



# International Economics: Lecture 1

## An Introduction to International Trade

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You and I are about to embark on a journey.  
A journey of inquiry into the world of  
International Economics



- In this country per capita GDP was \$3,389 in 1960. Comparable figure in the US was \$17,036; five times bigger.

GDP is in constant 2010 US\$. Source: World Bank.



- **Trade and Outward Orientation** played a crucial role in the development of this country.

Trade (exports plus import) of this country is more than 3 times bigger than its GDP.

GDP is in constant 2010 US\$. Source: World Bank.



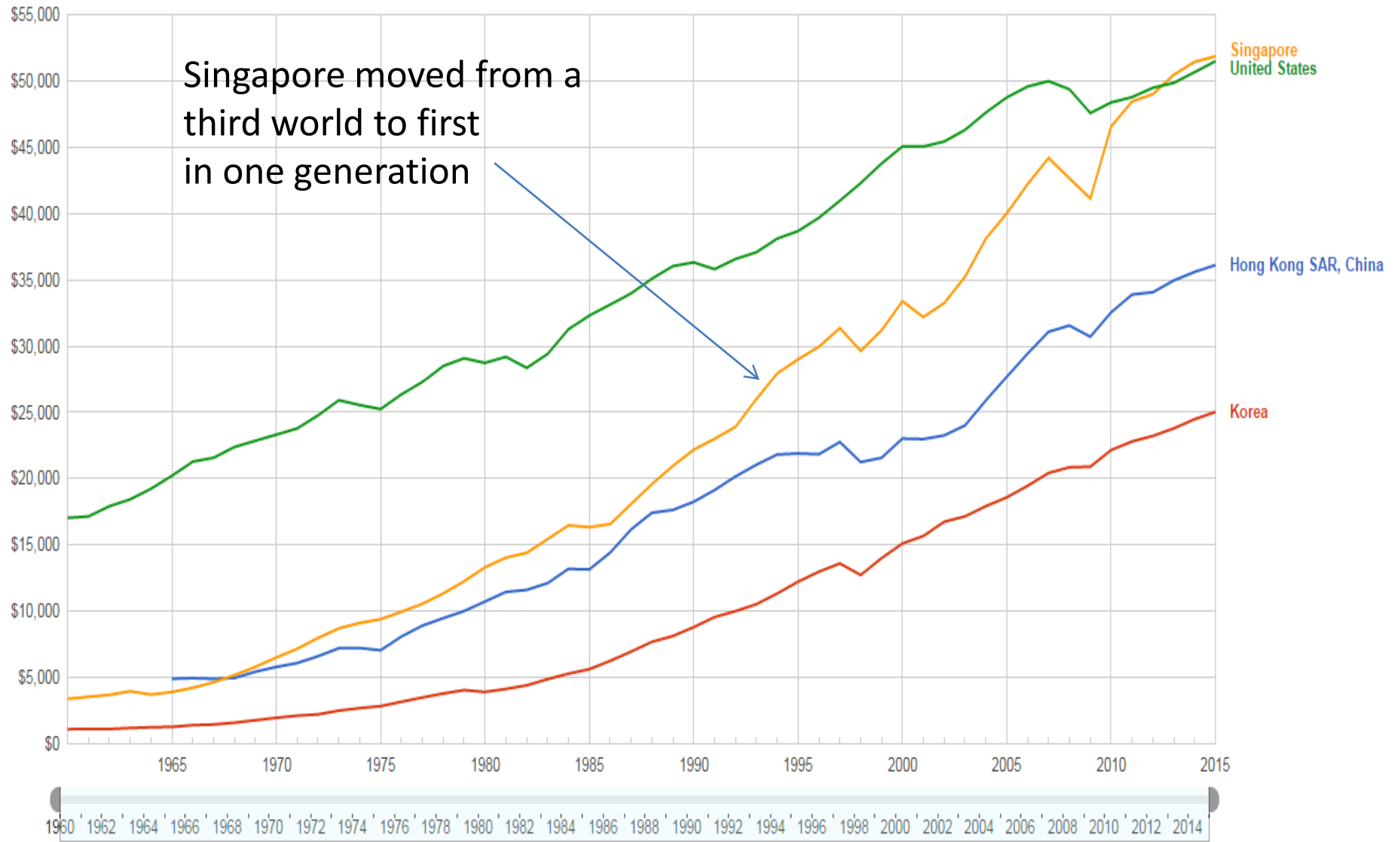
The same country now, just a half century later.

In 2015 per capita GDP in that country was \$51,855.

Comparable figure in the US was \$51,638.

GDP is in constant 2010 US\$. Source: World Bank.

GDP per capita (constant 2000 US\$) ?



Data from World Bank Last updated: Oct 7, 2016

So one of the crucial  
questions of the  
International Economics is:  
What is the impact of  
trade on development?

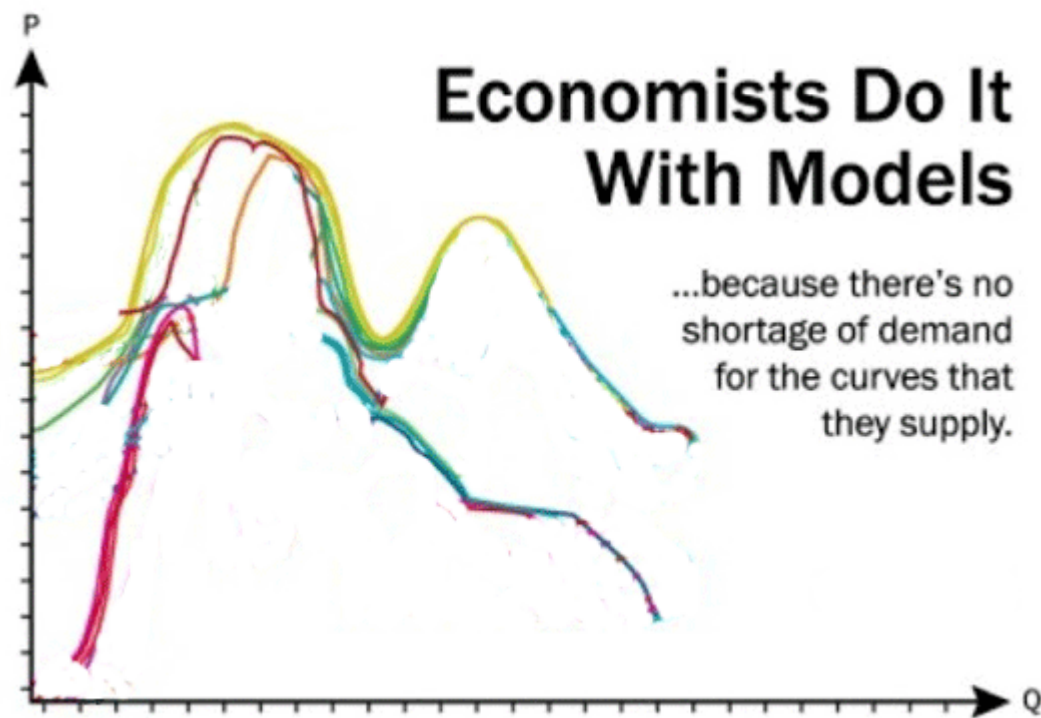


## Fundamental questions of International Trade

- What determines the pattern of international trade?
- What are the effects of trade on welfare and income distribution?
- What are the effects of trade barriers and should trade be regulated?
- What are the effects of economic integration (such as Eurasian Econ. Union) and labor and capital flows?
- Who gains and who loses from the trade?

Our aim will be to develop a coherent tool kit, which will enable us to systematically analyze real world situations and answer to those and related questions.

Our main tool will be MODELS.



## What is a MODEL?

A MODEL is a stylized and simplified representation of reality.

Why we “simplify”, instead of describing reality in its richness and multidimensionality?

By simplifying we articulate only fundamental relationships, which have general relevance.

By simplifying we leave out myriad unimportant or accidental relationships.

We simplify, because the real world is extremely complex, and is impossible to describe in finite time.

## But which are the important relationships?

Every model-builder may have his/her distinct understanding of which relationships are important.

That is why in economics we have competing models, which try to describe the same phenomenon.

Modeling is ART as much as it is SCIENCE.

But before delving deeper into multiple model's world, some preliminary concepts....

GNI vs. GDP

Purchasing Power Parity

Trade Openness

**Exports** – goods and services sold abroad by residents of a country.

**Imports** – goods and services **purchased** abroad by residents of a country.

**Trade Balance** – exports minus imports (surplus/deficit)

# GNI vs. GDP

**GDP** measures the value of all final goods and services produced in an economy in a given period of time.

*Total income of everyone = Total expenditure on all goods and services*

equivalently **GDP** measures the total income produced within the borders of economy.

but **GNI** measures the total income earned by residents.

$$\text{GNI} = \text{GDP} + \text{Factor payments from abroad} - \text{factor payments to abroad}$$

Factor Payments (Primary Incomes)

- ⊕ Compensation of employees
- ⊕ Investment income (direct, portfolio, interest)

$$\text{GNI} = \text{GDP} + \text{Net primary income}$$

## GNI and GDP in Armenia in 2015

	Current US\$
GDP	10,529,182,498
Primary income receipts	885,882,034
Primary income payments	450,507,037
Net primary income	435,374,997
<b>GNI</b> (GNI = GDP + Net primary income)	<b>10,964,557,495</b>

All data in current US\$. Source: World Bank.

# Purchasing Power Parity GDP

How we compare income level  
in different countries?

Monthly rent in 3 cities

Paris, 13<sup>th</sup>, 40 sq. m, \$1,320



Mumbai, 3 bedr., 2 bath., \$1,470



Cairo, 4 bedr., 1 bath., \$1,230



## Purchasing Power Parity GDP

In Yerevan you will get this 4 bedroom, 3 bathroom 250 sq. m. tasteless apartment for \$1500.



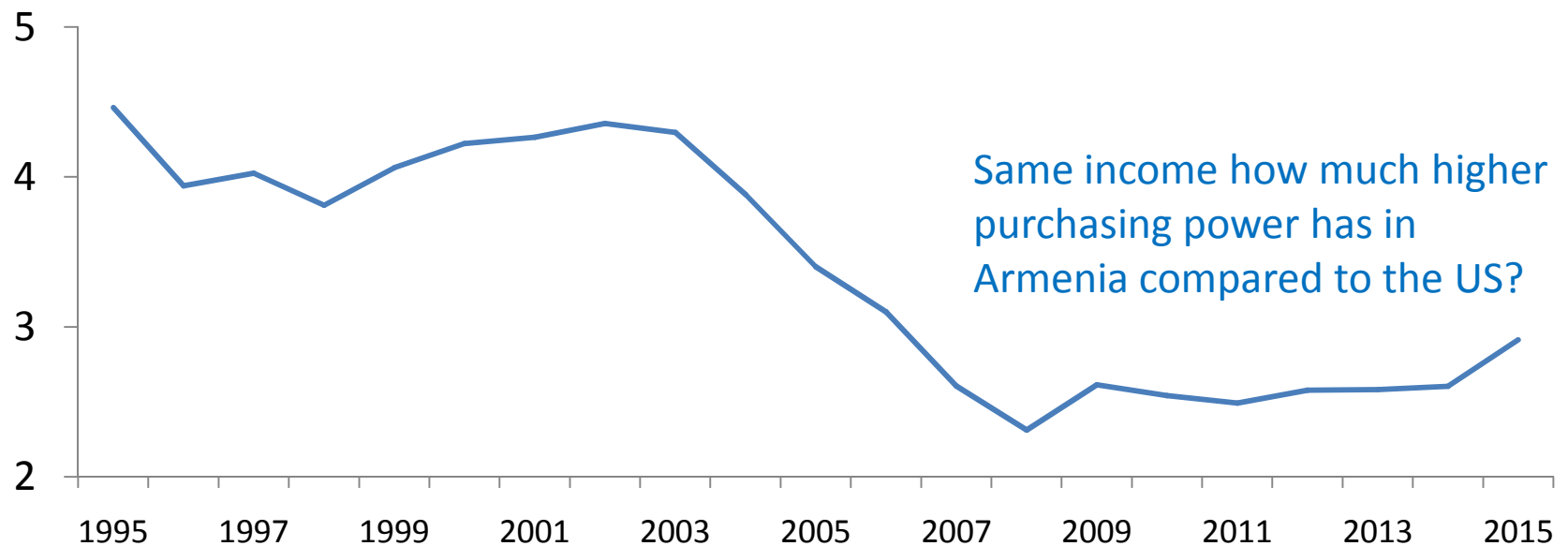
## Purchasing Power Parity GDP

The value of same basket of goods is drastically different in different countries.

In general, prices are higher in high income (developed) countries.

For example **prices** in **Armenia** in average are about **2.5 times lower** than in the **US**.

Therefore to make a meaningful comparison of income levels we need to take that difference into account.



## Per capita PPP GDP in Armenia in 2015

GDP in Armenia (current US\$)	10,529,182,498
GDP per capita in Armenia (current US\$)	3,489
PPP GDP per capita in Armenia (current international \$)	8,419 (6.7 times lower than US)
PPP GDP per capita in the US (current international \$)	56,116

Source: World Bank

# Why prices are higher in high income (developed) countries?

Note: The main **difference is in non-traded** good's prices.

Bella Balassa, Paul Samuelson in 1964 showed price differences are due to different **productivities of traded good's industries.**

Why prices are higher in high income (developed) countries?

## Balassa-Samuelson hypothesis

### Assumptions

1. Productivity in **traded goods is higher** in developed country.  $Q_T^* > Q_T$
2. Productivity in **non-traded goods is the same** (think of hairdressing).  $Q_N^* > Q_N$
3. Wages are the same in each country.  $W_T^* = W_N^*$ ;  $W_T = W_N$

$$P_T^* = W_T^* / Q_T^*$$

$$P_N^* = W_N^* / Q_N^*$$

$$P_T = W_T / Q_T$$

$$P_N = W_N / Q_N$$

$$P_N^* / P_T^* = Q_T^* / Q_N^* \quad P_N / P_T = Q_T / Q_N$$

Because  $Q_T^* > Q_T$  then  $P_N^* / P_T^* > P_N / P_T$

Because  $SP_T^* = P_T$  then  $SP_N^* > P_N$

# Trade Openness

$$\text{Trade Openness Index} = (\text{Exports} + \text{Imports}) / \text{GDP}$$

# Trade Openness in Armenia in 2015

	Current US\$	% of GDP
GDP	10,529,182,498	
Exports of goods and services	3,137,295,852	30%
Imports of goods and services	4,418,183,192	42%
Trade Balance	-1,280,887,340	-12%
Trade Openness (Exports + Imports)/GDP	72%	

All data in current US\$. Source: World Bank.

## Trade Openness in Singapore: Extreme case

$$\begin{array}{cccccc} \text{GDP} & \text{C} & \text{I} & \text{G} & \text{X} & \text{M} \\ 281,439 & = & 103,203 & + & 73,991 & + & 29,266 & + & 496,726 & - & 421,095 \end{array}$$

$$\text{Trade balance} = X - M = 75,631$$

$$\text{Trade Openness Index} = (X + M)/\text{GDP} = 326\%$$

Trade Openness Index >100% when the economy imports a lot of **intermediate** goods, turns them into final goods and then exports most of them.

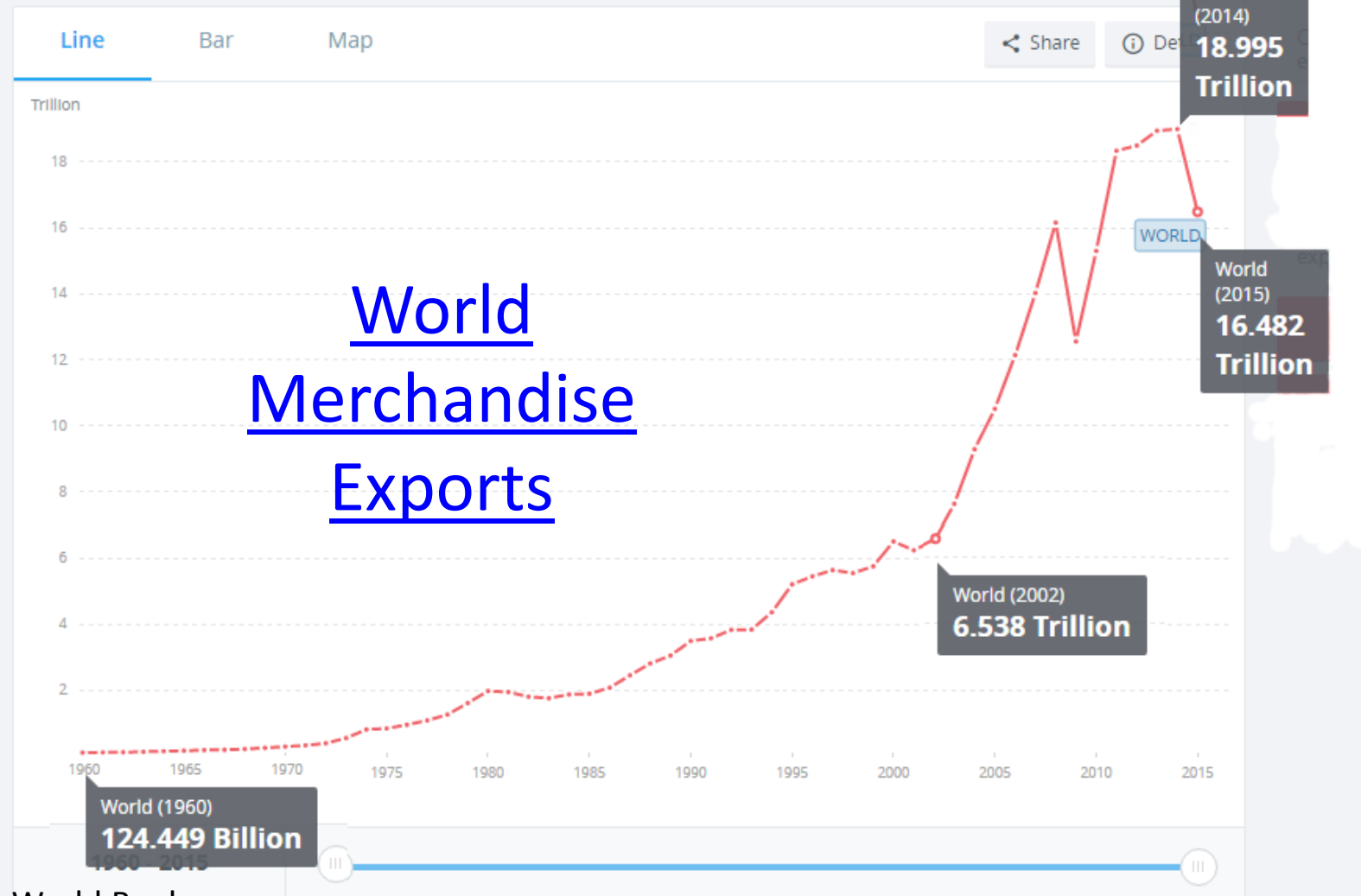
All data in current million US\$

Source: SingStat. Average 2015 Exchange rate 1.43 (irs.gov). Stat. Discrepancy: -652mil.

## Merchandise exports (current US\$)

World Trade Organization.

License: [Open](#)

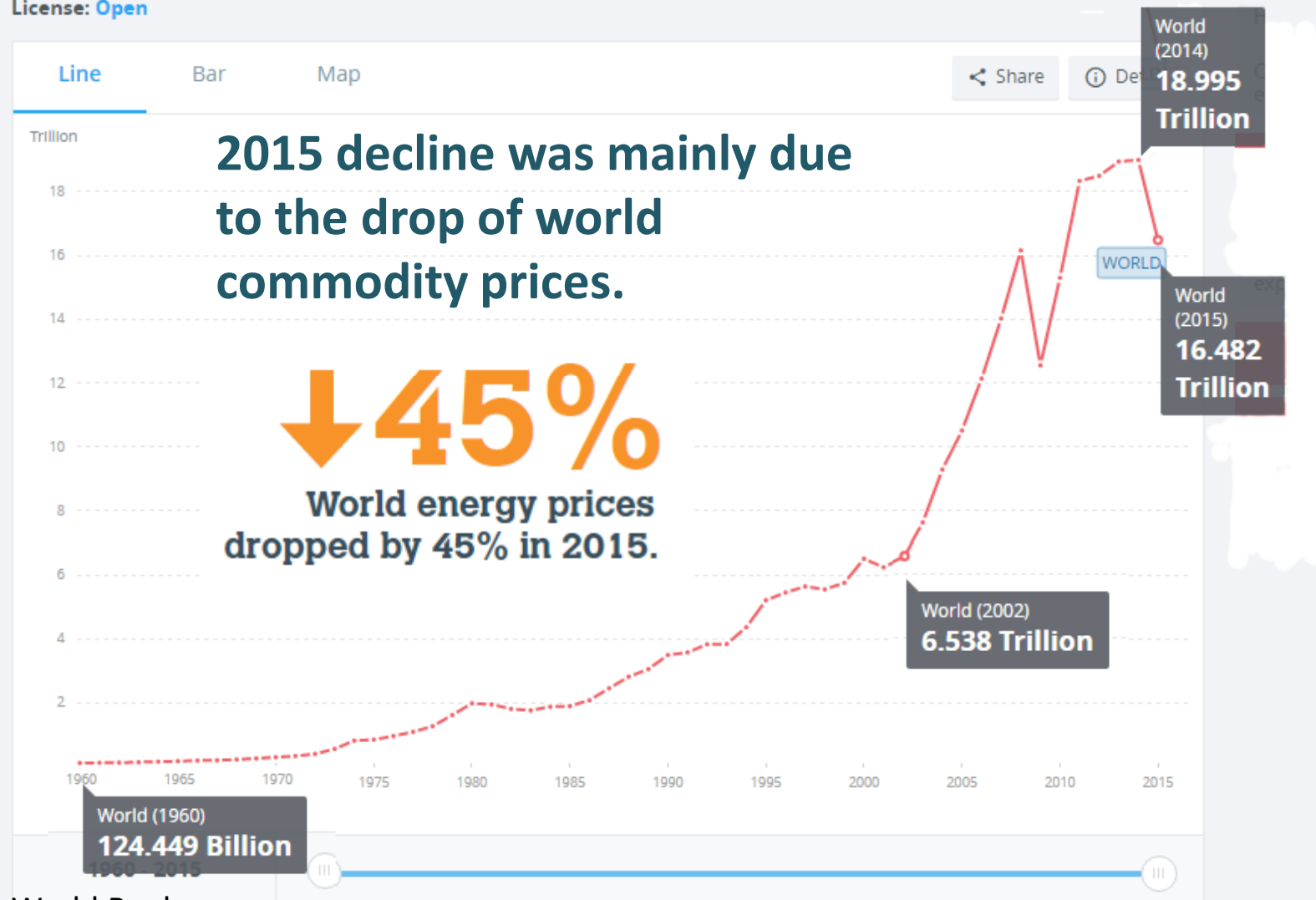


Source: World Bank

### Merchandise exports (current US\$)

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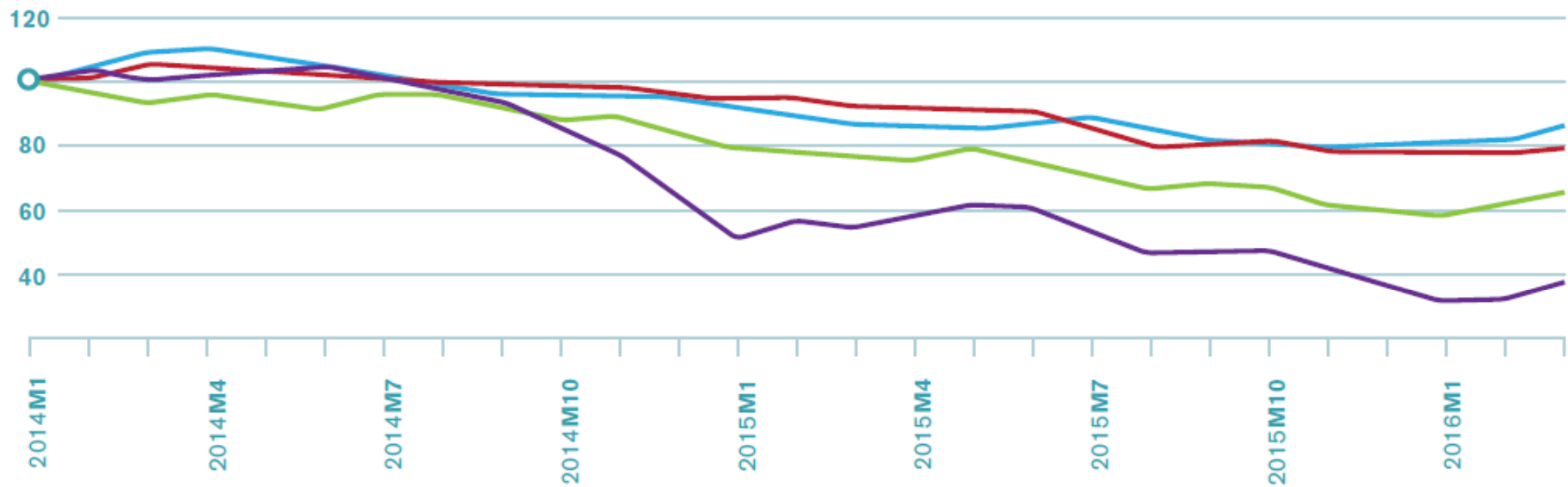
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Source: World Bank

## Prices of primary commodities, January 2014-March 2016

(indices of dollar values, January 2014=100)



● Food and beverages ● Agricultural raw materials ● Metals ● Fuel (energy)

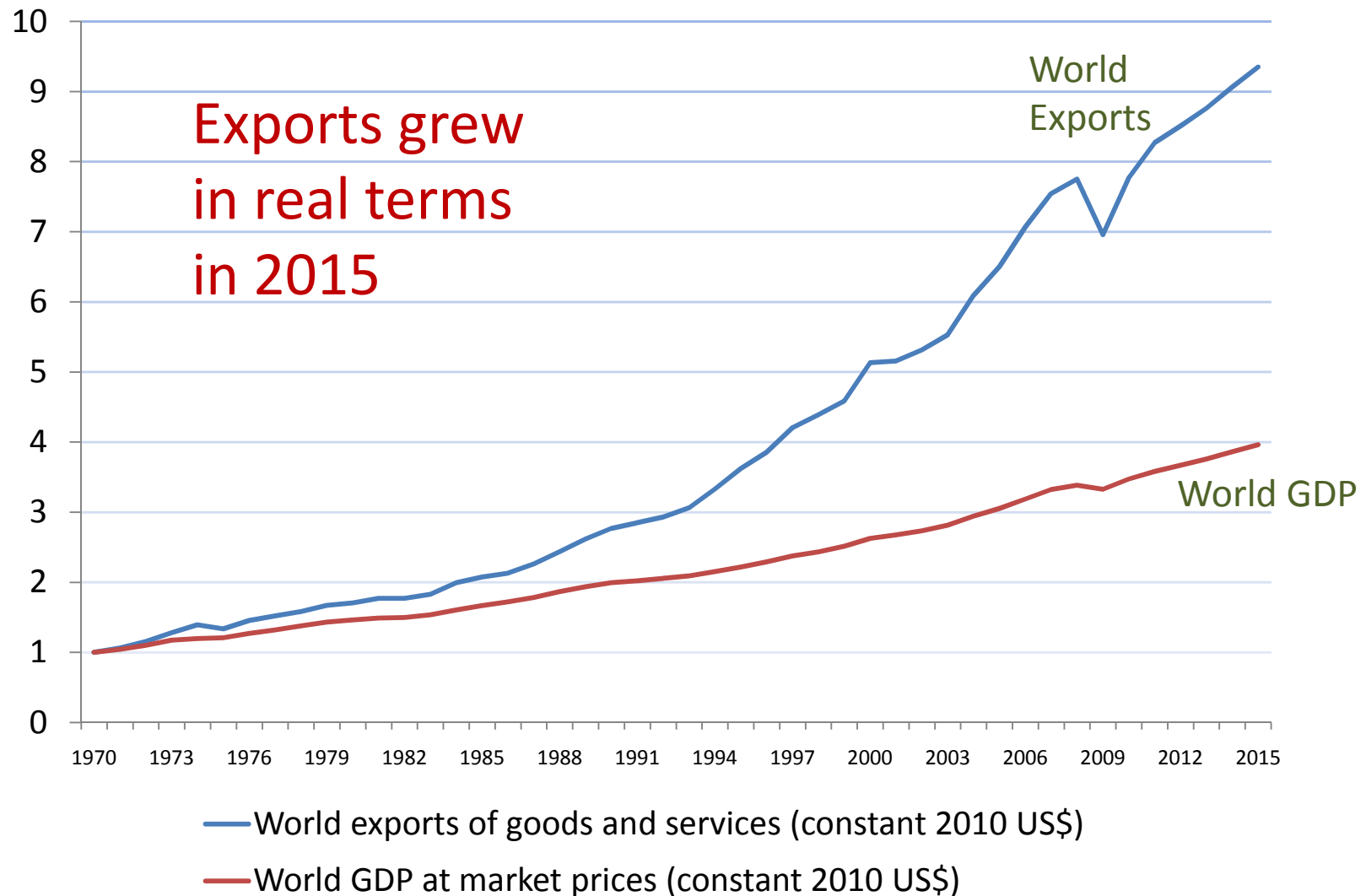
↓16%

↓20%

↓36%

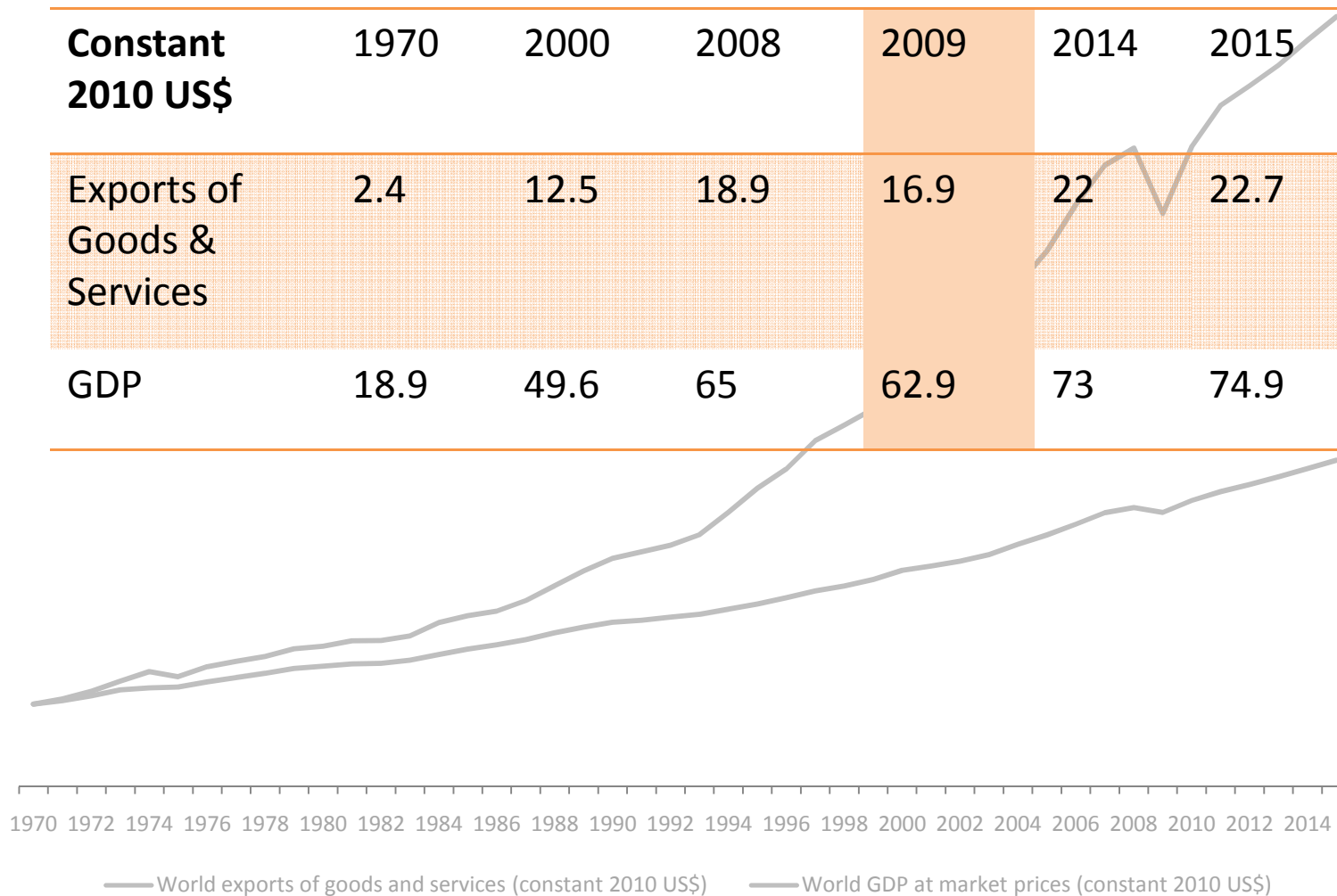
Source: WTO World Trade Statistics 2016 Report

## World Exports and GDP in real terms (1970=1)



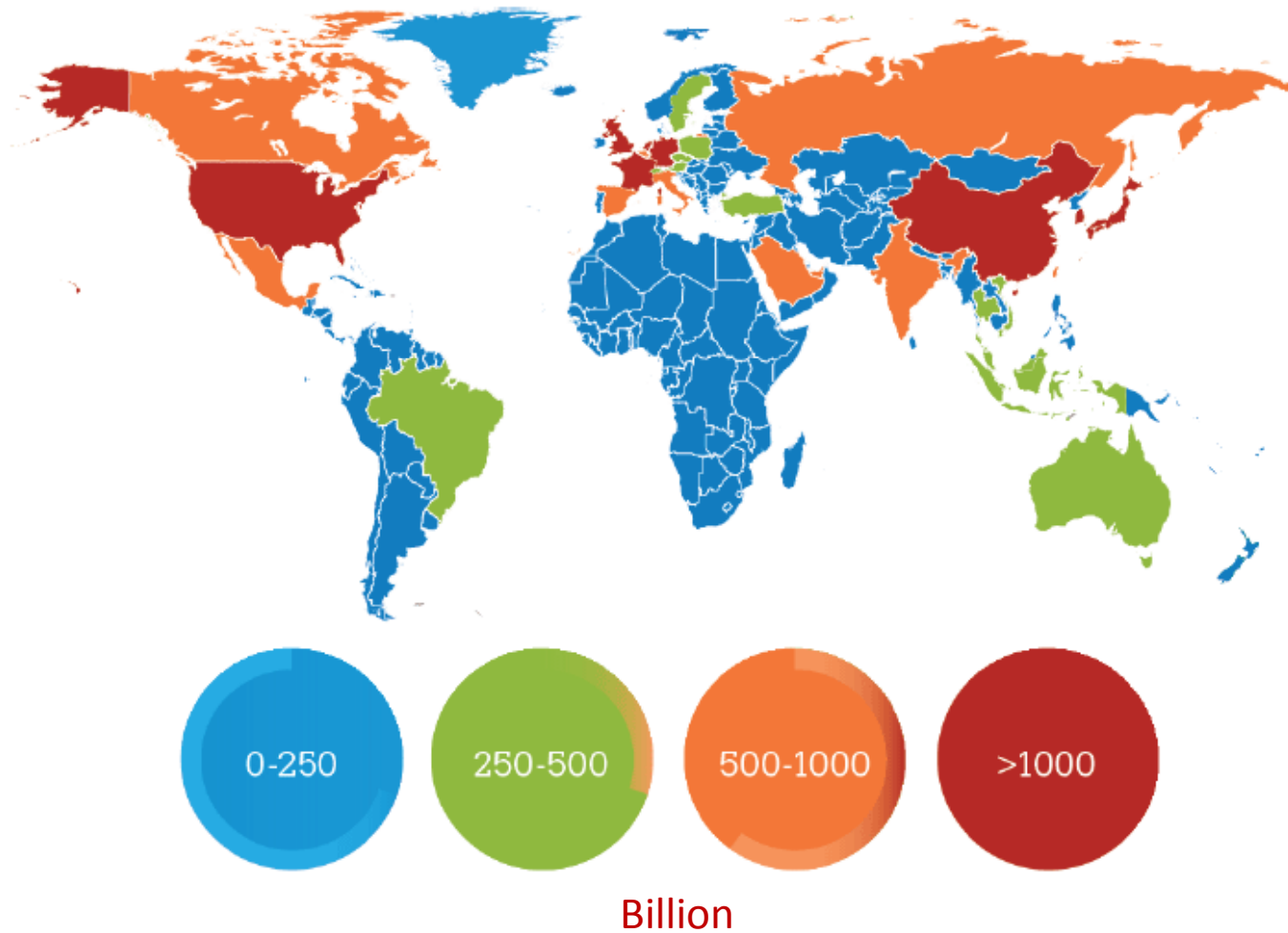
Source: World Bank

## World Exports and GDP in constant 2010 US\$ (trillion)



Source: World Bank

## Economies by size of merchandise trade, 2014



Source: WTO World Trade Statistics 2016 Report





## World's main export markets

- US – 12%, \$2.19T
- China – 8.7%, \$1.53T
- Germany – 6.4%, 1.13T
- .
- .....
- .....
- .
- Russia – 1.7%, \$295B

So Russia is mere 1.7% of world export market.

Source: MIT OEC

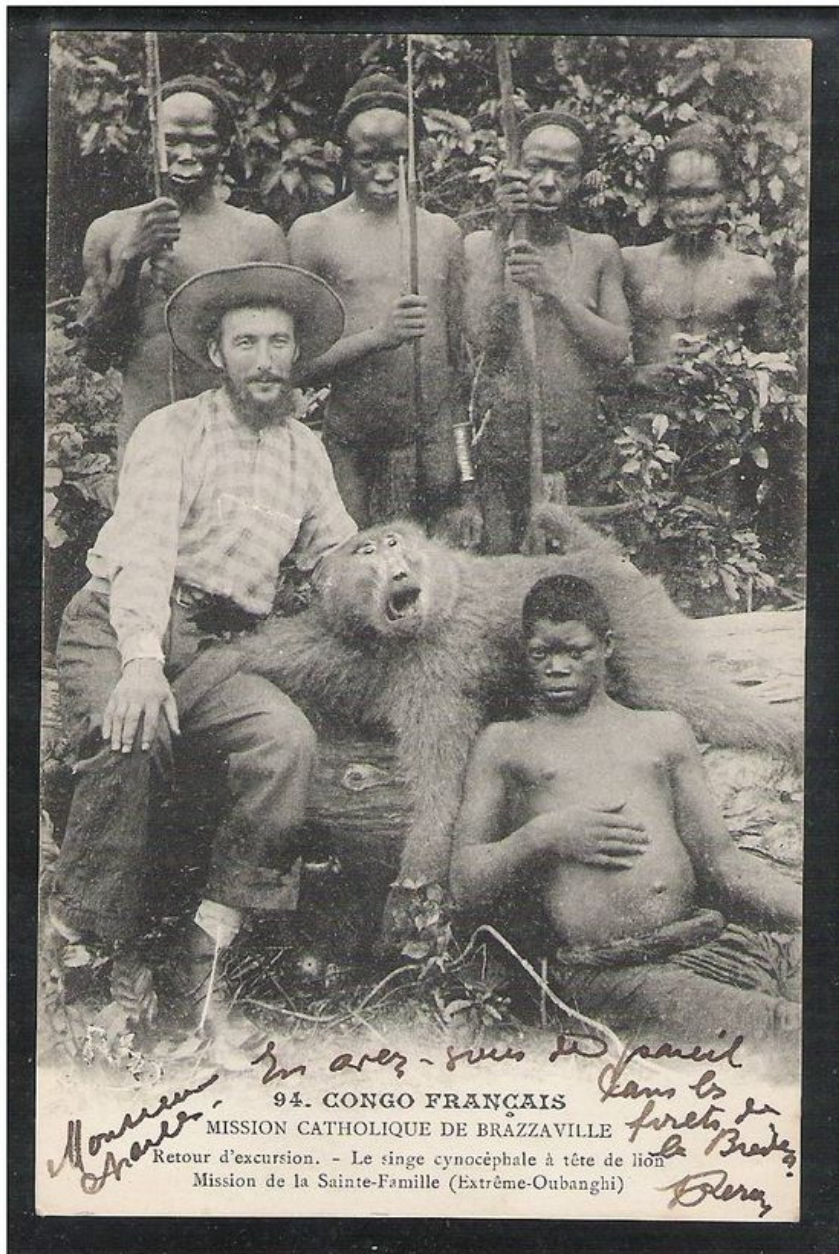
**Attention:** This lecture is data-heavy. But that is exception, not rule.

Though real life observations are a powerful tool for understanding world, but there is an even more powerful tool.

That tool is model building, which uses pure logic, and thus helps us avoid misconceptions.

We started the lecture with the fascinating case of Singapore.  
And stressed that trade and outward integration were integral to  
the success of that country.

But trade in itself doesn't bring to prosperity, here is another country.



In 1960 GDP per capita was  
\$1,463, Trade Openness was 108%

GDP is in constant 2010 US\$. Source: World Bank.



In 2015 GDP per capita was \$3,163, Trade Openness was 143%.  
Growth is modest, and this is one of rare success stories in Africa.

GDP is in constant 2010 US\$. Source: World Bank.

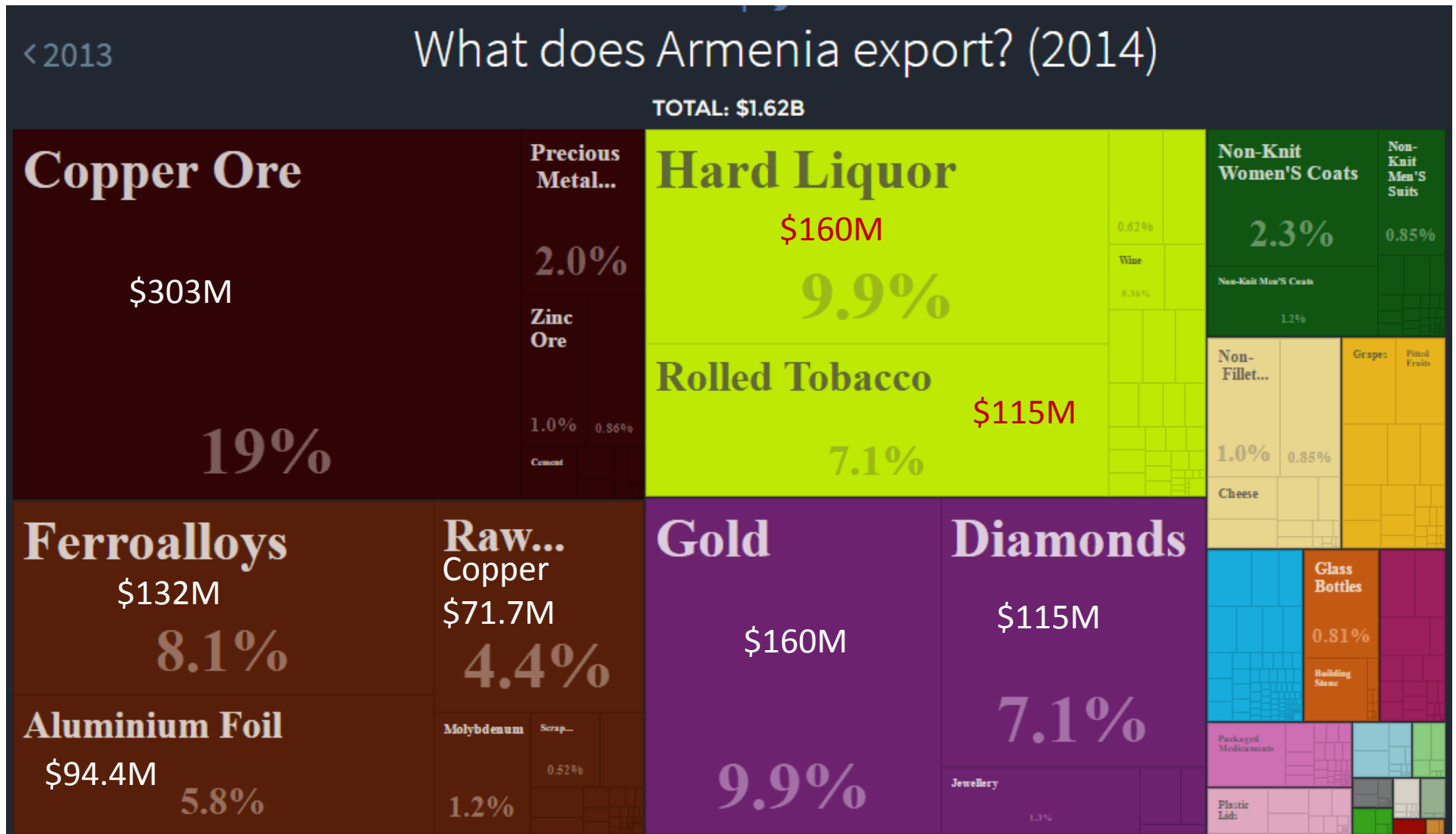
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# Where does Armenia export to? (2014)

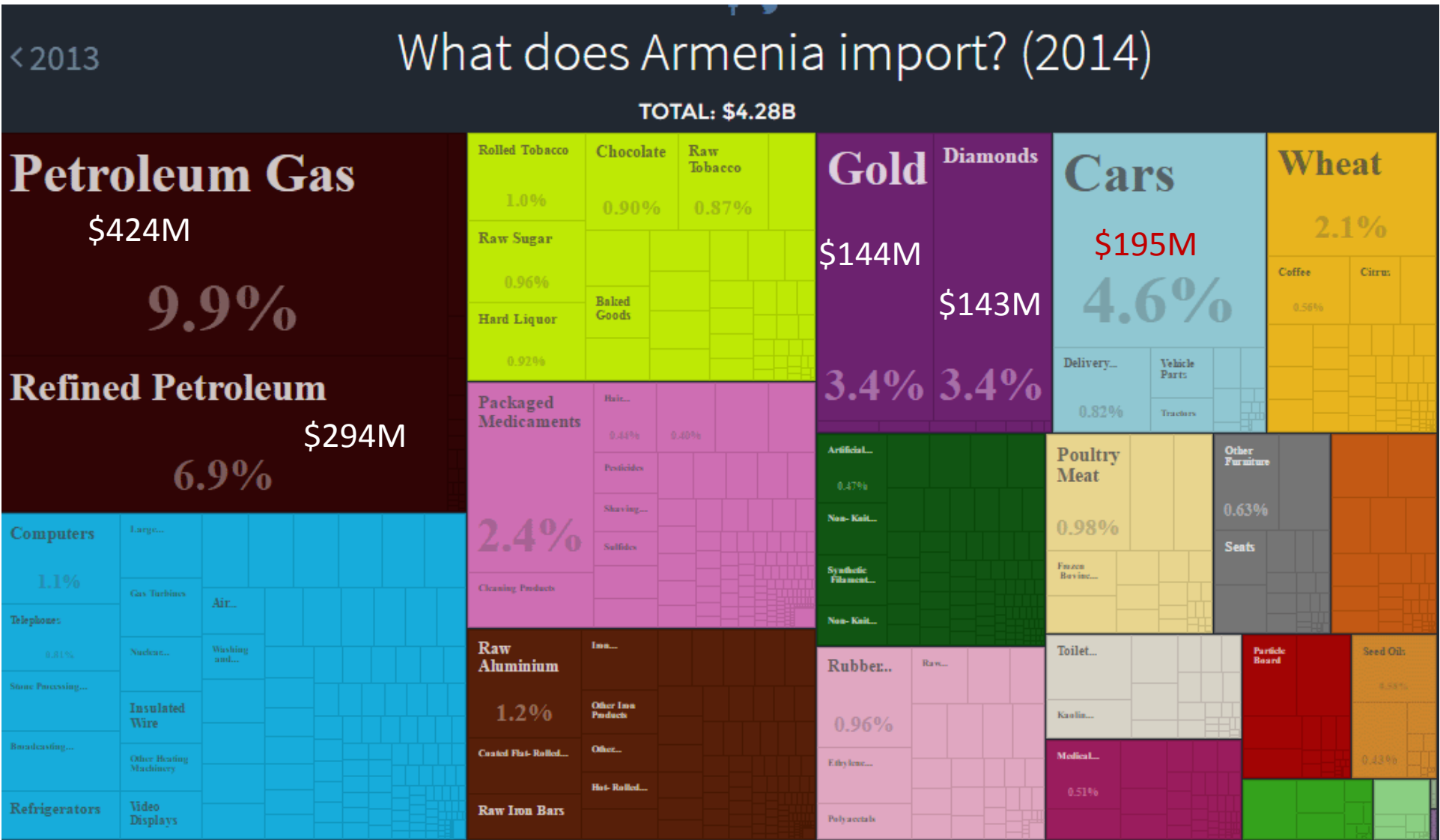
TOTAL: \$1.62B



Source: MIT OEC



Source: MIT OEC



Source: MIT OEC

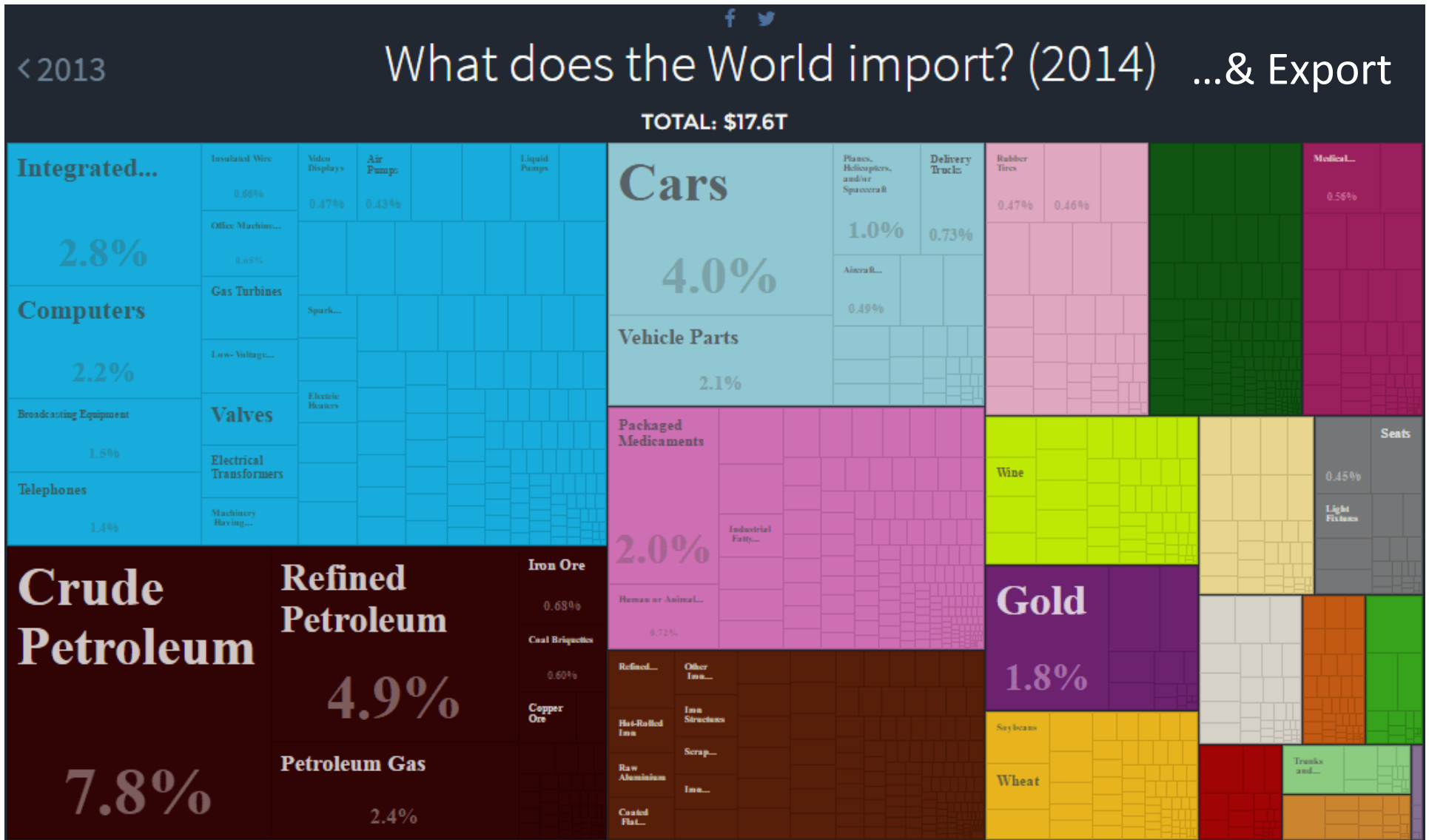
## Share in Total Import

	<b>World</b>	<b>Armenia</b>	<b>Armenia (US\$)</b>
Cigarettes	0.13%	1%	
Computers	2.2%	1.1%	
Hard Liquor	0.17%	0.92%	
Cars	4%	4.6%	
Toilet paper	0.15%	0.55%	\$23.7M
Children's picture books	0.0059%	0.0028%	

Source: MIT OEC

Trade data shows, that we love smoking, drinking and driving. For some strange reason we also love using toilet paper.

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Source: MIT OEC

## Leading Exporters and Importers of **Commercial Services**

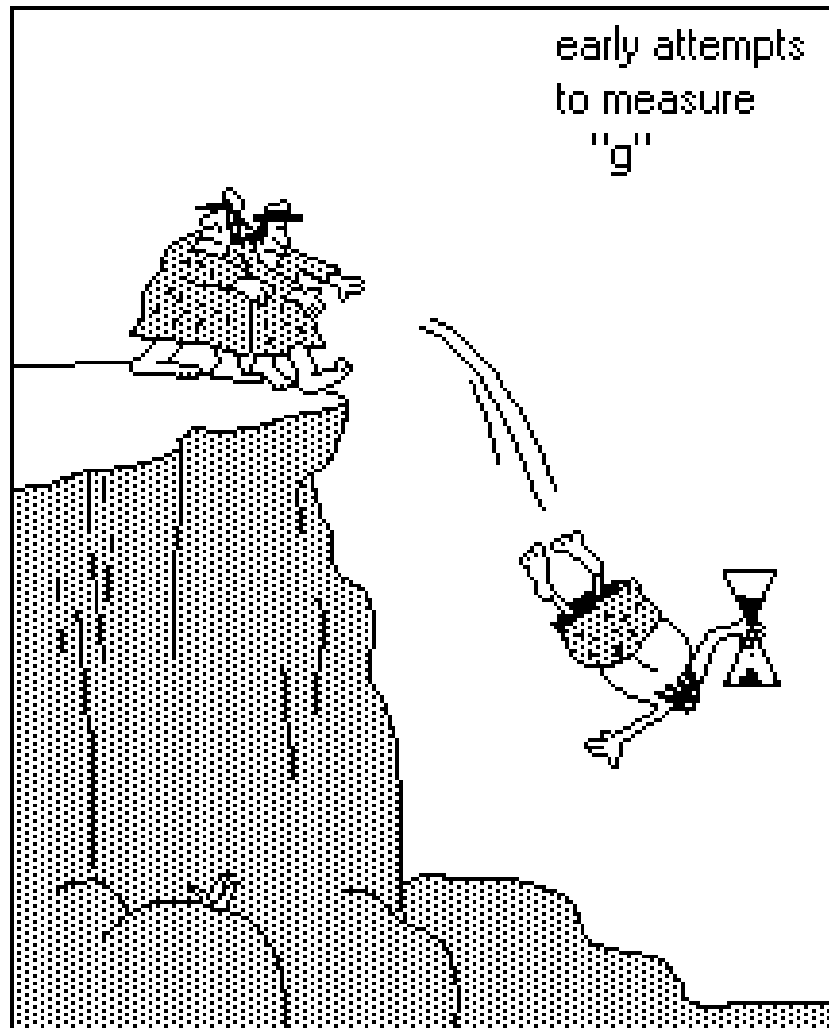
<b>Exporters</b>	<b>B US\$</b>	<b>Importers</b>	<b>B US\$</b>
US	690	US	469
UK	345	China	466
China	285	Germany	289
Germany	247	France	228
....		....	
Russia (24)	51	Russia (16)	87
....		....	
World	4755		

Source: WTO World Trade Statistics 2016 Report

## Commercial Services Trade Components

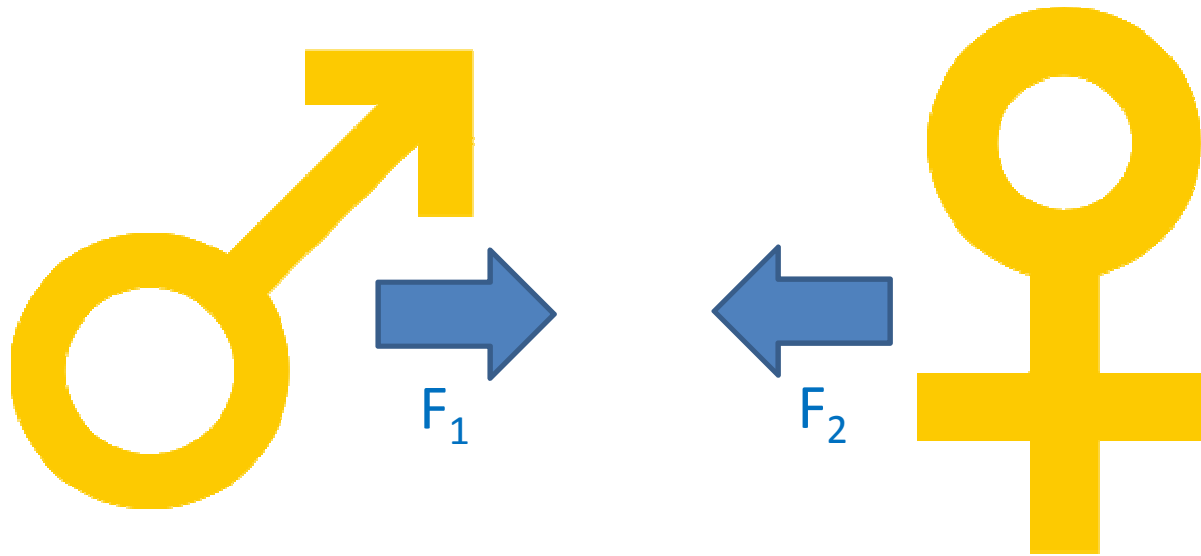
<b>1 Goods-related services</b>	Manufacturing services	Processing, assembly, labeling, packing, etc. for fee. Example: iphone assembly.	150 B
	Maintenance & repair		
<b>2 Transport</b>			875 B
<b>3 Travel</b>			1230 B
<b>4 Other commercial services</b>	Construction		
	Insurance		
	Financial services		2495 B
	Telecommunication		
<b>TOTAL</b>			4755 B

Source: WTO World Trade Statistics 2016 Report



Don't forget to stop the timer when you get  
to the bottom of the cliff!

## Newton's Law of Universal Gravitation & Trade



$$F_1 = F_2 = \frac{m_1 \times m_2}{d^2} \times G$$

$m \times 2 \Rightarrow F \times 2$

$d \times 2 \Rightarrow F \times 1/4$

$G = 6.674 \times 10^{-11} \text{ N} \cdot (\text{m}/\text{kg})^2$



$$F_{AR} = \frac{(GDP_A)^\alpha \times (GDP_R)^\beta}{Dist_{AB}^\delta}$$

## What we learned?

What are the fundamental questions of International Trade?

What is a Model?

Basic concepts such as GNI, GDP, Trade Openness, PPP.

World and Armenia Trade Volume and Structure.

Gravity Equation in Economics.

Thank you and enjoy.

But remember

All models are wrong, but  
some are useful.