ESG/Green Investment and Portfolio Allocation

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Outlines

1 ESG Investment / Green Investment

2 Rate of Return, Risk and ESG

3 Different definition of ESG by rating agencies

4 Greenness Score (ICMA)

5 Tax on Greenhouse gas

6 Accurate measuring of CO2 emission

Table 1: Rating methods provided by major ESG rating agencies

ESG Score	Evaluation criteria overview
Bloomberg ESG Disclosure Scores	Evaluated based on the degree of disclosure. Environmental aspects are evaluated based on the degree of disclosure.
FTSE Russell's ESG Ratings	ESG risks are evaluated based on disclosure, commitment to policy formulation and improvement, etc. In terms of the environment, in addition to disclosure, we evaluate the existence of policies and commitments to improvement.
MSCI ESG Ratings	Evaluated based on 37 key ESG issues (ESG key issues). The environment side is also evaluated by setting a key issue.
Sustainalytics' ESG Risk Ratings	Based on ESG measures, information disclosure, and the level of problems. The same is true in terms of the environment.
Thomson Reuters ESG Scores	10 items: for the Environment factor, resource use, emissions, and innovation; for Society factor, employees, human rights, local communities, and product responsibility; and on Governance, management, shareholders, and CSR strategy. Regarding the environment, evaluated based on actual carbon emissions and whether or not there is a policy.

(Source) Created by the authors after processing part of the data of Yoshino and Yuyama (2021), Yuyama (2020), and each rating agency.

ESG (Environment, Social, Governance)

The evaluation methodologies and criteria for E scores vary from one evaluating organization to another.

(1) a company's ESG efforts
(2) the degree of disclosure
(3) whether or not the company has an ESG policy

Need for accurate monitoring of CO2
→ Tax on net CO2 emission
in order to **increase Green investments**

Current ESG investment: distort asset allocation

1, **Traditional asset allocation :**

two parameter approach

(i) Rate of return (R), (ii) Risks (σ^2)

2, **ESG component is added for the asset allocation**

(iii) ESG(E) multi-factor model

3, **Each Investor changes its' asset allocation based on specific criteria of ESG given by a rating agency**

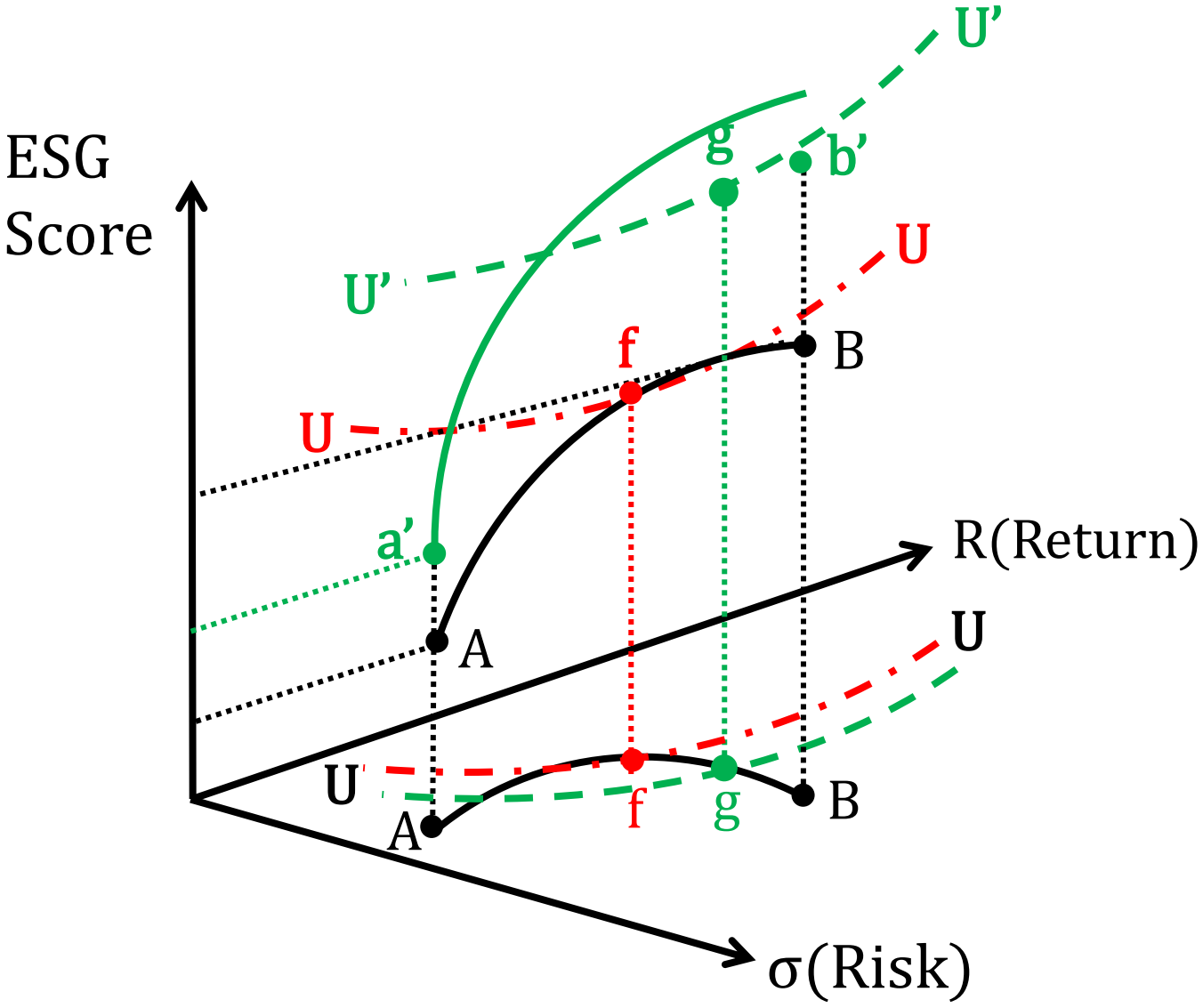

U'
ESG
Score
g
b'
U
U'
f
B
U
a'
R(Return)
A
U
U
f
g
B
A
σ(Risk)

Table 3: Empirical Application of the theory

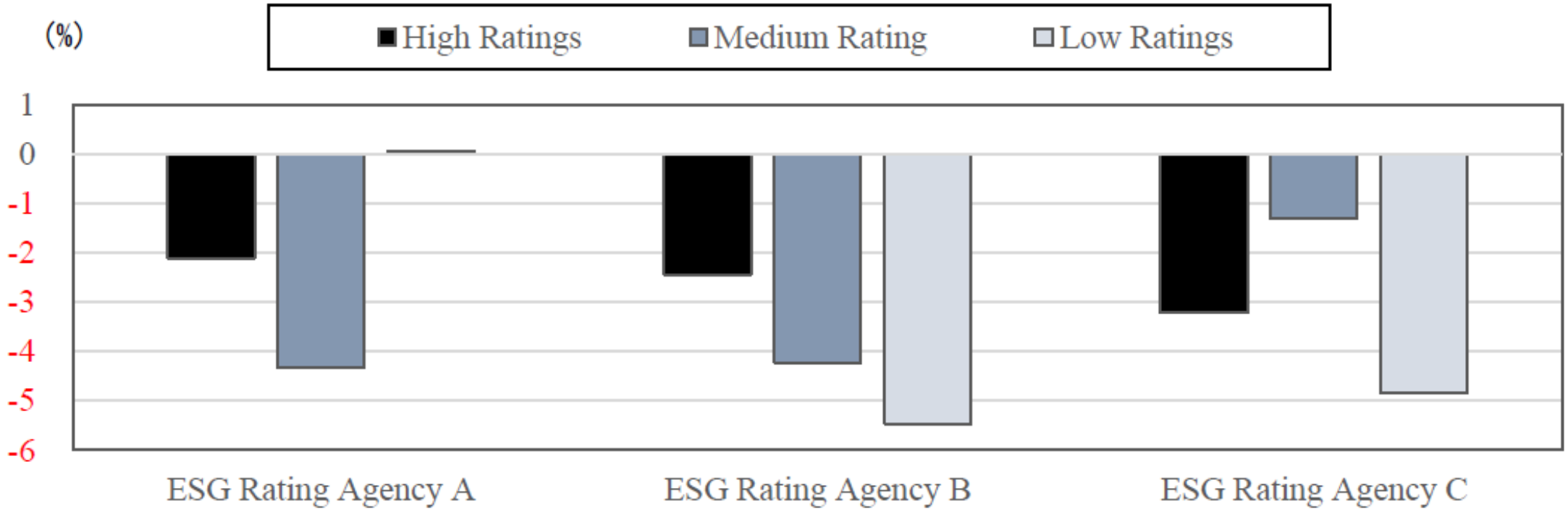
ESG Score	No Rating	RobecoSAM	Sustainalytics	Bloomberg
ESG score of company A	-	8.6	9.6	2.9
ESG score of company B	-	1.8	1.3	3.9
Value of α	0.57	0.71	0.74	0.54

(Source) Based on each company's 2019 actual stock returns, standard deviation, covariance, and ESG score.

Author's calculations based on equation (12) from Bloomberg data

- The allocation of assets between A and B changes which ESG rating agencies' ESG score is used for the portfolio allocation.
- The higher ESG score value is the higher α, and thus the higher the investment allocation. For example, since Sustainalytics is the highest ESG score for Company A, investors following this rating will have the highest allocation to Company A.
- On the other hand, the Bloomberg score is lower for Company A than for Company B, resulting in a smaller investment allocation.
- If we do not take into account the ESG score, the investment allocation to Company A is 0.57

ESG Investment and Stock Price



Note: Only stocks covered by each ESG rating agency are aggregated. The estimation period is the first quarter of 2020 (December 30, 2019 to March 31, 2020).

Source: Authors' calculations from Bloomberg data.

Figure 8: ESG score (high-medium-low quintile) and stock returns (first quarter of 2020)

Satellite photo can catch the amount of CO2 exposure

Need for
AI technoloty
To monitor
CO2
exposures

After tax rate of return and Risk

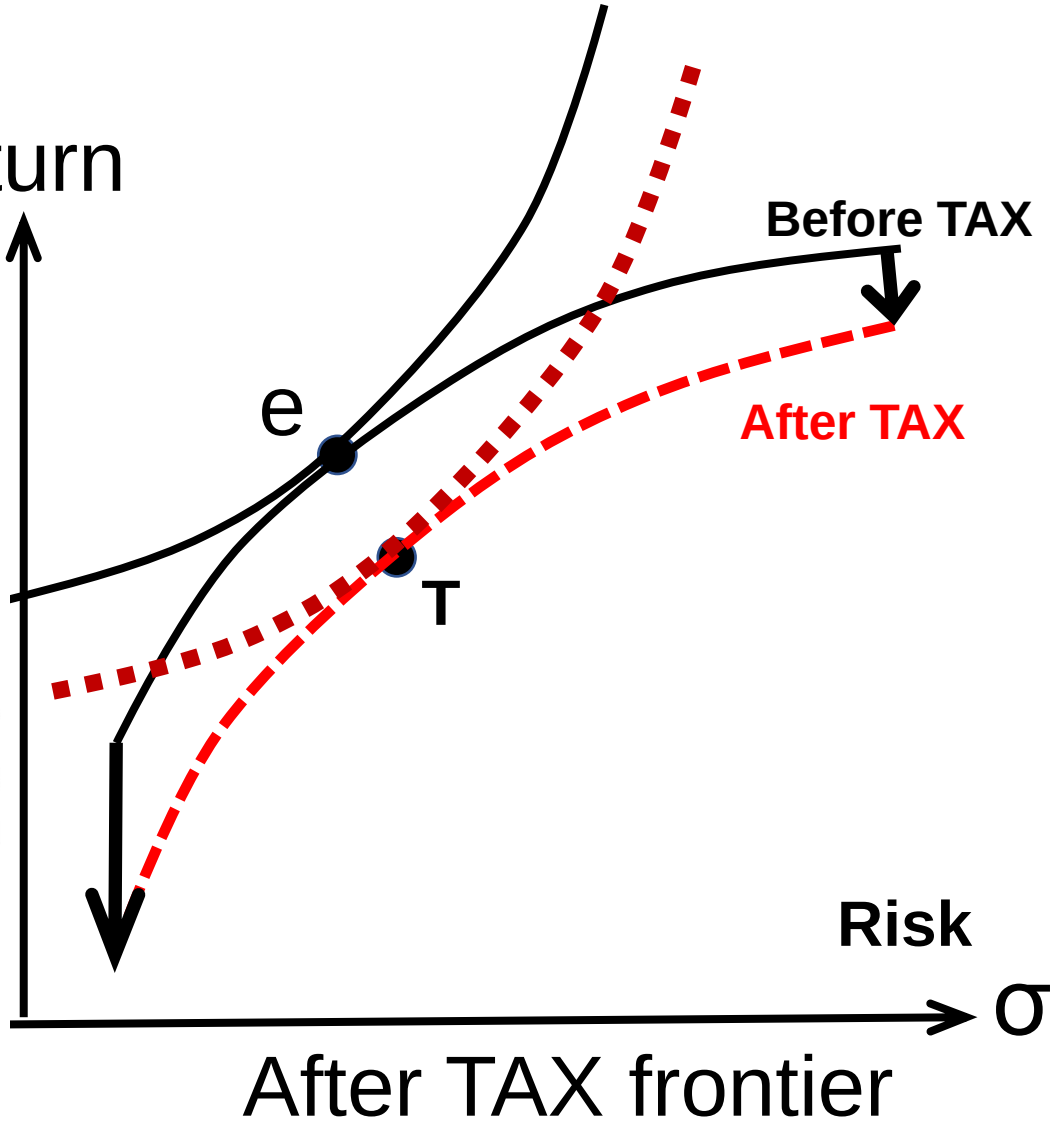
$$\tilde{R}_t^A = R_t - T_A \tag{16}$$

$$\tilde{R}_t^B = R_t - T_B \tag{17}$$

Equations (16) and (17) show the after-tax rate of return of company A and company B. We can compute the optimal allocation of assets between company A and company B as in equations (18) and (19), which show the optimal rate of return and risks, respectively:

$$\tilde{R}_t = \tilde{\alpha}_t \tilde{R}_t^A + (1 - \tilde{\alpha}_t)\tilde{R}_t^B \tag{18}$$

$$\tilde{\sigma}_t^2 = \tilde{\alpha}_t^2 (\tilde{\sigma}_t^A)^2 + (1 - \tilde{\alpha}_t)^2 (\tilde{\sigma}_t^B)^2 + 2\tilde{\alpha}_t (1 - \tilde{\alpha}_t)\tilde{\sigma}_t^{AB} \tag{19}$$



Actual Policy Implementation

1, Tax on "Net Carbon Emission"

(i) Improvement of forestry and see weed etc.

2, Gradual increase of tax rate to SMEs and emerging economies

3, Loopholes of SMEs

Large businesses have pressure from the market

50 % of CO_2 emission comes from SMEs (OECD)

June 2018
Green Bond Principles
Voluntary Process Guidelines for Issuing Green Bonds

International Capital Market Association

ICMA Paris Representative Office

62 rue la Boétie

75008 Paris

France

Tel: +33 1 70 17 64 70

greenbonds@icmagroup.org

- **renewable energy** (including production, transmission, appliances and products);
- **energy efficiency** (such as in new and refurbished buildings, energy storage, district heating, smart grids, appliances and products);
- **pollution prevention and control** (including reduction of air emissions, greenhouse gas control, soil remediation, waste prevention, waste reduction, waste recycling and energy/emission-efficient waste to energy);
- **environmentally sustainable management of living natural resources and land use**

Green Bond Principles (GBP) 2018

(i) renewable energy
(ii) energy efficiency
(iii) pollution prevention and control
(iv) environmentally sustainable management of living natural resources and land use
(v) terrestrial and aquatic biodiversity conservation
(vi) clean transportation
(vii) sustainable water and wastewater management
(viii) climate change adaptation
(iX) eco-efficient and/or circular economy adapted products, production technologies and processes
(X) green buildings which meet regional, national or internationally recognized standards or certifications.

Source: The Green Bond Principles: Voluntary Process Guidelines for Issuing Green Bonds, ICMA, June 2018

Issues of Green Bonds

1, Rating of green bond based on accurate data

Interest rate and risks

accurate measure of CO2 emission

2, Buy and hold, Secondary market

3, Maturity of green bond

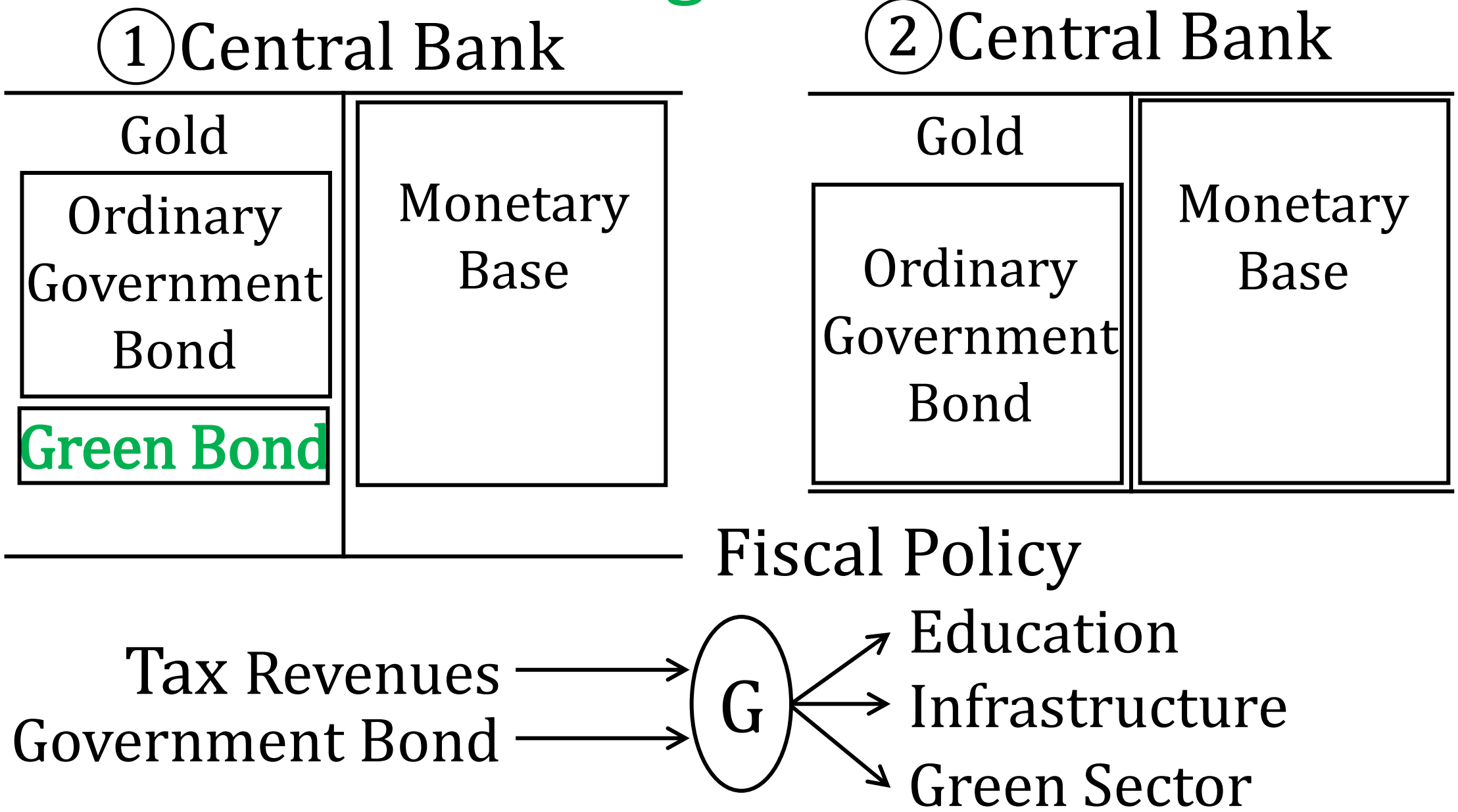
Demand by banks, insurance, pension funds

4, Purchase of green bond by the Central Bank

5, Open Market Operations (=Ordinary bond)

6, Same issue applies to Transition Bond

Green Central Banking



Thank you for your attention

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Covid-19 and Optimal Portfolio Selection for Investment in Sustainable Development Goals

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ESG/Green Investment and Allocation of Portfolio Assets[1]

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ABSTRACT

This article examines the current portfolio allocation in ESG and Green projects. Traditional investments focus on rates of return and risks associated with investment. Environmental, Social and Governance (ESG) or Green factors are additional components that investors have to pay attention to. Environmental protection is very important. However, we see that the current different definitions of ESG or Green factors lead to distorted allocations in portfolio investments. In order to bring portfolio allocations to a desirable direction, global taxation on pollution or creation of an accurate Green credit rating based on emissions of various pollutants are recommended.

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GREEN BONDS AND GLOBAL OPTIMAL PORTFOLIO ALLOCATION

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ABSTRACT

This study proposes a theoretical model for measuring the greenness factors of a firm. We develop the multifactor utility function and find that the proportion of investment in green bonds is higher if greenness factors account for by a firm and vice versa. Moreover, we further develop the global aspects of greenness measures which identify how much level of greenness is maintained by a firm to make the environment green. In terms of reduction in emissions based on global measures, we report that the proportion of investment in green bonds is higher. This study argues that the difference between firm-related and global measures of greenness refers to distortion in portfolio allocation. Lastly, we compare the results of five Asian countries and report that Japanese firms are