



***Education's Impact on various
Developmental Factors across
multiple countries***

TABLE OF CONTENTS

- ❖ **01 PROBLEM STATEMENT & INTRODUCTION**
 - *Problem Statement*
 - *Introduction- Theme:* Education
- ❖ **02 RESEARCH BACKGROUND**
 - *Categories:* Why are they important/ relevant?
 - Economy
 - Social Development
 - Health
- ❖ **03 PROPOSED RESEARCH METHODOLOGY**
 - Data Source & Time Period
 - Grouping Variable
 - Variables
 - Hypothesis Testing
 - Summarized Key Results
- ❖ **04 SCOPE AND LIMITATIONS**
- ❖ **05 CONCLUSIONS AND FUTURE RESEARCH**



01

PROBLEM STATEMENT & INTRODUCTION

PROBLEM STATEMENT

- To analyze how **Education** influences the ***Economy, Social Development, and Health*** across countries throughout the five continents of North America, South America, Asia, Africa and Europe.
- To study the Economy, Social Development, and Health and examine if they impact each other.

THEME: EDUCATION

- All people have a right to education. It is vital to future development, accomplishments and success.
- Children and youth gain necessary knowledge and skills through quality basic education.
- It also reduces rates of poverty and promotes economic growth and social development.
(Habitat for Humanity of Broward, 2020)

THEME: EDUCATION

- Having an educated population leads to:
 - Economic development and growth. (Bansal, 2020)
 - More allocative and productive efficiency; which leads to rapid rates of development across multiple sectors. Example: Health, agriculture, public administration, private sector growth, etc. (Radcliffe, 2020)
- For a country to fully reap such benefits, they need to unleash the potential of the human mind:
 - There is no better tool to achieve this than education (The World Bank, 2021).

THEME: EDUCATION

- People with more education:
Live longer, healthier lives than those with fewer years of schooling.
- Families with higher incomes can easily purchase healthy foods, have time to exercise regularly, and pay for health services and transportation.
- An additional four years of education lowers five-year mortality, reduces the risk of heart diseases and diabetes. (Picker, 2007)



02

RESEARCH BACKGROUND

CATEGORIES

Why are they important/ relevant?

Category: ECONOMY

- An economy is the system according to which the money, industry and trade of a country or region are organized. (Collins, 2020)
- Education is a ***leading determinant*** of a country's ***economic growth, employment and earnings.*** (Grant, 2017)
- For every US \$1 spent on education, as much as US \$10 to US \$15 can be generated in economic growth. (UNESCO, 2011)
- An additional year of schooling can increase a person's earnings by 10% and average GDP by 0.37%. (Hanushek et al., 2008)

Category: SOCIAL DEVELOPMENT

- Social Development aims to improve the well-being of every individual in society so that they can reach their full potential. (New Brunswick Canada, 2008 - 2009)
- Education is an essential tool for social development.
 - It contributes to the improvement of the human condition through better knowledge and awareness across multiple areas such as health, living conditions, social equity and productivity, etc; which in turn results in a more socially sustainable environment. (Spiel, 2018)
 - People often use education to form their social identity, outlining their relationship with others and while outlining their understanding of themselves. (Manstead, 2014)
 - People with low levels of education have a harder time developing a positive social identity; which can negatively affect self-esteem and wellbeing. (Manstead, 2014)

Category: HEALTH

- A healthcare system can be defined as “the method by which healthcare is financed, organized, and delivered to a population. It includes issues of access (for whom and to which services), expenditures, and resources (healthcare workers and facilities).” (Encyclopedia, 2021)
- Countries with higher education levels are more likely to have better health conditions on a national scale:
 - “An additional 4 years of education lowers 5-year mortality by 1.8% points, reduces the risk of heart disease by 2.16 % points, and lowers the risk of diabetes by 1.3% points.” (Picker, 2007)
- Adversely, education also tends to increase awareness and attention to preventative care which can raise a country’s health costs in the short term, despite the benefits this may bring in the long term. (Raghupathi, 2020)

Category: HEALTH

- Lower educational attainment has been linked to shorter life expectancies, lower survival rates when sick and lower levels of reported self help.
(Raghupathi, 2020)
- Most health care systems aim to enhance the health of the population in the most effective manner possible given the country's available resources and competing needs.
- There is a complex relationship between education and its impact on health. Education may bring beneficial but also adverse effects to a country's health system.

03

RESEARCH METHODOLOGY

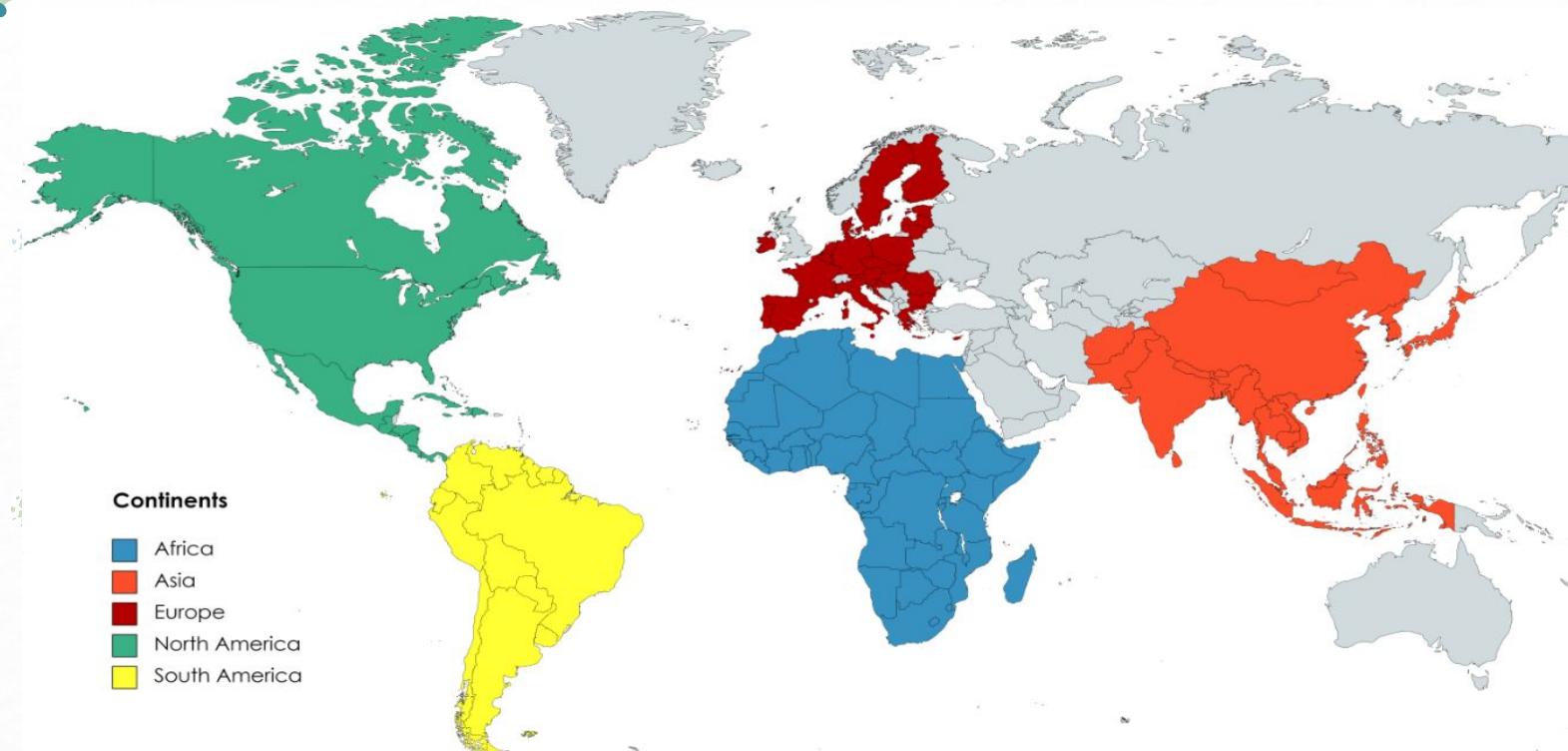


DATA SOURCE & TIME PERIOD

- Data Source: World Bank
- Time Period: 2002- 2015



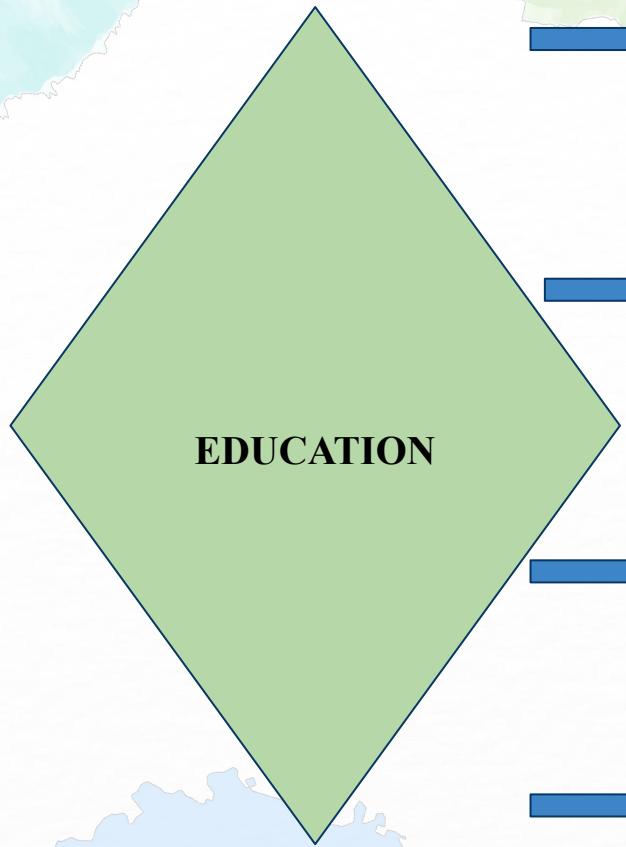
GROUPING VARIABLE: CONTINENTS



GROUPING VARIABLE- Expanded

NORTH AMERICA	SOUTH AMERICA	ASIA	AFRICA	EUROPE
Mexico	Brazil	Japan	South Africa	Germany
Panama	Peru	Thailand	Egypt Arab Rep	Spain
El Salvador	Colombia	Vietnam	Tunisia	Netherlands
Costa Rica	Ecuador	Indonesia	Morocco	UK (United Kingdom)
Honduras	Chile	Malaysia	Kenya	Poland

VARIABLES



Primary education,
pupils (numbers)



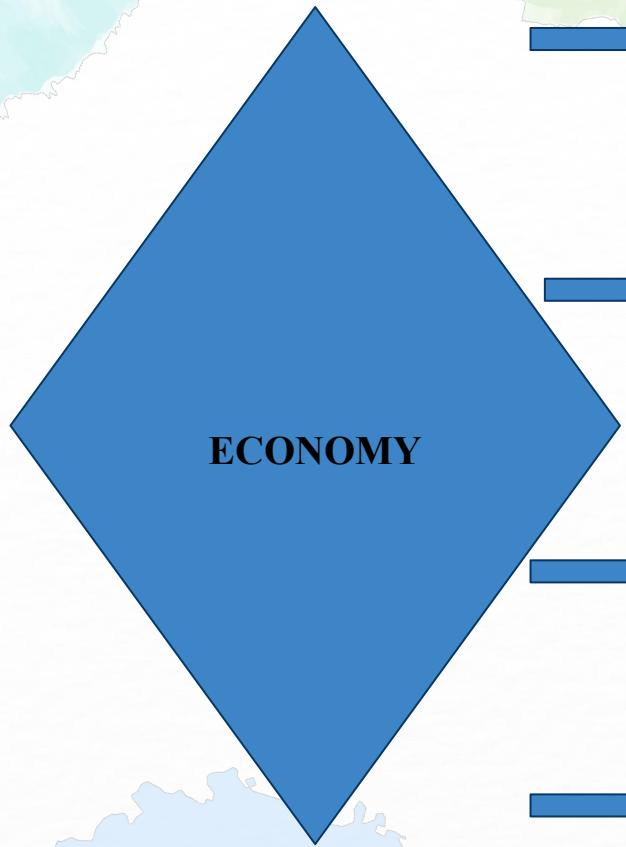
Compulsory
education, duration
(years)



Primary school
starting age (years)



Adjusted savings:
education expenditure
(% of GNI)



Current account
balance (% of GDP)



Adjusted net national
income (annual %
growth)

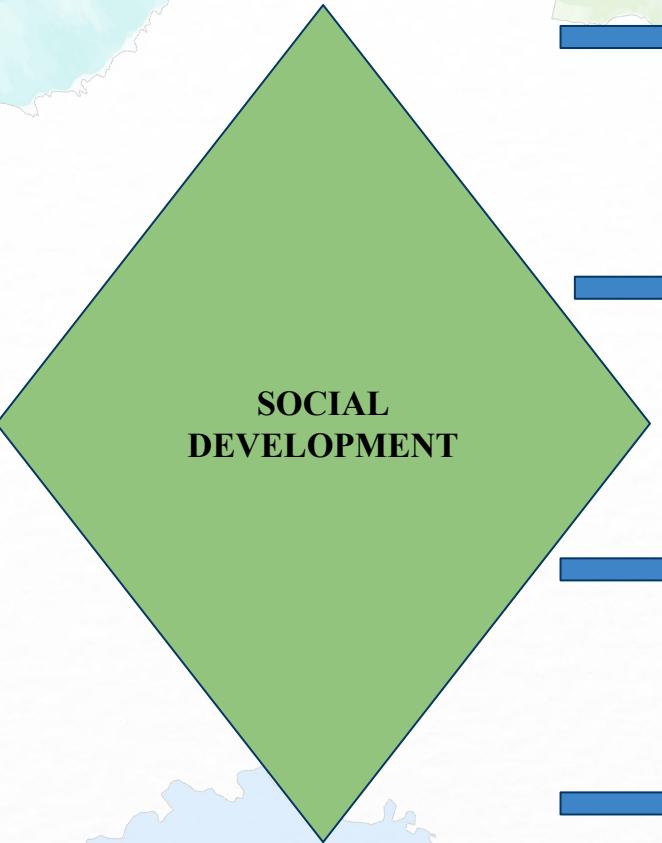


Gross savings (% of
GDP)

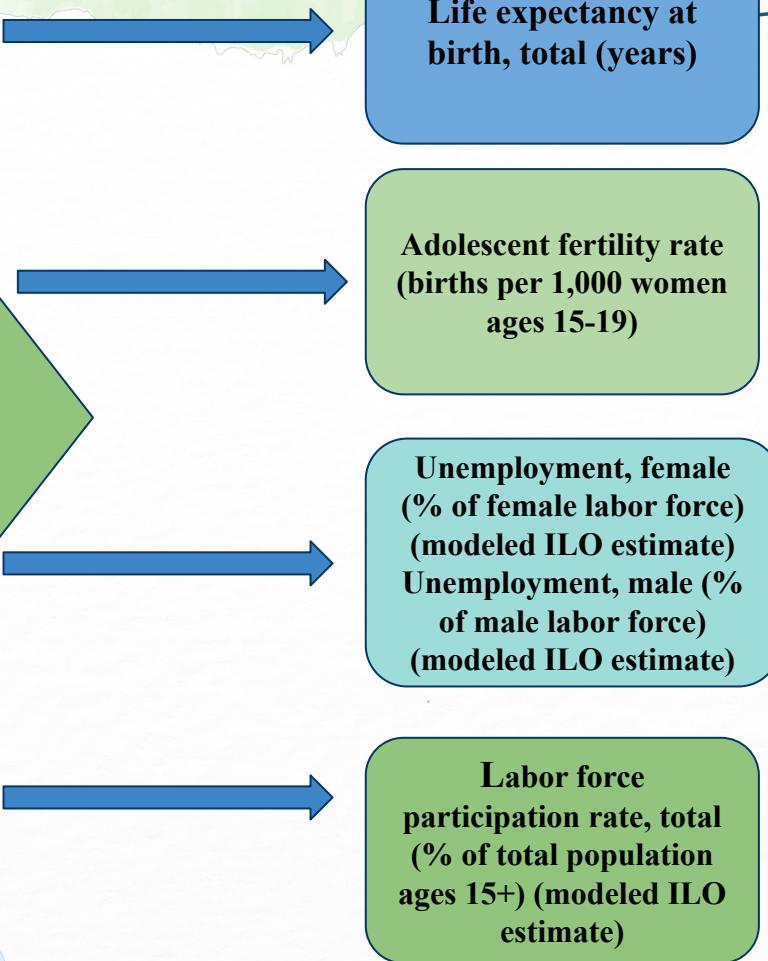


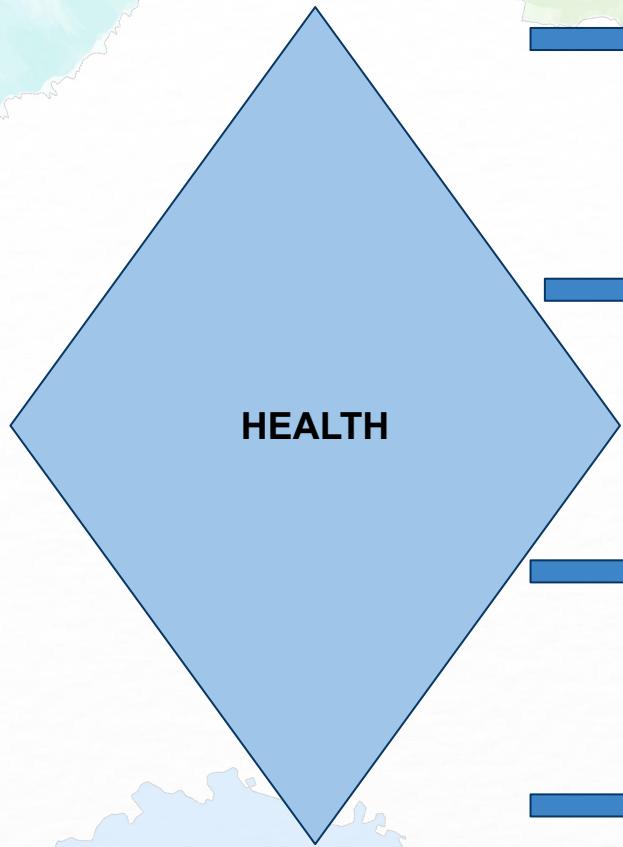
Inflation, consumer
prices (annual %)





SOCIAL DEVELOPMENT





Survival to age 65,
female (% of cohort)

Survival to age 65, male
(% of cohort)



Prevalence of anemia
among children (% of
children under 5)



Prevalence of
undernourishment (%
of population)



Population ages 0-14 (% of
total population)

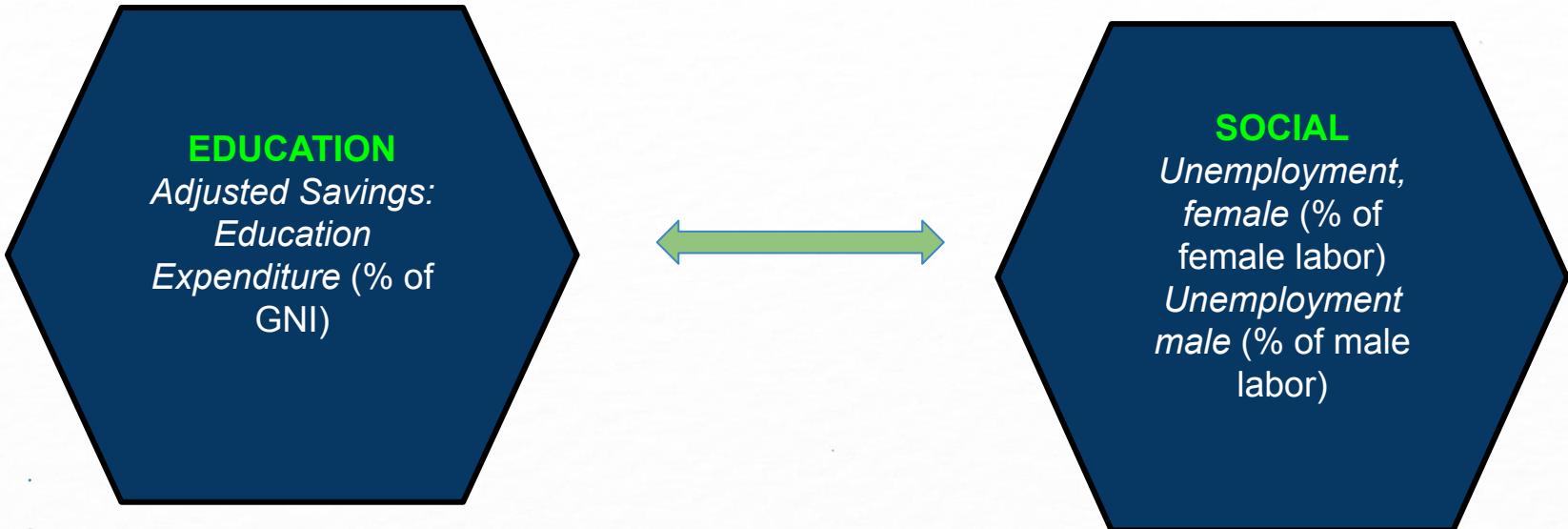
Population ages 15-64 (% of
total population)

Population ages 65 and above
(% of total population)



HYPOTHESES TESTING

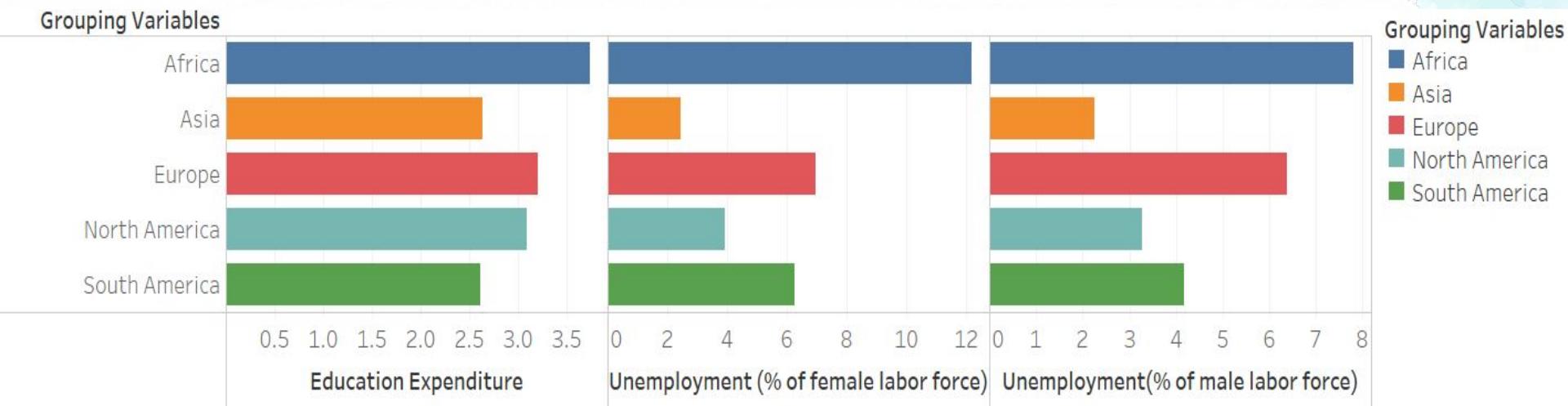
HYPOTHESIS #1



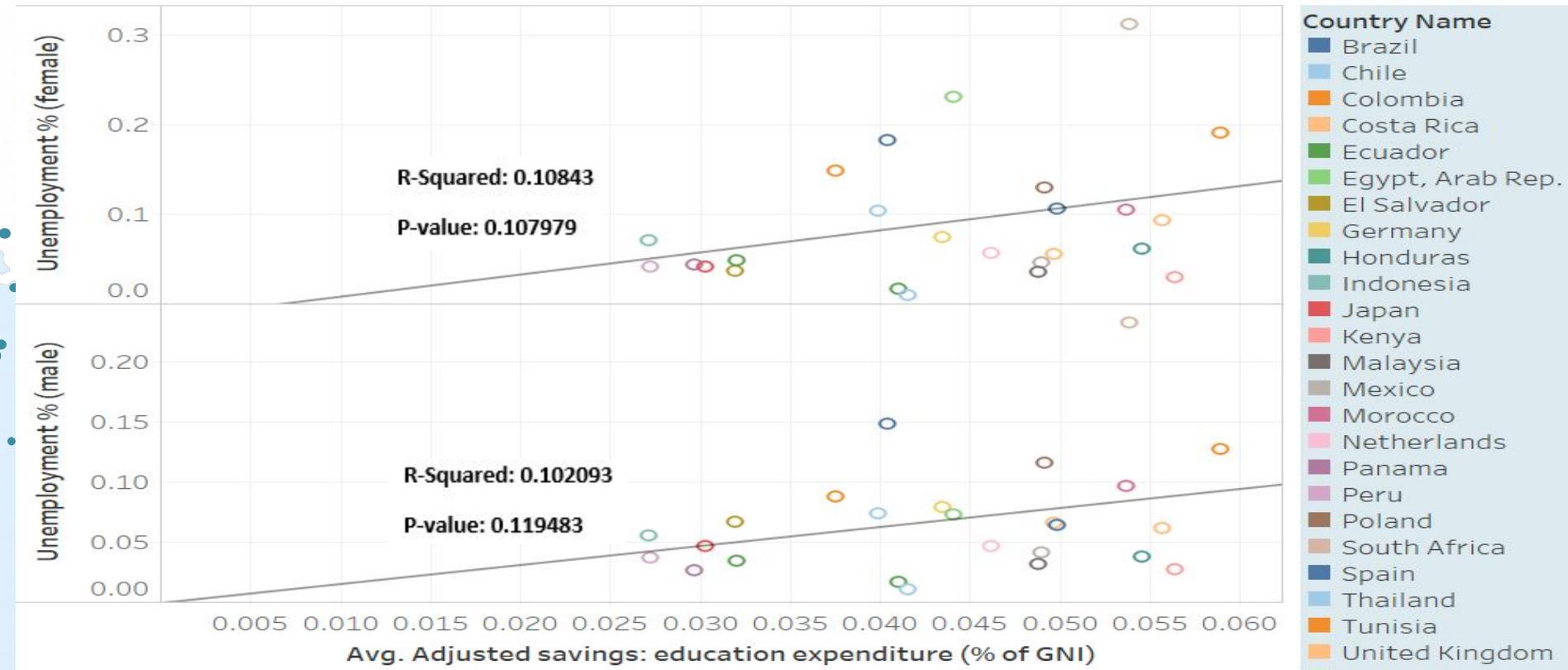
HYPOTHESIS 1:

- **HYPOTHESIS:** *Adjusted savings: education expenditure (% of GNI) is negatively correlated with Unemployment female (% of female labor force) and Unemployment male (% of male labor force).*
- **RATIONALE:** The more expenditure on a country's education, the increase in the number of people having access to education. As such, the more qualified people will become available for various jobs and the lower will be the unemployment levels for both male and female.

H1: Adjusted savings: education expenditure (% of GNI) is **negatively correlated** with Unemployment female (% of female labor force) and Unemployment male (% of male labor force).



H1: Adjusted savings: education expenditure (% of GNI) is **negatively correlated** with Unemployment female (% of female labor force) and Unemployment male (% of male labor force).



RESULTS H1: Adjusted savings: education expenditure (% of GNI) is **negatively correlated** with *Unemployment female* (% of female labor force) and *Unemployment male* (% of male labor force).

- **Horizontal Bars:**

- Length of first far left Horizontal bars shows the average expenditure on education by the 5 analyzed Continents and the length of the following set of horizontal bars respectively show the female and male average unemployment rate in the continents. Color differentiates the continents from each other.
- We can see that the African and European countries have the highest average education expenditure, yet they also have the highest average male and female unemployment. South American countries have the least average education expenditure and surprisingly also, they have the least average male and female unemployment. We expected a negative relationship between the two variables.

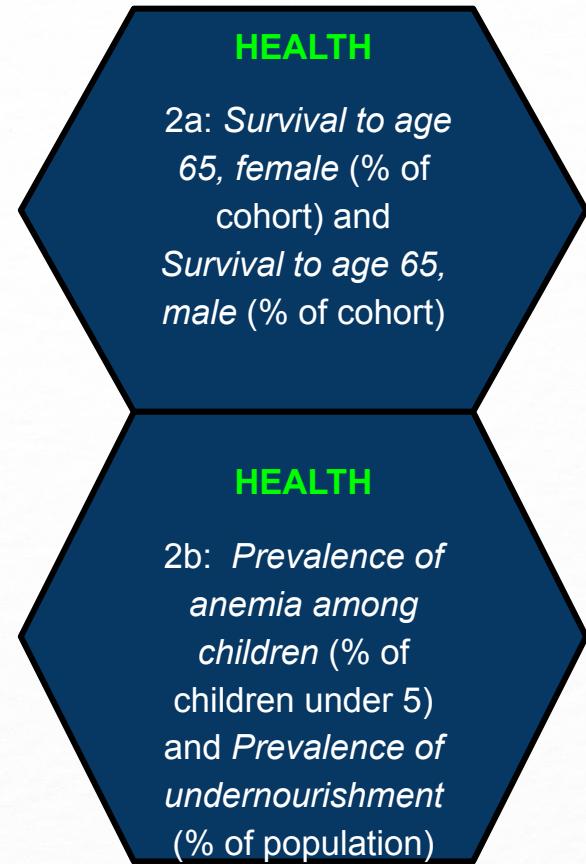
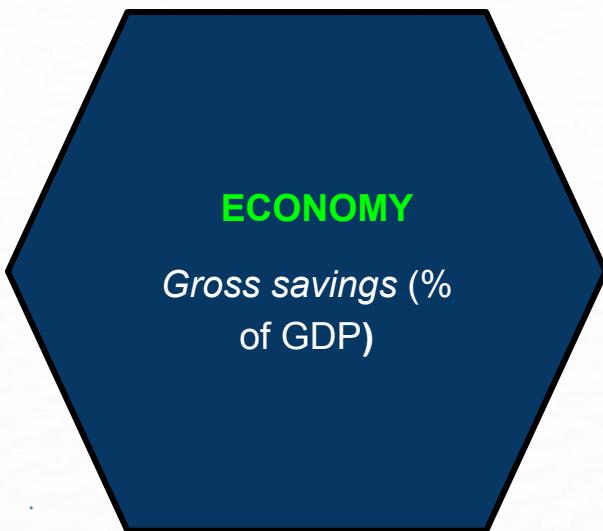
- **Scatter plot:**

- Scatter Plot also represents the same data set.
- The trend lines show a positive relationship between the two variables and the color or the bubbles represent every individual country.

- **Conclusion:**

- *The trend lines with P-values of 0.1079 and 0.1194 and low R-squared values of 0.1084 and 0.1020 for males and females respectively show that average education expenditure and average unemployment are related although not significantly, and that there are other unrecognized "factors" or variables causing the positive relationship.*

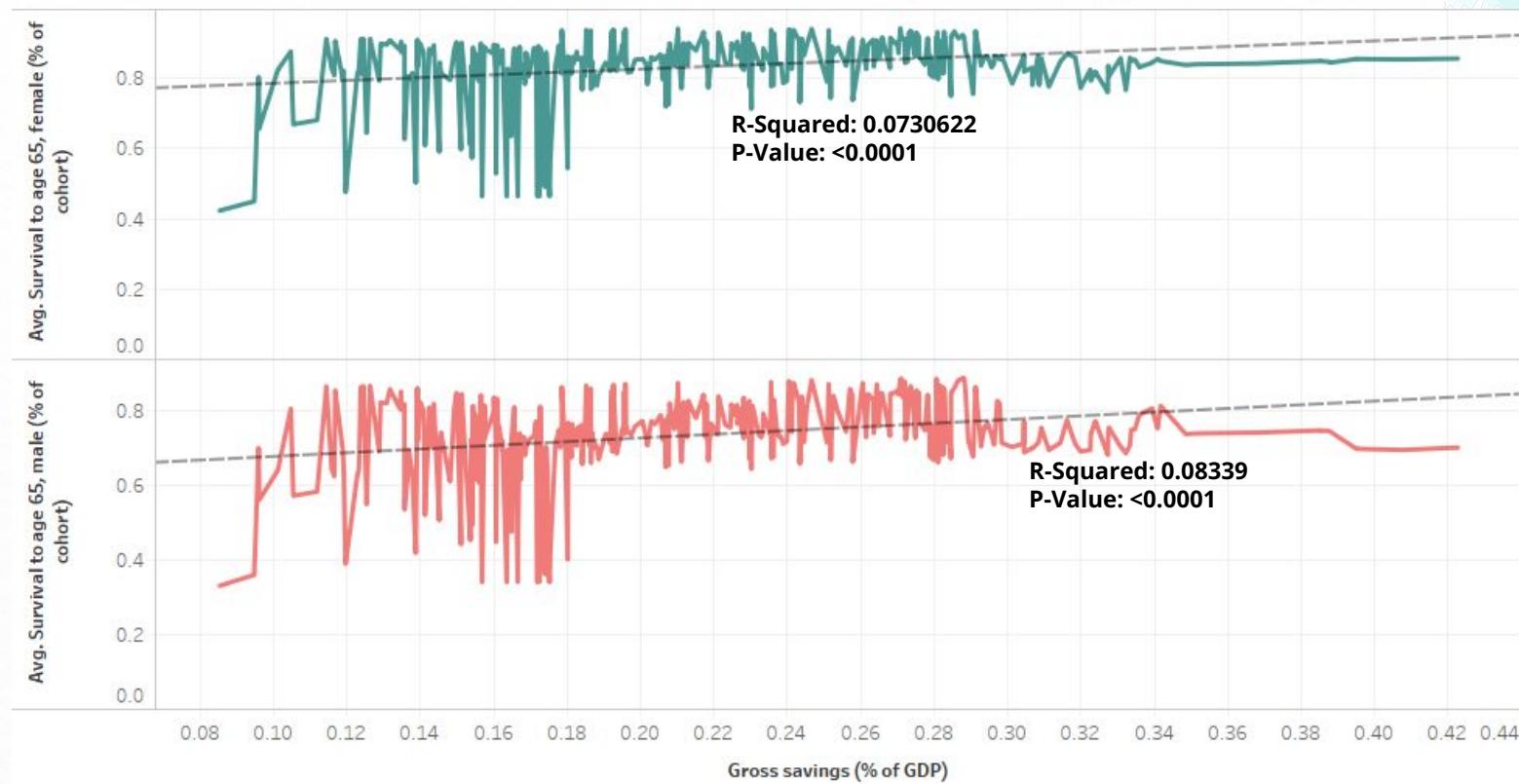
HYPOTHESIS #2



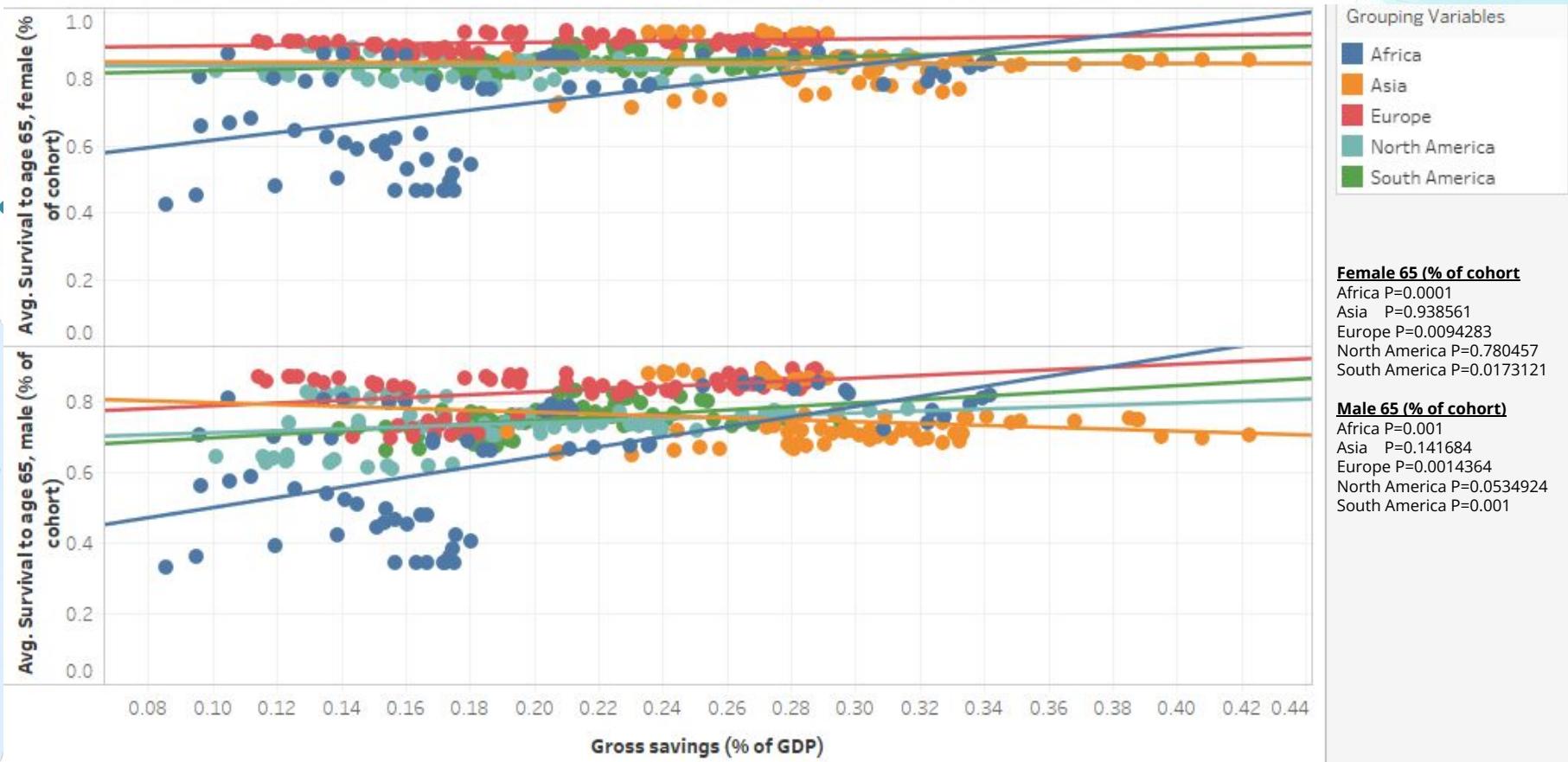
HYPOTHESIS 2:

- **Hypothesis-2a:** Gross savings (% of GDP) is **positively** correlated with *Survival to age 65, female* (% of cohort) and *Survival to age 65, male* (% of cohort)
- **Hypothesis-2b:** Gross savings (% of GDP) is **negatively** correlated with *Prevalence of anemia among children* (% of children under 5) and *Prevalence of undernourishment* (% of population)
- **RATIONALE:** As the gross savings of a country increases, the people's quality of life will be improved, food will be sufficient, and the level of medical attention will increase. This will decrease prevalence of anemia and prevalence of undernourishment. Also, the Survival to age 65 (% of cohort) will increase.

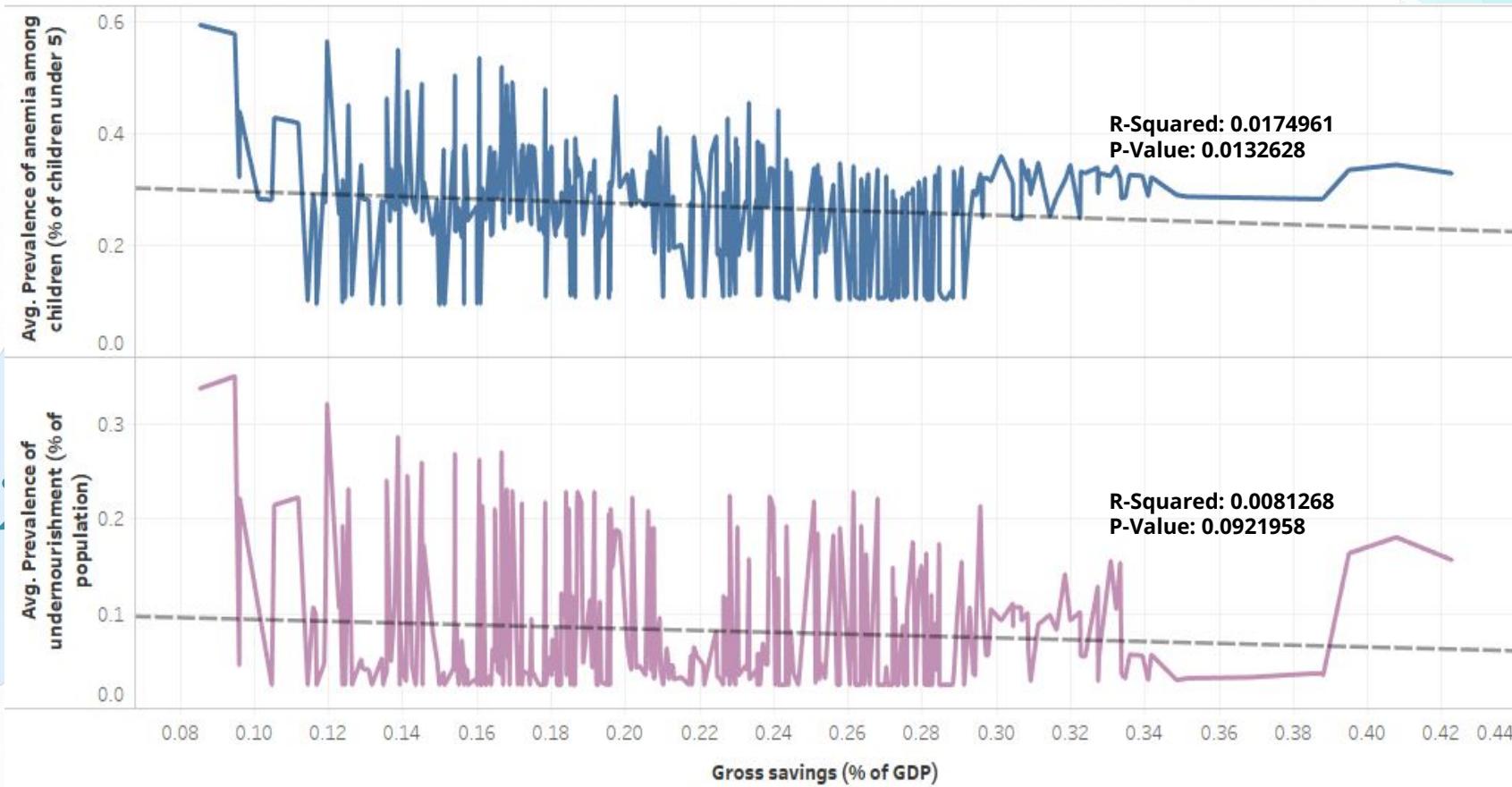
ANALYSIS 2A: Gross savings (% of GDP) is **positively** correlated with *Survival to age 65, female* (% of cohort) and *Survival to age 65, male* (% of cohort)



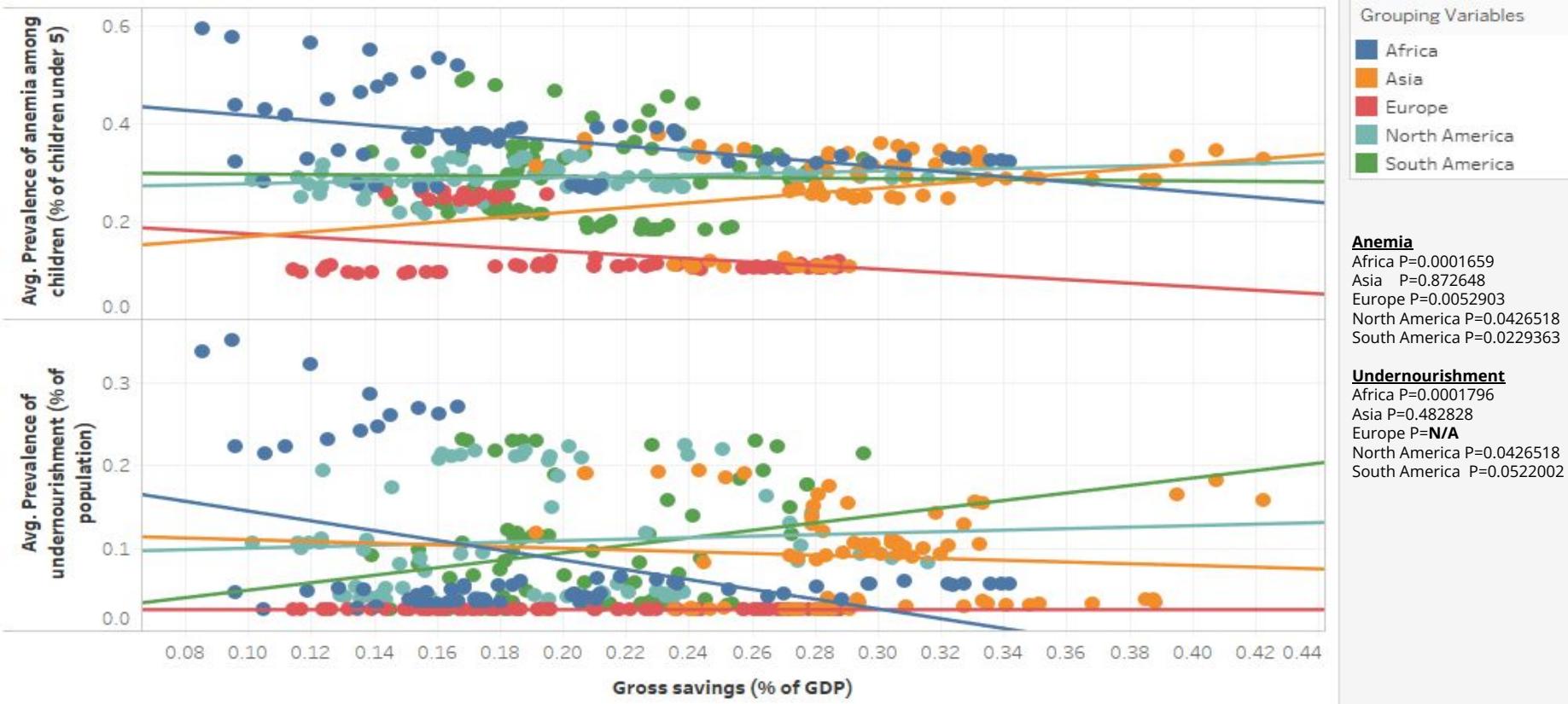
ANALYSIS 2A: Gross savings (% of GDP) is **positively** correlated with Survival to age 65, female (% of cohort) and Survival to age 65, male (% of cohort)



ANALYSIS 2B: Gross savings (% of GDP) is **negatively** correlated with *Prevalence of anemia among children (% of children under 5)* and *Prevalence of undernourishment (% of population)*



ANALYSIS 2B: Gross savings (% of GDP) is **negatively** correlated with *Prevalence of anemia among children* (% of children under 5) and *Prevalence of undernourishment* (% of population)



RESULTS H2A: Gross savings (% of GDP) is **positively** correlated with *Survival to age 65, female* (% of cohort) and *Survival to age 65, male* (% of cohort).

RESULTS H2B: Gross savings (% of GDP) is **negatively** correlated with *Prevalence of anemia among children* (% of children under 5) and *Prevalence of undernourishment* (% of population)

- **Line Chart:**

- The trend line with a $p<0.0001$ shows there is a significantly positive relationship between Gross savings and Survival to age 65, female.
- The trend line with a $p<0.0001$ shows there is a significantly positive relationship between Gross savings and Survival to age 65, male.
- The trend line with a $p=0.013$ shows there is a significantly negative relationship between Gross savings and Prevalence of anemia among children.
- The trend line with a $p=0.092$ shows there is a significantly negative relationship between Gross savings and Prevalence of undernourishment.

- **Scatter plot:**

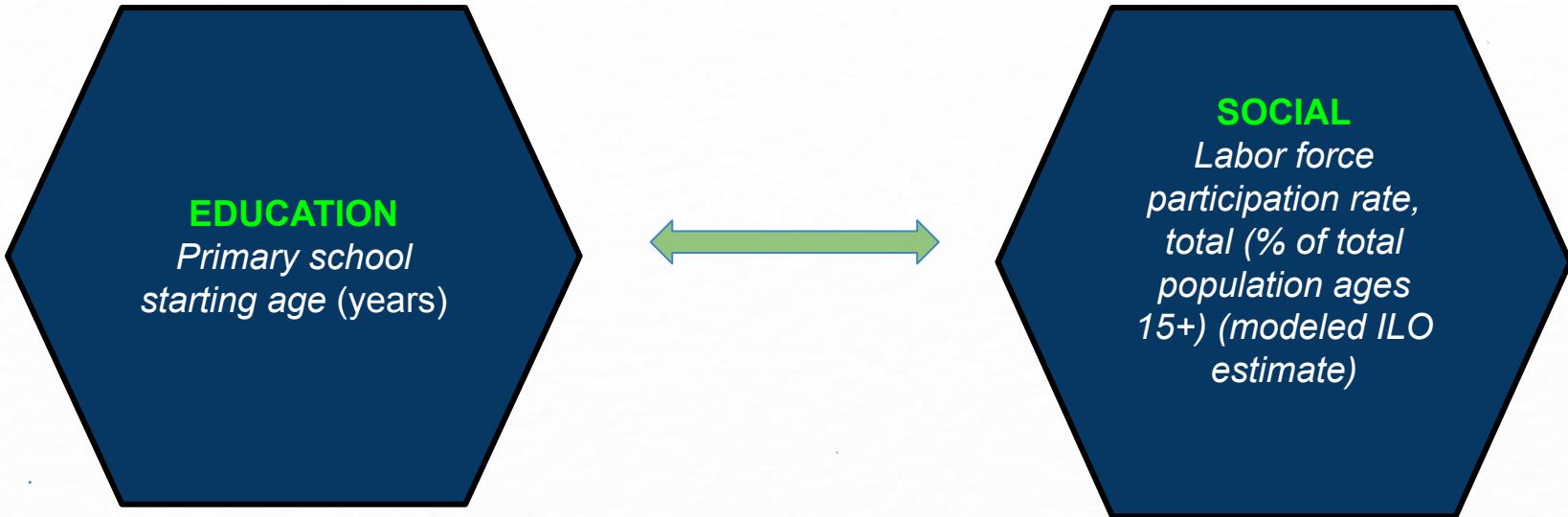
- The trend lines with a low p-value show there is a significantly positive relationship between Gross savings and Survival to age 65, female in Africa, Europe and South America.
- The trend lines with a low p-value show there is a significantly positive relationship between Gross savings and Survival to age 65, male in 4 other continents except Asia.
- The trend lines with a low p-value show there is a significantly negative relationship between Gross savings and Prevalence of anemia among children in Africa and Europe.
- The trend line with a $p=0.00018$ shows there is a significantly negative relationship between Gross savings and Prevalence of undernourishment only in Africa.

RESULTS H2A: Gross savings (% of GDP) is **positively** correlated with *Survival to age 65, female* (% of cohort) and *Survival to age 65, male* (% of cohort).

RESULTS H2B: Gross savings (% of GDP) is **negatively** correlated with *Prevalence of anemia among children* (% of children under 5) and *Prevalence of undernourishment* (% of population)

- Conclusion:
 - Based on the charts, we can conclude that there is a significantly positive correlation between Gross Savings (% of GDP) and Survival to age 65, male and female in most continents.
 - There is a significantly negative correlation between Gross savings (% of GDP) and Prevalence of anemia among children in Africa and Europe.
 - There is a significantly negative correlation between Gross savings (% of GDP) and Prevalence of Undernourishment only in Africa.

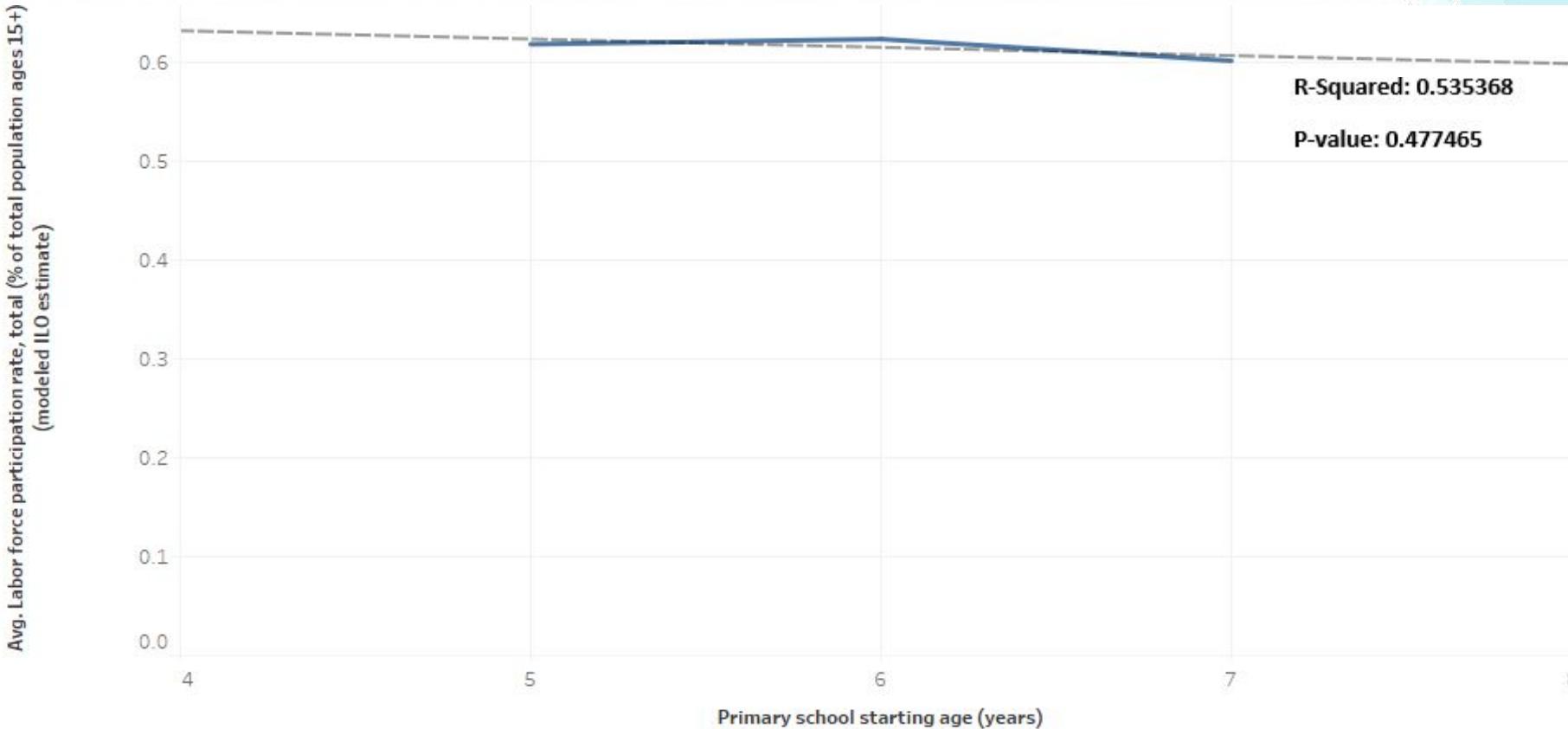
HYPOTHESIS #3



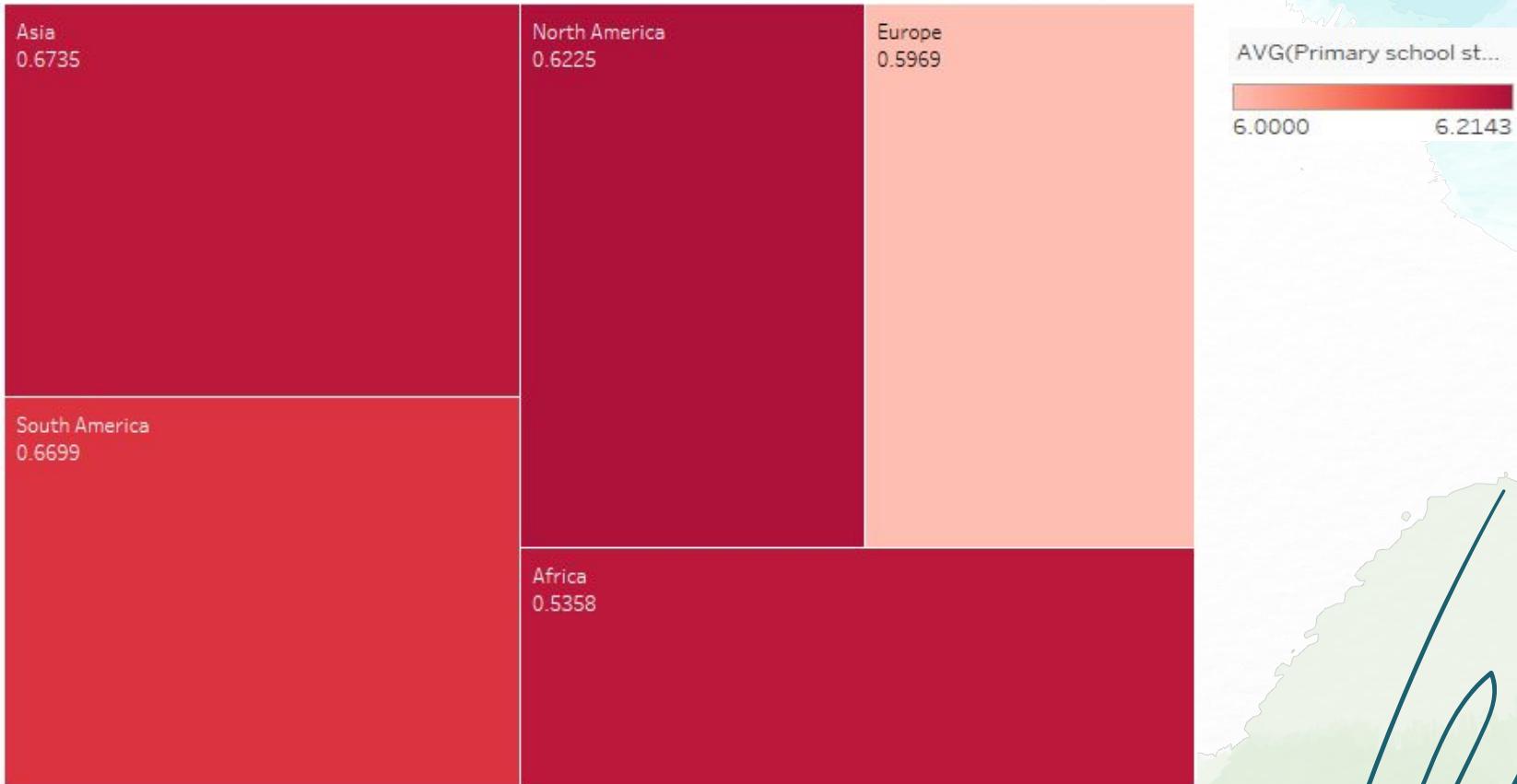
HYPOTHESIS 3:

- **HYPOTHESIS:** *Primary school starting age (years)* is **negatively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate).
- **RATIONALE:** Starting primary school earlier can boost both cognitive and non-cognitive skills easily. Confidence, problem-solving skills, coordination, self-esteem and social skills are the examples of the benefits that can be gained from school. If children cultivate these skills earlier, there will be more people in a country who can supply labor for the production of goods and services.

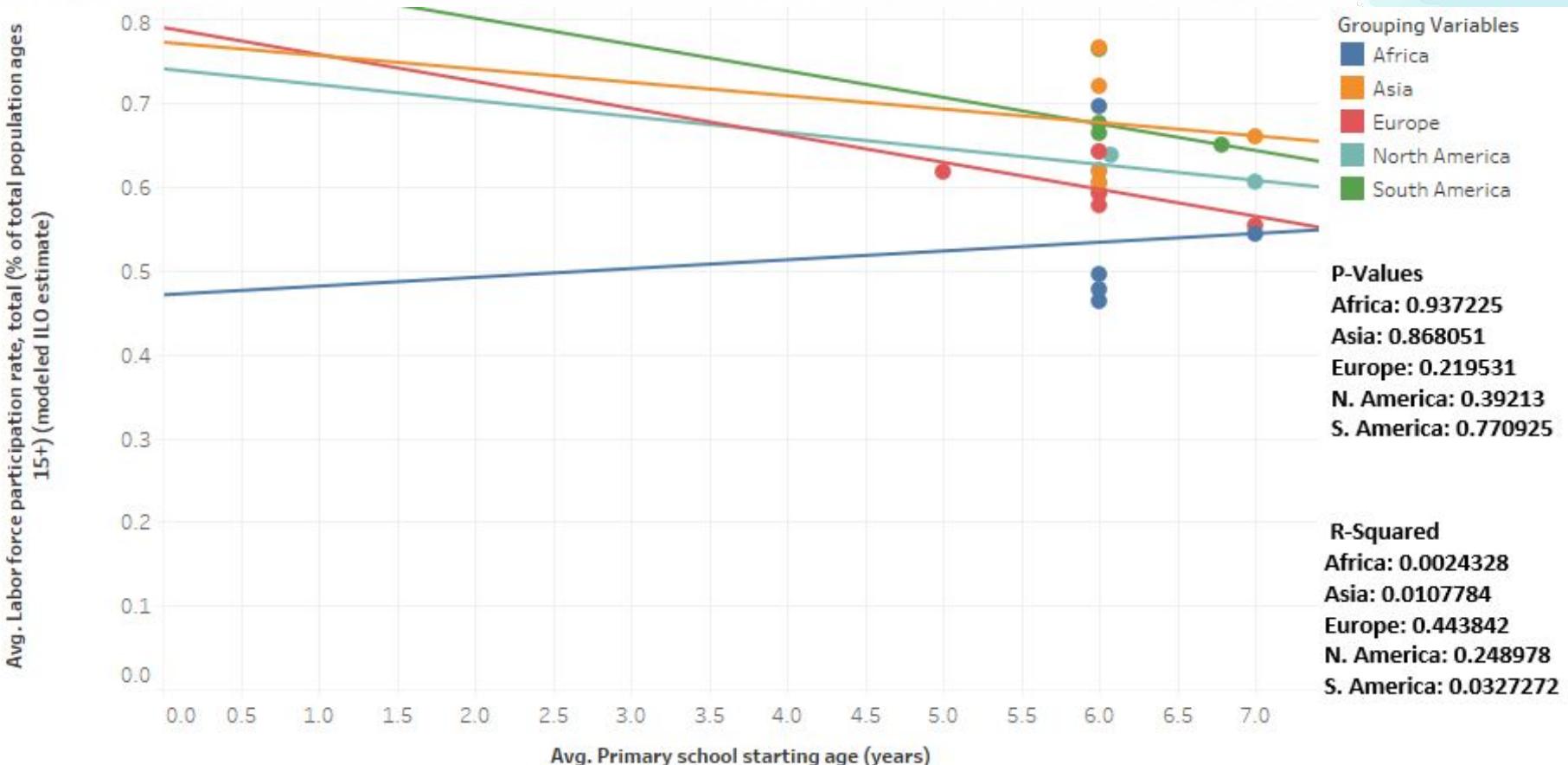
H3: Primary school starting age (years) is **negatively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate).



H3: Primary school starting age (years) is **negatively** correlated with *Labor force participation rate, total* (% of total population ages 15+) (modeled ILO estimate).



H3: Primary school starting age (years) is **negatively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate).



RESULTS H3: Primary school starting age (years) is **negatively** correlated with Labor force participation rate, total (% of total population ages 15+) (modeled ILO estimate).

Line Chart:

- Little to no deviation between the 2 variables across the 25 countries within the 5 continents
- Average force participation rate ranges between 60% to 62.5%
- Primary school starting age (years) ranges between 5 years to 7 years
- Trend Line: R-Squared= 0.54; P-Value= 0.48
 - Indicates a **negative relationship** between the Primary school starting age and Labor force participation rate
 - Barely any correlation between the 2 variables
 - Fairly high P-value, indicates that the null hypothesis is accepted therefore there is no significant relationship between the variables.

Tree Map:

- Color shade indicates the average primary school starting age, and the numbers in the box represent the average labor force participation rate in decimal form.
- Europe had the lowest primary school starting age but did not have the highest labor force participation rate (60%)
- Asia had the highest labor force participation rate (67%) with a higher primary school starting age than Europe
- North America had the highest Primary school starting age with a labor participation rate of 62%
- Overall, all three observations go against our hypothesis

RESULTS H3: Primary school starting age (years) is **negatively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate).

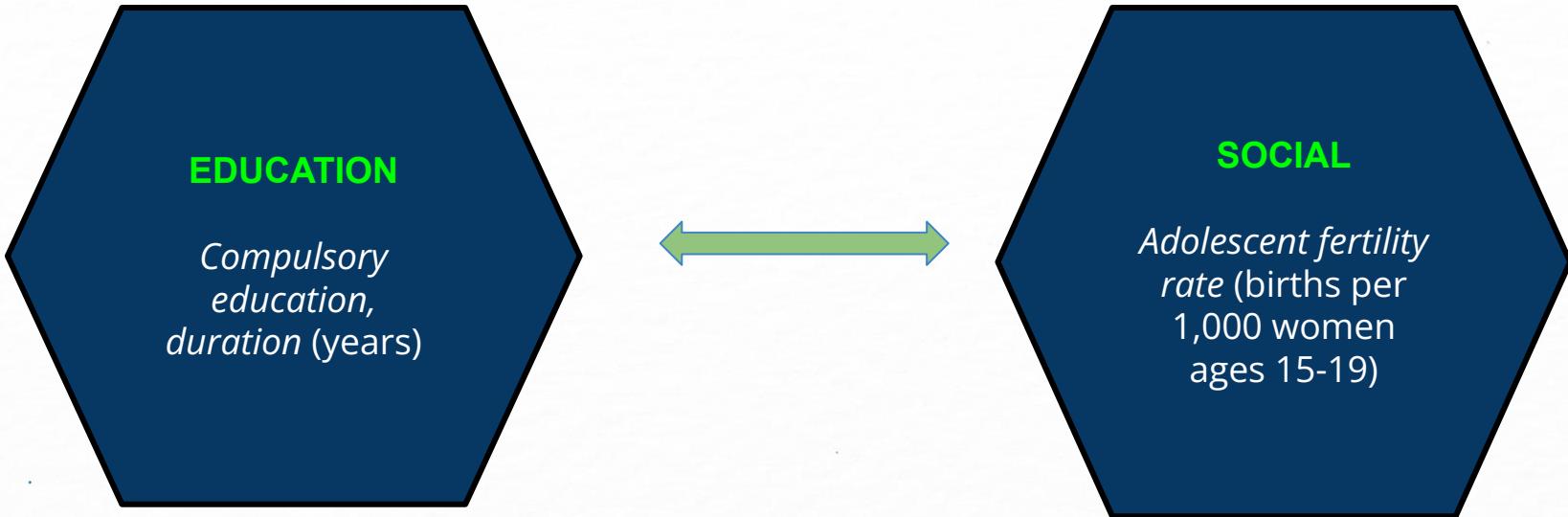
Scatter Plot:

- Africa's trend line indicates a **positive relationship** between the 2 variables
 - R-Squared= 0.0024, P-Value= 0.94
- Europe, North America, South America and Asia's trend indicate a **negative relationship** between the two variables
 - Low R-Squared values indicate that a lot of the data has no correlation to the hypothesis
 - R- Squared range for these 4 continents: 0.44- 0.011. Europe was the highest indicating that this continent was closest to fitting the trend line model, however the R-Squared value still indicated that most of the data's variation could not be explained.

Conclusion:

- ***There is no significant relationship between the average labor force participation rate total (% of total population ages 15+) and the average primary school starting age (years)***

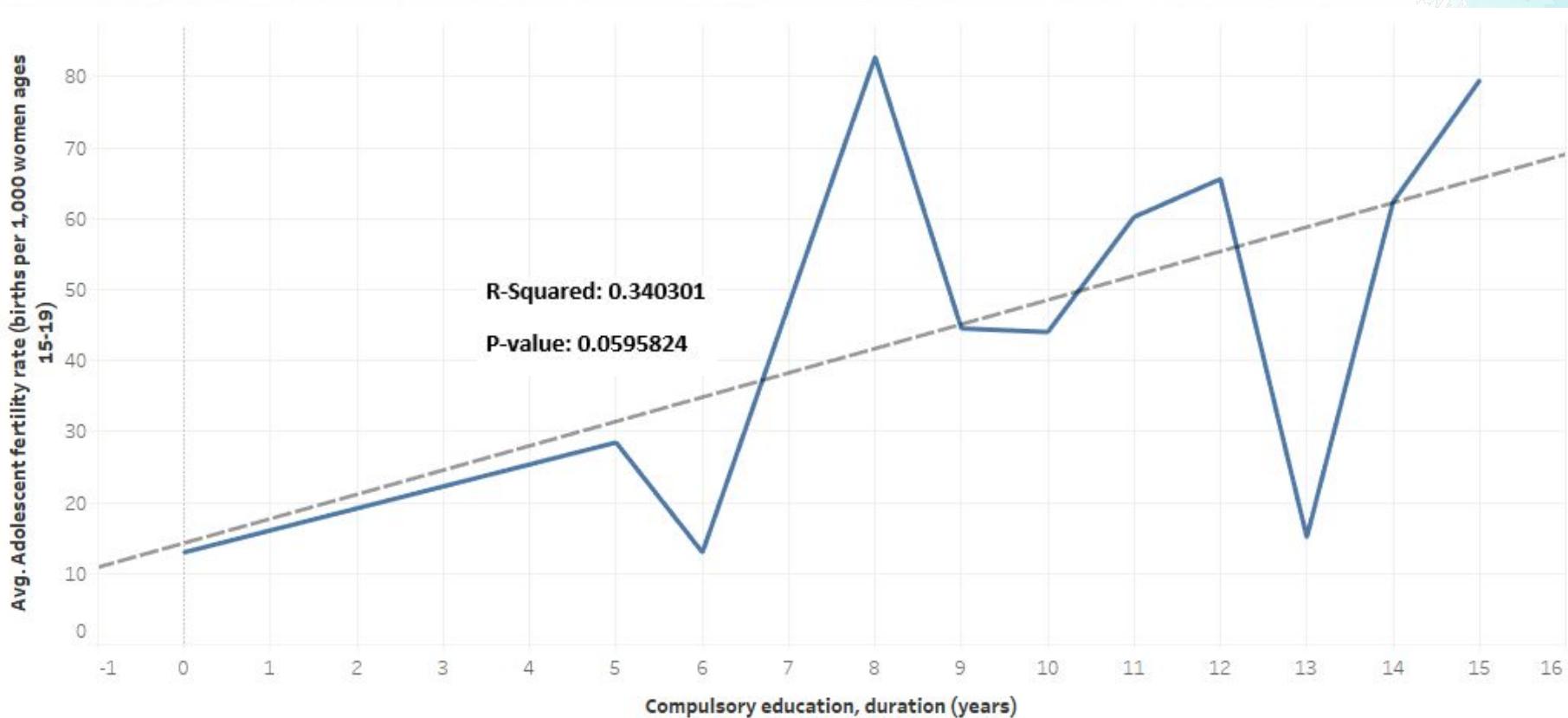
HYPOTHESIS #4



HYPOTHESIS 4:

- **HYPOTHESIS:** *Compulsory education, duration (years)* is **negatively** correlated to *Adolescent fertility rate* (births per 1,000 women ages 15-19)
- **RATIONALE:** The more young women (15-19) stay in school, the more they will be educated about family planning and risks of pregnancies at a young age. This will lower births per 1,000 women ages 15-19.

H4: Compulsory education, duration (years) is **negatively** correlated to Adolescent fertility rate (births per 1,000 women ages 15-19)



H4: Compulsory education, duration (years) is **negatively correlated to Adolescent fertility rate (births per 1,000 women ages 15-19)**



RESULTS H4: Compulsory education, duration (years) is **negatively correlated to Adolescent fertility rate (births per 1,000 women ages 15-19)**

- **Line Chart:**

- Compulsory education (years) ranged from 0 to 15 years
- Big spike was seen for the compulsory education duration of 8 years which had the highest fertility rate births per 1000 women of 82.78
- The lowest fertility rate births per 1000 women was 13, for a compulsory education duration of 6 years
- A 13 year mandatory education duration saw a fairly low fertility rate of 15.16 in support of the hypothesis
- This trend was counteracted by the higher fertility rates seen in longer duration years like 14 and 15 years
- **Trend line** goes against the hypothesis showing a **positive relationship** between the 2 variables:
 - R-Squared is low at 0.34. This shows that 66% of the data's variation cannot be explained

- **Tree Map:**

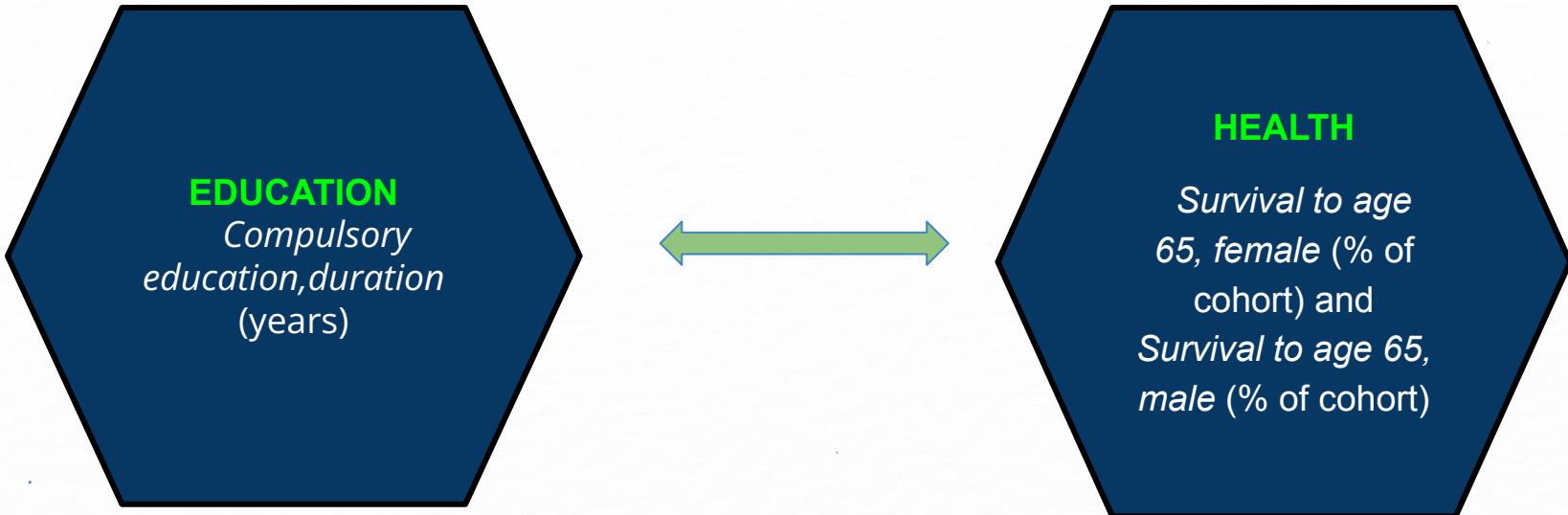
- Color shade represents the average adolescent fertility rate, while the figures in the boxes represent the average compulsory education duration in years for each country
- The highest adolescent fertility rates were seen in North America and South America which had compulsory education years ranging between 10 - 12 years which does not support the hypothesis
- Kenya stood out among the African countries for having the highest fertility rate in this region. Their average compulsory education duration is 8 years (lower end of spectrum), which supports the hypothesis
- Europe had some of the lowest fertility rates, with longer duration years ranging between 9 to 13 years

RESULTS H4: Compulsory education, duration (years) is **negatively** correlated to Adolescent fertility rate (births per 1,000 women ages 15-19)

- **Conclusion:**

- Missing data for Malaysia (Asia) for its compulsory education duration for 2002
- Major peaks in fertility rates per 1000 women were seen for compulsory years 8, 12 and 15
- The greatest increase in fertility rates for consecutive years were seen between 13 and 14 years of education
- ***Despite the few countries in Europe and one country in Africa that supported the hypothesis, no general trend was seen between the compulsory education duration (rates) and the adolescent fertility rate (births per 1,000 women ages 15-19)***

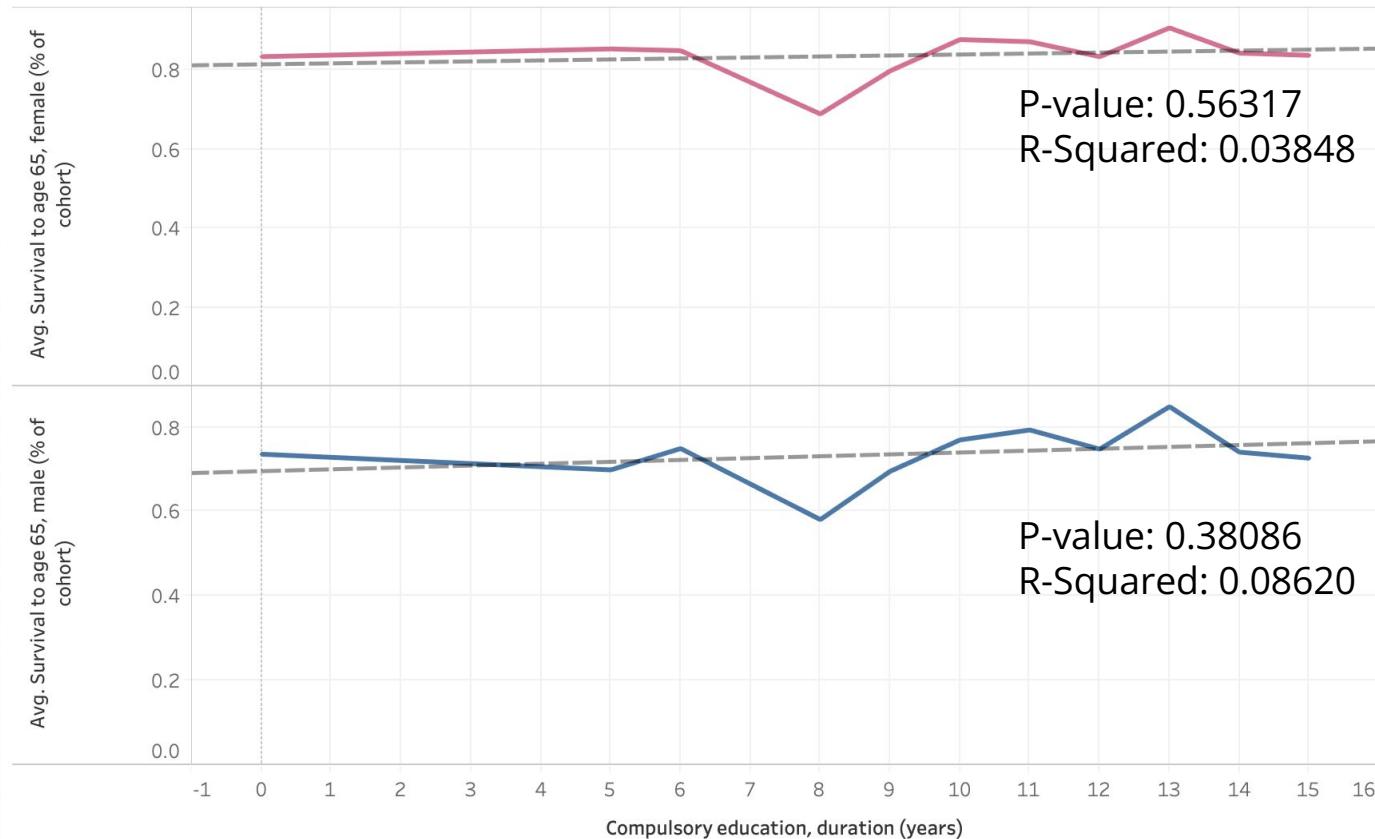
HYPOTHESIS #5



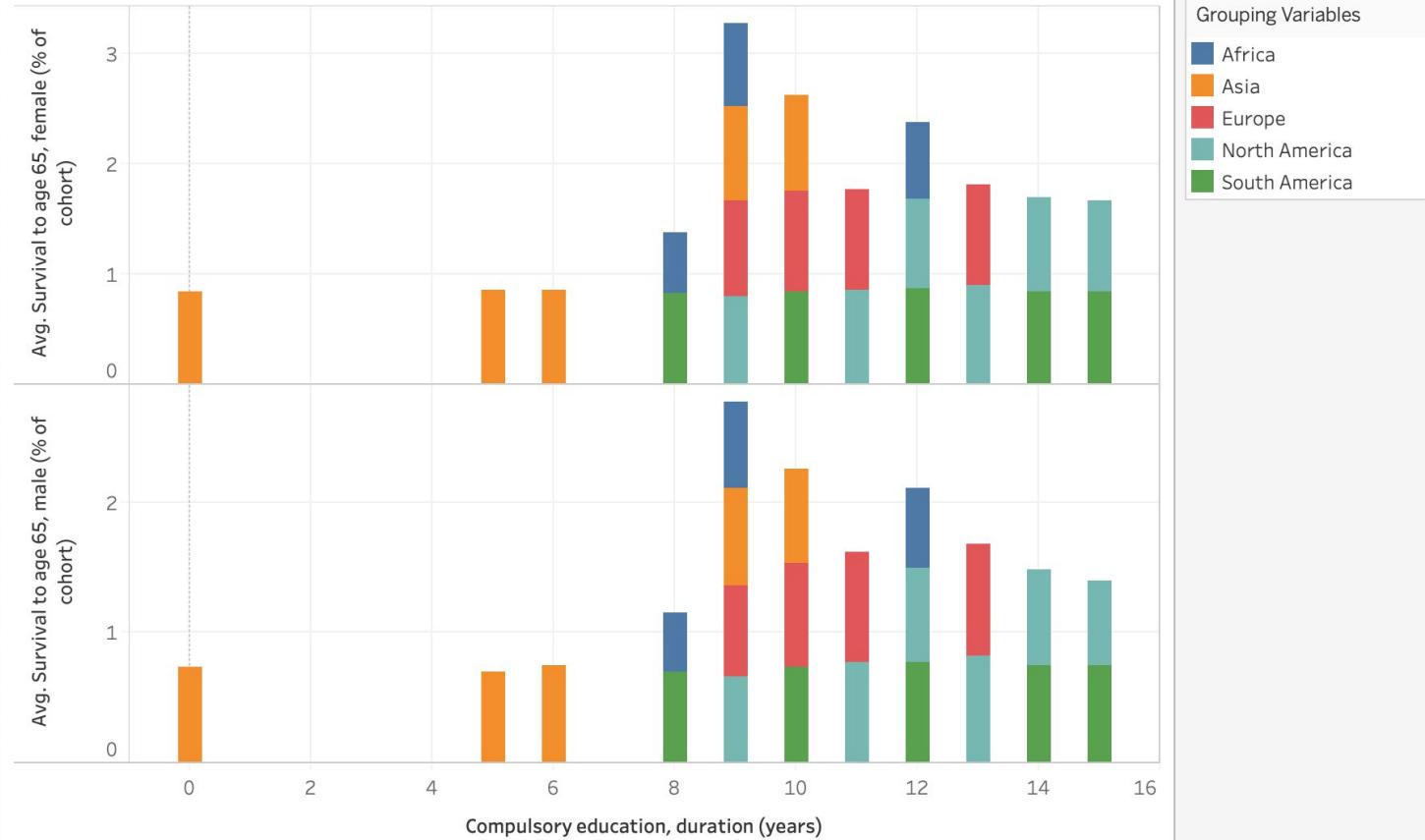
HYPOTHESIS 5:

- **HYPOTHESIS:** *Compulsory education, duration (years) is positively correlated to Survival to age 65, female (% of cohort) and Survival to age 65, male (% of cohort).*
- **RATIONALE:** Males and Females in areas with more years of compulsory education will be more educated on healthy lifestyles such as nutrition, physical education, e.t.c. This in turn makes them survive longer.

H5: Compulsory education, duration (years) is **positively** correlated to Survival to age 65, female (% of cohort) and Survival to age 65, male (% of cohort).



H5: Compulsory education, duration (years) is **positively correlated** to Survival to age 65, female (% of cohort) and Survival to age 65, male (% of cohort).



RESULTS H5: Compulsory education, duration (years) is **positively correlated** to Survival to age 65, female (% of cohort) and Survival to age 65, male (% of cohort).

- **Line Chart:**

- Compulsory education (years) ranged from 0 to 15 years
- Downward dip in survival of both male and females with compulsory education till 8 years.
- Compulsory education above 10 years shows slight increase in both male and female survival rate.
- **Trend line** supports the hypothesis showing a **positive relationship** between the variables
 - R-square is 0.038 while P value is 0.563 for survival of female, and R-square is 0.086 while P-value is 0.380
 - Fairly high P-values depict that positive relationship is not significant.

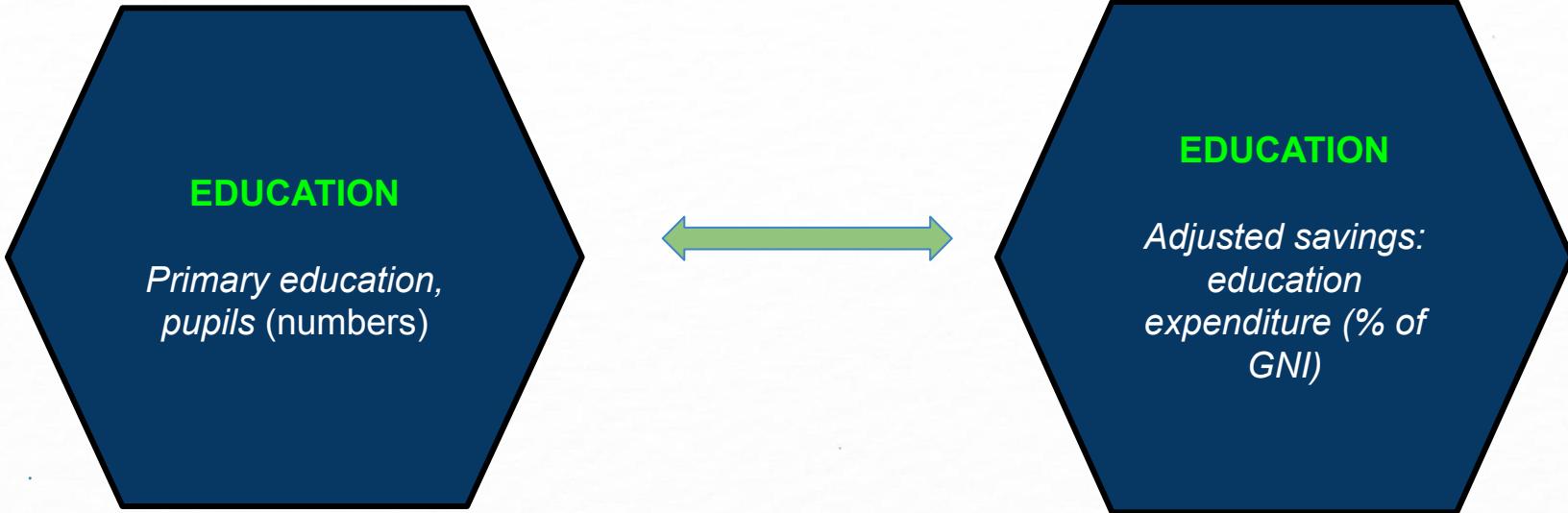
Stacked Bars:

- Compulsory education between 0-6 in asia survival rate is constant, ages 9+ show increase in survival rate.
- South America shows constant survival age even with higher compulsory education.
- Europe and North America show increase in survival rate between ages 12-15.
- Africa shows highest survival rate at compulsory education of 9 years.

Conclusion:

- **Although there is positive relationship between compulsory education, duration (years) and the Survival to age 65, female (% of cohort) and Survival to age 65, male (% of cohort), it is insignificant.**

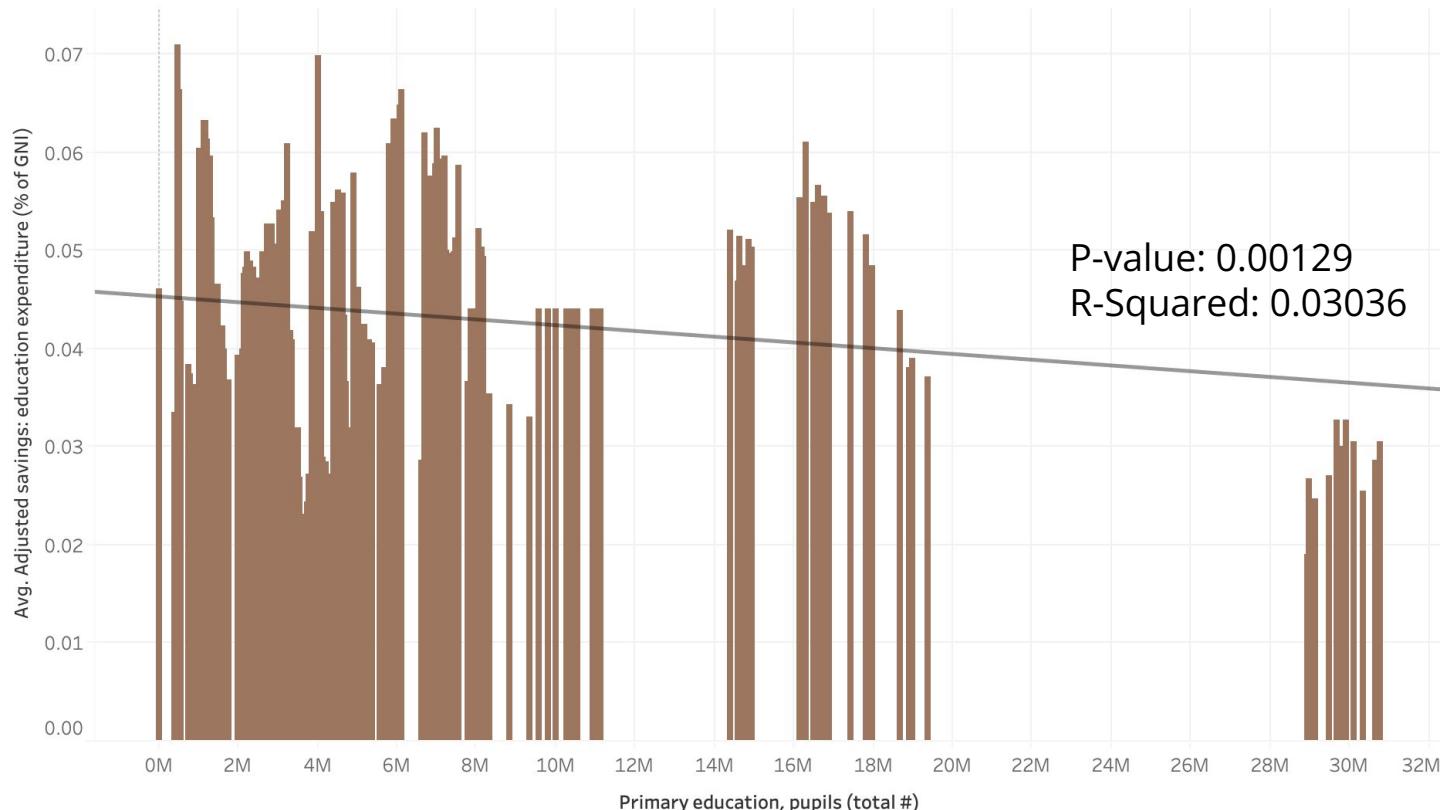
HYPOTHESIS #6



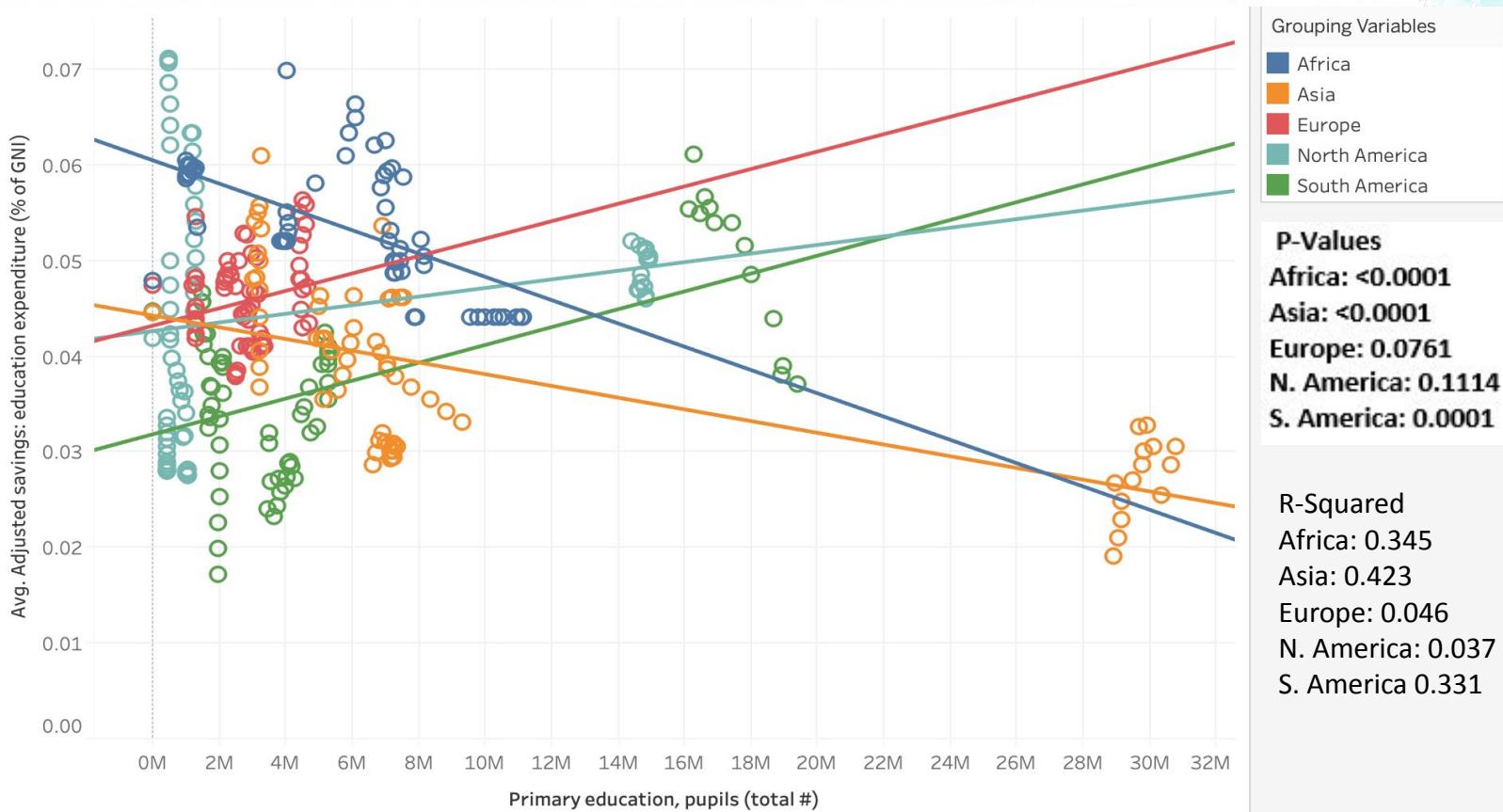
HYPOTHESIS 6:

- **HYPOTHESIS:** *Primary education, pupils* (numbers) is **positively** correlated with
Adjusted savings: education expenditure (% of GNI)
- **RATIONALE:** As the number of primary education pupils increases, the number of primary schools will increase, and there will require more teachers. Thus, the wages and salaries that the country needs to spend on education will increase. This will increase adjusted savings: education expenditure (% of GNI).

H6: Primary education, pupils (numbers) is **positively** correlated with Adjusted savings:
education expenditure (% of GNI)



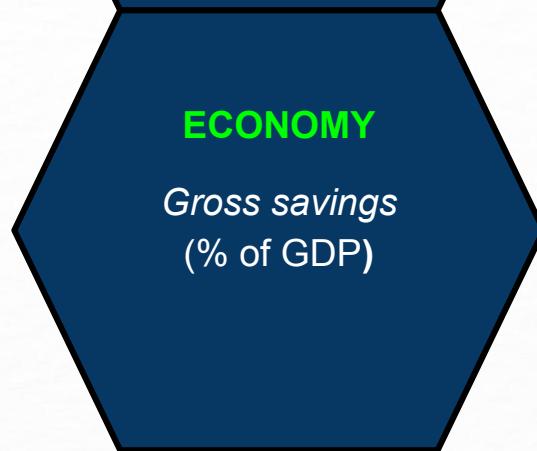
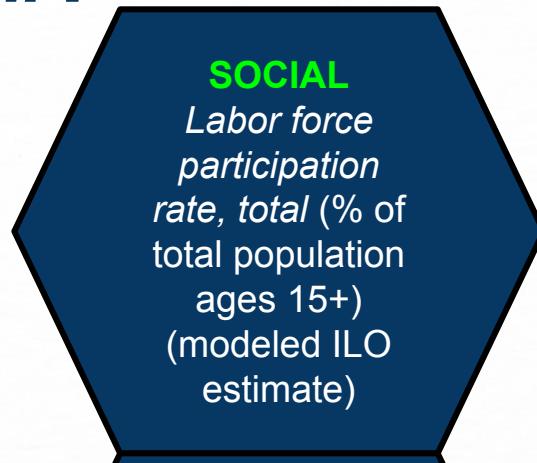
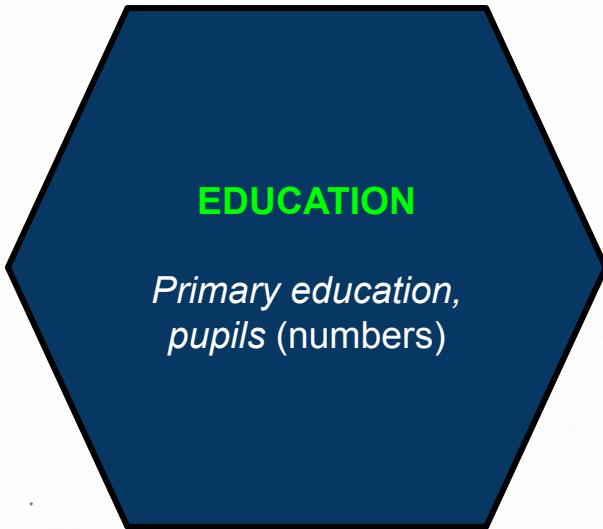
H6: Primary education, pupils (numbers) is **positively** correlated with Adjusted savings: education expenditure (% of GNI)



RESULTS H6: Primary education, pupils (numbers) is **positively correlated with Adjusted savings: education expenditure (% of GNI)**

- **Bar Graph:**
 - Primary education, pupils (total #) ranged from 0 to 31 million
 - Primary education pupils ranging from 0m - 6m had a larger increase in education expenditure.
 - With the total # of pupils above 20m+ we see there is a decrease in adjusted savings.
 - **Trend Line** does not support the hypothesis showing a ***negative relationship*** between the 2 variables
 - R-squared is 0.030 while P-value is 0.001
- **Scatter Plot:**
 - Education expenditures are higher in North America and Africa when primary education total is between 0m-3m
 - Europe, North America and South America's trend line indicates a ***positive relationship*** between the 2 variables, with respective r-squares and p-values
 - R-Squared= 0.046, P-Value= 0.076, R-Squared= 0.03, P-Value= 0.11, R-Squared= 0.033, P-Value= 0.0001,
 - Africa and Asia's trend indicate a ***negative relationship*** between the two variables
 - However, low R-Squared values indicate that a lot of the data has no correlation to each other and therefore the hypothesis
- **Conclusion:**
 - ***Overall, there is no significant relationship between the primary education, pupils (total #) and the Adjusted savings: education expenditure (% of GNI)***

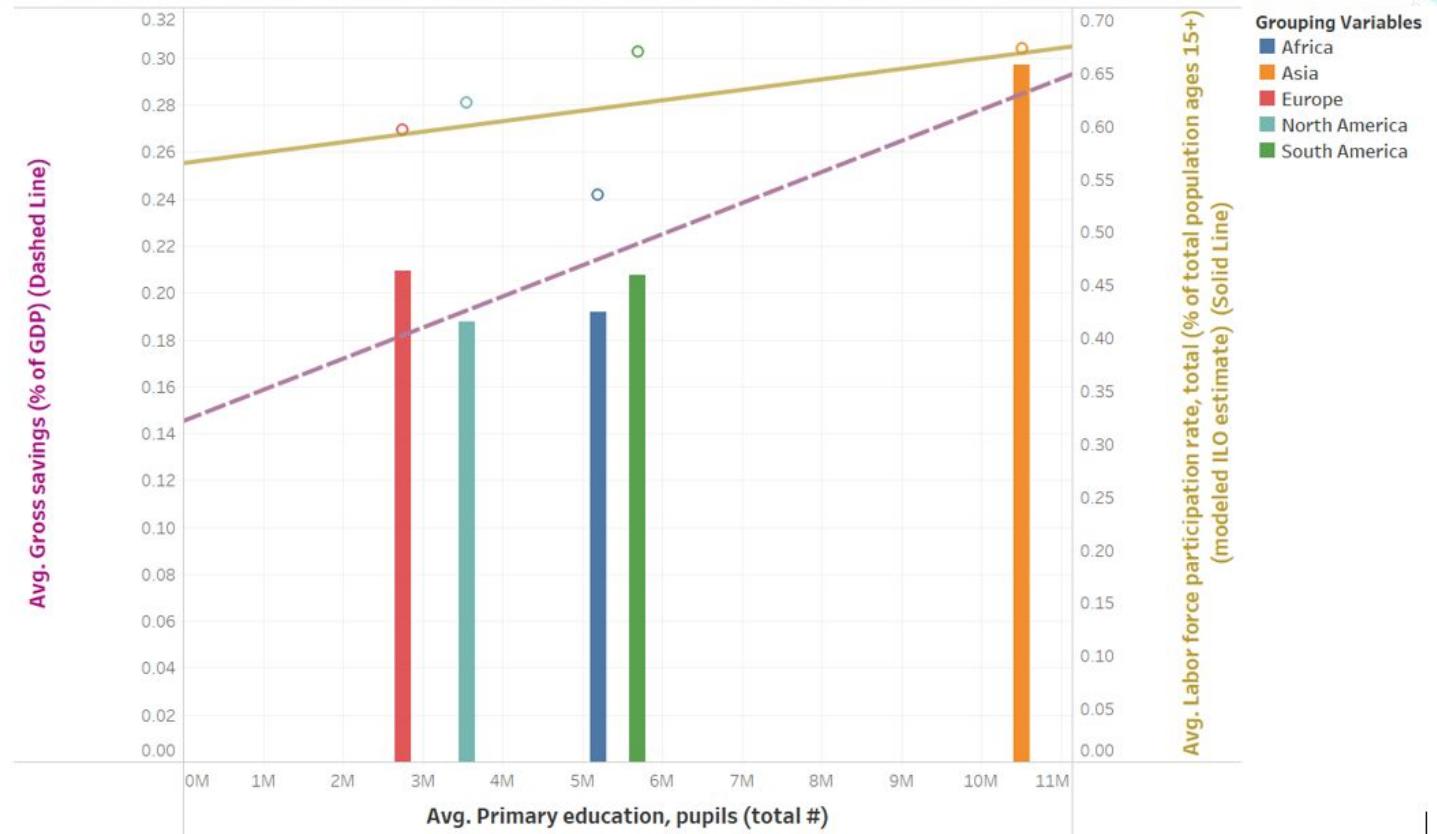
HYPOTHESIS #7



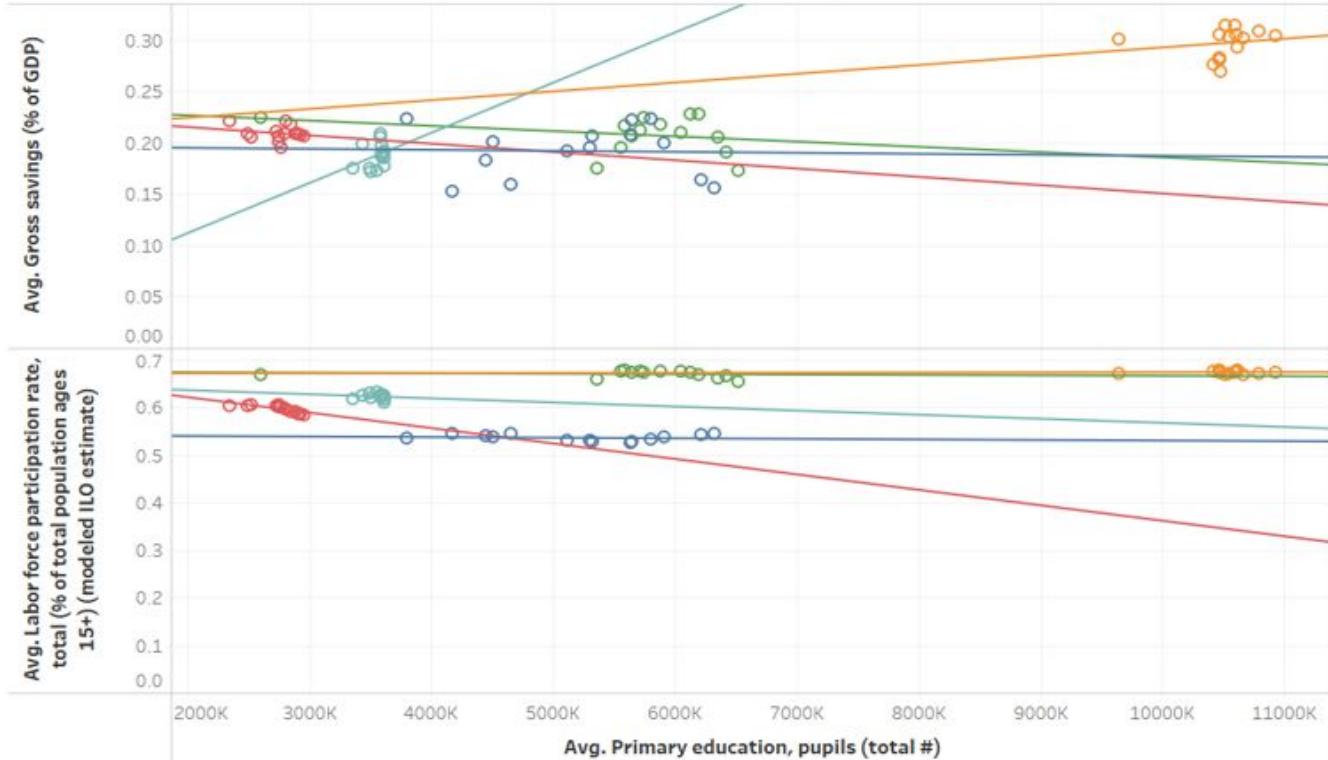
HYPOTHESIS 7:

- **HYPOTHESIS:** *Primary education, pupils* (numbers) is **positively** correlated with *Labor force participation rate, total* (% of total population ages 15+) (modeled ILO estimate) and *Gross savings* (% of GDP).
- **RATIONALE:** As the number of primary education pupils increases, educated workers will increase. (Even if they only graduated from primary school and did not attend a higher level school.) A country's economy becomes more productive as the proportion of educated workers increases since educated workers can more efficiently carry out tasks that require literacy and critical thinking. Also, there will be more people who can supply labor for the production of goods and services.

H7: Primary education, pupils (numbers) is **positively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate) and *Gross savings (% of GDP)*.



H7: Primary education, pupils (numbers) is **positively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate) and *Gross savings (% of GDP)*.



RESULTS H7: Primary education, pupils (numbers) is **positively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate) and *Gross savings (% of GDP)*.

- **Scatter Plot:**

- Average of Primary education, pupils (total #) ranged from 2.3 m to 11m
- Average of Gross savings (% of GDP) ranged from 15% to 31%
- Average of Labor force participation rate, total (% of total population ages 15+) (modeled ILO estimate) ranged from 53% to 68%
- The trend line graph of Primary education, pupils vs Gross savings shows statistically a positive relationship in North America and Asia and a negative relationship in the other 3 continents.
- The trend line graph of Primary education, pupils vs Labor force shows statistically a positive relationship only in Asia and a negative relationship in the other 4 continents

RESULTS H7: Primary education, pupils (numbers) is **positively** correlated with *Labor force participation rate, total (% of total population ages 15+)* (modeled ILO estimate) and *Gross savings (% of GDP)*.

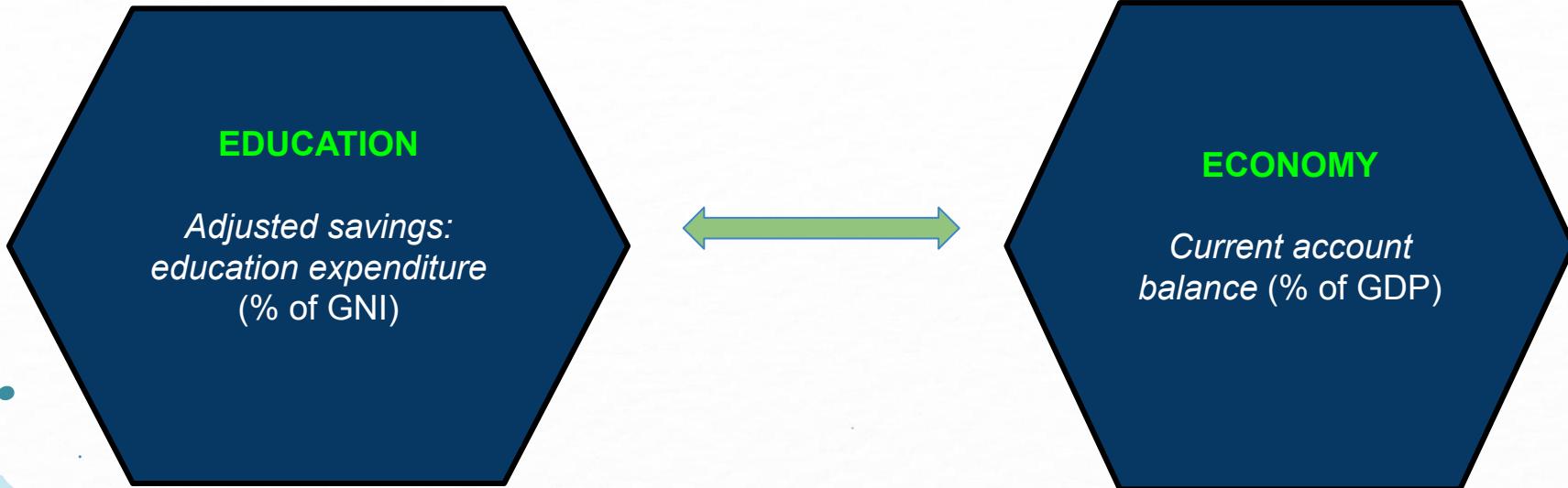
- **Bar Chart:**

- The trend line of Primary education, pupils vs Gross savings (aggregated model) shows that when Primary education, pupils increases the Gross savings increases.
- The trend line with a $p<0.04$ confirms there is a significant relationship between Primary education, pupils, and Gross savings.
- The trend line of Primary education, pupils vs Labor force participation rate, total, shows that when Primary education, pupils increases the Labor force increases.
- The trend line with a $p>0.36$ confirms there is no significant relationship between Primary education, pupils and Labor force.

- **Conclusion:**

- Missing data for Primary education for the following countries and years:
 - Egypt for 2008 and 2015; Kenya for 2010 – 2013; Thailand for 2003; Netherlands for 2013 and 2014; Poland for 2015; Costa Rica for 2003; Honduras for 2002; Brazil for 2006; Columbia for 2003
- ***There is a statistically positive relationship between Primary education, pupils and Gross savings in North America and Asia.***
- ***There is a statistically positive relationship between Primary education, pupils and Labor force only in Asia.***

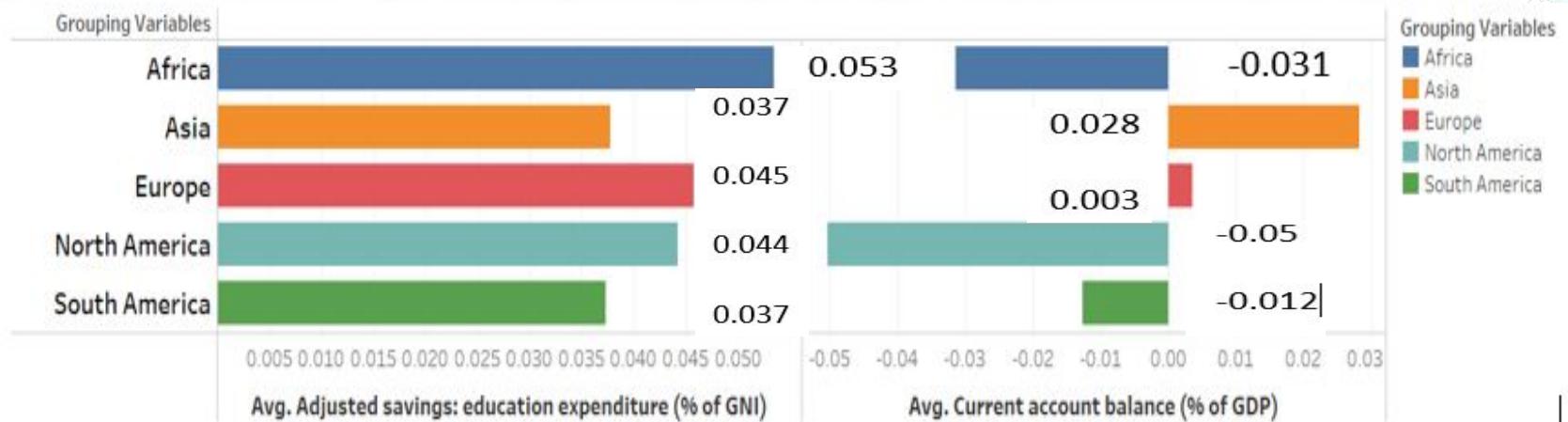
HYPOTHESIS #8



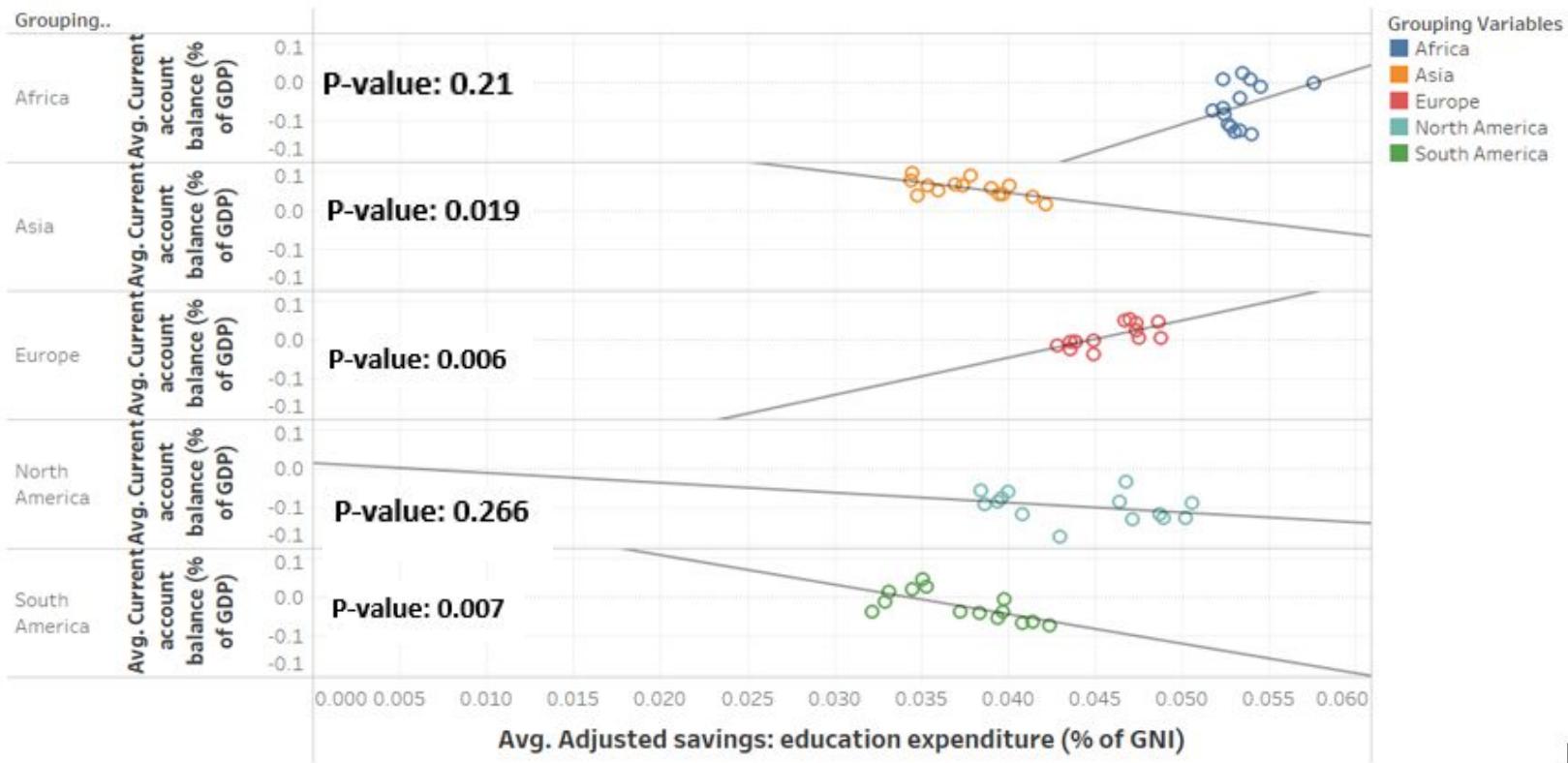
HYPOTHESIS 8:

- **HYPOTHESIS:** *Adjusted savings: education expenditure (% GNI)* is **positively** correlated with *Current account balance (% of GDP)*.
- **RATIONALE:** The current account balance is the sum of net exports of goods and services, net primary income, and net secondary income. (World Bank, 2021) The more expenditure on education can show that a country attaches more importance to education. Education enriches people's understanding of themselves and the world. Education raises people's productivity, creativity and promotes entrepreneurship and technological advances. In addition, education plays a very crucial role in securing economic and social progress and improving income distribution, all of which contributes to a better current account balance (% of GDP).

H8: Adjusted savings: education expenditure (% GNI) is **positively** correlated with *Current account balance* (% of GDP).



H8: Adjusted savings: education expenditure (% GNI) is **positively** correlated with *Current account balance* (% of GDP).



RESULTS H8: *Adjusted savings: education expenditure (% GNI) is positively correlated with Current account balance (% of GDP).*

- **Horizontal Bar Chart:**

- Length of left Horizontal bars shows the average expenditure on education by the 5 Continents and the length of right Horizontal bars shows the 5 continents' average current account balance. Color differentiates the continents from each other.
- Africa and Europe have the highest average education expenditure, Asia has a high average current account balance and North America has the lowest average current account balance at -5%.

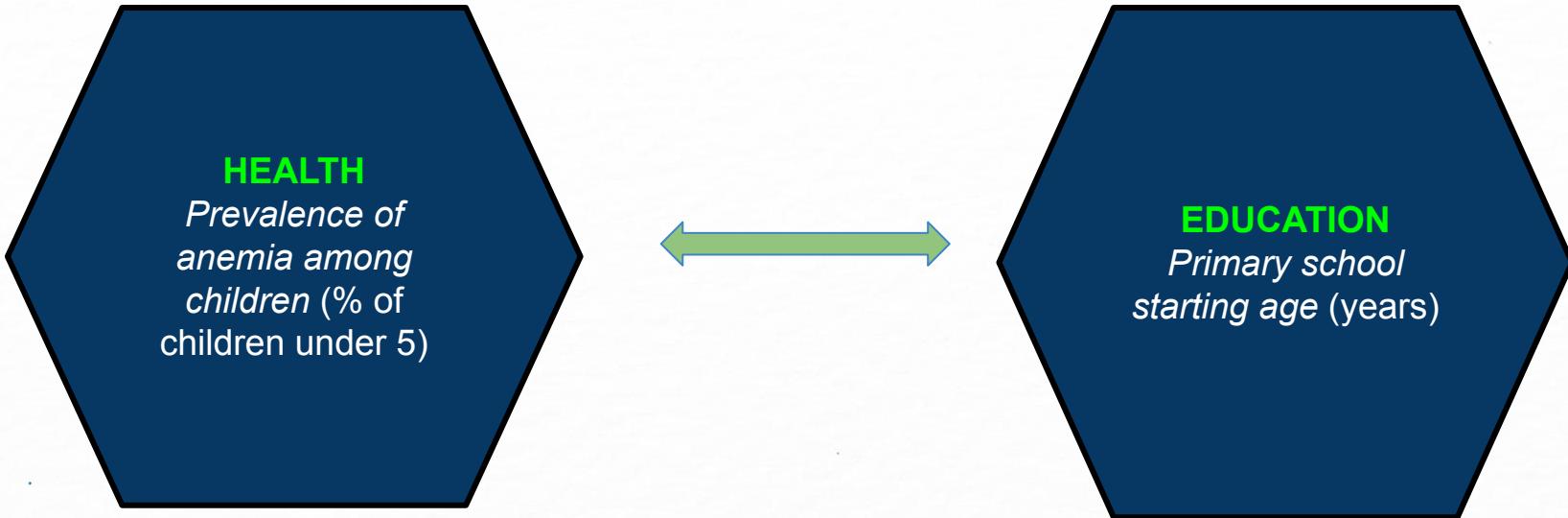
- **Scatter Plot:**

- Adjusted savings: education expenditure (% GNI) ranged from 3.2% to 5.8%
- Current account balance (% of GDP) ranged from -8.9% to 4.8%
- The trend line graph indicates a ***positive relationship*** between the Adjusted savings: education expenditure vs Current account balance for Africa and Europe but the trend line of Africa has a high p-value of 0.22.
- So, the trend line graph of Adjusted savings: education expenditure vs Current account balance confirms a significantly positive relationship only in Europe and a negative relationship in the other 4 continents.

- **Conclusion:**

- ***There is a significantly positive relationship between the Adjusted savings: education expenditure and Current account balance only in Europe.***

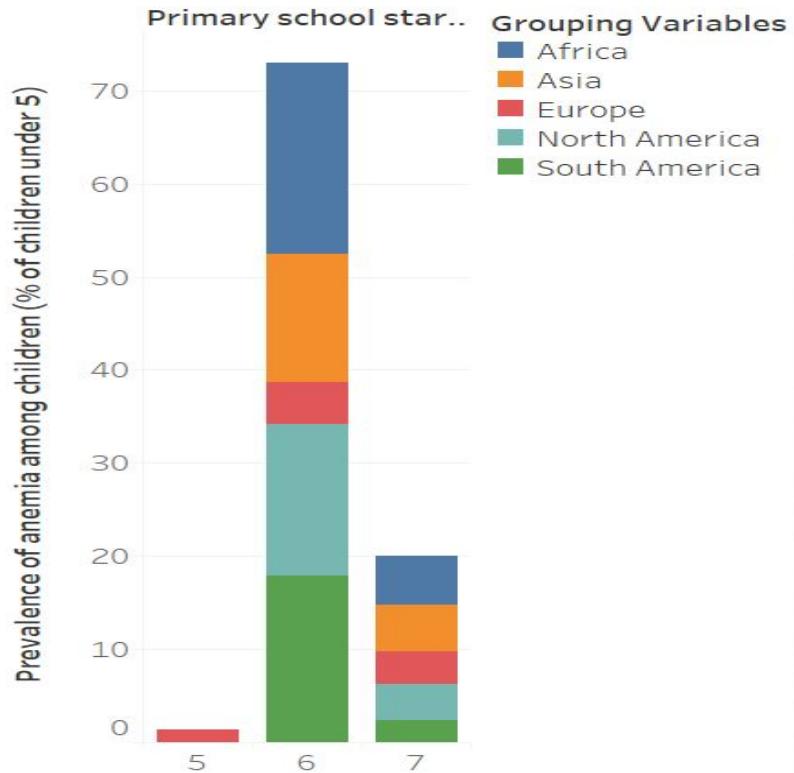
HYPOTHESIS #9



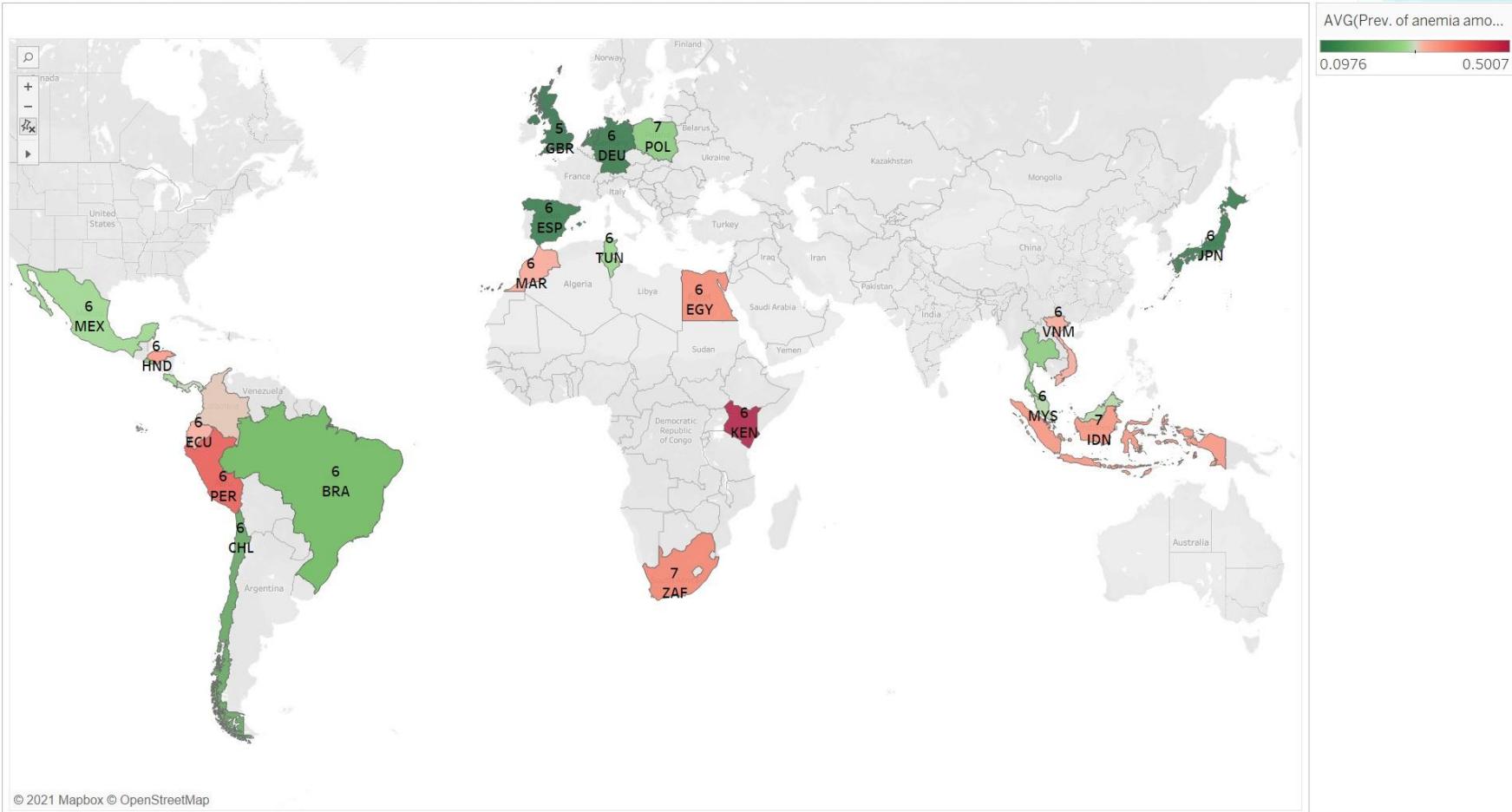
HYPOTHESIS 9:

- **HYPOTHESIS:** *Prevalence of anemia among children* (% of children under 5) is **positively** correlated with *Primary school starting age* (years).
- **RATIONALE:** Anemia continues to become a major public health problem in some countries particularly among younger children as they are more vulnerable to this sickness and its consequences. Thus, when the prevalence of anemia among children is increased, the primary school starting age will also increase as children are then forced to start primary school at a later age due to the illness.

H9: Prevalence of anemia among children (% of children under 5) is **positively** correlated with Primary school starting age (years).



H9: Prevalence of anemia among children (% of children under 5) is **positively** correlated with Primary school starting age (years).



RESULTS H9: Prevalence of anemia among children (% of children under 5) is **positively correlated with Primary school starting age (years).**

- **Horizontal Bars:**

- Most of the continents in our analysis have a starting age of 6 regardless of the rate of prevalence of anaemia among children under 5
- Only Europe (red) has countries that have a starting age of 5 and it has the lowest rate of prevalence of anaemia among all the continents we analyzed

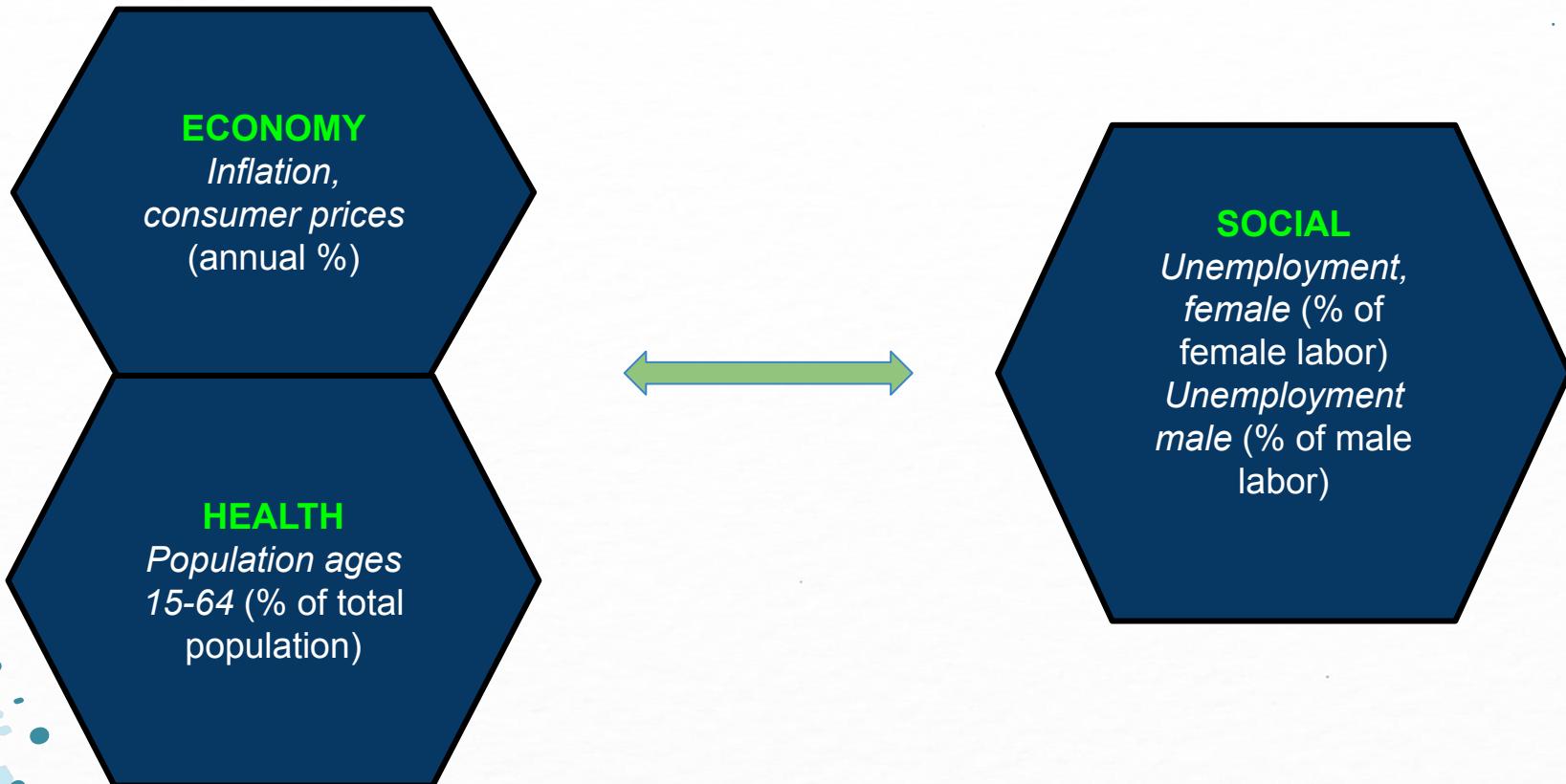
- **Symbol Map:**

- World map shows countries color coordinated in a way that the darker the green, the lower the average prevalence of anaemia among children under 5 years; The darker the red, the higher the prevalence of anaemia among children under 5 years in those countries.
- Kenya has the highest average prevalence of anemia (0.5007) among children under the age of 5. United Kingdom has the least average prevalence of anemia among children under 5 (0.0976).
- Kenya is one of the countries tied with the highest Primary School starting age (7) and Great Britain is one of the countries tied with the lowest Primary School starting age (5).
- This pattern however is not uniformed in all countries. For example, Japan has a very low prevalence of anemia (0.1098) represented by a dark green color yet, it has the same Primary School starting age (6) as Kenya, Peru and Egypt to name a few. These three countries all happen to have a red color indicating they have a higher prevalence of anemia among children under 5.

- **Conclusion:**

- ***The prevalence of anemia in children under 5 has no effect on Primary School starting age in the current countries analyzed because a good number countries with low and high anaemia rates have the same primary school starting age***

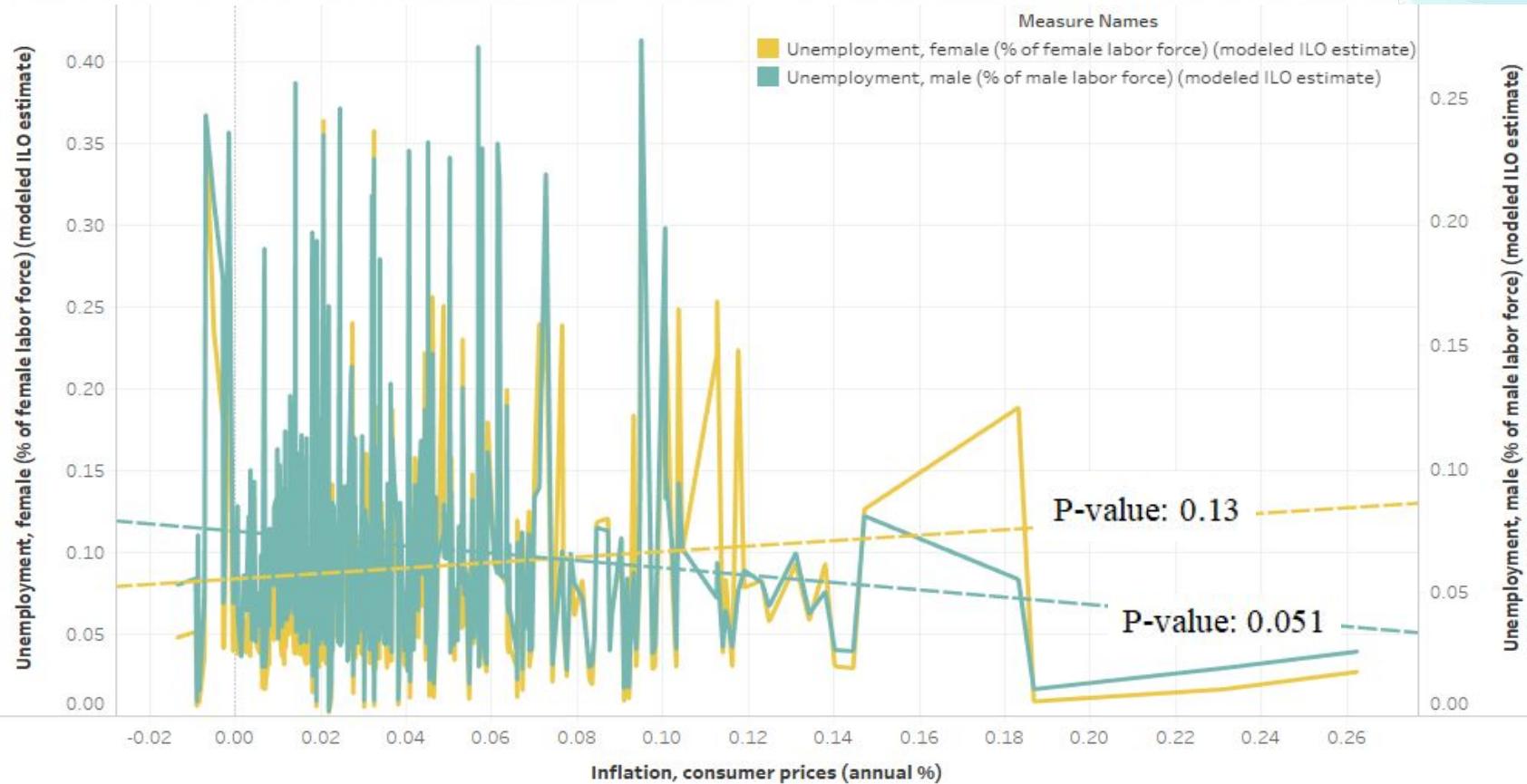
HYPOTHESIS #10



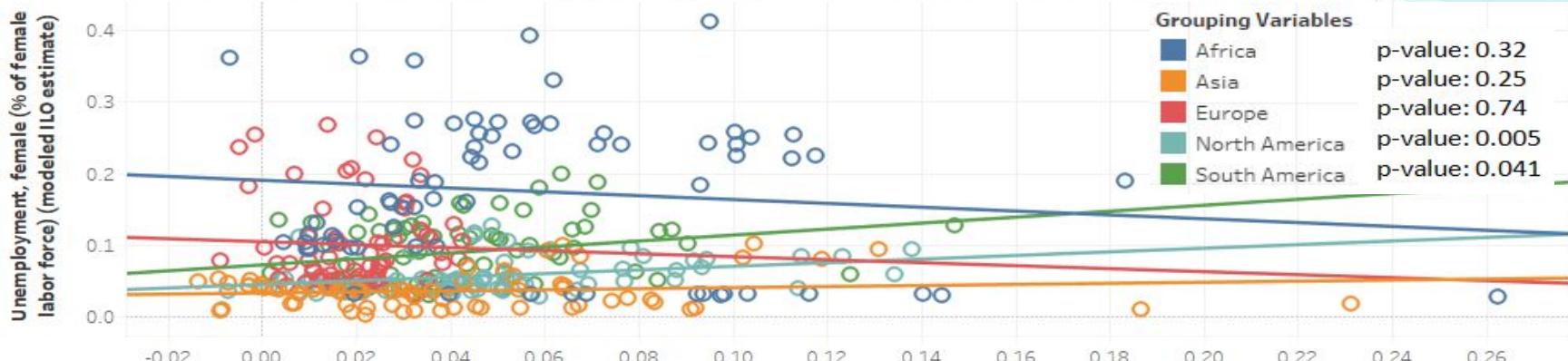
HYPOTHESIS 10:

- **HYPOTHESIS-10a:** *Inflation, consumer prices (annual %)* is **positively** correlated with *Unemployment, female (% of female labor force)* and *Unemployment, male (% of male labor force)*.
- **HYPOTHESIS-10b:** *Population ages 15-64 (% of total population)* is **positively** correlated with *Unemployment, female (% of female labor force)* and *Unemployment, male (% of male labor force)*.
- **RATIONALE:** 1. A high inflation rate can hurt the economy. Since everything costs more, manufacturers produce less and may be forced to lay off workers. 2. The more the population ages 15-64 increase, the more available labor a country has. This makes the labor market more competitive, which will result in it being difficult for people to find jobs, which will thus lead to an increase in the unemployment rate.

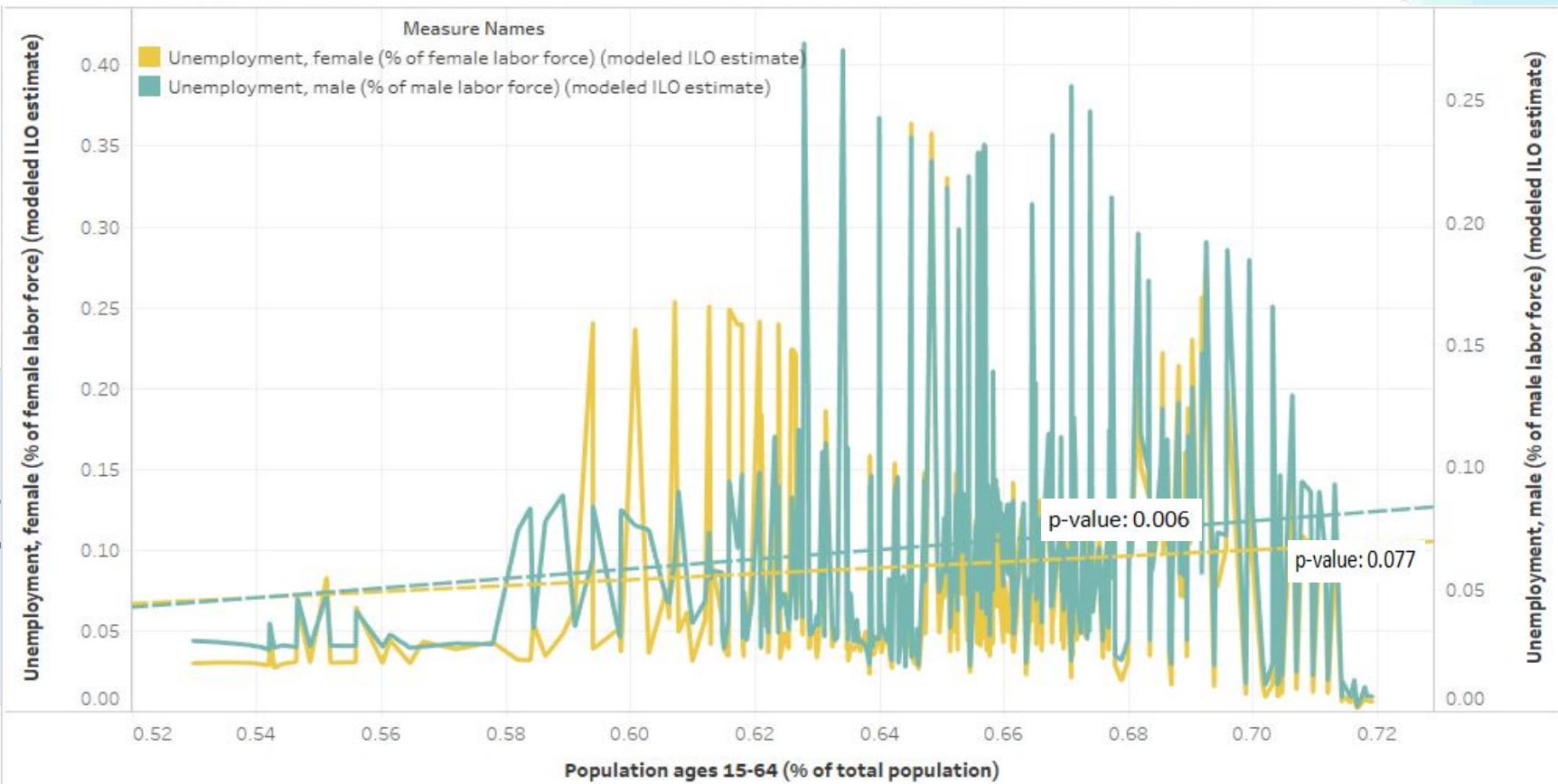
H10a: *Inflation, consumer prices (annual %)* is **positively** correlated with *Unemployment, female (% of female labor force)* and *Unemployment, male (% of male labor force)*.



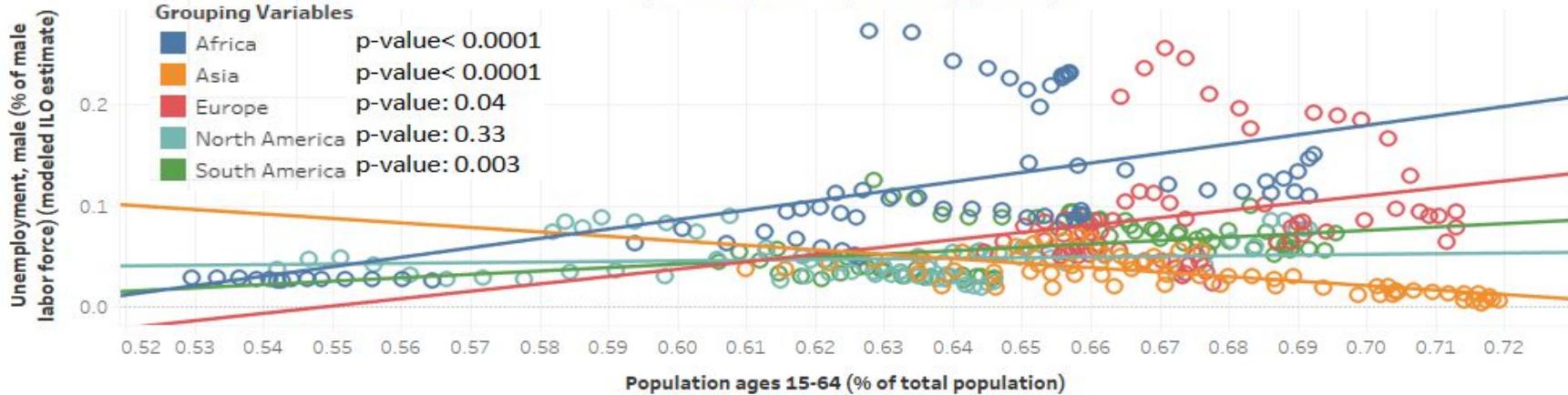
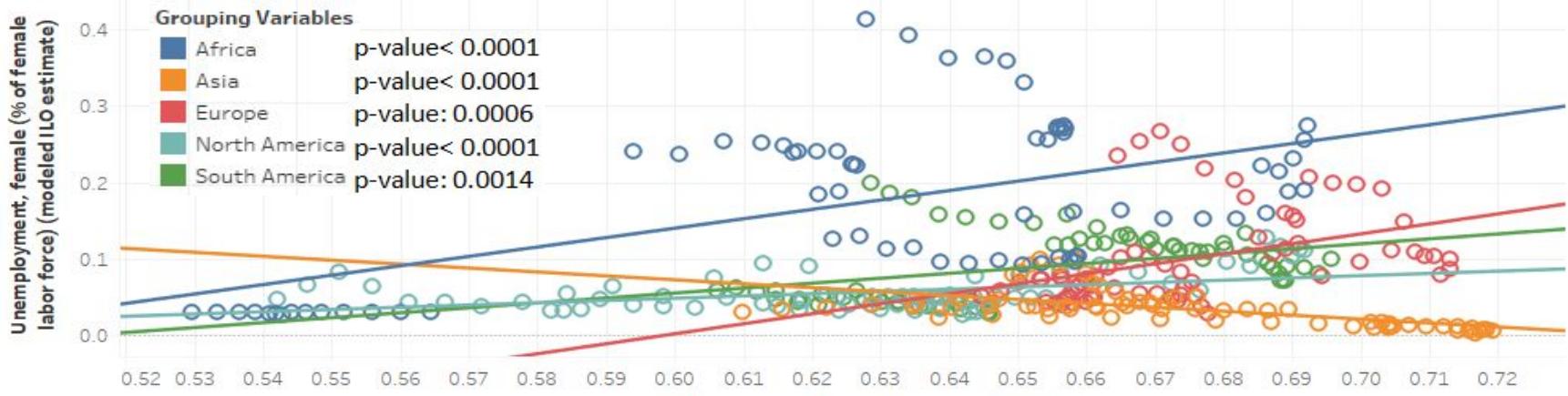
H10a: Inflation, consumer prices (annual %) is **positively** correlated with Unemployment, female (% of female labor force) and Unemployment, male (% of male labor force).



H10b: Population ages 15-64 (% of total population) is **positively** correlated with Unemployment, female (% of female labor force) and Unemployment, male (% of male labor force).



H10b: Population ages 15-64 (% of total population) is **positively** correlated with Unemployment, female (% of female labor force) and Unemployment, male (% of male labor force).



RESULTS H10a: *Inflation, consumer prices (annual %)* is **positively** correlated with *Unemployment, female* (% of female labor force) and *Unemployment, male* (% of male labor force).

H10b: *Population ages 15-64 (% of total population)* is **positively** correlated with *Unemployment, female* (% of female labor force) and *Unemployment, male* (% of male labor force).

- Data available for all countries and years we chose.
- **Dual Line Chart: When combined with 5 Continents data,**
 - the trend line of Inflation VS Unemployment(male) shows that when Inflation increases, the Unemployment(male) decreases; and the trend line of Inflation VS Unemployment(female) shows a positive relationship but with a high p-value of 0.13. Thus, **there is not a significantly positive association between Inflation and Unemployment(female/male).**
 - the trend line of Population ages 15-64 VS Unemployment(female) and the trend line of Population ages 15-64 VS Unemployment(male) show that when Population ages 15-64 increases, the Unemployment (female&male) increases. And, the trend line with a p-value of 0.08 and the trend line with a p-value of 0.006 confirm the above observation that **there is a significantly positive association between Population ages 15-64 and Unemployment (female/male)**, although the correlation coefficients are small.

RESULTS H10a: *Inflation, consumer prices (annual %)* is **positively** correlated with *Unemployment, female* (% of female labor force) and *Unemployment, male* (% of male labor force).

H10b: *Population ages 15-64 (% of total population)* is **positively** correlated with *Unemployment, female* (% of female labor force) and *Unemployment, male* (% of male labor force).

- **Scatter Plot:**

- The trend lines of Inflation VS Unemployment(female) with p-values of 0.0005 and 0.041 show a **significantly positive relationship between Inflation and Unemployment(female) only in North America and South America** but a negative relationship in Africa and Europe.
- The trend lines graph of Inflation VS Unemployment(male) shows a negative relationships between Inflation and Unemployment(male) in North America, Africa, Asia and Europe; and shows a positive relationship in South America, but the trend line of South America has a high p-value of 0.13. Thus, **Inflation has no significantly positive impact on Unemployment(male) in the 5 Continents we chose.**
- The trend lines of Population ages 15-64 VS Unemployment(female) with a low p-value show that **except Asia, the Population ages 15-64 has significantly positive impact on Unemployment(female) in the Continents we chose.**
- The trend lines of Population ages 15-64 VS Unemployment(male)with a low p-value show that **Population ages 15-64 has significantly positive impact on Unemployment(male) in Africa, Europe and South America.**

RESULTS H10a: *Inflation, consumer prices (annual %)* is **positively** correlated with *Unemployment, female (% of female labor force)* and *Unemployment, male (% of male labor force)*.

H10b: *Population ages 15-64 (% of total population)* is **positively** correlated with *Unemployment, female (% of female labor force)* and *Unemployment, male (% of male labor force)*.

- **Conclusion:**
- ***There is no significant relationship between the Inflation(consumer prices) and Unemployment of (female&male).***
- ***There is a significantly positive correlation between Population ages 15-64 and Unemployment of (female&male).***



SUMMARIZED KEY RESULTS

SUMMARIZED KEY RESULTS

Based on our data:

- Heavy investment into a country's education sector does not guarantee less unemployment levels for its population.
- A country's investment in education can contribute to its economic development. Thus, countries should increase investing in education as that has the potential of increasing their current account balance.
- Normal assumption is that a country with a longer compulsory education duration will have a lower adolescent fertility rate, however this is false as the relationship between these 2 variables is insignificant.
- Primary school starting age has no major impact on a country's Economy, Health sector, or its Social Development.
- Growing economies are associated with longer and healthier lives. The increase in gross savings of a country has shown to reduce the rates of undernourishment for countries in Africa.

04

SCOPE & LIMITATIONS

SCOPE AND LIMITATIONS

Scope:

- The purpose of this study was to analyze and compare how Education influences each of the following aspects:
 - ◆ Economy
 - ◆ Social Development
 - ◆ Health
- The time period of this study was from the years 2002 through 2015.
- The topics covered in this study was whether Education had a significant relationship between the various variables, Economy, Social Development and Health.
 - The geographical location covered in this study were as follows:
 - ◆ 5 countries in Asia (Japan, Thailand, Vietnam, Indonesia, and Malaysia)
 - ◆ 5 countries in Africa (South Africa, Egypt Arab Republic, Tunisia, Morocco, and Kenya)
 - ◆ 5 countries in Europe (Germany, Spain, Netherlands, United Kingdom, and Poland)
 - ◆ 5 countries in North America (Mexico, Panama, El Salvador, Costa Rica, and Honduras)
 - ◆ 5 countries in South America (Brazil, Peru, Colombia, Ecuador, and Chile)

SCOPE AND LIMITATIONS

Limitations:

- Only 5 countries per continent were analyzed so, conclusions drawn may not represent the other countries that were not analyzed.
- Data only represents 14 years of data from 2002 to 2015. As such, the relationships and trends presented could be different for years prior to 2002 and years after 2015.
- Missing data for Compulsory education for the following countries and years:
 - ◆ Malaysia for 2002
- Missing data for Primary education for the following countries and years:
 - ◆ Egypt for 2008 and 2015; Kenya for 2010 – 2013; Thailand for 2003; Netherlands for 2013 and 2014; Poland for 2015; Costa Rica for 2003; Honduras for 2002; Brazil for 2006; Columbia for 2003

05

CONCLUSIONS & FUTURE RESEARCH

CONCLUSIONS AND FUTURE RESEARCH

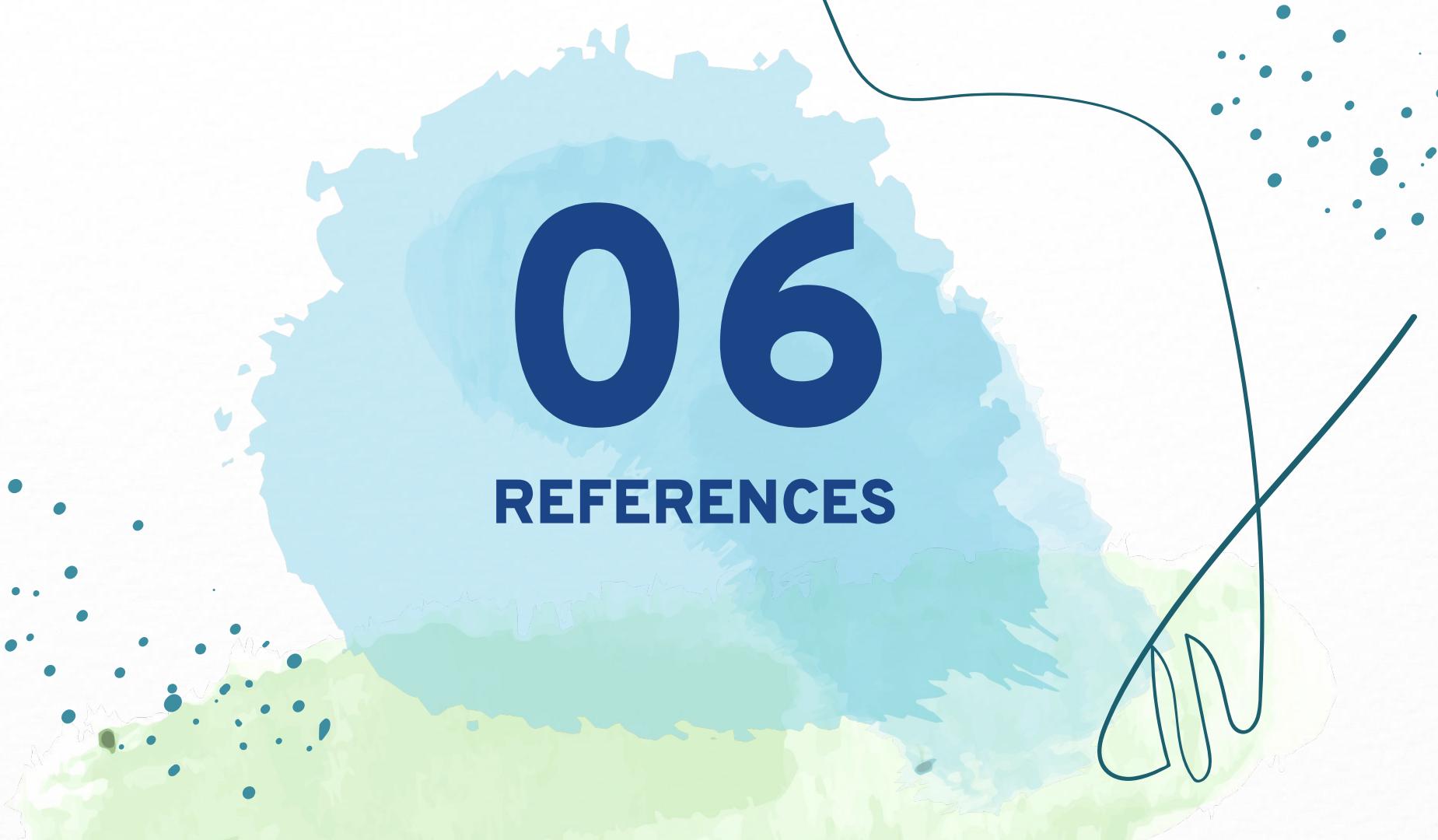
- **Build upon findings:**
 - Expand the number of countries studied per continent to 15 or more in order to have a more representative sample
 - Expand the time period studied to 15-20+ years
- **Explore more variables within each category:**
 - Some variables such as primary school starting age as an example are inconclusive; other causal factors/variables need to be included in the regression in order to have a more complete conclusion of the hypotheses.
- **Explore new categories as Education may have a greater impact on them than those explored in this study:**
 - Examples of these categories can be ***Technology and Innovation*** or the ***Environment*** as these both influence a country's development to a great extent. Studying how access to or a lack of access to Education impacts such categories, can be of great insight to a country's decision making process.

CONCLUSIONS AND FUTURE RESEARCH

- Analyze more recent data to understand how over time education requirements have evolved. This in turn may provide more context of their impact on developmental factors such as those explored in this study.

06

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THANK YOU!

