The effect of aging on the current account

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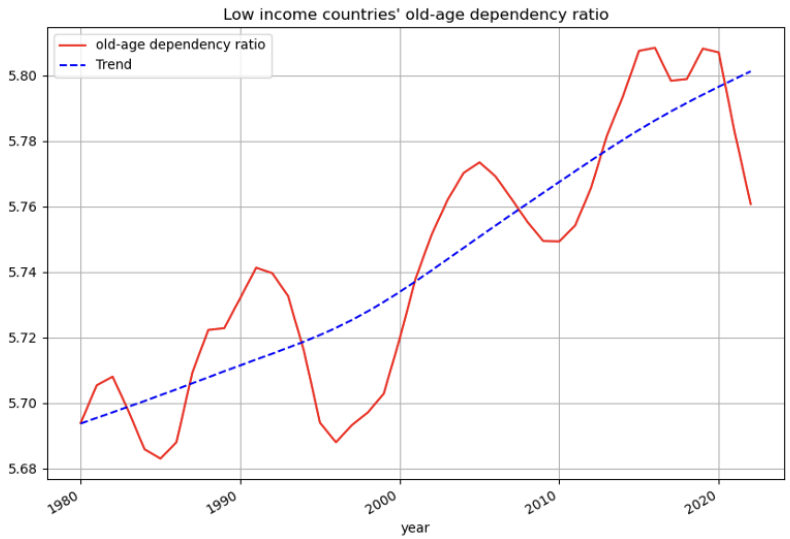
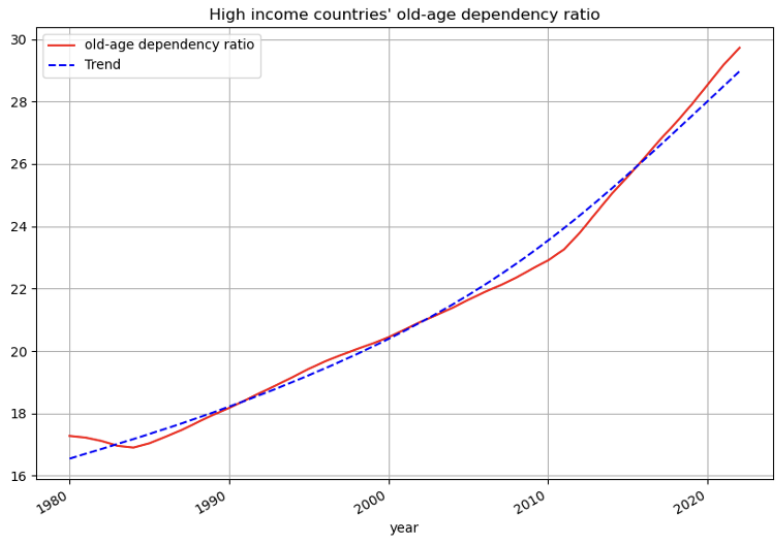
Introduction

Motivation

Aging Population

- Both low- and high-income countries show an increasing trend of old-age dependency ratio for the last 40 years.
- High-income countries' old-age dependency ratio doubles.

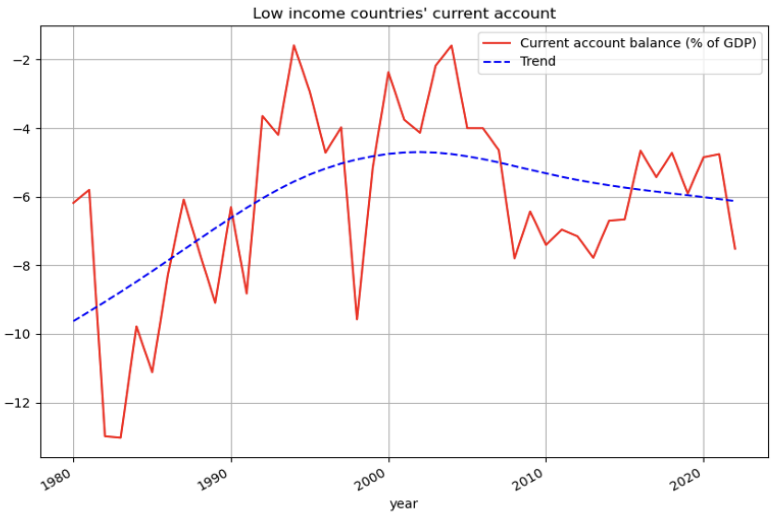


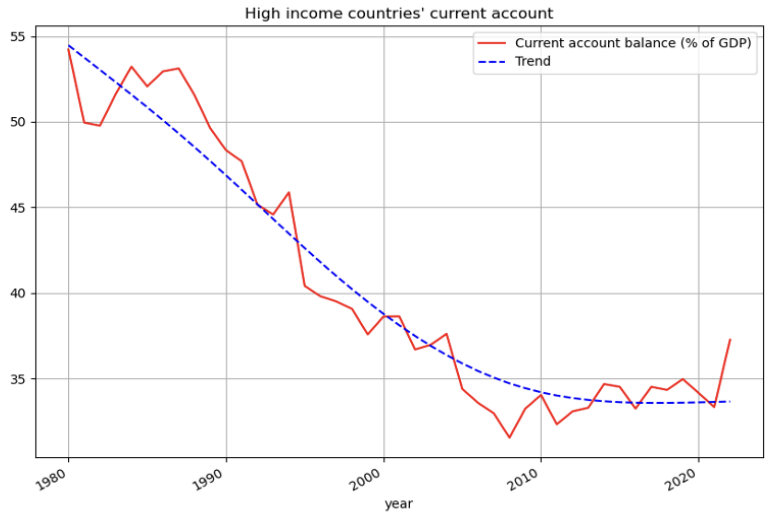


Motivation

The Current Account

- Low-income countries show an increasing trend in the current account, whereas high-income countries show a decreasing trend over the last 40 years.

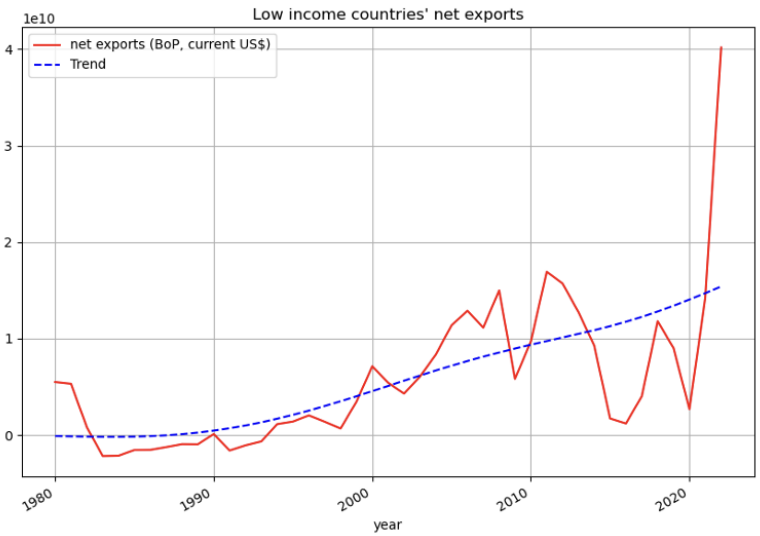


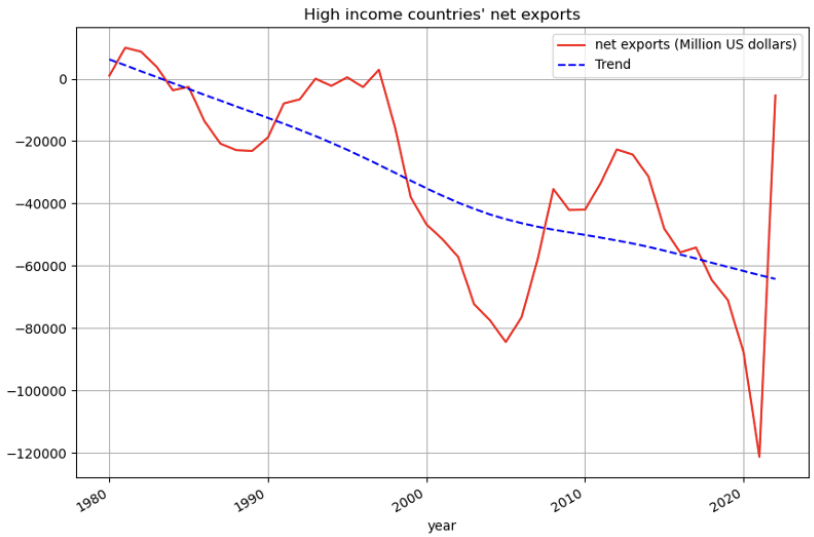


Motivation

Net Exports

- Low-income countries show an increasing trend in net exports, whereas high-income countries show a decreasing trend over the last 40 years.





Research Topic

Empirical research on the effect of aging on the current account

- Aging affects the current account through net exports
- Collect relevant data
- Two regression analysis
  (1) The effect of aging on the current account
  (2) The effect of aging on net exports

Mechanism

Mechanism


Aging
Real wage increases
Price level increases
Net exports decreases
Current account decreases

Data and Methodology

Data

- Data source: World Bank database
- Annual data of 106 countries showed an increasing trend of old-age dependency ratio
- From 1980 to 2022
- Current Account, Net exports, Old-age dependency ratio, Real GDP, Consumer Price Index, Real effective exchange rate, Real interest rate, Government reserves

Methodology

Arellano-Bond dynamic panel data estimation

$$NX_{i,t} = \alpha_i + \beta_3 * NX_{i,t-1} + \beta_4 * DC_{i,t} + \gamma_2 * \mathbf{Z}_{i,t} + \epsilon_{i,t} \quad (1)$$

- $NX_{i,t}$: Net exports
- Old-age dependency ratio (%): percentage of elderly $\frac{age \geq 65}{15 \leq age \leq 64}$ * $15 \leq age \leq 64$: working population
- α_i: Country-fixed effect
- $\mathbf{Z}_{i,t} = \{$Real GDP, Consumer Price Index, Real effective exchange rate, Real interest rate, Government reserves$\}$

Methodology

Arellano-Bond dynamic panel data estimation

$$NX_{i,t} = \alpha_i + \beta_3 * NX_{i,t-1} + \beta_4 * DC_{i,t} + \gamma_2 * \mathbf{Z}_{i,t} + \epsilon_{i,t} \quad (1)$$

- Net exports: Percentage of GDP (%)
- Real GDP: take log (lnGDP)
- Consumer Price Index: take log (lnCPI)
- Real effective exchange rate: take log (lnREER)
- Real interest rate (%)
- Government reserves: Percentage of GDP (%)

Methodology

Arellano-Bond dynamic panel data estimation

$$CA_{i,t} = \alpha_i + \beta_1 * CA_{i,t-1} + \beta_2 * DC_{i,t} + \gamma_1 * \mathbf{X}_{i,t} + \epsilon_{i,t} \quad (2)$$

- Current account balance (% of GDP)
- α_i: Country-fixed effect
- $\mathbf{X}_{i,t} = \{$Real GDP, Consumer Price Index, Real effective exchange rate, Real interest rate$\}$

Empirical Results

Empirical Results

- Mechanism estimation
  $NX_{i,t} = \alpha_i + \beta_3 * NX_{i,t-1} + \beta_4 * DC_{i,t} + \gamma_2 * \mathbf{Z}_{i,t} + \epsilon_{i,t}$
- Main regression estimation
  $CA_{i,t} = \alpha_i + \beta_1 * CA_{i,t-1} + \beta_2 * DC_{i,t} + \gamma_1 * \mathbf{X}_{i,t} + \epsilon_{i,t}$

Mechanism estimation

Variables	Estimated Coefficient
Net Exports $_{t-1}$	0.853*** (0.019)
Old-age Dependency ratio	*-0.002*** *(0.001)*
Log Real GDP	0.004* (0.002)
Log Real Effective Exchange Rate	-0.002 (0.009)
Real Interest Rate	-0.001 (0.000)
Log Consumer Price Index	-0.001 (0.003)
Government Reserves	0.029 (0.019)
AR(1)	0.002
AR(2)	0.379
Number of Observations	1,270

* 10%, ** 5%, *** 1% significance level

- An increase in a country's old-age dependency ratio by 1 percent point decreases net exports over GDP by 0.002 on average.
- Significant at a 5% significance level.

Main regression estimation

Variables	Estimated Coefficient
Current Account $_{t-1}$	0.716*** (0.029)
Old-age Dependency ratio	*-0.138*** *(0.068)*
Log Real GDP	0.510** (0.248)
Log Real Effective Exchange Rate	-2.327*** (0.887)
Real Interest Rate	-0.058 (0.042)
Log Consumer Price Index	0.347 (0.337)
AR(1)	0.002
AR(2)	0.406
Number of Observations	1,270

* 10%, ** 5%, *** 1% significance level

- An increase in a country's old-age dependency ratio by 1 percent point decreases the current account over GDP by 0.138 on average.
- Significant at a 5% significance level.

Conclusion

Conclusion

- As a country becomes old, the country's net exports decrease.
- As a country becomes old, the country's current account depreciates.
- A country's current account depreciates because of the negative effect of aging on the trade balance.
- Our regression results are not perfectly free from endogeneity concerns.

Thank you