

Environmental Kuznets Curve in Military Terms in NATO and BRICS+

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INTRODUCTION

EKC theory describes the relationship between growth and environmental degradation [1]. Its inverted U shape initiates from homonymous towards inequality Kuznets curve. In bibliography, more than 3,000 EKC documents have already been published [2-5]. However, a very few minority of them includes **military expenses** and **armed forces personnel** as control variables of EKC models.

Scope of this poster: to examine the **validation of EKC theory in terms of the above variables in two parties: NATO and BRICS+.**

DATA

Source: World Bank - 1973 to 2022 [6]. **Independent variables:** i) GDP/capita, measured as a total of both groups in constant 2015 US\$ (GDP_PC_1) in Purchasing Power Parity (PPP) of 2021 US\$ (GDP_PC_PPP_1), in average constant 2015 US\$ (GDP_PC) and in PPP of 2021US\$ (GDP_PC_PPP), ii) their squared values, iii) the total military expenses as %GDP in the whole groups (MEX), iv) the total number of armed forces personnel (AFP). **Dependent environmental variable:** CO2 emissions in metric tons per capita (CO2).

METHODOLOGY

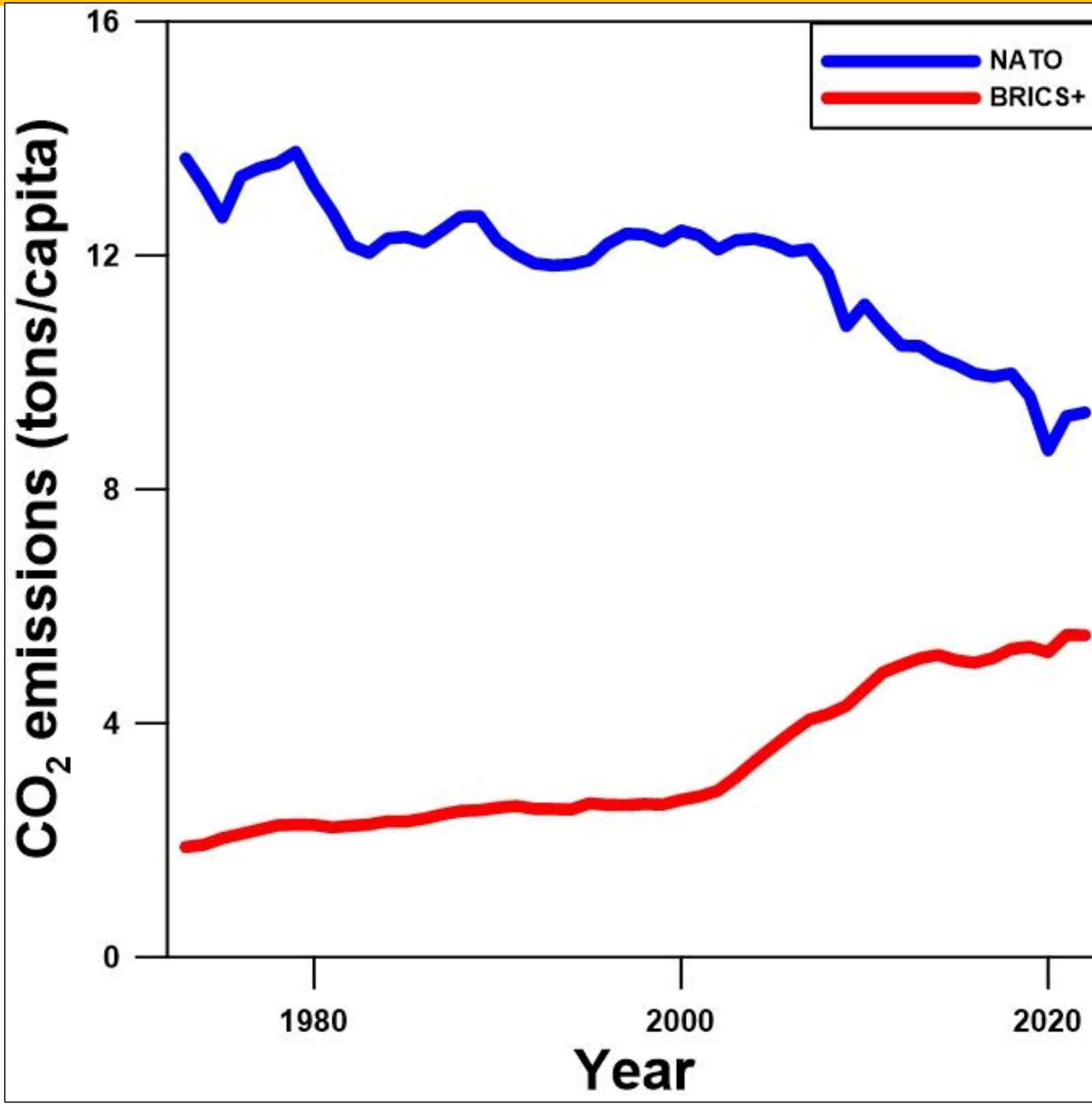
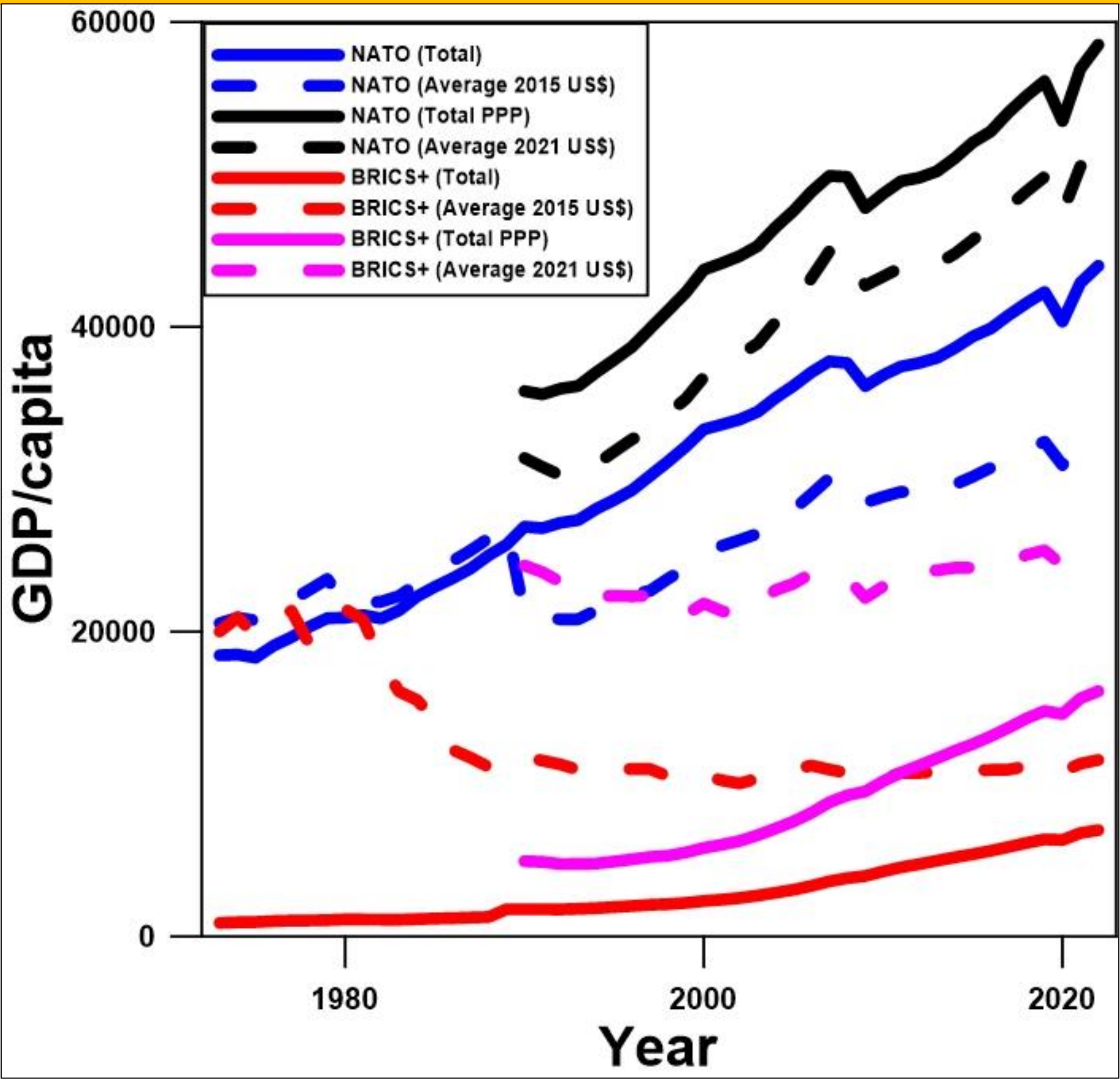
Stepwise and backward regression analysis, launched from the Gretl program, by the following log-form models:

$$CO2 = a + bGDP_PC_1 + cSQ_GDP_PC_1 + dMEX + eAFP \quad (1)$$

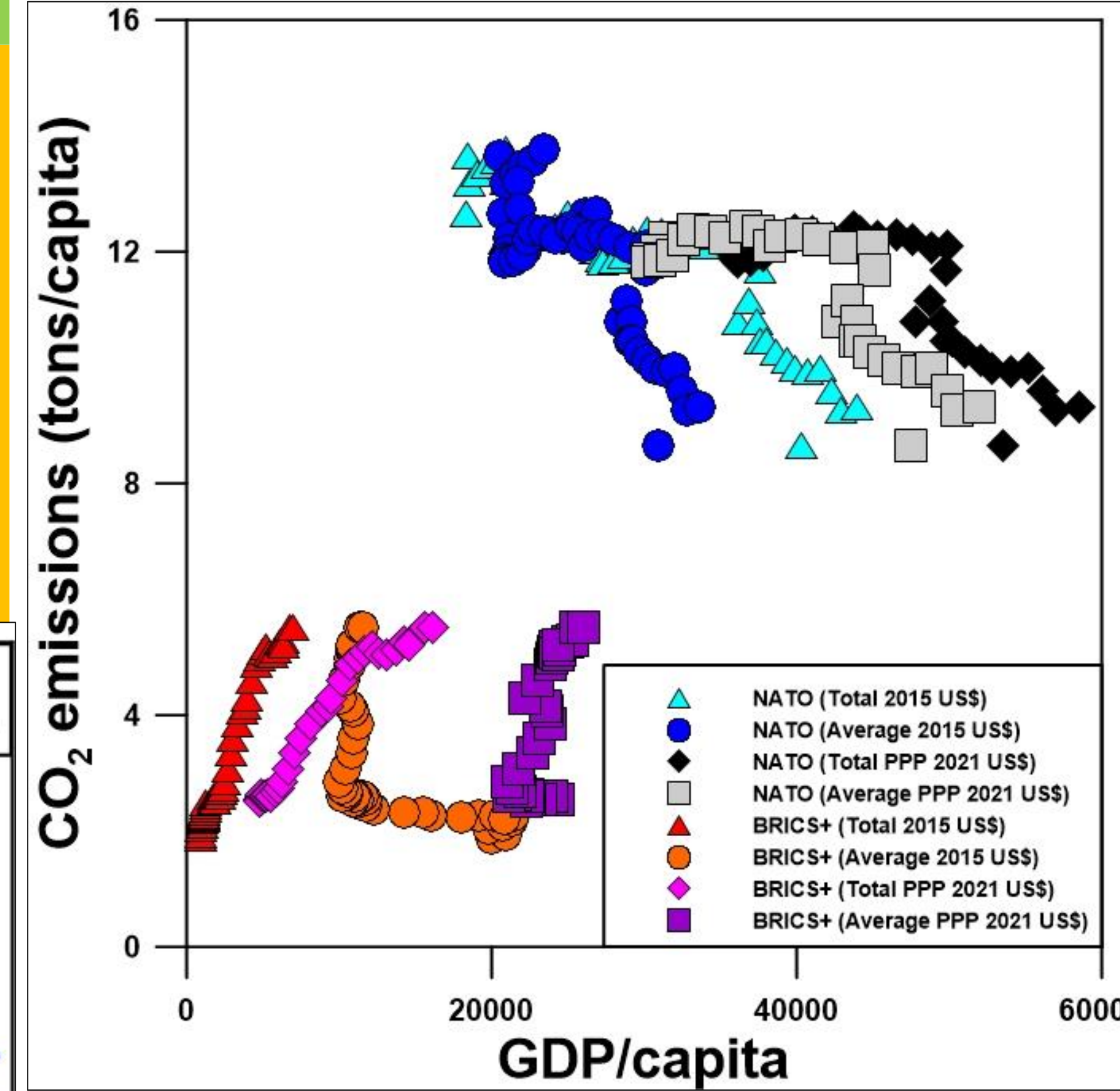
$$CO2 = a + bGDP_PC_PPP_1 + cSQ_GDP_PC_PPP_1 + dMEX + eAFP \quad (2)$$

$$CO2 = a + bGDP_PC + cSQ_GDP_PC + dMEX + eAFP \quad (3)$$

$$CO2 = a + bGDP_PC_PPP + cSQ_GDP_PC_PPP + dMEX + eAFP \quad (4)$$



Model (1)		Model (1)	
I_GDP_PC_1	13.8792	I_GDP_PC_1	-3.6048
I_SQ_GDP_PC_1	-0.6975	I_SQ_GDP_PC_1	0.2506
I_MEX	-0.1704	I_MEX	-
I_AFP	-	I_AFP	-
Model (2)		Model (2)	
I_GDP_PC_PPP_1	54.1461	I_GDP_PC_PPP_1	7.8281
I_SQ_GDP_PC_PPP_1	-2.5257	I_SQ_GDP_PC_PPP_1	-0.3940
I_AFP	0.5433	I_AFP	-
Model (3)		Model (3)	
I_GDP_PC	31.3459	I_GDP_PC	-12.1138
I_SQ_GDP_PC	-1.5516	I_SQ_GDP_PC	0.6182
I_MEX	-	I_MEX	-0.9071
I_AFP	-	I_AFP	-
Model (4)		Model (4)	
I_GDP_PC_PPP	30.2696	I_GDP_PC_PPP	-99.3989
I_SQ_GDP_PC_PPP	-1.4401	I_SQ_GDP_PC_PPP	5.1906
I_MEX	-	I_MEX	-
I_AFP	-	I_AFP	0.9868
Table 1: NATO regression results		Table 2: BRICS+ regression results	



CORRELATION RESULTS: Related to CO2 emissions, GDP/capita in NATO has negative marks and positive in BRICS+. MEX have negative correlation with environmental degradation in both groups of countries. MEX have peculiar behavior with GDP/capita in NATO and strong negative correlation in BRICS+. AFP has generally a weakly positive contribution in environmental degradation.

CONCLUSIONS

EKC is verified in both groups of countries. BRICS+ has not yet reached its turning point, following a monotonic increasing curve.

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