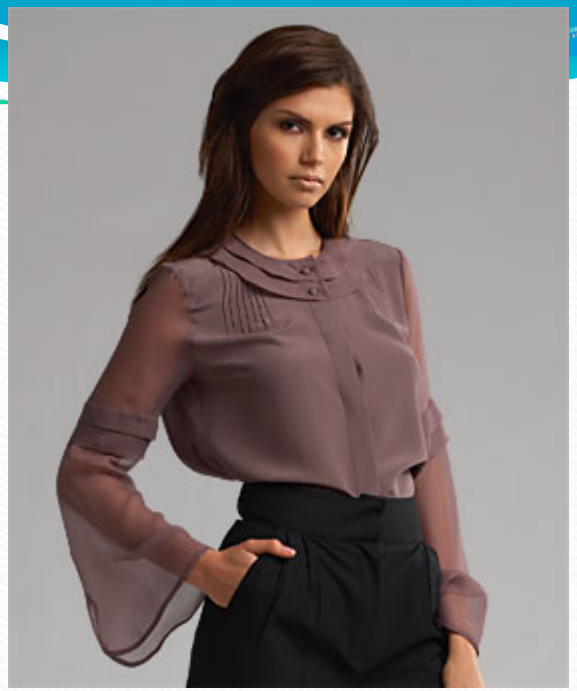


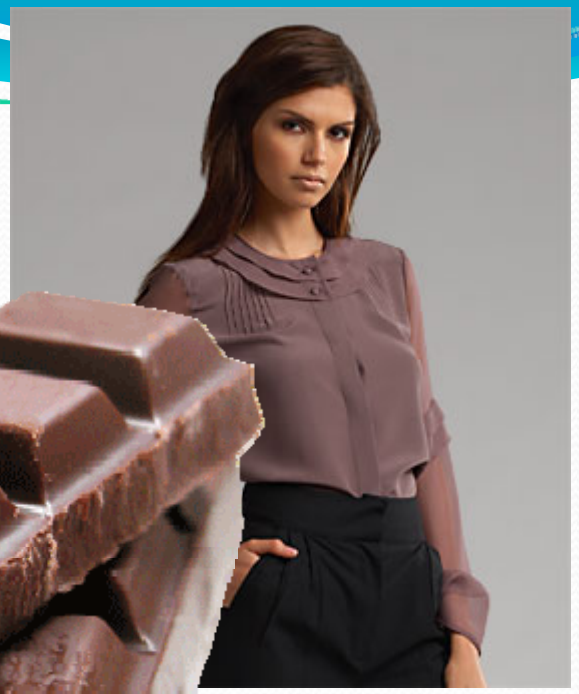
# What makes growth difficult?

- The chicken and egg problem
- You cannot make new products because you lack the capabilities
- You don't want to accumulate the capabilities because the products that need them are not being made
  - Because of other missing capabilities
- How does the world deal with this?
- By moving towards "nearby" products

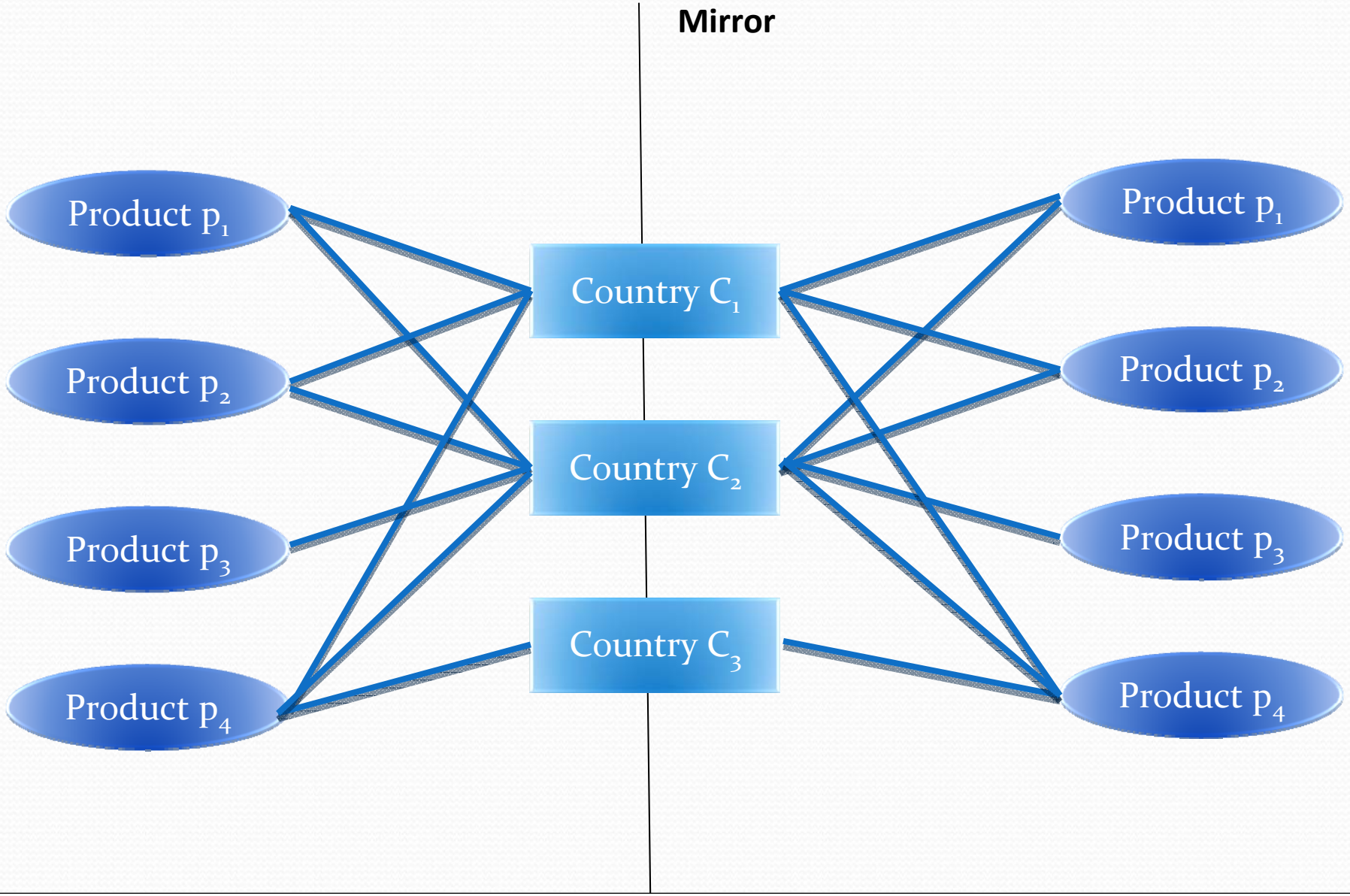








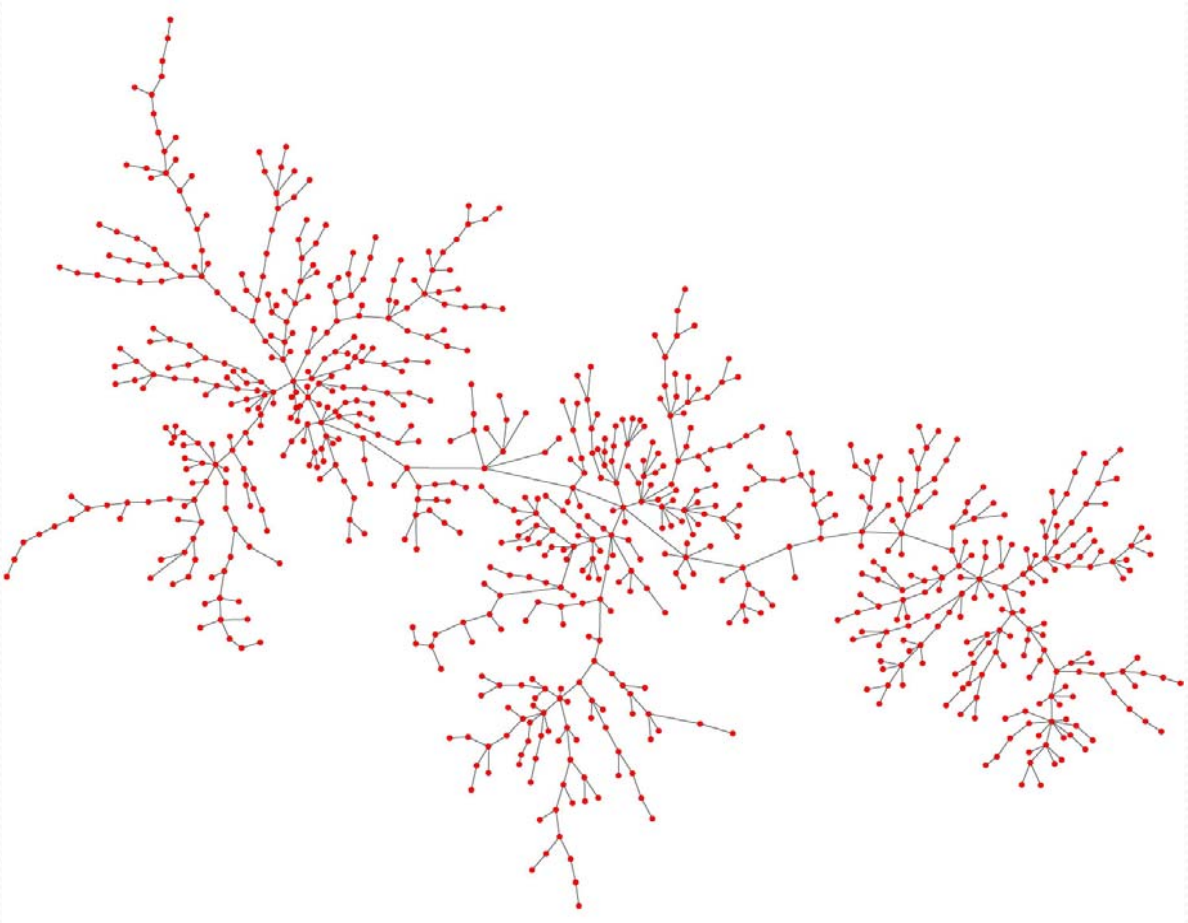
# If products require similar capabilities, they should be exported by the same countries



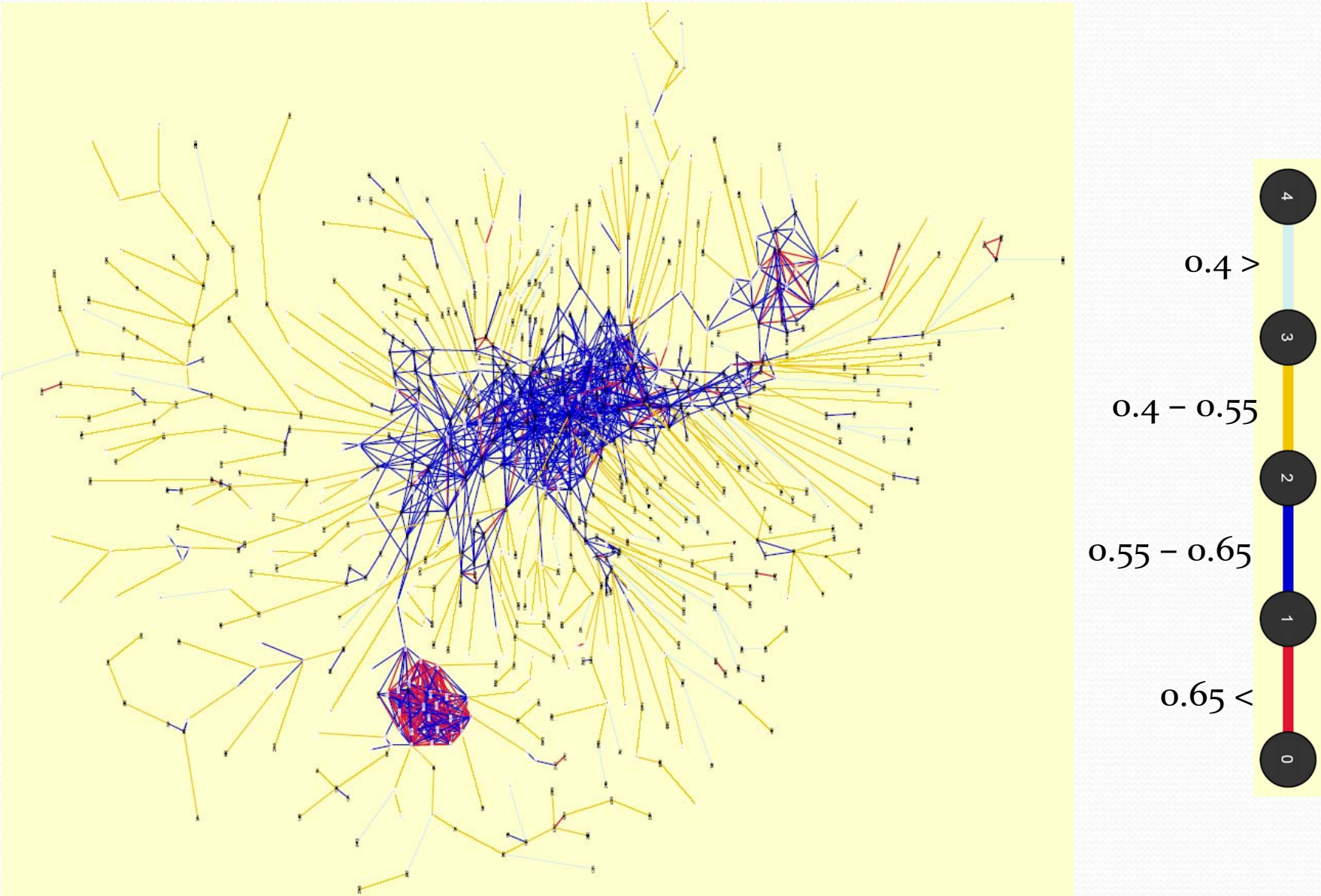
# Step 1: Maximum Spanning Tree

**Our Approach:**

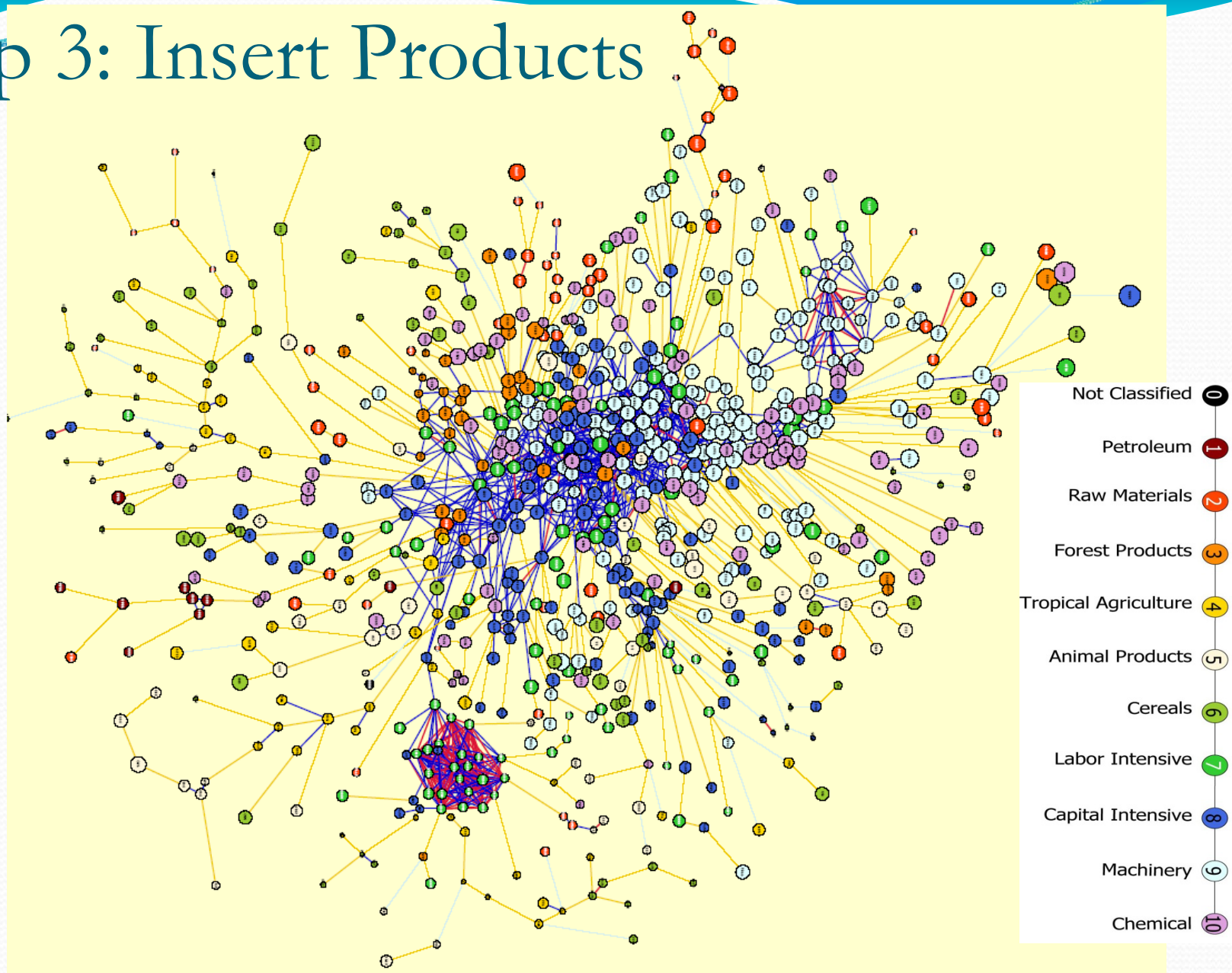
- Distance measured by probability that, if a country is good in one product, it's also good in another product.
- What is the shape of a forest?
  - Homogenous or Heterogeneous?
- What does it look like?



# Step 2: Overlay Strong Links



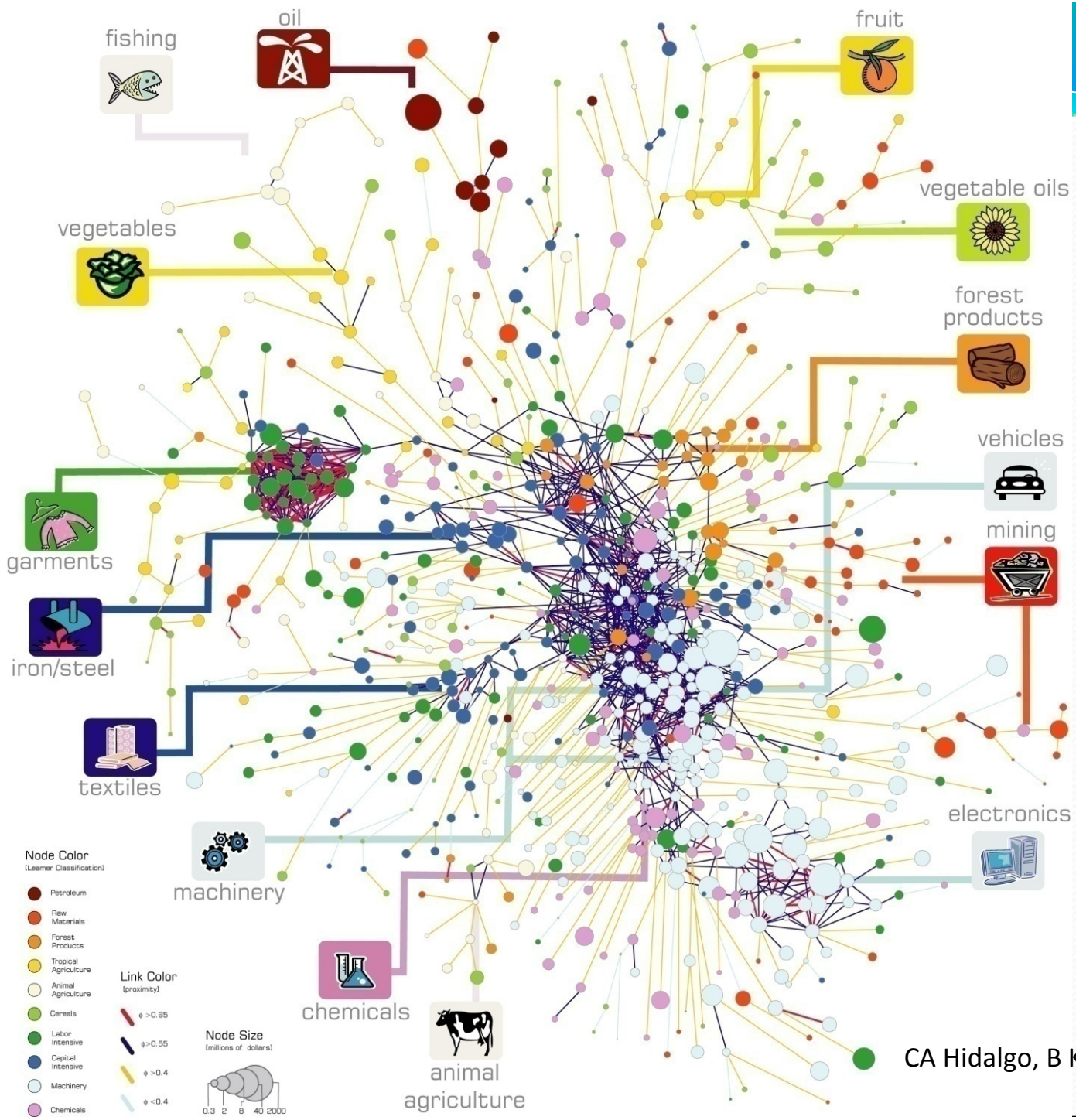
# Step 3: Insert Products




Nodes sized according to PRODY, darker links are stronger (red is strongest)

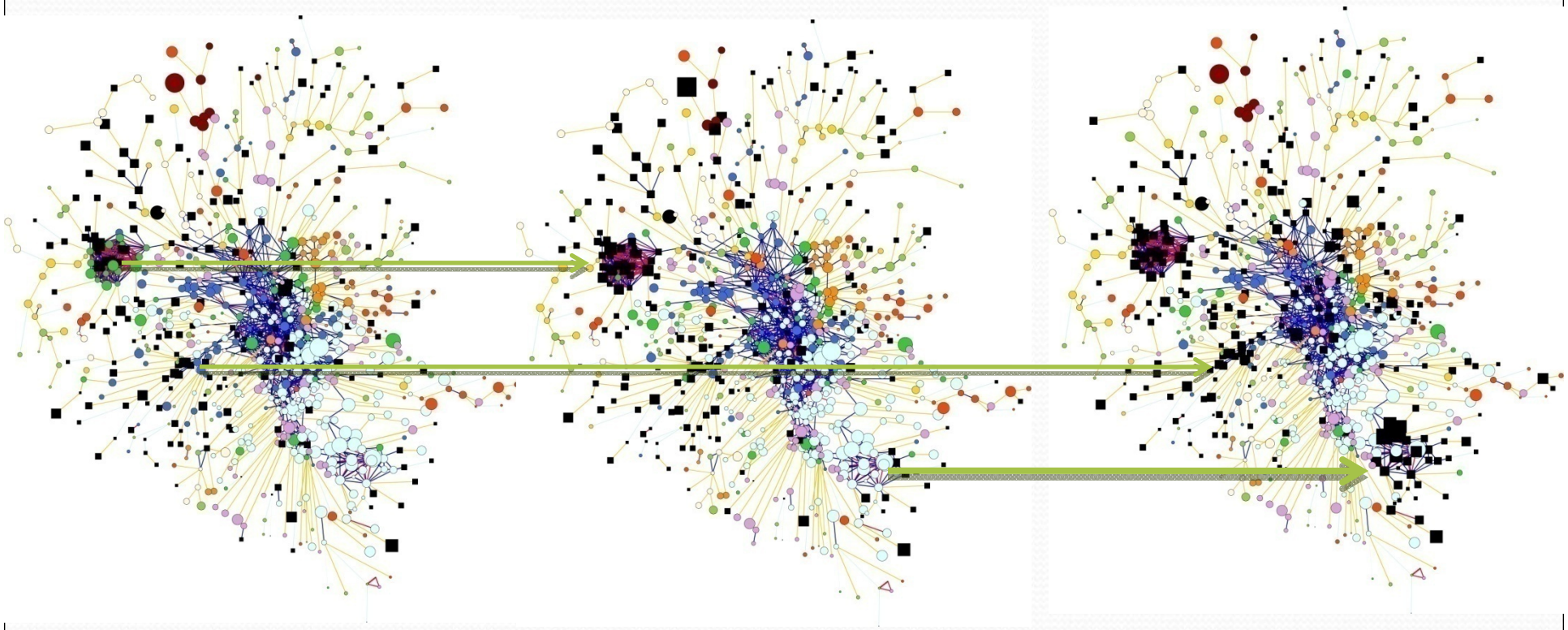
Using Feenstra et al. Trade Data:

132 Countries
1006 Products
SITC-4
(1975-2000)

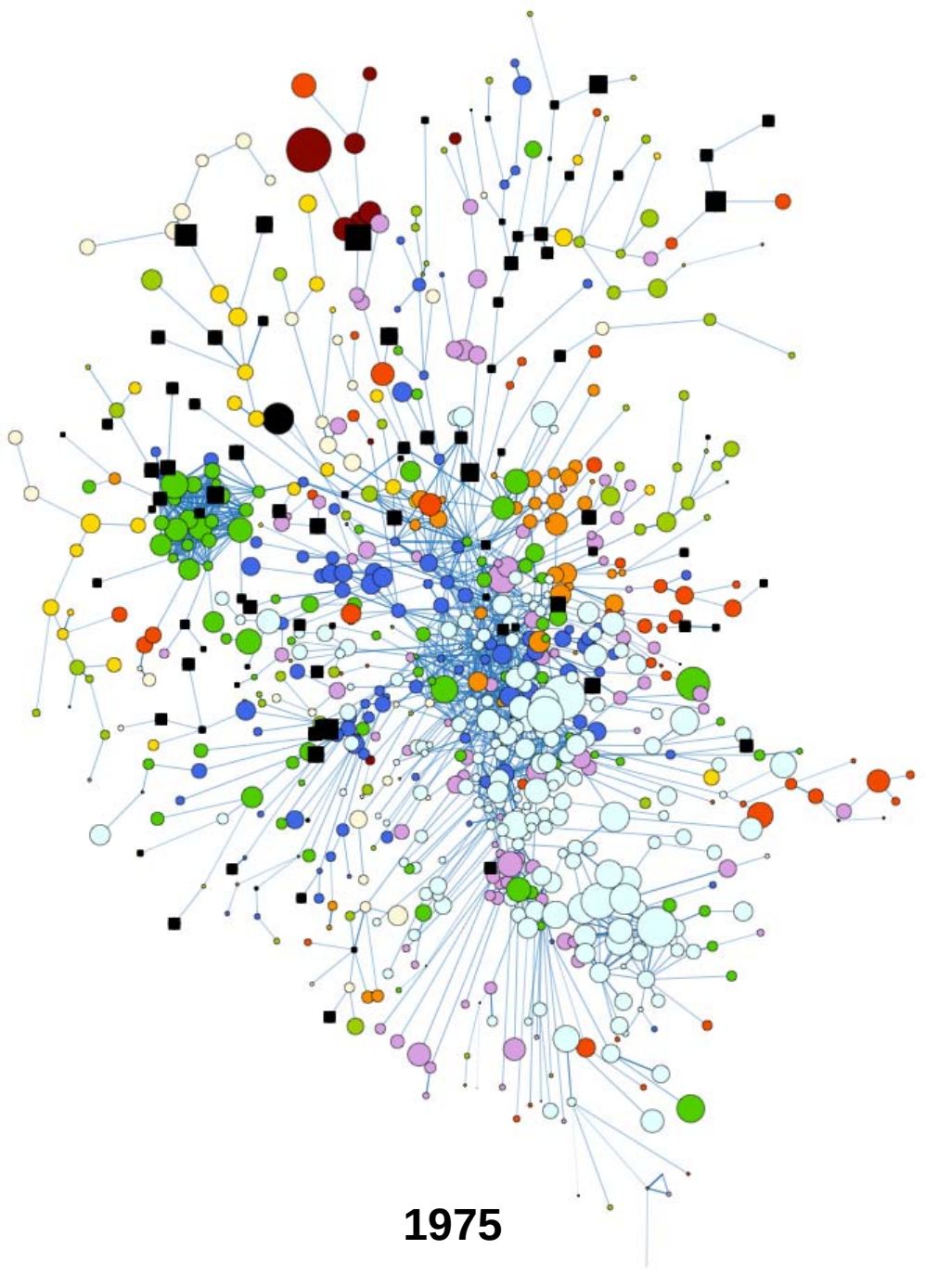



CA Hidalgo, B Klinger, A-L Barabasi, R Hausmann. *Science* (2007)

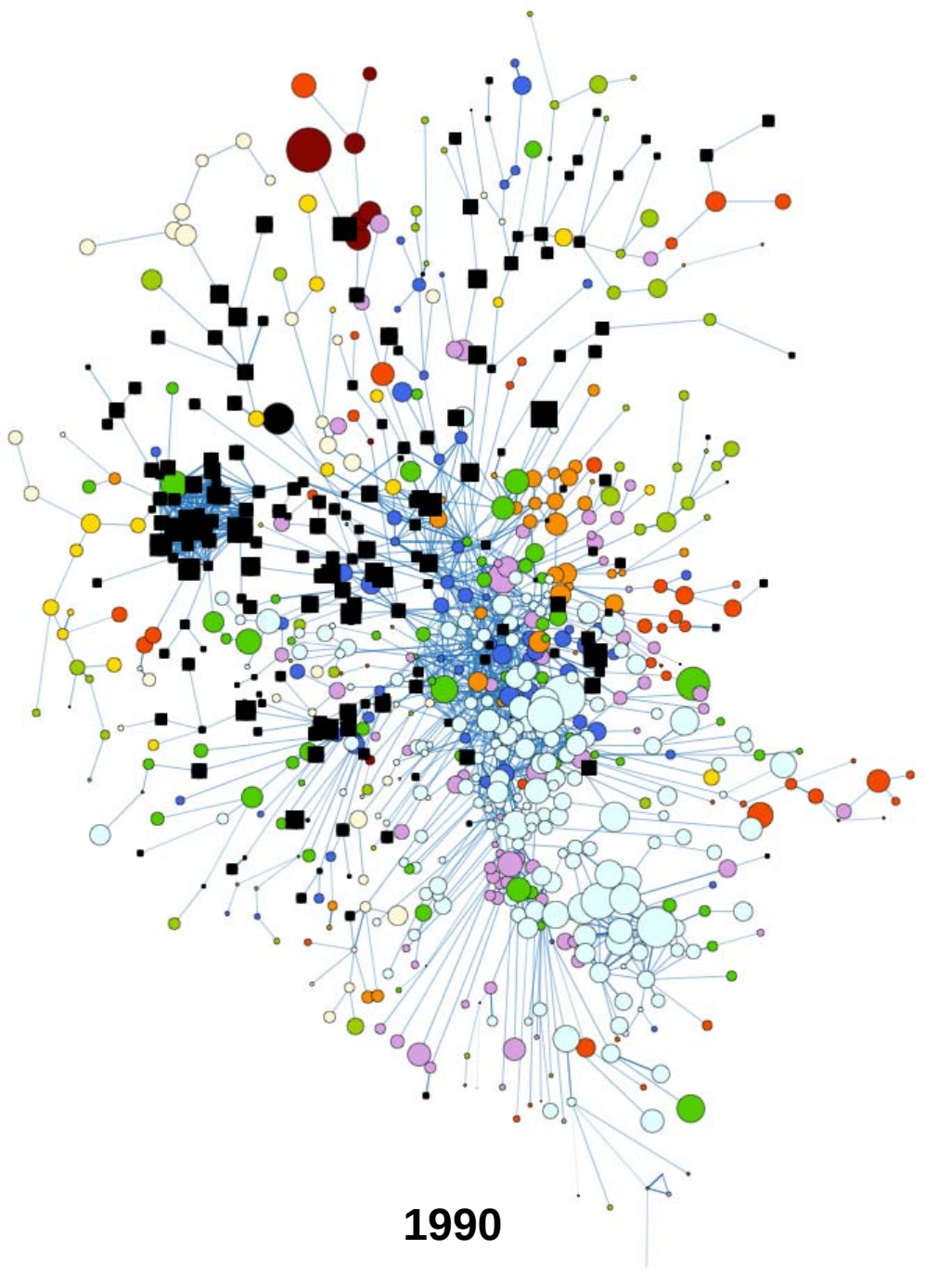
# China



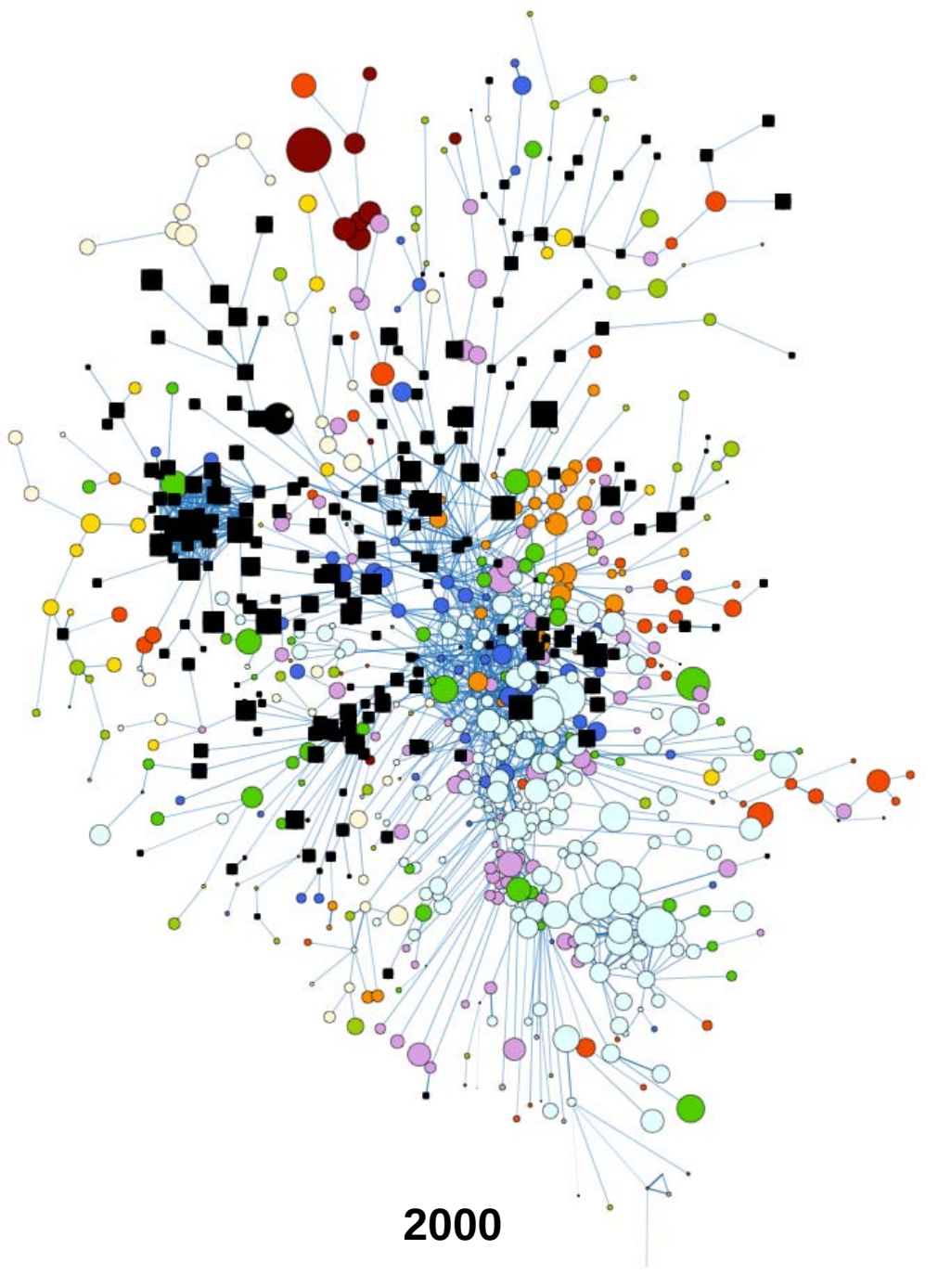
1975 1985 2000

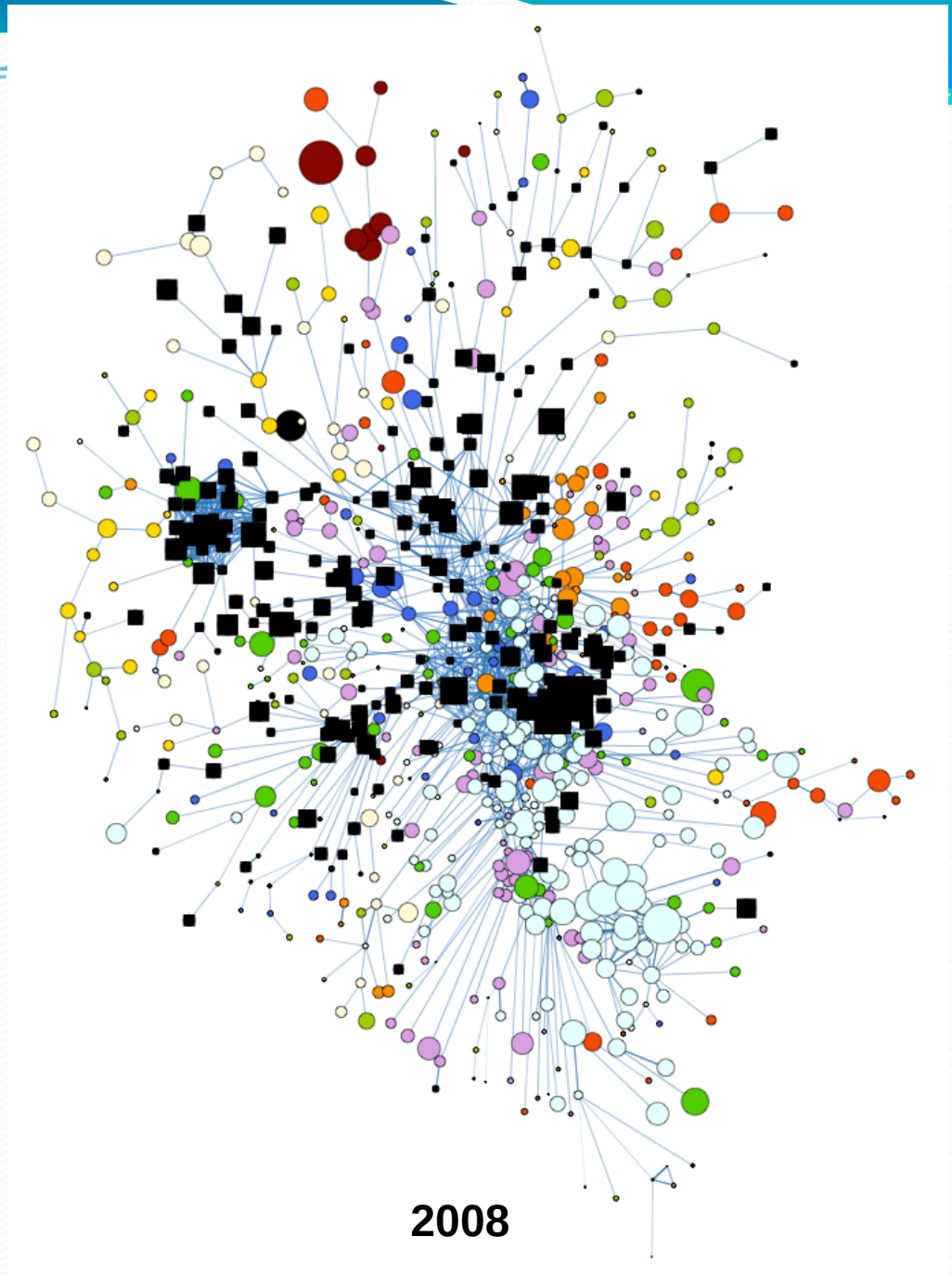


1975

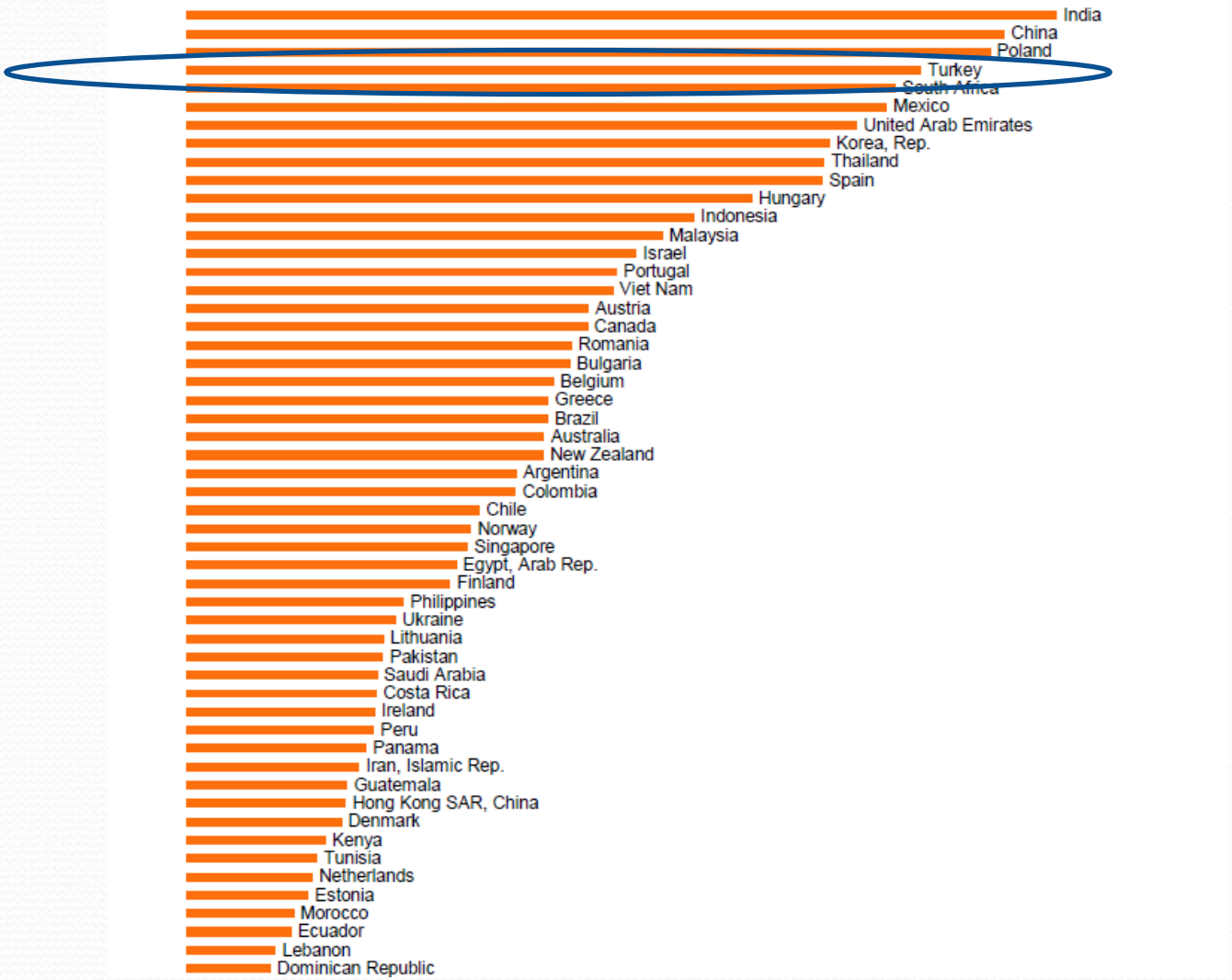


1990

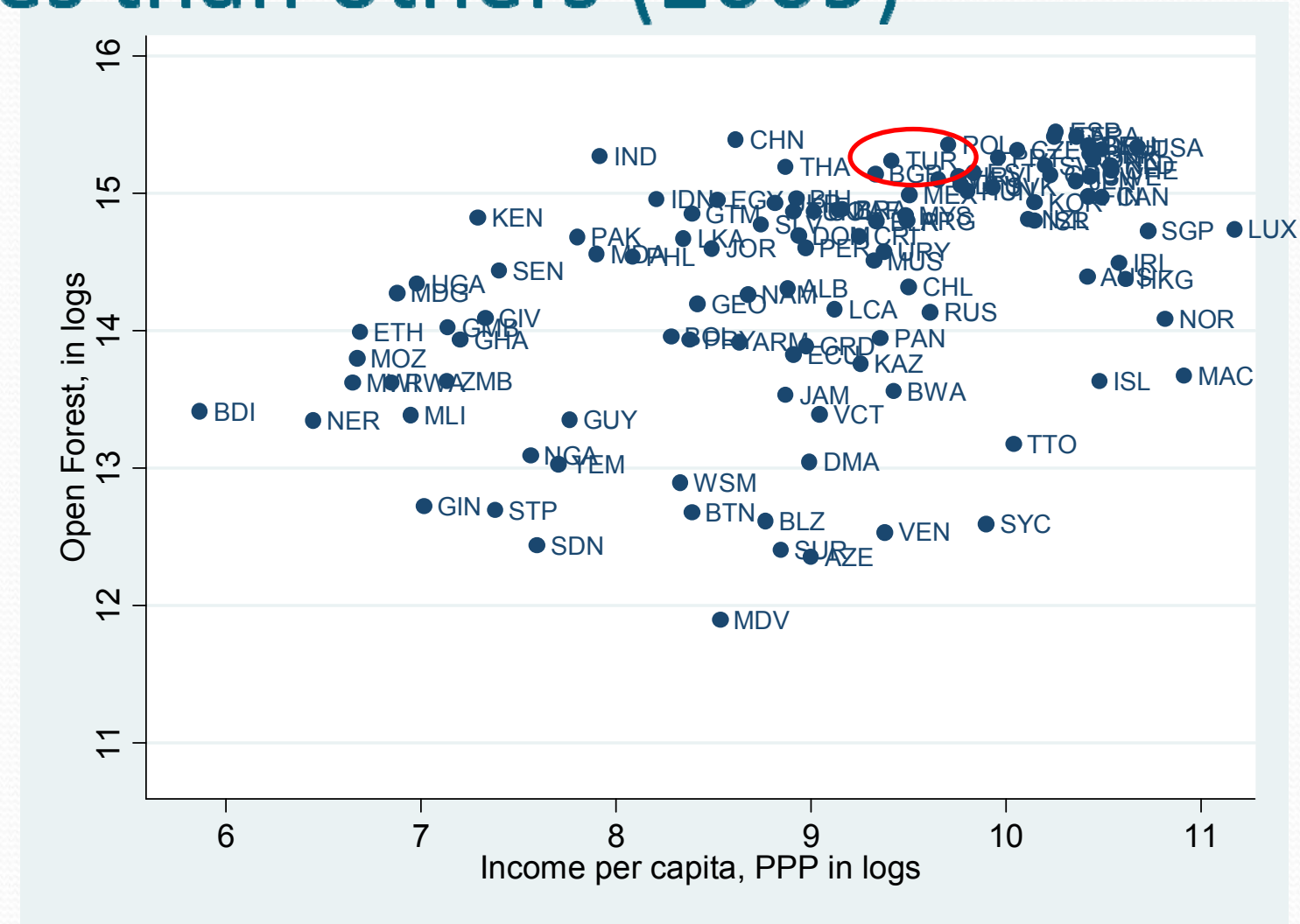

2000


2008

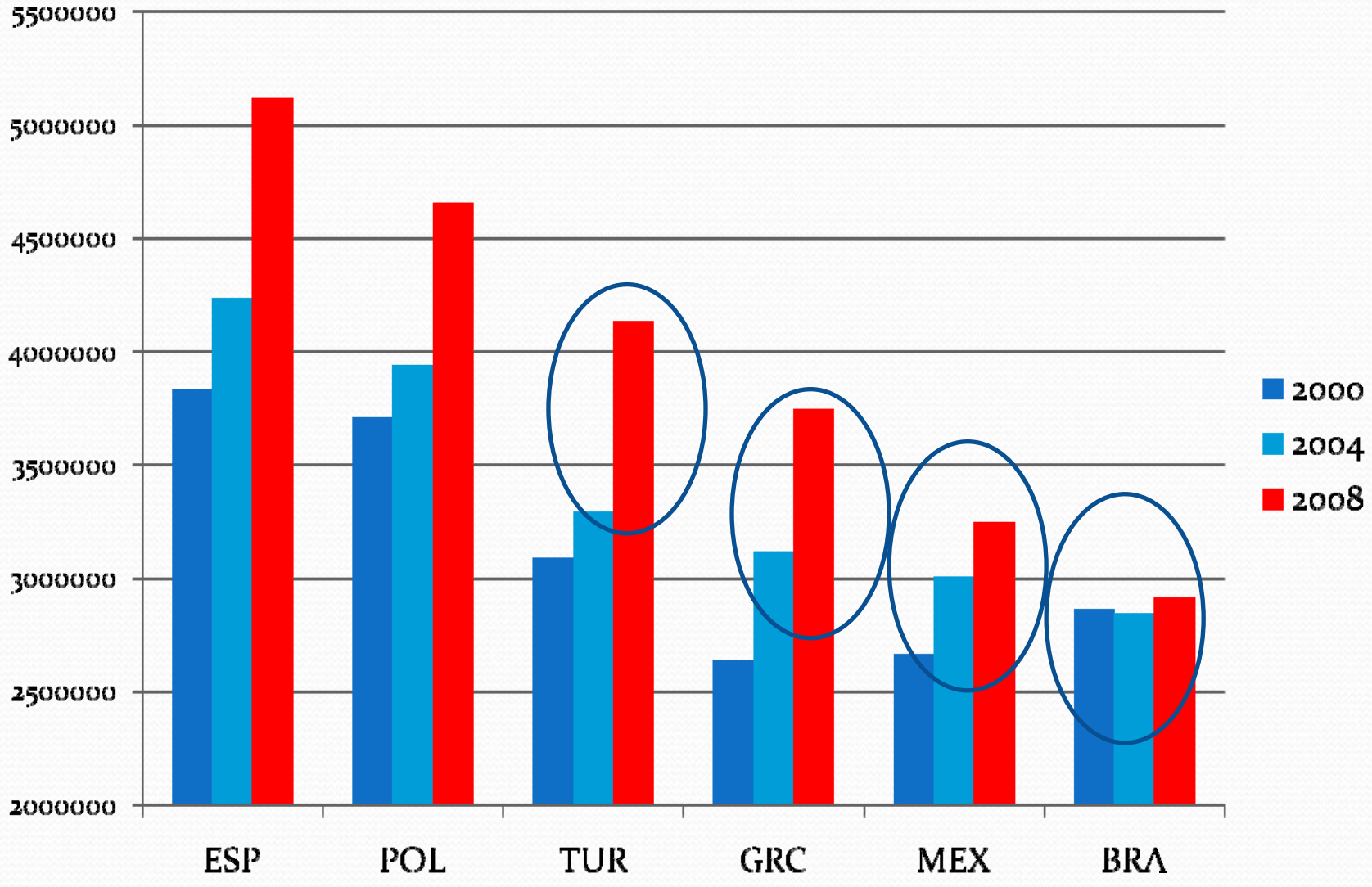
# Improvements in productive capacity: 1984-2009



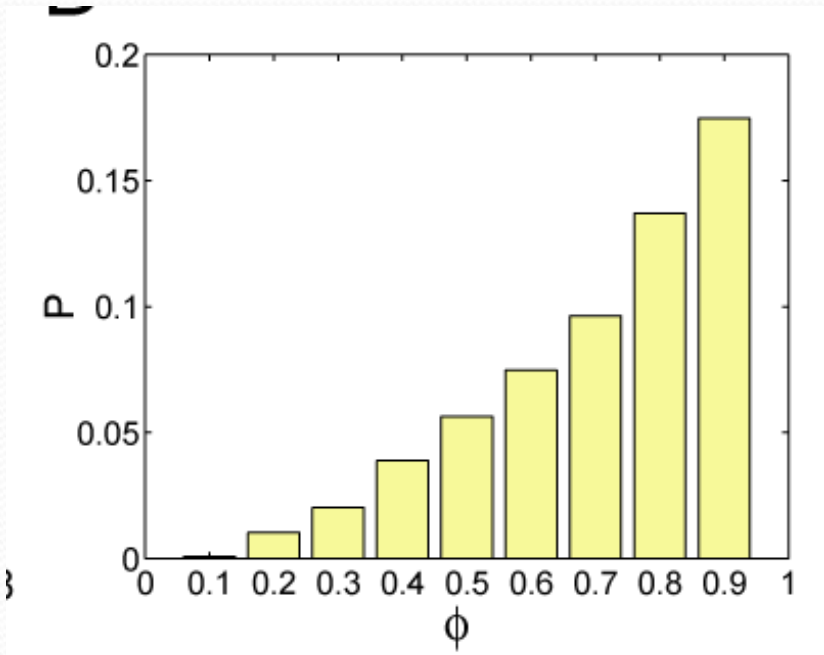
# Some countries have more nearby trees than others (2009)



# Improvements in open forest

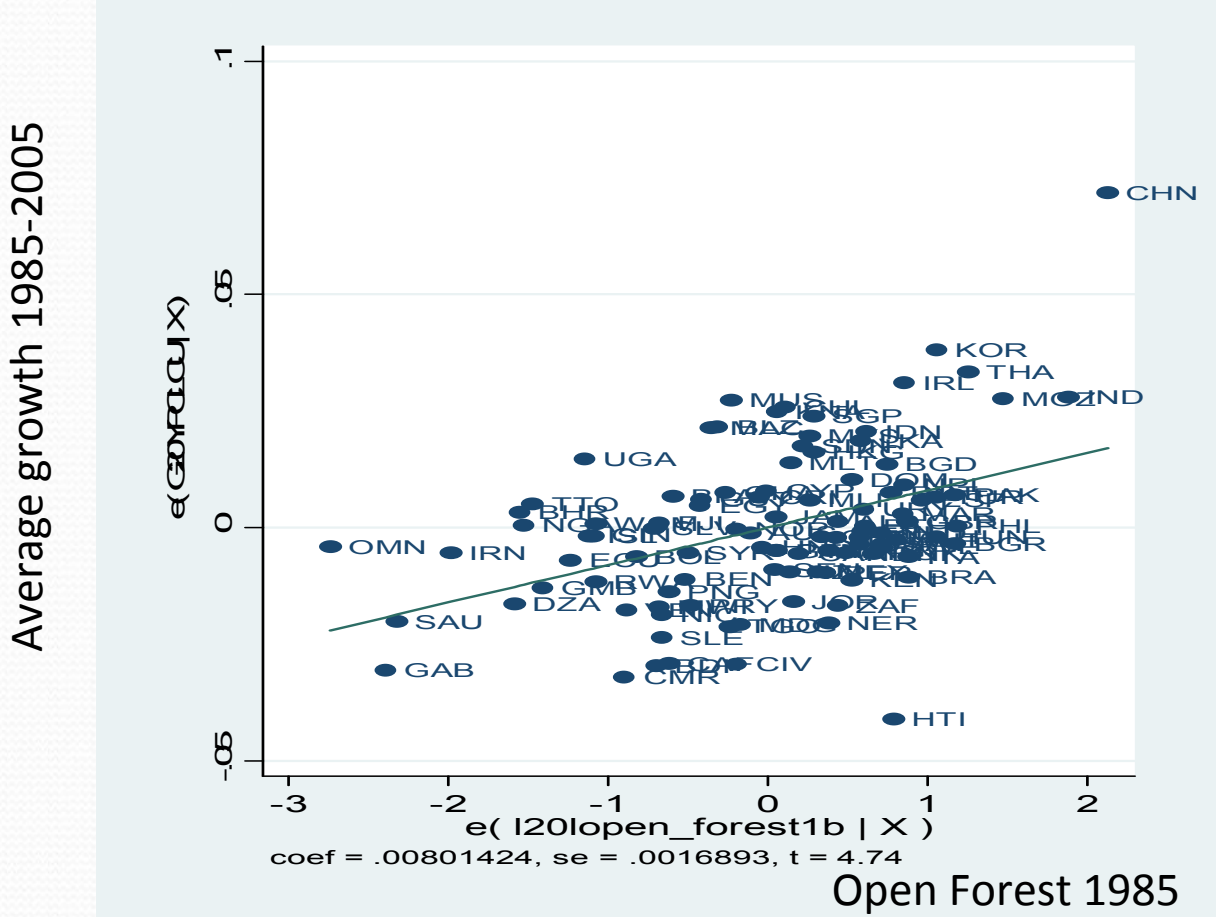


# The closer the tree, the more likely the monkey will jump




Probability of transitioning if the nearest neighbor is at a proximity of ϕ

# Countries with closer nearby trees grow faster



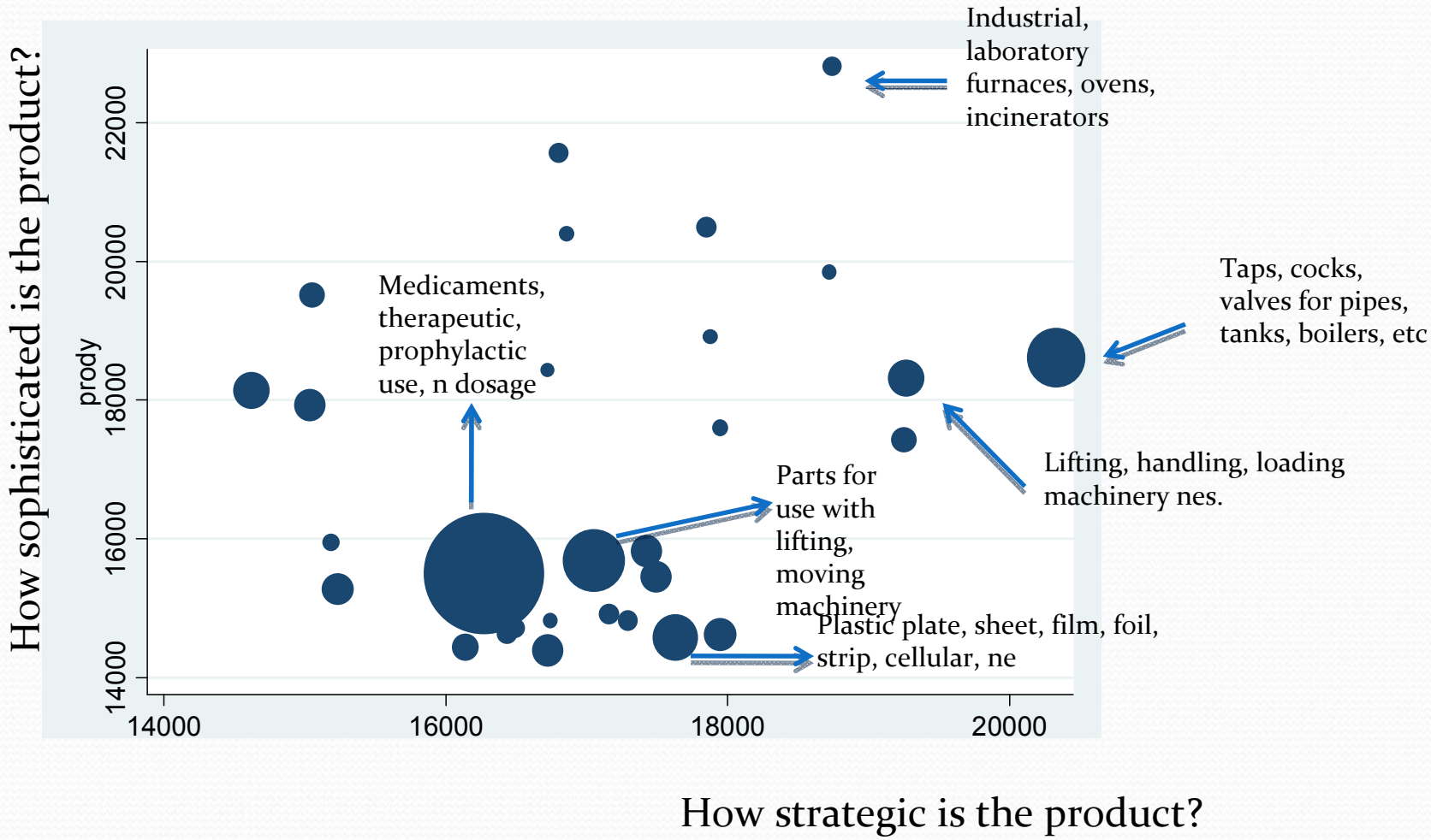

Open Forest 1985

# The strategic setting

# Four elements of strategy

- How near is the product?
  - How easy would it be to become good at it?
- How large is the global market in the product?
  - How big is the potential gain?
- How sophisticated is the product?
  - How big is the wage advantage with competitors?
  - How profitable would it be if one succeeds to make it?
- How strategic is the product?
  - How will it improve my position in the product space, putting me closer to other products?

# What is in the nearby forest?




Bubbles are proportional to world trade in that product

# Which industries in which Turkish cities are the most likely to emerge?

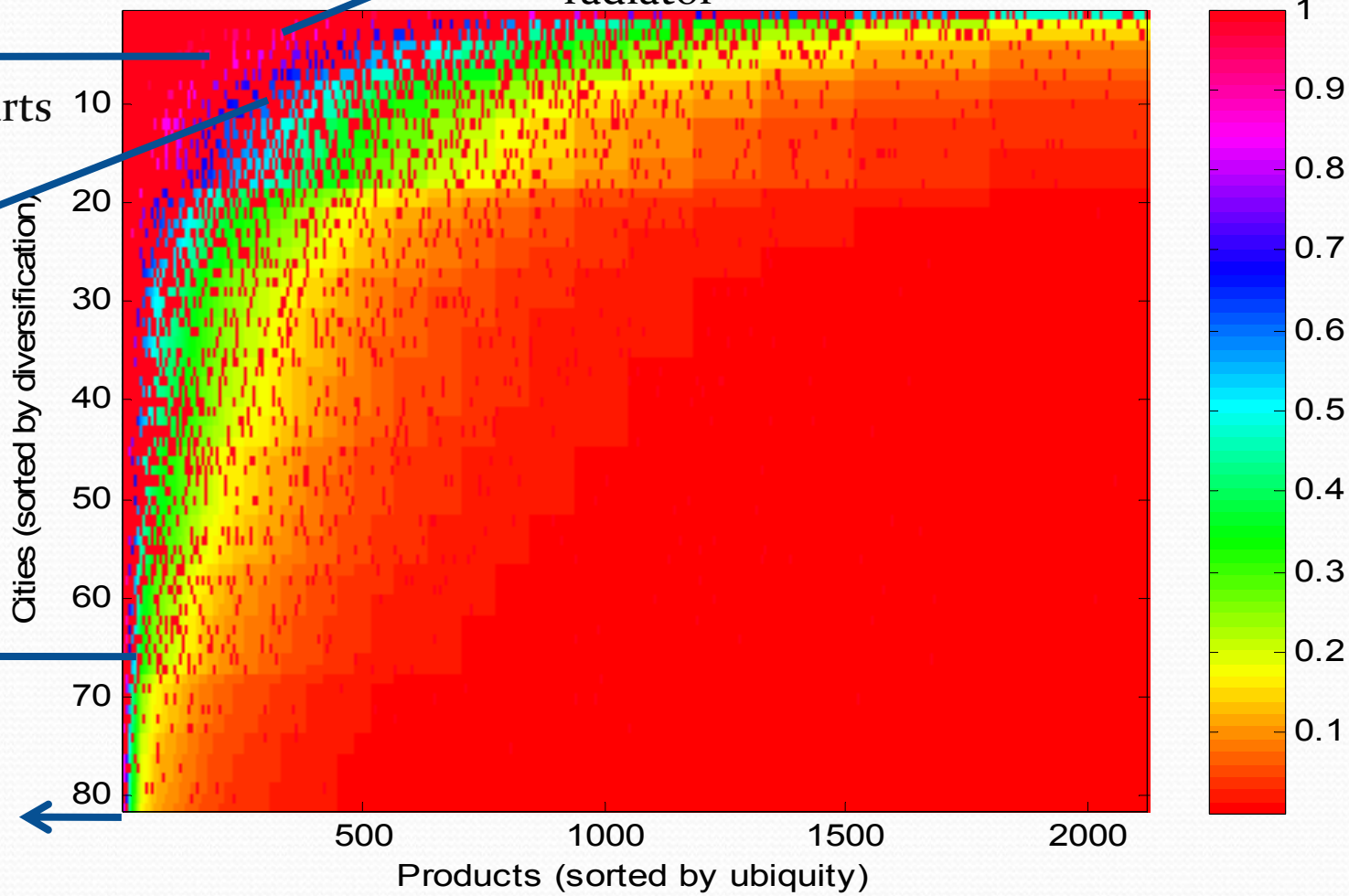
**Konya:** Aluminum radiator

**Adana:** Lift components' parts

**Kayseri:** Food processing machinery

**Mus:** PVC joinery

**Ardahan:** Ready-mixed concrete



# Final remarks

- Turkey has a great position in the "Product Space" and has moved quickly in it
- But its growth rate has not been stellar or stable
- ..and it has very large internal differences across its many cities
- Diversification is the road forward at the national and city level
- This requires addressing the "chicken and egg problems"
- The quality of public-private collaboration in identifying opportunities and obstacles is the true foundation of sustainable competitiveness

# THANKS!

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