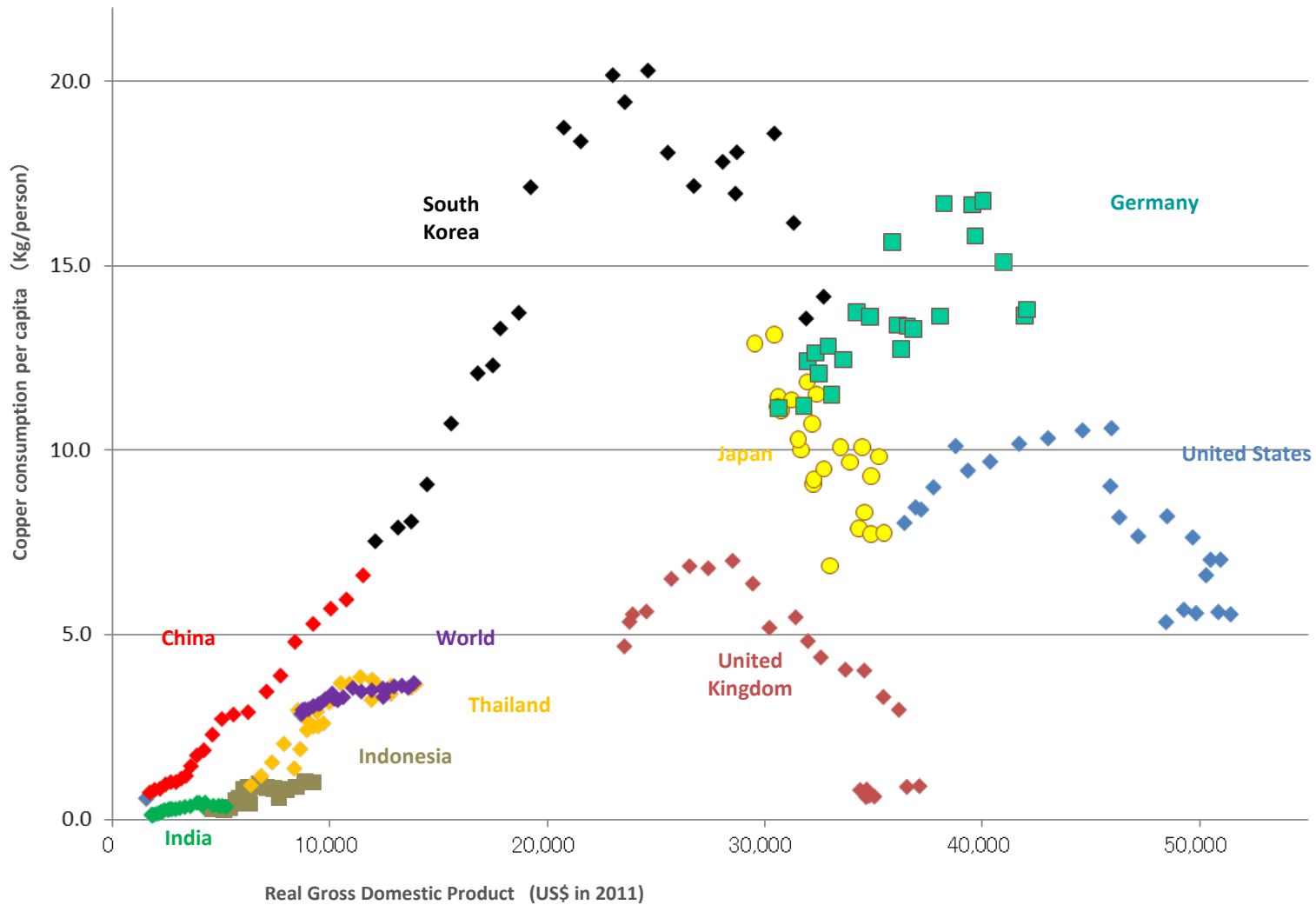


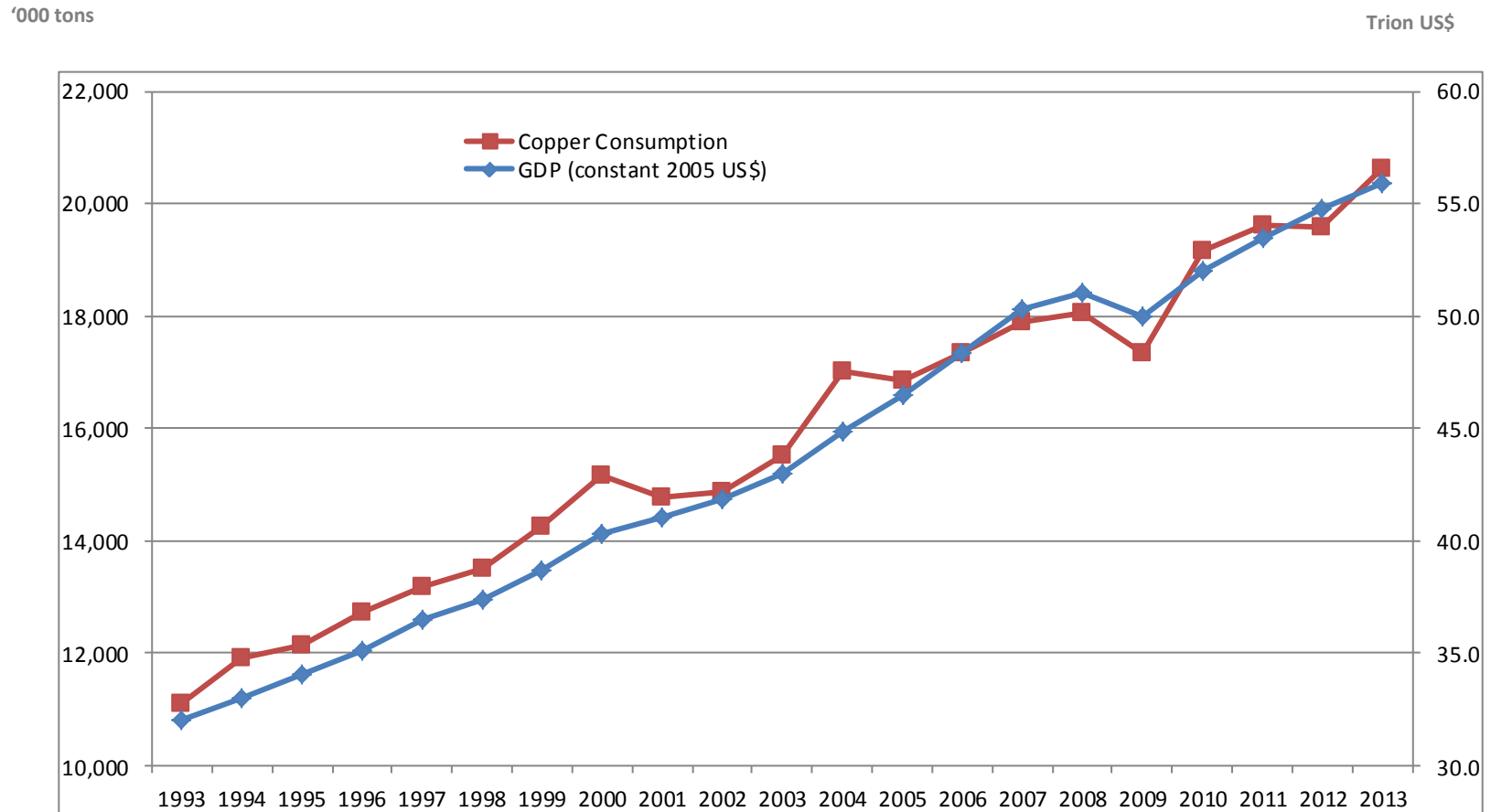
Relationship between Copper Consumption and Real Gross Domestic Product



Relationship between Copper Consumption and Real Gross Domestic Product

- Globally, correlation efficient between copper consumption and real gross domestic product (1990 – 2013) is 0.99.
 - There is a strong positive correlation.
 - There are also strong positive correlations in emerging countries.
 - China : 0.99
 - Thailand : 0.88
 - India : 0.85
 - Indonesia : 0.83
 - There are relatively negative correlations in developed countries
 - United Kingdom : -0.77
 - Japan : -0.75
 - United States : -0.64
- Copper demand should increase in association with expansion of the economy

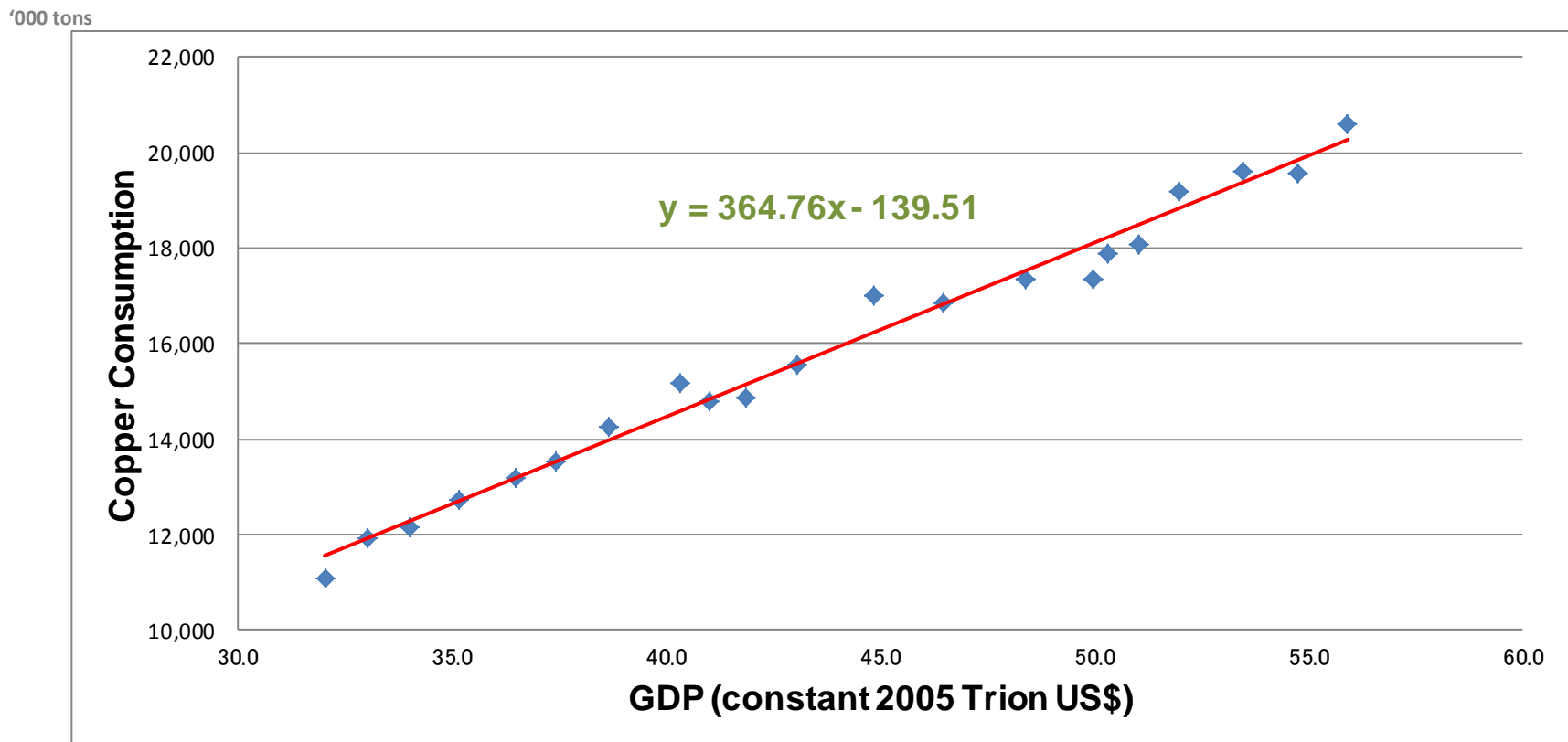
Relationship between Copper Consumption and Real Gross Domestic Product



Relationship between Copper Consumption and Real Gross Domestic Product

■ Linear Approximation Equation between GDP and Copper Consumption

■ **Copper Consumption ('000 tons) = 364.76(GDP Trion US\$)- 139.51**



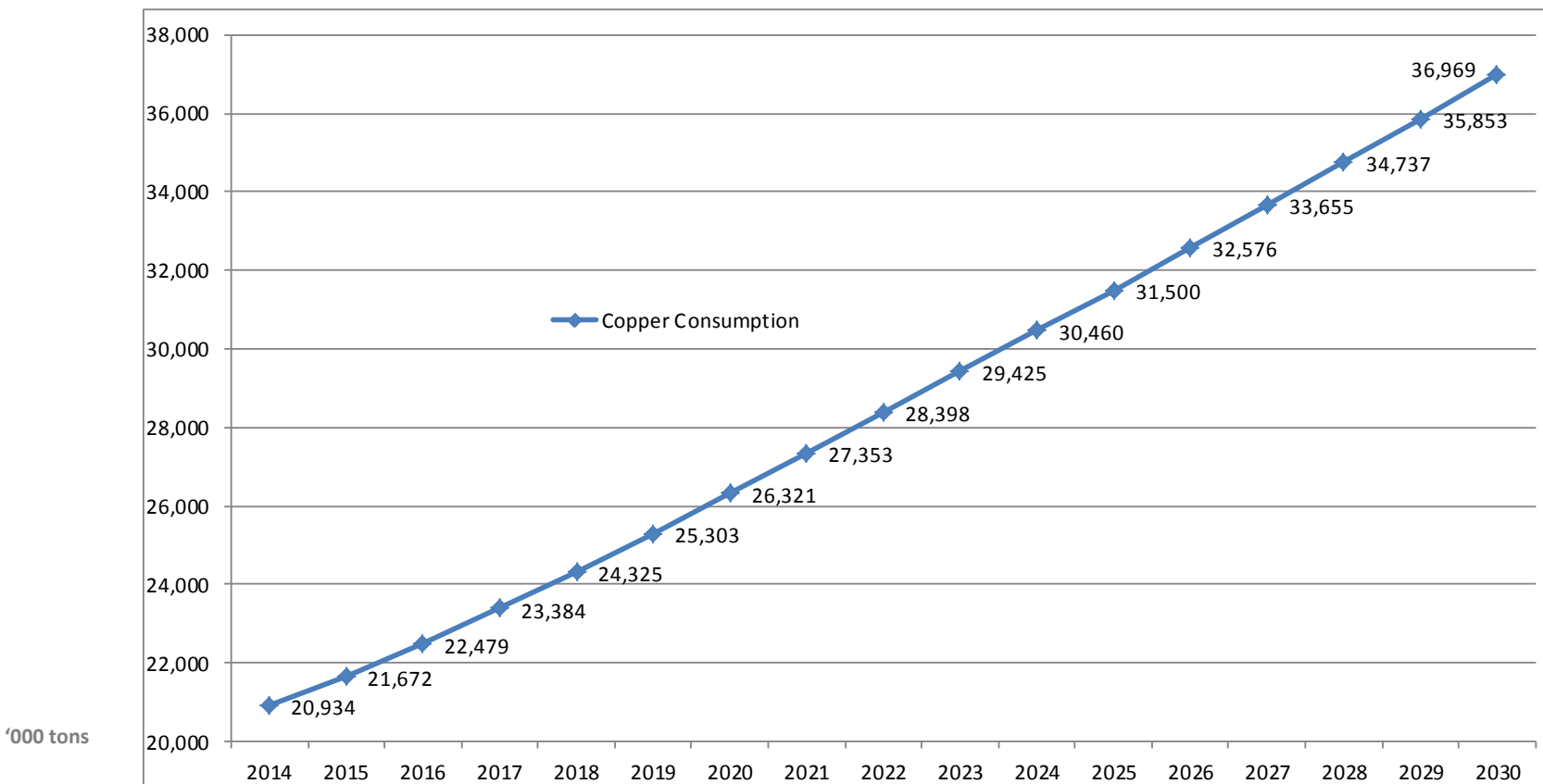
Relationship between Copper Consumption and Real Gross Domestic Product

- Assuming growth rates of real gross domestic product in the world between 2014 and 2030

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Growth Rate	3.3%	3.5%	3.7%	4.0%	4.0%	4.0%	4.0%	3.9%	3.8%	3.6%	3.5%	3.4%	3.4%	3.3%	3.2%	3.2%	3.1%
GDP T\$	57.8	59.8	62.0	64.5	67.1	69.8	72.5	75.4	78.2	81.1	83.9	86.7	89.7	92.6	95.6	98.7	101.7

Relationship between Copper Consumption and Real Gross Domestic Product

- Applying the calculated Linear Approximation Equation and the assumed Real GDP
 - In 2030, Copper Consumption may be over 30 million tons
 - Simply in terms of relationship with GDP growth, copper demand has potentiality to grow to this level.
 - Other parameters are not taken into account.



Outlook of Copper Price

Incentive copper price for new mining development

Preconditions

- Production volume: 200,000 Cu t/year
- Construction period: 3 years
- Start of operation: 2018
- Mine life: 20 years
- Initial investment: US\$48.00 million
(US\$24,000/Cu t/year)
- OPEX in 2018: ¢ 187.8/lb (50% centile)
- Additional investment: 24.2c/lb
(average of all mines in 2018)
- Taxes: 35% of pre-tax
- IRR: 10%

Conclusion (calculation result)

When it is OPEX 50% centile, copper price of 390c/lb is necessary to gain IRR 10%

- Without the premise that copper price in 2018 is 390c/lb or higher, it is difficult to make a decision to develop.
- As a result, the increase in supply from new mines from 2018 onwards will be limited.