

Oyu Tolgoi Economic Impact Assessment

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Introduction and objectives

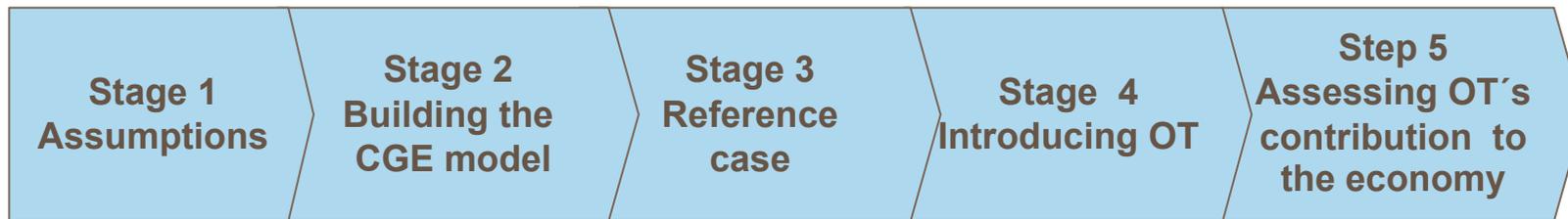
Oyu Tolgoi economic impact assessment:

- Joint study by the School of Economic Studies and BAEconomics Pty Ltd, sponsored by Rio Tinto, using a world class computable general equilibrium model of the Mongolian economy.
- The objective of the study is to understand and assess the fiscal, monetary and structural implications of the Oyu Tolgoi project for the Mongolian economy.
- The tool developed for this study, namely the computable general equilibrium model, may also be used as an objective policy tool to monitor and evaluate the social and economic impacts of policies and other projects in the Mongolian economy.
- The model will be made available to key government departments and the Bank of Mongolia for their independent use.



Overview of methodology

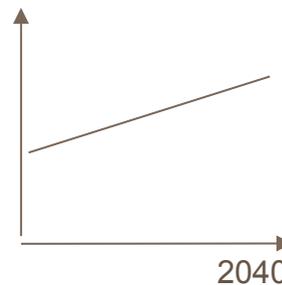
Mongolia's first computable general equilibrium model built specifically for the commodity sector



- Price projections
- Population projections
- Mining production
- Tavan Tolgoi
- Infrastructure

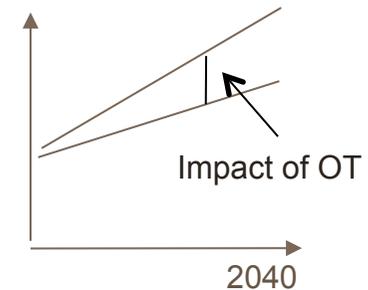
- NSO data
- 10 Regions
- 23 Sectors

- The trajectory of the Mongolian economy over the next 30 years, with out OT.
- GDP
- Fiscal receipts
- Exchange rate
- Trade
- Industry production



- Investment
- Production
- Labour
- Exports
- Procurement
- Tax receipts
- Dividends

- GDP
- Fiscal receipts
- Exchange rate
- Trade
- Industry production
- Policy implications

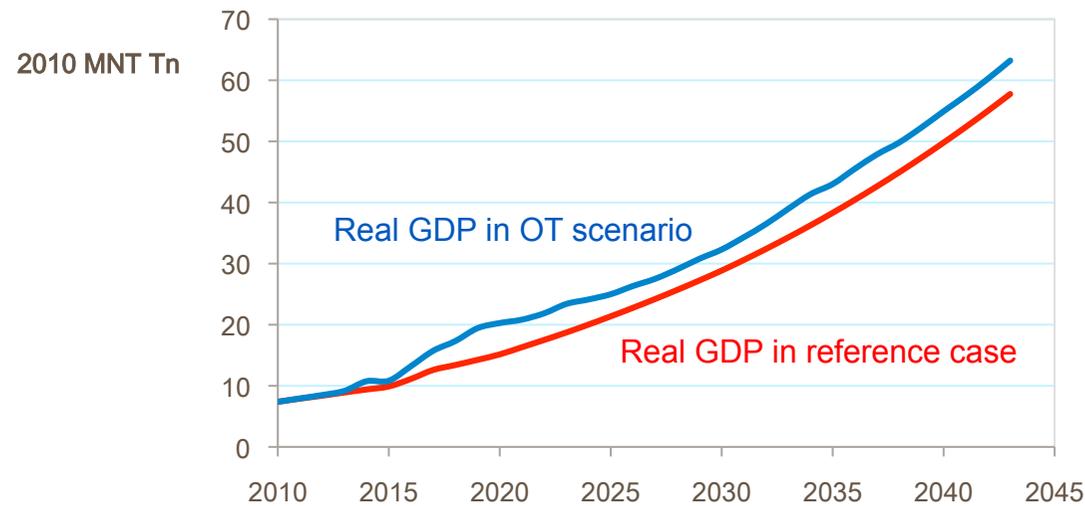


Projected impacts of Oyu Tolgoi

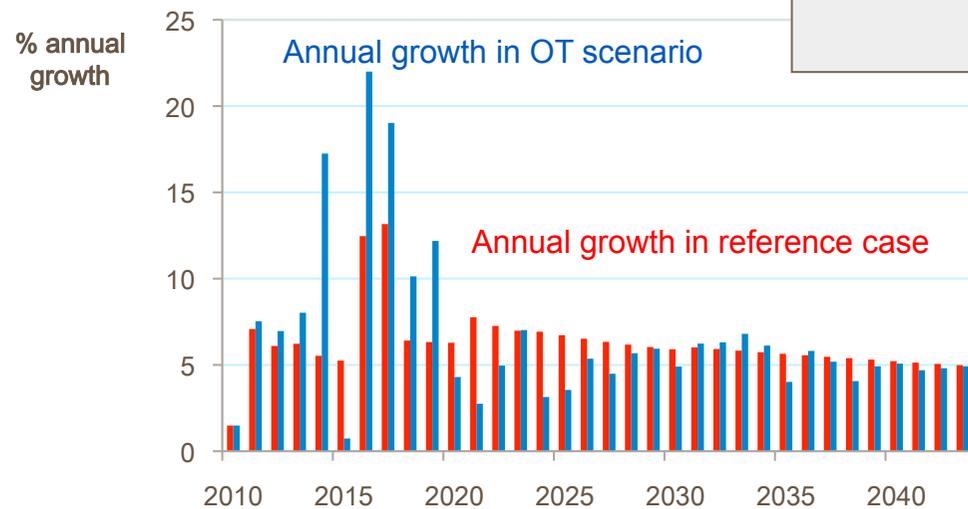


Oyu Tolgoi is projected to increase the size of the Mongolian economy by over 35% by 2020

Mongolian real gross domestic product
MNT trillions and annual growth

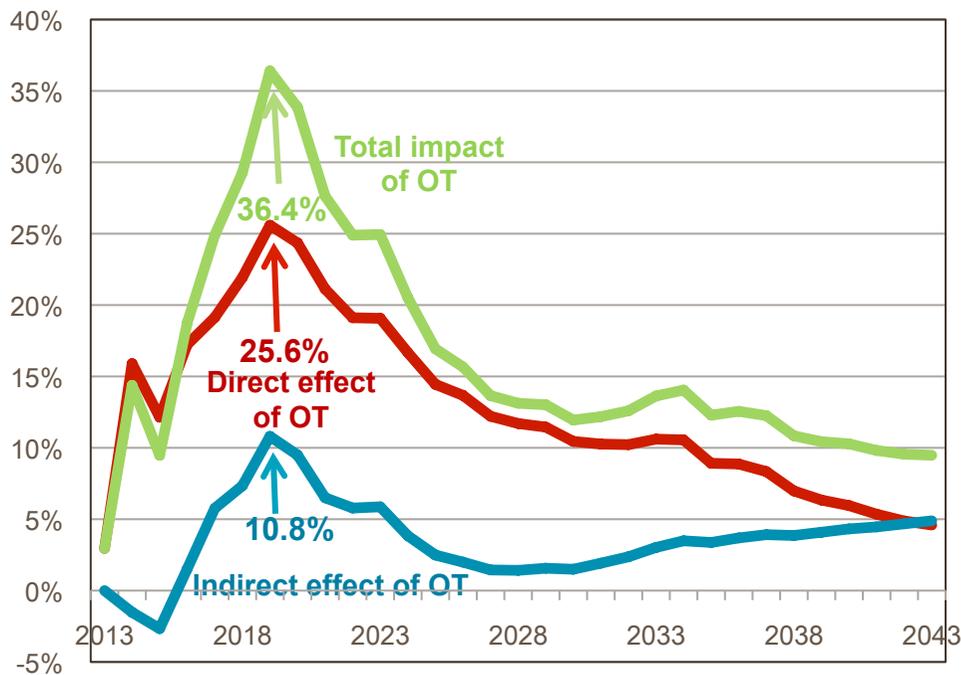


- By 2020 Oyu Tolgoi's impact will increase GDP by around a third.
- Oyu Tolgoi will lift GDP per person by MNT1.7 million (over \$1000) in 2020 – an increase equivalent to over 60% of today's GDP per person.
- GDP growth peaks at 22% in 2016.
- The average growth rate from 2013-2020 is projected to be 11.7% compared to 7.7% without Oyu Tolgoi.



Both the direct and indirect effects of Oyu Tolgoi on the economy are large

Decomposition of deviation in GDP into direct and indirect effects
 Percentage difference of OT scenario from the reference case



- GDP will be approximately a third greater because of Oyu Tolgoi by 2020.
- Oyu Tolgoi's direct impact accounts for over a quarter of the economy in 2020.
- Oyu Tolgoi's direct contribution is expected to decline after 2020 as production slows.
- If we had 2010's prices in 2020 Oyu Tolgoi would directly account for nearly a third of the economy.
- The indirect effect is greater than the direct impact by the early 2040s.
- If Oyu Tolgoi was up and running at peak production levels today its direct impact alone would double the size of the economy.

- The steep decline is driven by copper grades. It is possible that OT could further expand in the 2020s, to temper this
- The final feasibility study to be complete by 2012 will likely show a less steep decline.

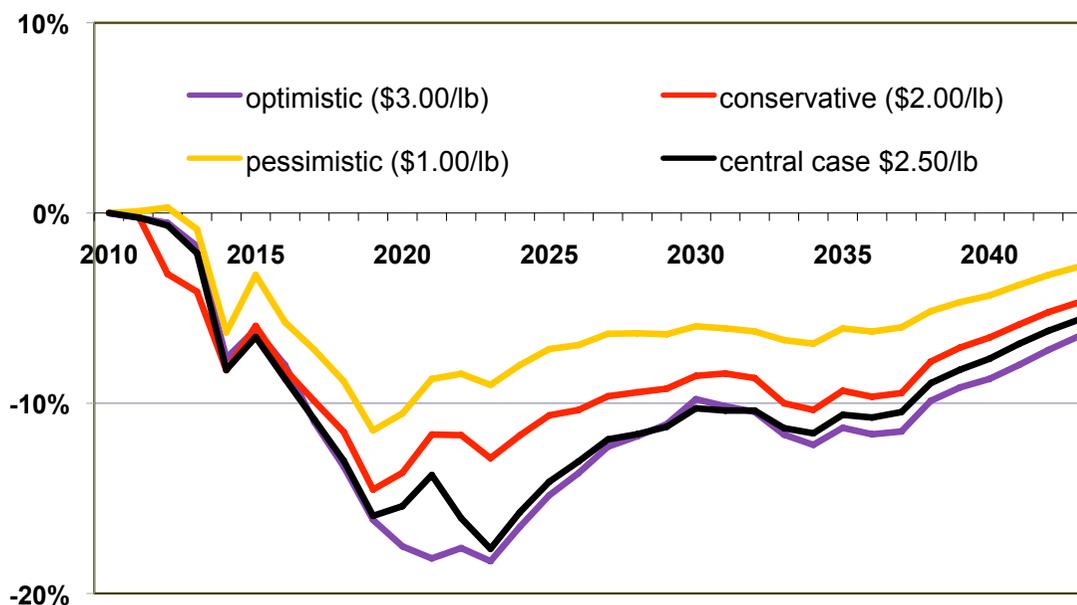


Oyu Tolgoi causes the exchange rate to strengthen by around 15 per cent in 2020

Mongolian real exchange rate

% Deviation from reference case (a decrease is an appreciation)

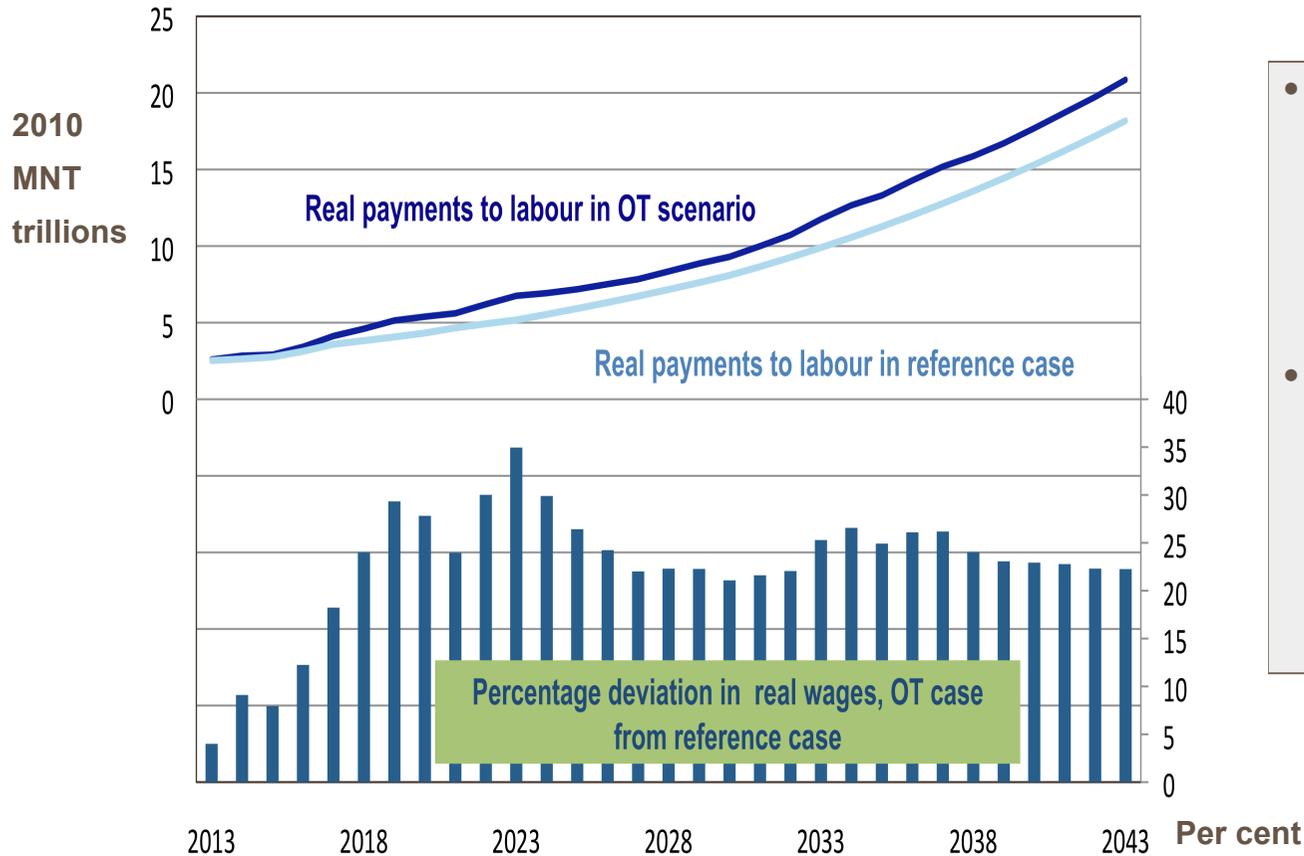
% Deviations



- In 2020 the exchange rate is projected to strengthen by around 15 per cent compared to what it would have been without Oyu Tolgoi.
- The extent of the appreciation will depend on the copper price and government policy.
- If the copper price was around \$3/lb, then the exchange rate would appreciate by nearly 20 per cent at 2020 relative to the reference case.
- The impact of OT on the exchange rate is projected to peak in 2023.
- A stronger exchange rate will have a negative impact on the competitiveness of trade exposed industries.

Real wages are nearly 30% higher in 2020 because of Oyu Tolgoi

Mongolian real wages in base OT scenario
Percentage deviation from reference case and real value

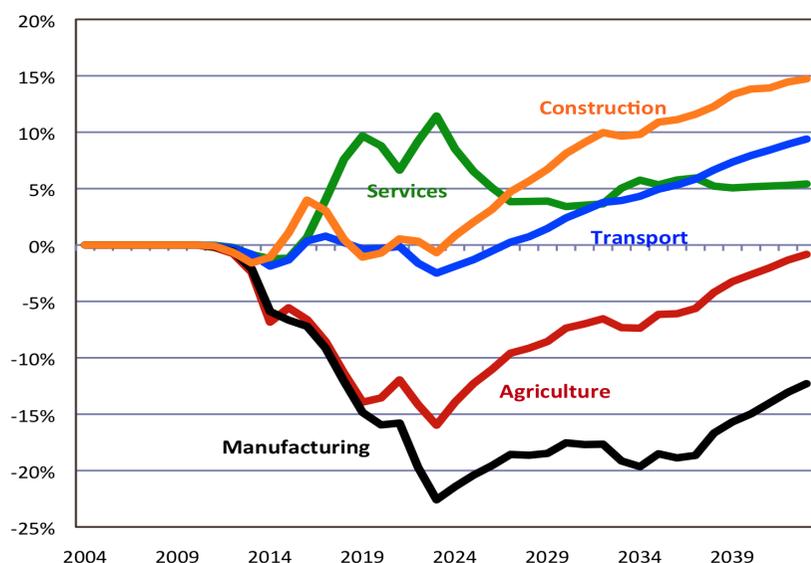


- Real wages increase strongly because both household incomes and government expenditure rise which leads to an increase in the demand for labour by the services sectors.
- In 2020 real wages are 28 per cent higher because of Oyu Tolgoi and in 2023 they are 35 per cent higher due to Oyu Tolgoi.

Pressure for structural adjustment will occur in the tradable sectors but all major sectors continue to grow in absolute size

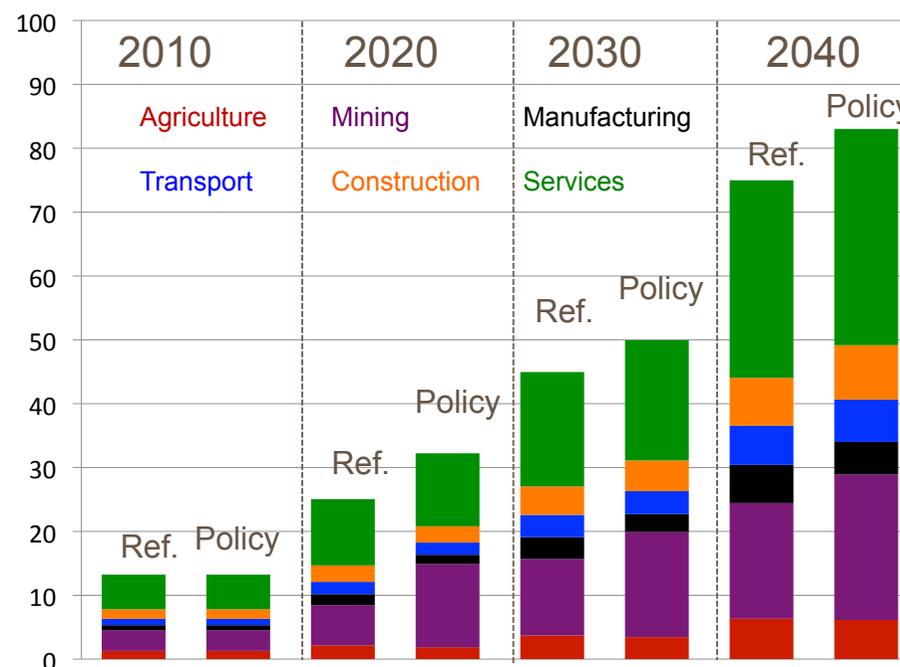
Sectoral output

Percentage deviation from reference case: OT scenario



Sectoral Contribution to Output

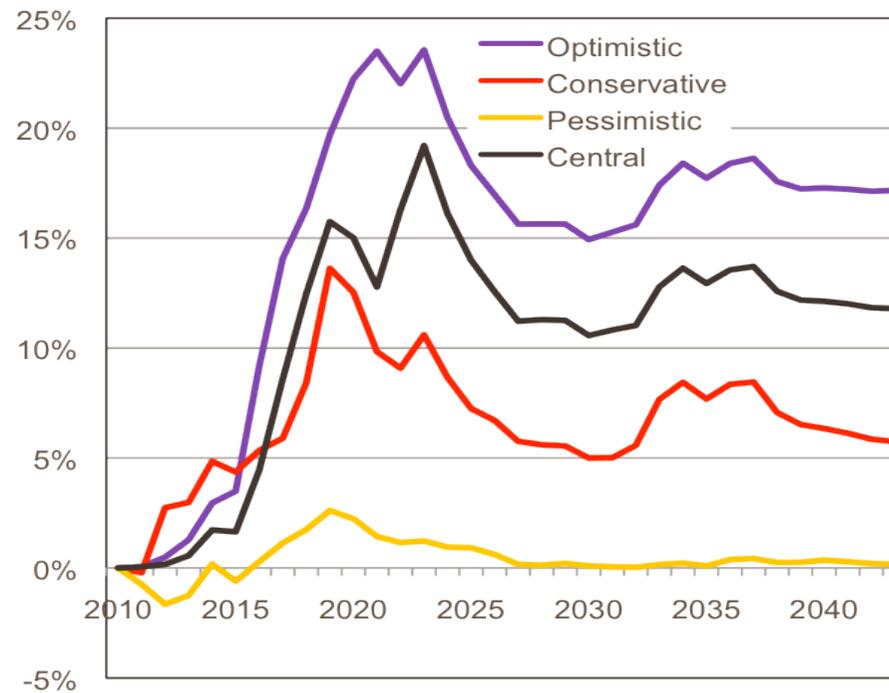
MNT trillion (2010)



- The tradable sector will be less competitive because of rising real wages and a rising exchange rate.
- Agriculture and manufacturing are expected to decline relative to the non-OT reference case, but the economy is growing more strongly.
- Construction increases relative to the reference case due to increased foreign investment.
- Transport expands due to increased incomes.
- Services (including government expenditure on health and education) increases in line with government revenues and increased household incomes.

The copper price determines Oyu Tolgoi's impact on the economy but even in the most pessimistic scenario Mongolia is better off with OT

Mongolian real gross national product
 Percentage deviation from the respective reference cases

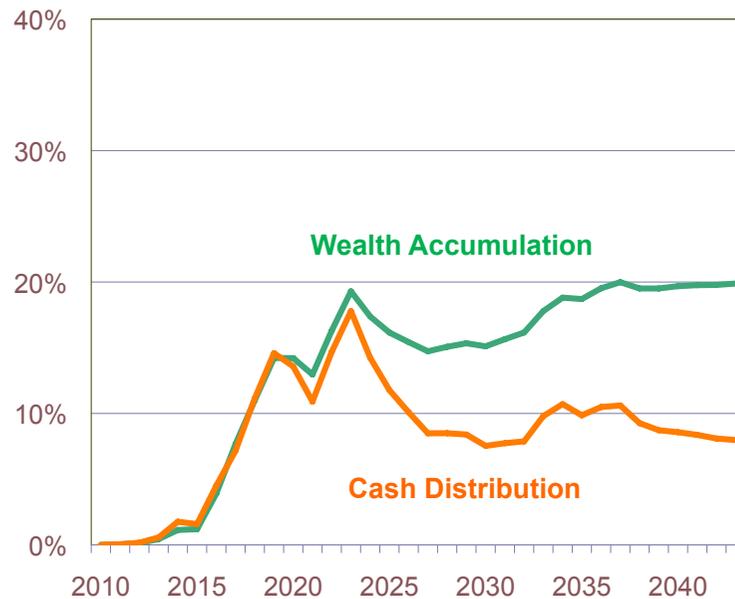


- Long term copper prices (US 2010 c/lb): Central 250, Optimistic 300, Conservative 200, Pessimistic 100.
- Under the optimistic price scenario GNP is around 23% higher in 2020 as a result of OT compared to the reference case whereas in the pessimistic scenario GNP is less than 3% higher as a result of OT.



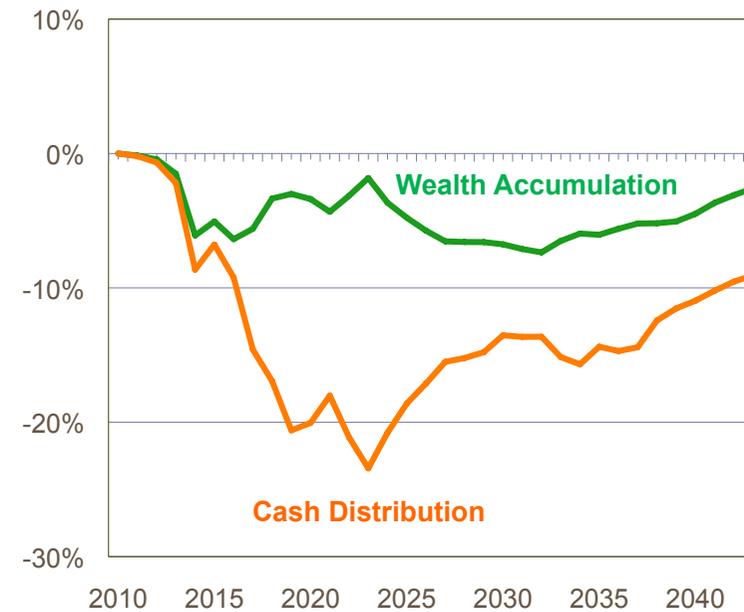
An OT wealth accumulation fund has a long term positive impact on GNP and mitigates structural adjustment pressures

Mongolian real gross national product
Percentage deviation from reference case



Mongolian real exchange rate

Percentage deviation from reference case (negative is a real appreciation relative to the reference case)



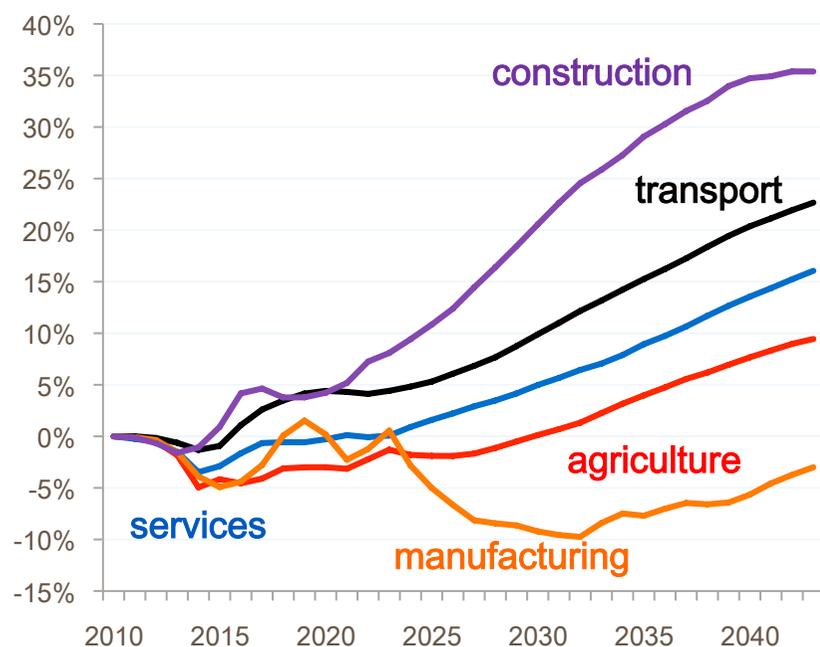
- Interest payments from the wealth accumulation fund will fund long run growth.
- Keeping OT fiscal receipts in foreign currency will mitigate exchange rate volatility and associated structural adjustment pressures.

An OT wealth accumulation fund would ease structural adjustment pressures

Hypothetical policy scenario

Mongolian sectoral output

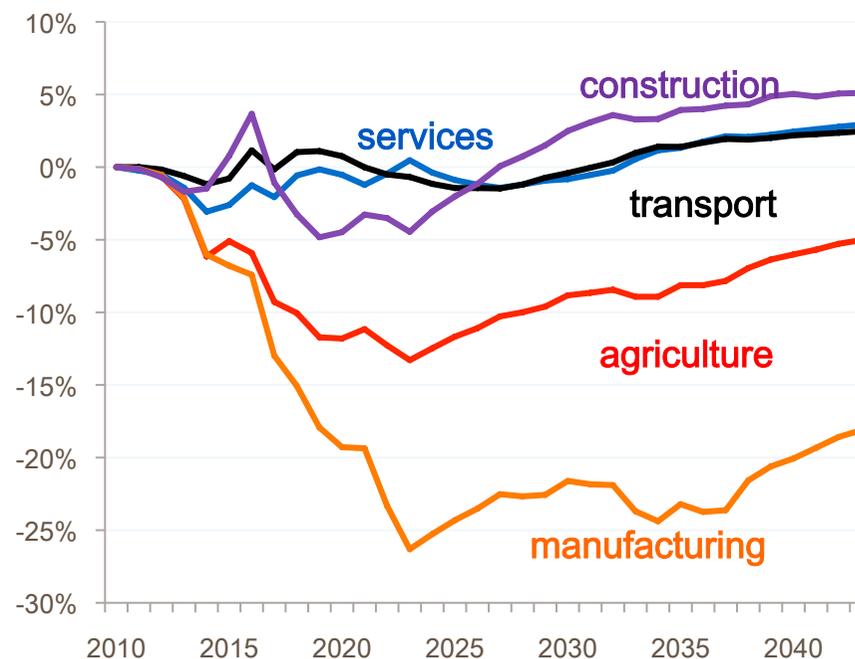
Percentage deviation of wealth accumulation scenario from reference case



Hypothetical policy scenario

Mongolian sectoral output

Percentage deviation of cash distribution scenario from reference case

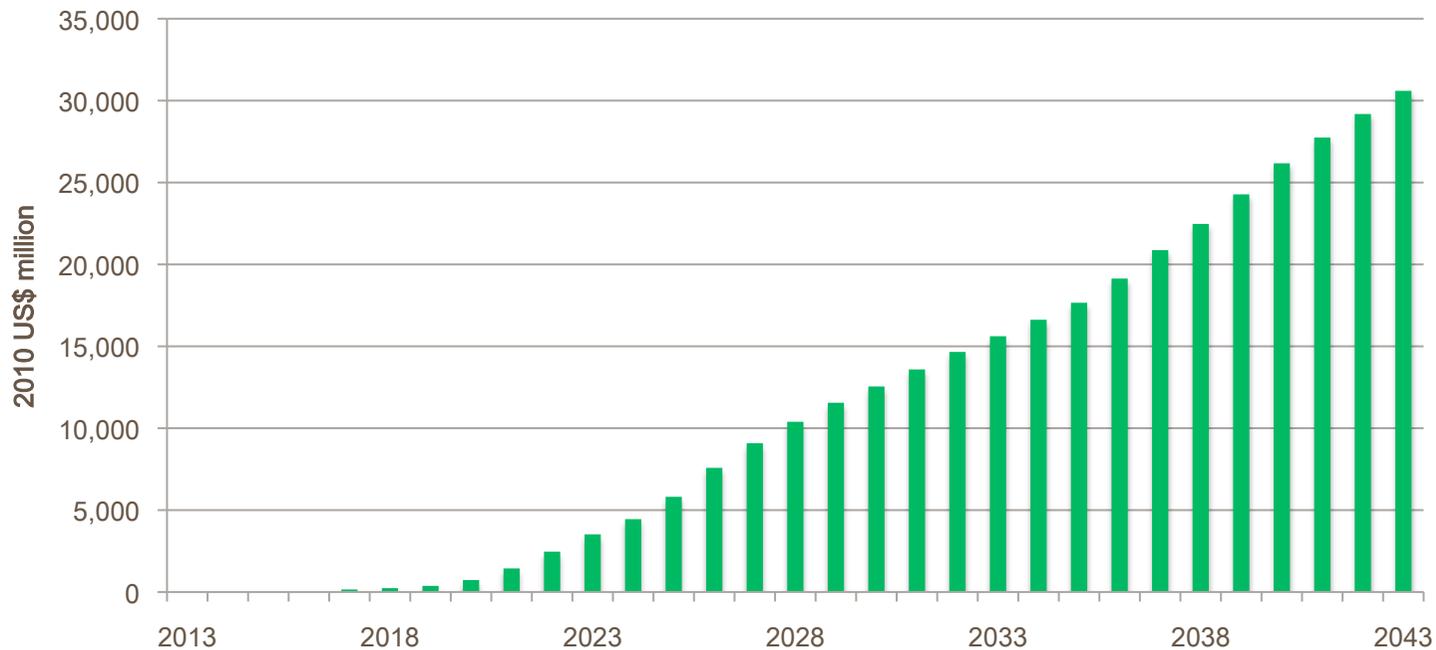


- Trade exposed sectors including manufacturing and agriculture benefit significantly under the wealth accumulation scenario compared with the cash distribution scenario. This is because of improved competitiveness as a result of exchange rate differences and in the long run increased domestic demand.
- All sectors benefit in the long run under the wealth accumulation scenario compared to the cash distribution scenario as a result of the increased domestic demand.

An OT wealth accumulation fund would be worth around 5 times current GDP by 2043

Hypothetical policy scenario

Projected value of wealth accumulation fund: 2010 US\$ millions



- In 2043 the wealth accumulation fund will be over MNT40 trillion (\$US30 billion). This is around half the annual GDP in that year and around six times current annual GDP.

Key findings of the study - 1

By 2020 we expect:

GDP	OT's direct contribution = 25% GDP OT's indirect contribution = 11% GDP
Exchange rate	15% appreciation compared to what it otherwise would have been
Wages	Average real wage = 30% higher than without OT
Trade	The tradable sector is less competitive OT increases the value of exports by 60% and the value of imports by 20%
Volatility	Government tax revenue and dividends are highly dependent on commodity prices

Policy issues:

- The use of a wealth accumulation fund would mitigate the effects of structural adjustment
- Cash distribution policies exacerbate structural adjustment pressures and cause greater volatility in international competitiveness
- Increasing the workforce participation rate and encouraging Mongolians to return home would ease structural adjustment pressures

Impact of Oyu Tolgoi

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