



Economic assessment of the impact of Mongolia's proposed new mineral law

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Purpose and contents of the analysis

Purpose of the analysis: The analysis seeks to estimate the total impact (direct and indirect) of proposed new mineral law implementation on the Mongolian economy (domestic and external sectors, households and government)

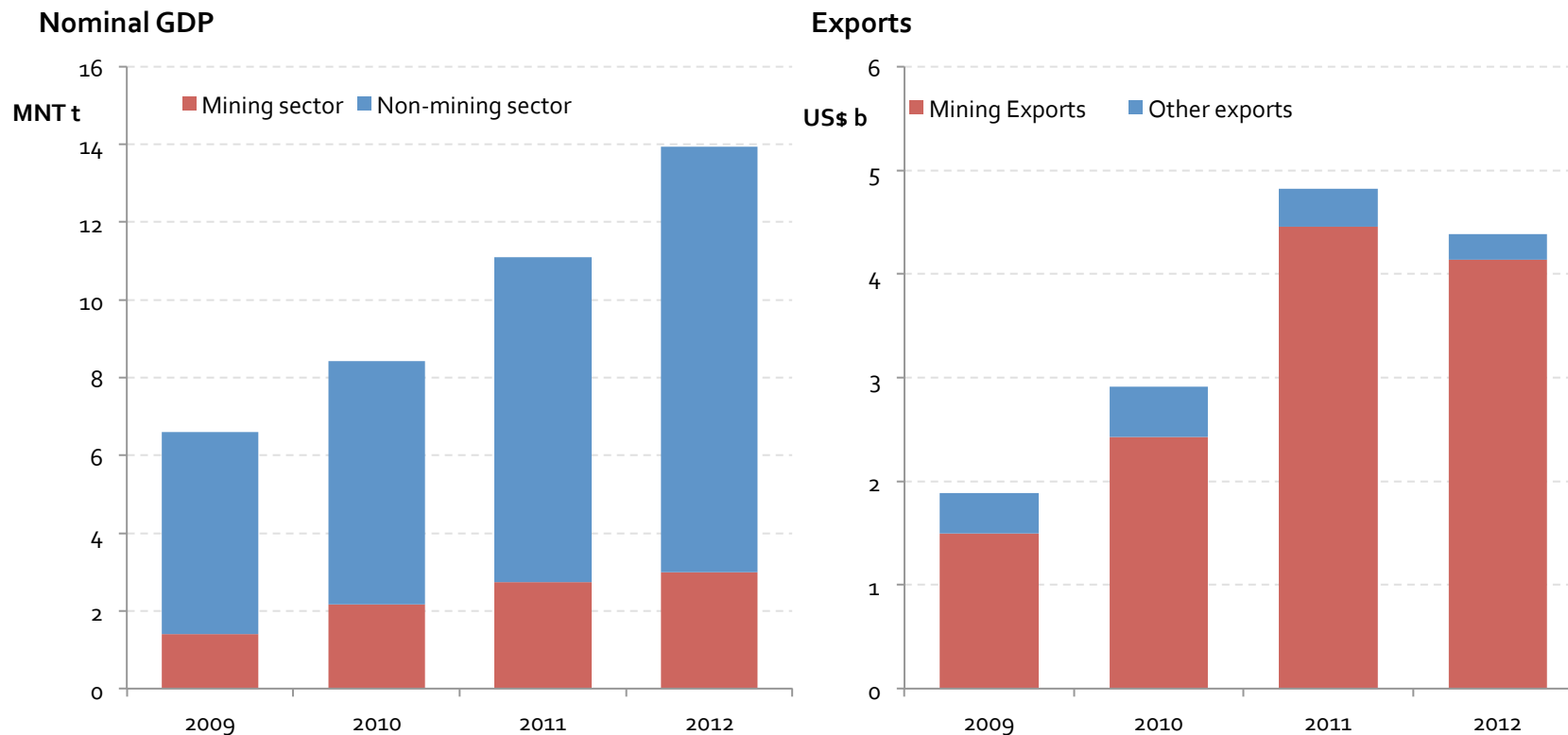
Contents:

- 1 • Role of the mining sector in the Mongolian economy
- 2 • Proposed new mineral law
- 3 • Methodology and assumptions used in the analysis
- 4 • Implications of the proposed new mineral law on the economy (model insights)
- 5 • Conclusions

The contribution of mining to the Mongolian economy

The mining sector became Mongolia's export engine of growth after the GFC

Mining sector impact on GDP and exports



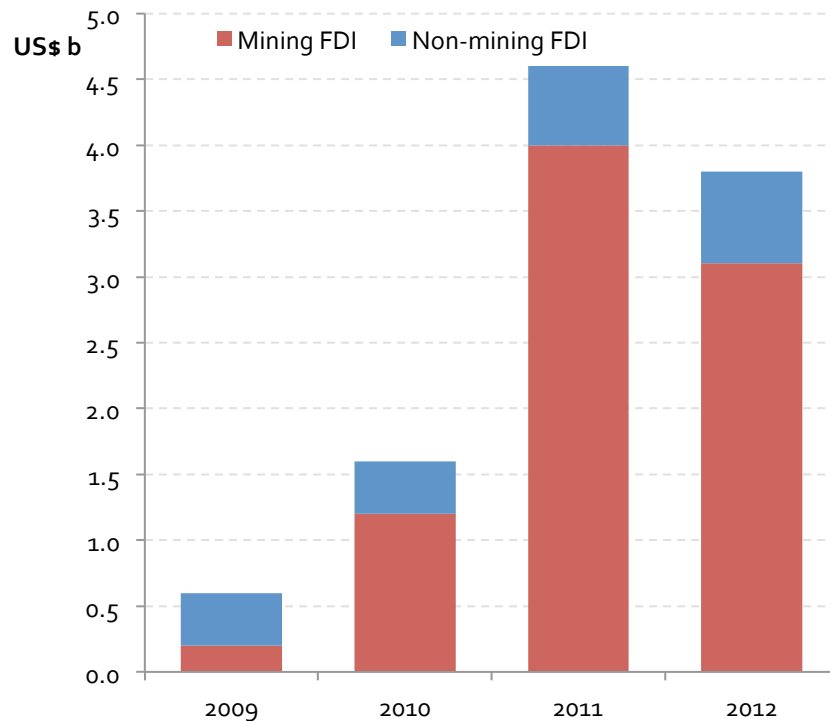
On average, the mining sector contributed around a quarter of national GDP over the past four years. After OT and TT reach full capacity, the mining sector will make further significant contributions to the domestic economy. The GDP share has not fully reflected the importance of the mining sector in recent years. From 2011, the mining sector has contributed more than 90% of total exports. Coal, copper and gold make up about 80% of mineral exports.

The growing demand of mining commodities and a favorable business environment have attracted foreign direct investment into Mongolia

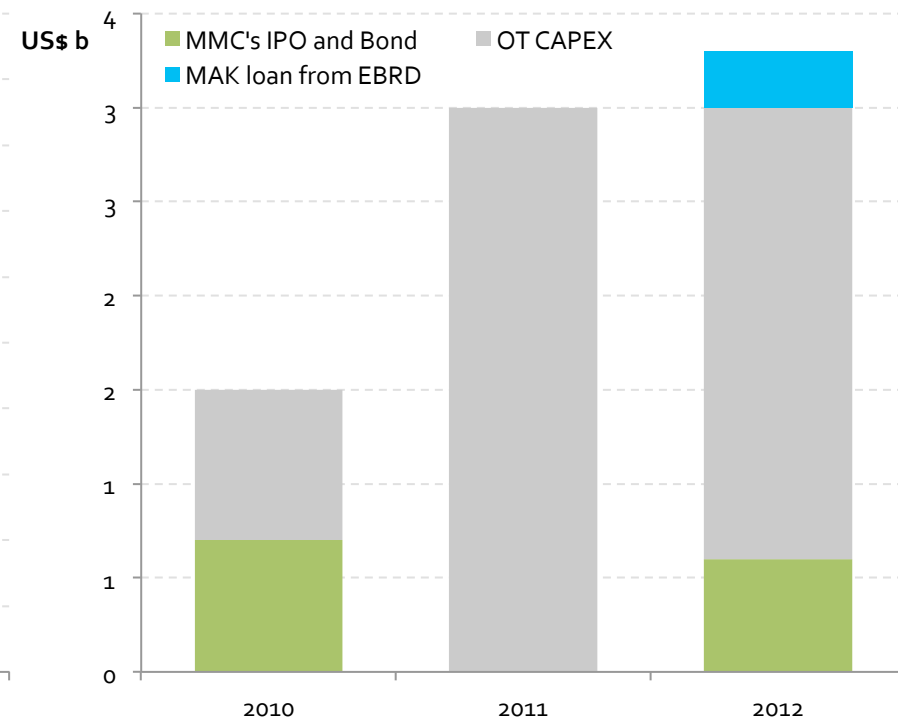


Mining sector impact on investment

Foreign Direct investment



Major foreign investment in the mining sector

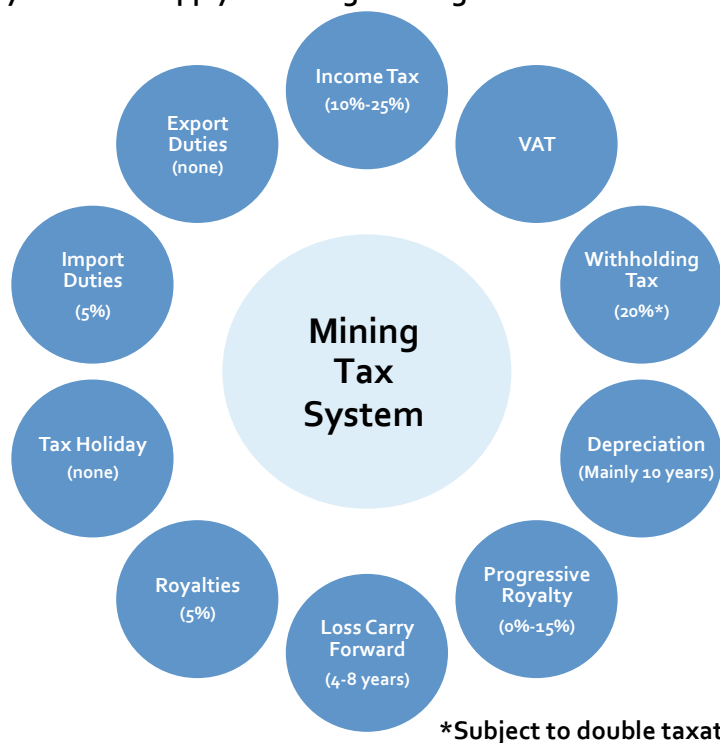


Of the total FDI inflow, US\$8.6 billion or approximately 81 per cent has been injected into the mining sector in Mongolia in the past four years. Of this percentage, OT alone has invested US\$6.2 billion of CAPEX in its first phase. In 2012 the Mongolian Mining Corporation (MMC), which owns one of the largest coking coal mines, Ukhaa Khudag, planned for its capital expenditure on infrastructure to rise by approximately US\$1.3 billion.

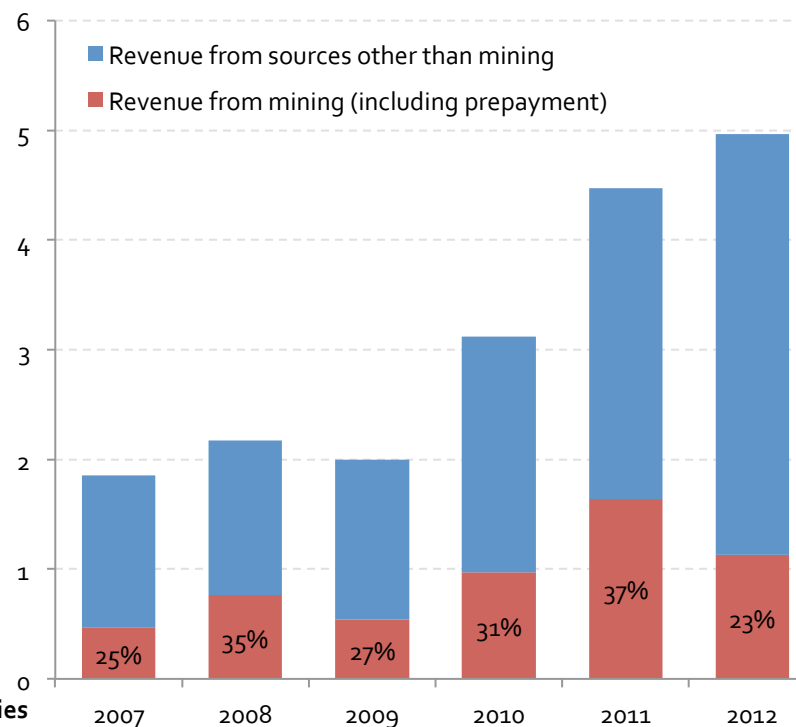
Income from the growing mining sector is a vital source of finance for the Mongolian government

Mining sector impact on government revenue

Key taxes that apply to mining in Mongolia



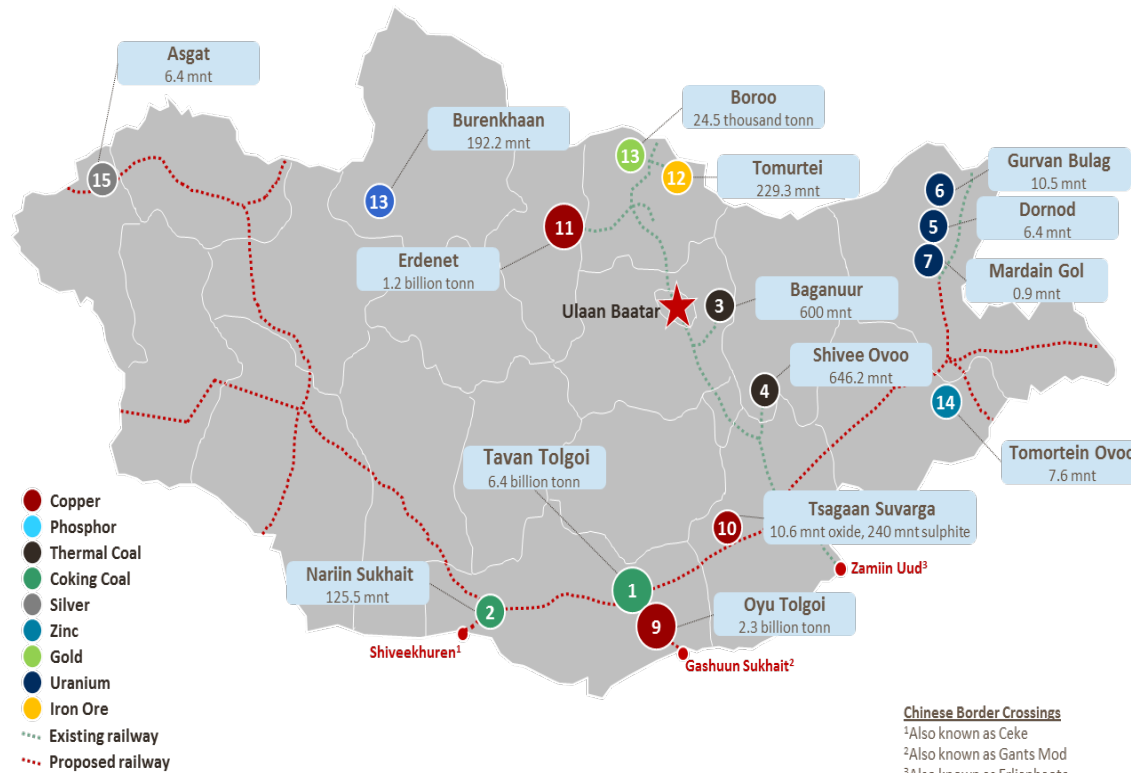
Budget revenue (MNT trillion)



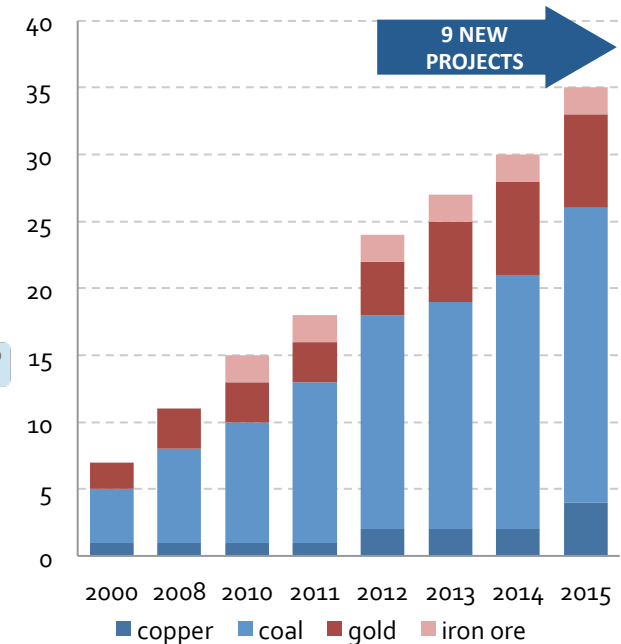
The government's reliance on mining sector income has grown higher in recent years via both tax and non-tax income collection. In the past four years the government earned MNT 4.2 trillion in tax income and MNT 0.75 trillion of prepayment from the mining sector. Not only is direct tax income from the mining sector important, tax income from mining service companies is also growing significantly. For example, a total of MNT 283.9 billion has been paid to local suppliers from Oyu Tolgoi LLC in the past three years.

If the business environment is favourable a number of mining companies are expected to commission operations in the near future

Strategic Resource Classification



Number of projects

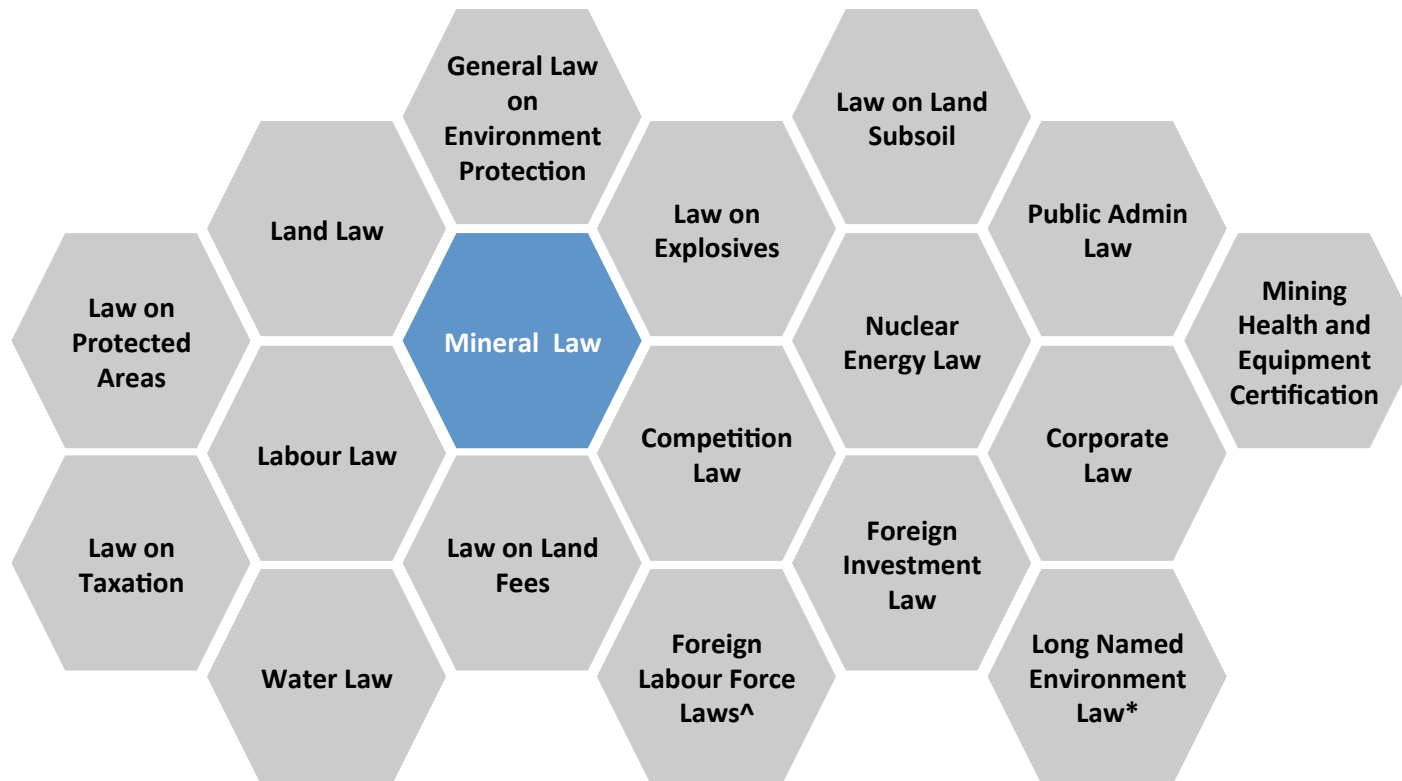


In the coming three years mining companies may implement nine new projects if business conditions are favourable. Coal projects are likely to constitute the majority of new projects. It is estimated that the total investment in these new mining projects could be US\$6.3 billion by 2015.

Mineral law

The Mineral law is the main regulation affecting the mining sector but there are many other laws that have an impact on mining

Legislation relevant to mining projects



^Sending Labor Force Abroad and Receiving Labor Force and Specialists from Abroad

*Law to Prohibit Mineral Exploration and Mining Operations at the Headwaters of Rivers, Protected Zones of Water Reservoirs and Forested Areas

Mineral law 2006 seeks to provide a transparent licencing system for investors in the sector



Mineral law amendment

	<u>Minerals Law 1997</u>	<u>Minerals Law 2006 (Amendment)</u>
1 Ownership	<ul style="list-style-type: none"> Mongolian citizens, foreign individuals, and any legal figure 	<ul style="list-style-type: none"> Up to 50 % government ownership of Strategic deposits, if the exploration is jointly funded by the State and private investors, up to 34% if the funds are from foreign investors
2 Licensing	<ul style="list-style-type: none"> Issued on a first come, first served basis Licence area <ul style="list-style-type: none"> 25 ha < EL Area < 400k ha ML Area = 500m in each direction Licence term <ul style="list-style-type: none"> EL = 2 years + 2 + 2 ML = 60 years + 40 	<ul style="list-style-type: none"> Issued on a tender basis Licence area <ul style="list-style-type: none"> 26 ha < EL Area < 400k ha ML Area = 500m in each direction Licence term <ul style="list-style-type: none"> EL = 3 years + 3 + 3 ML = 30 years + 10 + 10
3 Royalty	<ul style="list-style-type: none"> 2.5% 	<ul style="list-style-type: none"> 5.0%
4 Tax Exemption	<ul style="list-style-type: none"> Companies receive tax exemption <ul style="list-style-type: none"> 100% tax exemption for the first five (5) years of operation 50% for the next five (5) years of operation 	<ul style="list-style-type: none"> Companies receive tax exemption <ul style="list-style-type: none"> 100% tax exemption for the first two (2) years of operation 50% for the next three (3) years of operation

The 2006 Minerals Law substantially revised the 1997 law with the removal of tax holidays and the inclusion of defined rights and requirements for Government ownership in strategic deposits, though these were somewhat poorly defined. Minor amendments to the law in 2009 included the repeal of the mining windfall profits tax (WPT) that was passed in 2006. The Government is again rethinking its approach to mining regulation and has been developing new amendments to the Minerals Law since 2010 that address the perceived weaknesses in the current legislation.

Impact of proposed new mineral law on exploration companies is very negative

Relevant law article to the mining projects

Types of mining companies

Summary of law implication

Big mining projects: OT,
TT, EMC

- Higher ownership requirement (up to 75% vs up to 50%)
- Impractical requirement for local involvement (at 60% procurement, mandatory cooperation agreement with the community in prospecting and exploration)

Medium and small projects

- Prohibition of high grading (requires to extract entire ore without regard to the commercial value)
- Reduced financial incentive for investment (stabilization agreement is only available to strategic deposits, upfront closure cost payment tying up the capital investment)
- Reduced security of tenure (if the stabilization agreement ceases to comply with the interest of Mongolia, reopens the agreement and the equity is transferred to Mongolia free of charge)

Exploration companies

- Prohibitive minimum exploration expenditure requirements (US \$100k)
- Lack of transparency in the licensing process (Where a tender is rejected or blocked, it locks up potentially prospective ground for up to 4 years)

Despite potential significant future mining growth the proposed mineral law will restrict investment

Likely implication of the draft mineral law on mining companies

	Impact	Implication
<p>1</p> <p>Large mining projects (OT, TT, EMC)</p>	<ul style="list-style-type: none"> Higher ownership requirement Impractical requirement for local involvement 	<ul style="list-style-type: none"> Decreased FDI (no investment on underground of OT and West Tsankhi of TT) More bureaucracy Costly operation
<p>2</p> <p>Medium and small projects</p>	<ul style="list-style-type: none"> Prohibition on high grading Reduced financial incentive for investment Reduced security of tenure 	<ul style="list-style-type: none"> Sharp decrease in FDI in domestic companies listed abroad (no growth in production) No additional investment in domestic companies (no growth in production) New projects will not be launched
<p>3</p> <p>Exploration companies</p>	<ul style="list-style-type: none"> Prohibitive minimum exploration expenditure requirements Lack of transparency in the license process 	<ul style="list-style-type: none"> No additional exploration Expropriation of a number of existing small to medium size companies

Methodology and assumptions used in the economic assessment of the new mineral law

MINCGEMv2: A dynamic general equilibrium model with detailed sectoral, national and government accounts

Methodology of the economic analysis of proposed new mineral law

Database: GTAP8 database (MINCGEMv2)

GTAP v8 database with a base year of 2007 and covers 129 countries/regions across the world and 57 commodity groups

The MINCGEMv2 expands the GTAP commodity groups to 71 and was aggregated into 10 economies (Mongolia, China, Russia, India etc*...) and 20 commodities

- Mining (thermal coal, met coal, copper, gold, oil, gas, coke, petroleum and other minerals)
- Agriculture (crops, livestock, fishing and forestry)
- Manufacture (Processed Food, Copper refining and manufacturing, other manufacturing)
- Electricity
- Transport
- Construction
- Public Administration, Defense, Health and Education
- Other services

Methodology: Dynamic CGE (Computable General Equilibrium)

Dynamic multi-region, multi-sector CGE model developed by BAEconomics

Capable of simulating economic scenarios over a long time horizon. Each time step is one year

Demand for commodities in the model is determined by the social accounting matrices of the modeling regions, the prevailing economic conditions and policy settings

CGE models are structured on the basics of supply and demand. Each sector of the economy is linked by supply and use of factors and intermediate inputs.

CGE models account for the industrial flow-on effects triggered by shocks in other parts of the economy and the economic feedback effects that are neglected in many government policy analyses

Key features

CGE models ensure that the most important economic identities and constraints (extremely important for simulating long-term scenarios):

- GDP measured by the expenditure approach and the income approach;
- Supply of capital, labour and natural resources;
- Market clearance of individual markets;
- The relationship between the current account and the capital account;
- The relationship between government expenditure and taxes;

are respected during each simulation time step.

CGE models contain detailed industry cost structure and bilateral trade information in their databases such that substitution between commodities and competition between economies can be modelled explicitly

CGE models have several features making them the most appropriate tool for policy and scenario analysis

Two scenarios were developed under the MINCGEM framework to assess the macroeconomic implications of the new mining law



Assumptions of the two scenarios

	Existing mineral law scenario	New mineral law scenario
1 Mining production	<ul style="list-style-type: none"> All the existing mining projects will be operated including the projects of exploration companies 	<ul style="list-style-type: none"> The current mining projects will be operated* but new exploration projects will be severely affected
2 Mining prices	<ul style="list-style-type: none"> Commodity prices are based on consensus prices and discounted to Mongolian border price 	<ul style="list-style-type: none"> Commodity prices are based on consensus prices and discounted to Mongolian border price
3 Mining FDI (exploration & expansion)	<ul style="list-style-type: none"> Additional FDI investment in the mining sector Thermal coal - US\$1.4 billion Metallurgical coal - US\$1.2 billion Copper - US\$8.7 billion 	<ul style="list-style-type: none"> Determined endogenously by an alternative sectoral growth pathway with lower FDI investment in the mining sector
4 Infrastructure projects	<ul style="list-style-type: none"> Endogenously determined with the inclusions of additional infrastructure projects Coal washing plant: <ul style="list-style-type: none"> ETT and MMC Power plant: <ul style="list-style-type: none"> Tavan Tolgoi and Chandgana 	<ul style="list-style-type: none"> Determined endogenously by an alternative sectoral growth pathway with lower FDI investment in and lower demand for infrastructure projects

* - Oyu tolgoi will only operate open-pit mining

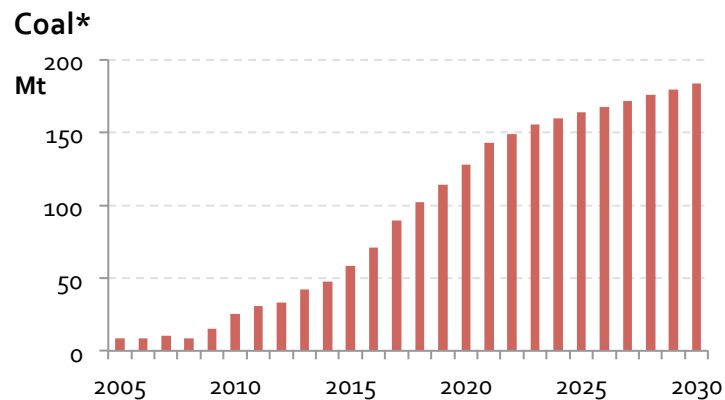
** - Tavan tolgoi will only operate East Tsankhii

Production from the mining sector is projected to be severely affected under the new mineral law

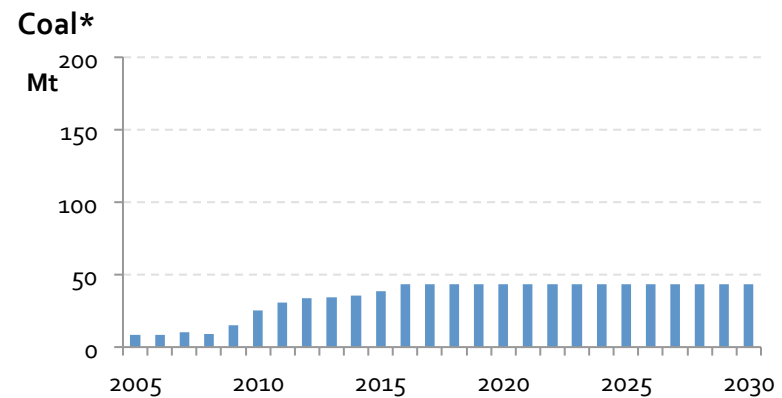


Assumptions : Mining production volume (coal and copper as main commodities)

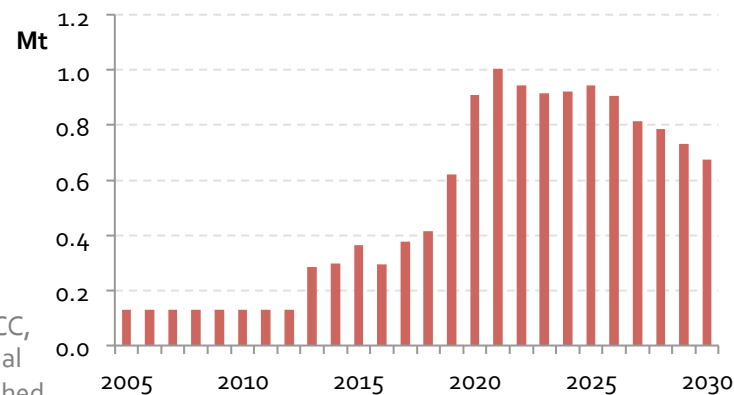
Existing mineral law scenario



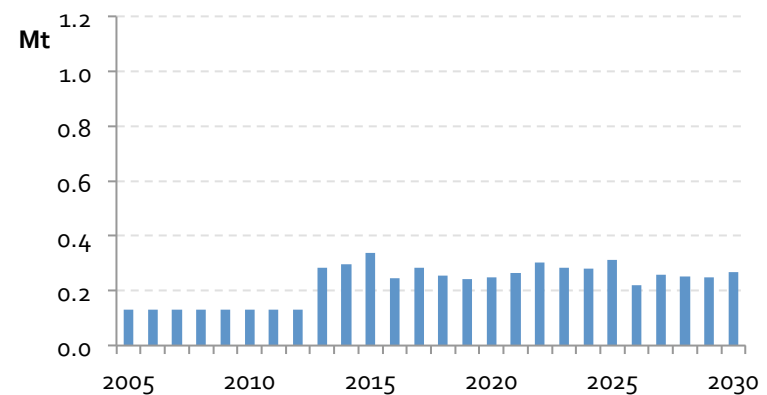
New mineral law scenario



Paid Copper



Paid Copper



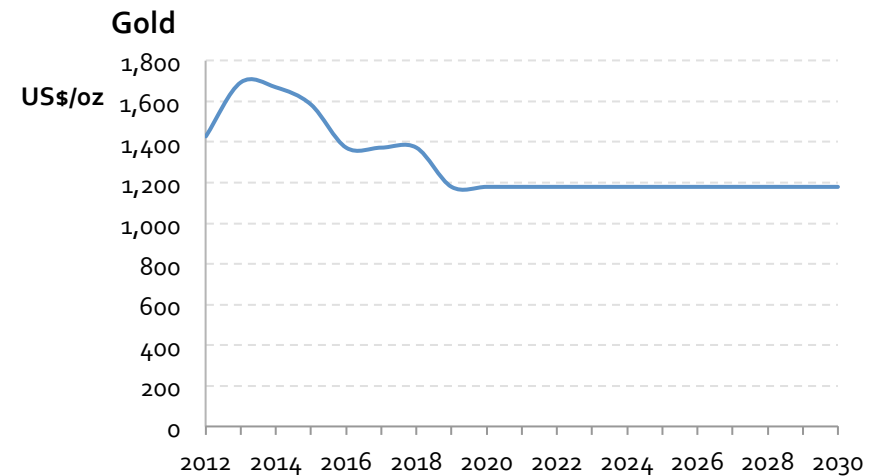
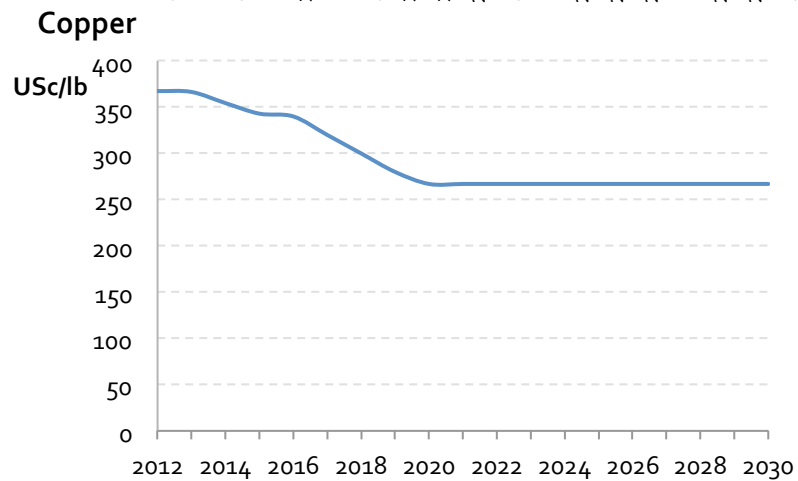
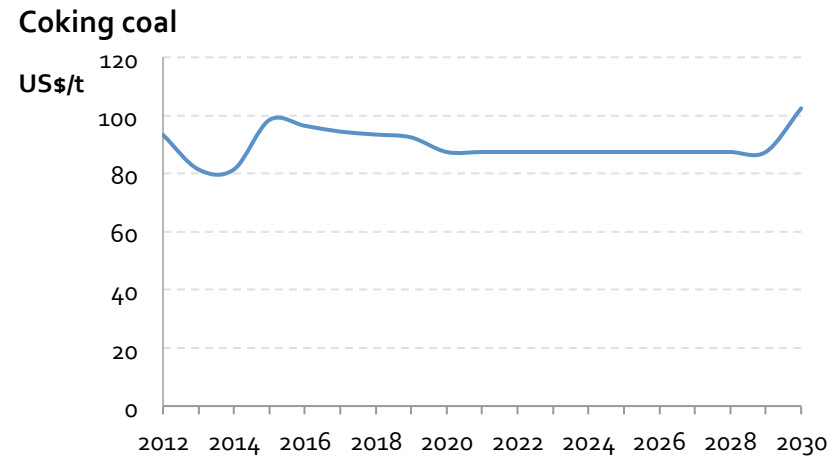
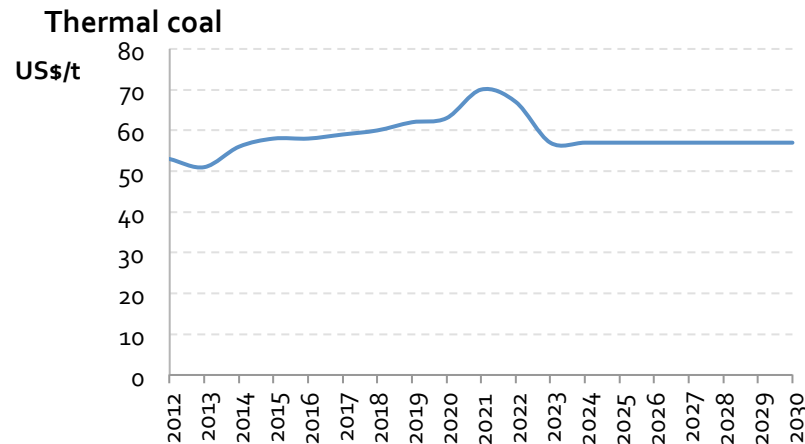
*included HCC, SSCC, thermal coal and washed coking coal

Before 2011 Mongolia's thermal coal was mainly used in domestic consumption (power and heating). Thermal coal exports began at the end of 2012 (November).

Price assumptions are based on latest consensus prices from economists around the world



Assumptions : consensus price (2013 price)



Coal price is discounted to Mongolian border price in the model

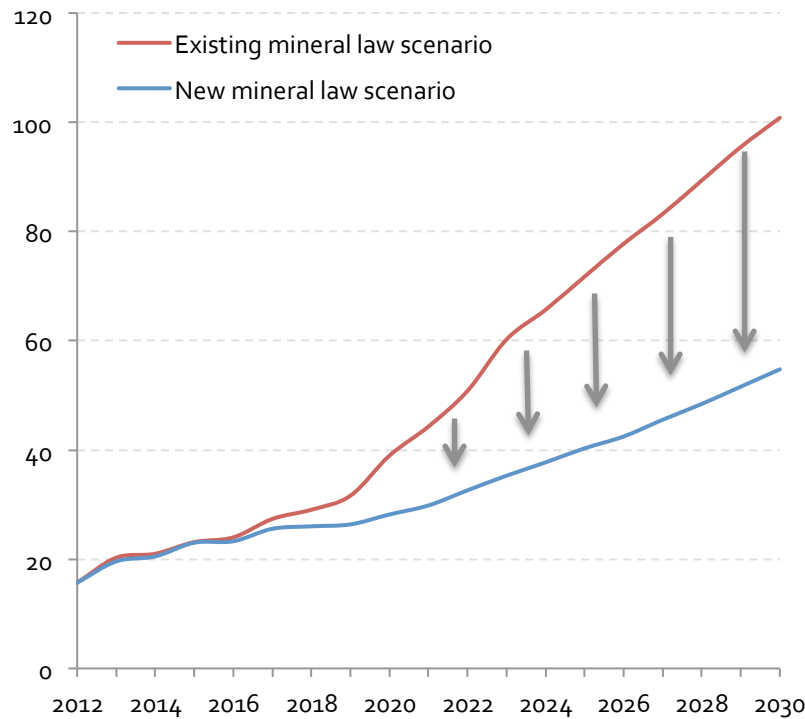
Modelling results

Mongolian economic growth would be 4 percentage points a year lower over two decades under the proposed new mineral law

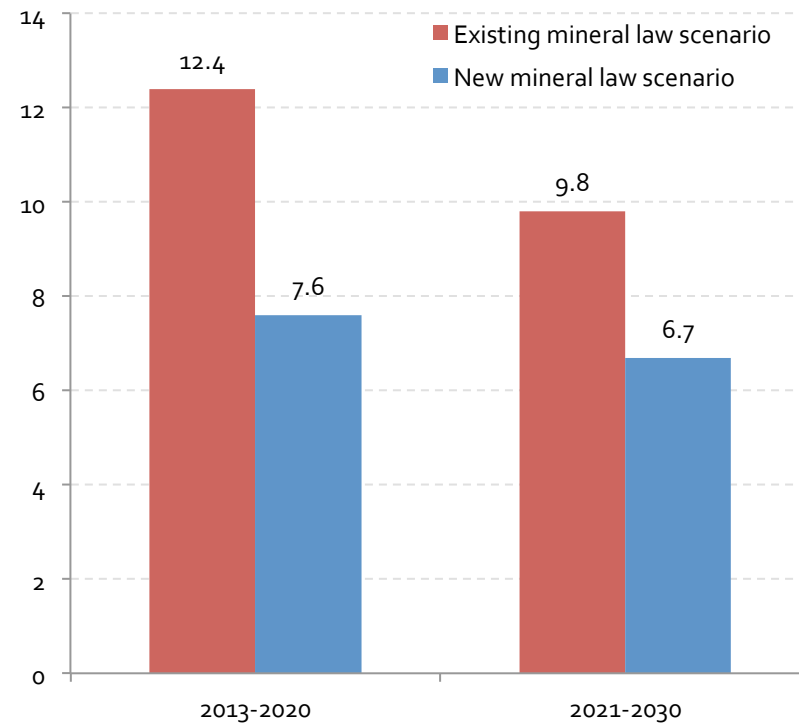


New Mineral law impact on the GDP

Real GDP (MNT trillion, 2013 price)



Average annual real GDP growth (%)

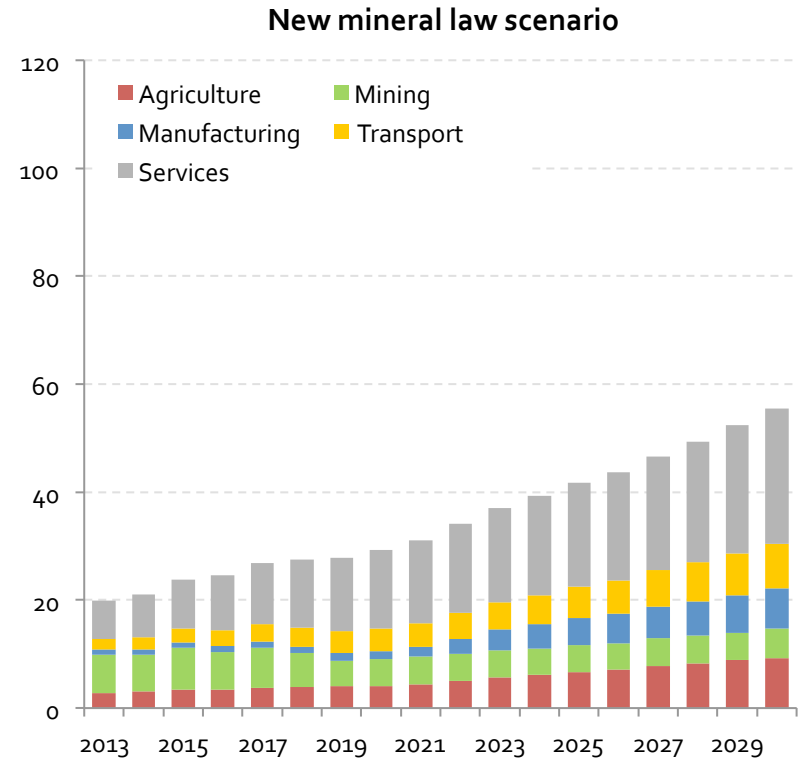
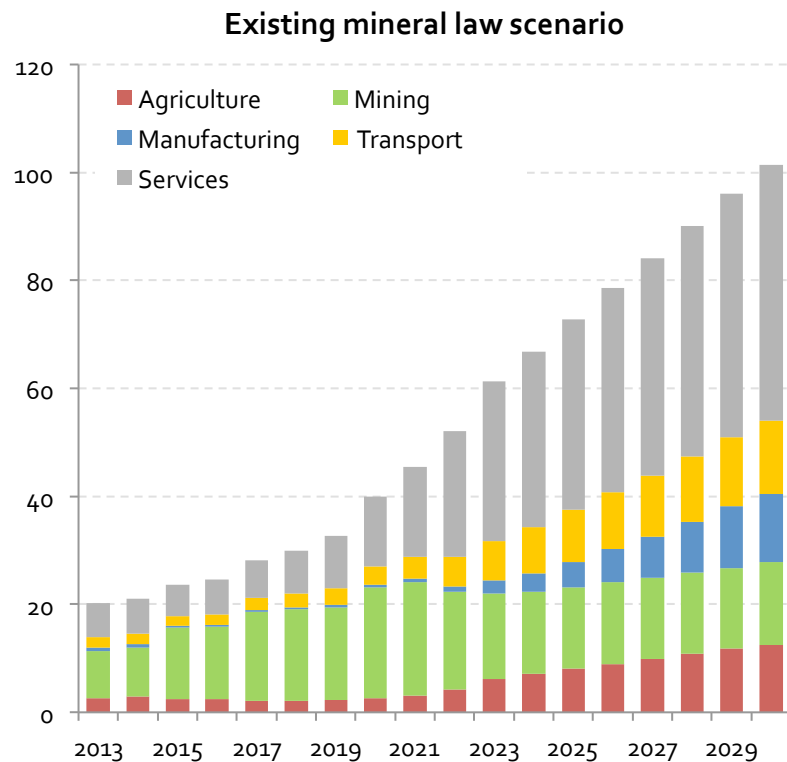


Under the new mineral law scenario, average GDP growth (2013-2030) would be 4 percentage points lower (7% vs 11%) compared to what it would be under the existing mineral law. This translates to a MNT 358 trillion (in 2013 price) loss in 2013-2030 which is 23 times greater than GDP in 2012

All production sectors would experience significant growth under the existing mineral law despite the competition for labour and capital from the mining sector

Domestic Sectors

GDP by sectors (MNT trillion, 2013 price)

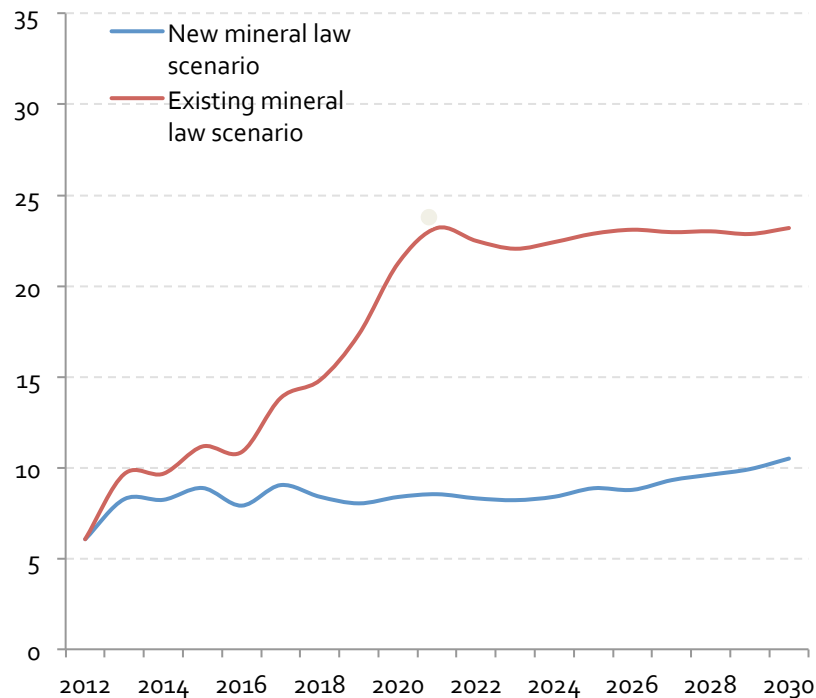


The size of the mining sector would at least 50% smaller under the scenario with the new mineral law. The size of the other production sectors would also be significantly smaller. The positive effects generated by the mining sector is far greater than the potential 'Dutch disease' effect.

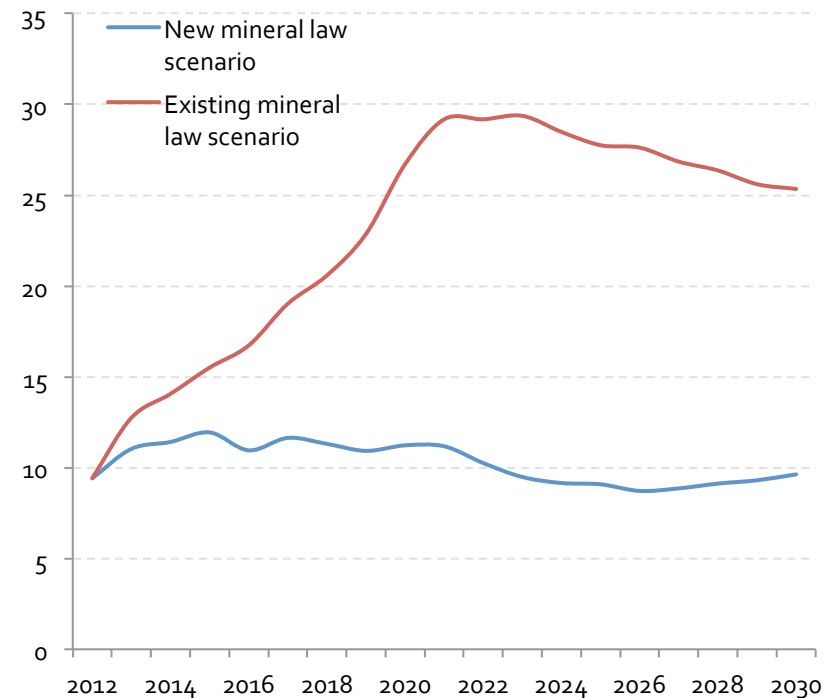
The proposed new mining law would have significant impacts on international trade

Impact on international trade (MNT trillion, 2013 price)

Impact on exports



Impact on imports



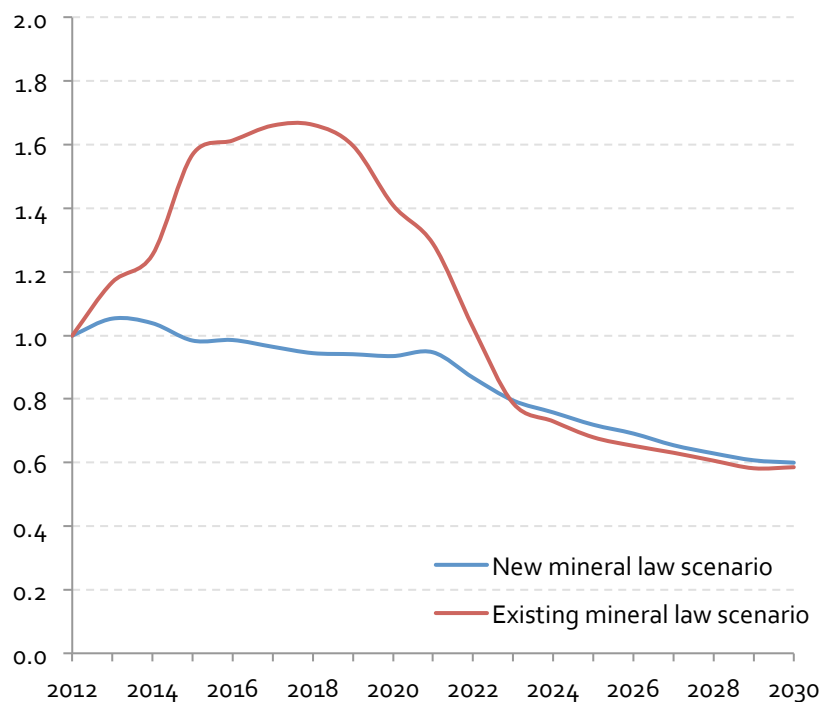
By 2020, the total exports would exceed 21 trillion MNT (in today's prices) under the existing mineral law. This is about threefold what it would be under the new mineral law. Strong economic growth and appreciation in the real exchange rate under the existing mineral law increases the purchasing power of domestic households, and thus increases the demand for imported goods.

New mining law weakens the domestic exchange rate of Mongolia in the short run but reduce the purchasing power of domestic households

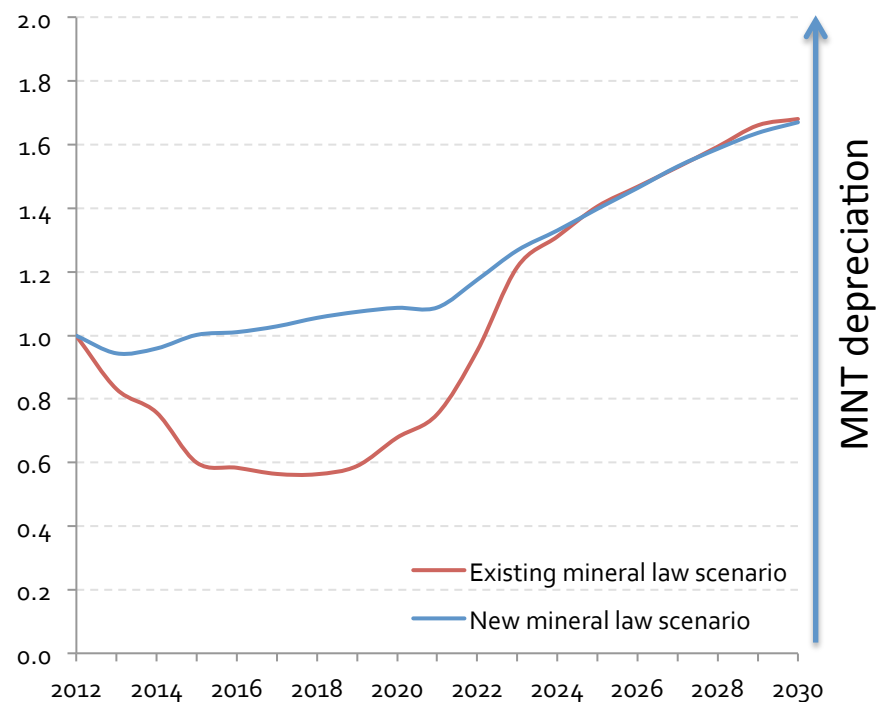
External Sectors

Impact on terms of trade and exchange rate (index, 2012=1)

Impact on terms of trade



Impact on exchange rate



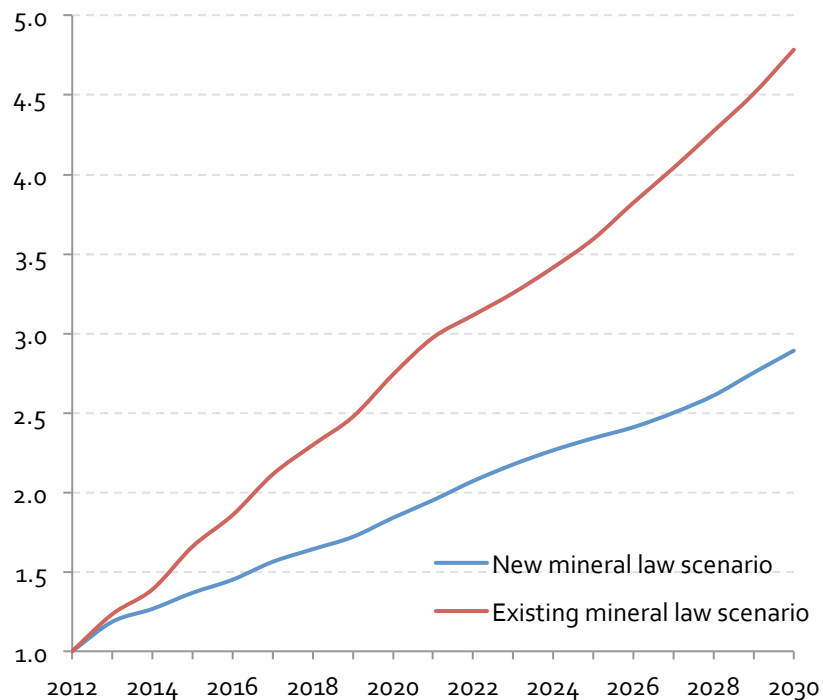
Strong export growth, coupled with strong commodity prices before 2020, lead to a rise in the terms of trade under the existing mineral law scenario. Rising terms of trade is strongly connected to the appreciation of real exchange rate before 2020. Rising terms of trade increase the purchasing power of domestic households and the welfare of consumers.

New mining law hurts private consumption and reduces real wages (purchasing power)

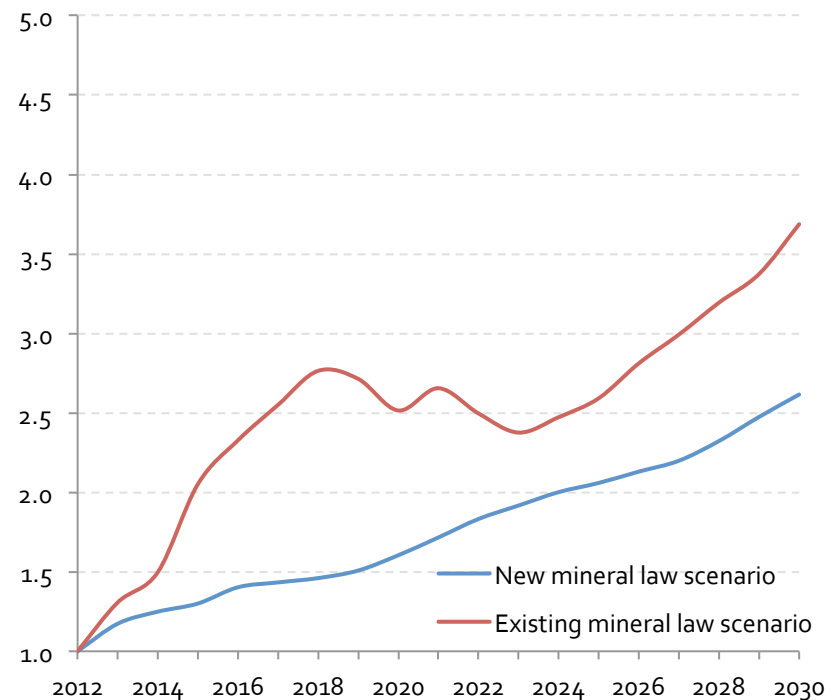
Households

Impact on real consumption and real wages (index, 2012=1)

Impact on real wages



Impact on real consumption



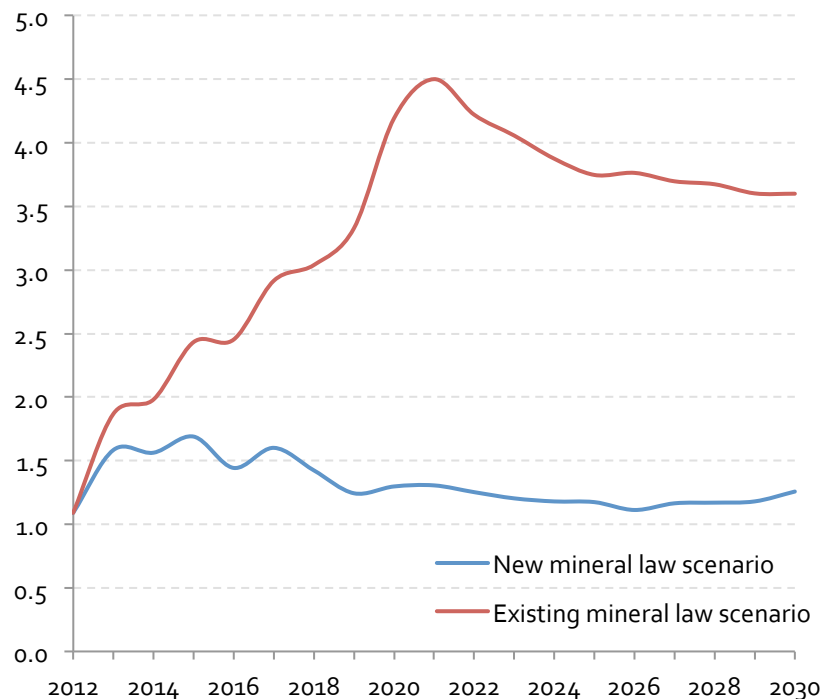
By 2020, real consumption private household consumption under the existing mineral law scenario is 56% higher than that under the new mineral law scenario. Fast labour productivity growth, driven by technology transfer from foreign companies and 'learning-by-doing' under the existing mineral law scenario is the main driver of real wage increase. By 2016, average real wage under the existing mineral law is about double that under the new mineral law scenario.

The proposed new mining law would weaken the government's financial position and its capability to raise debt in the international market

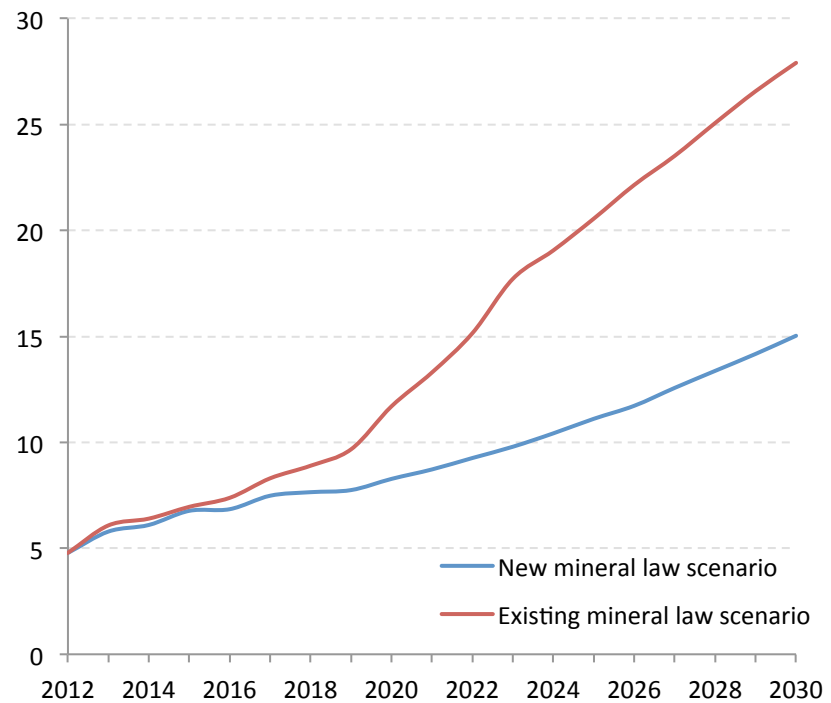
Government

Impact on state budget (MNT trillion, 2013 price)

Tax revenue from mining



Total tax revenue



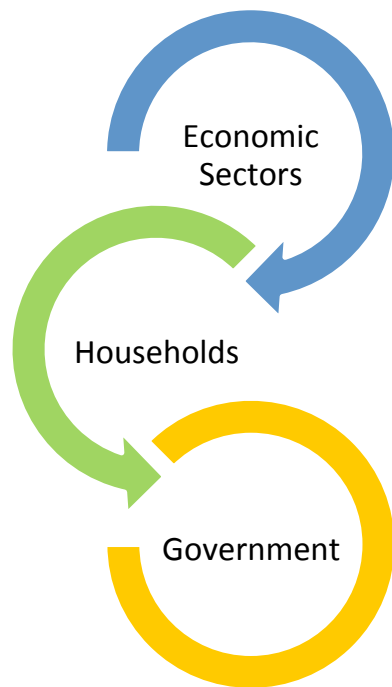
Under the new mining law, the government will receive considerably less tax from the mining sector and from other parts of the economy. Over the projection period from 2013-2030, the government will receive 37 trillion MNT (in today's prices) less from the mining sector and 110 trillion MNT (in today's prices) from the whole economy under the new mining law, in comparison with the existing mineral law scenario. Note that dividends from mining projects have not been included in these figures.

The negative impacts of the proposed new mineral law on Mongolia are significant

Conclusions

Under the new mining law:

- Average GDP growth over the projection period (2013-30) will be 4 percentage points lower (7% vs 11%) from what it otherwise would have been under the existing mineral law.
- Under the proposed mineral law all sectors of the economy would be significantly smaller than they would be under the existing mineral law. Strong growth in the minerals sector has significant positive spillover effects on other sectors of the economy.
- From 2020 to 2030, total exports will be around 60% lower than what they otherwise would have been under the existing mineral law. Total imports and Mongolian trading firms will suffer a similar fate.
- By 2030, real private household consumption would be around 30% lower under the proposed law. Average real wages would be around 35% lower than otherwise.
- Lower labour productivity growth is driven by fewer opportunities for Mongolians to learn the latest technology from world leading companies. Technology transfer and 'learning-by-doing' are the two key factors driving the economic success in East Asian countries.
- Over the projection period from 2013-2030, the government would receive 37 trillion MNT (in today's price) less from the mining sector and 110 trillion MNT (in today's price) from the whole economy, in comparison with the existing mineral law scenario.



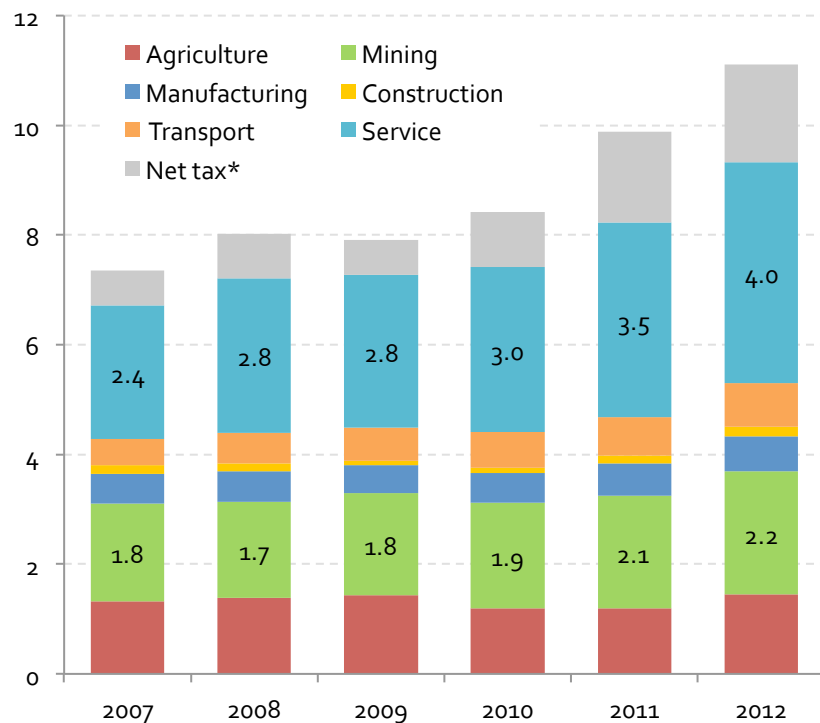
Appendix

The Mongolian economy has grown significantly since the GFC based on mining and service sector output

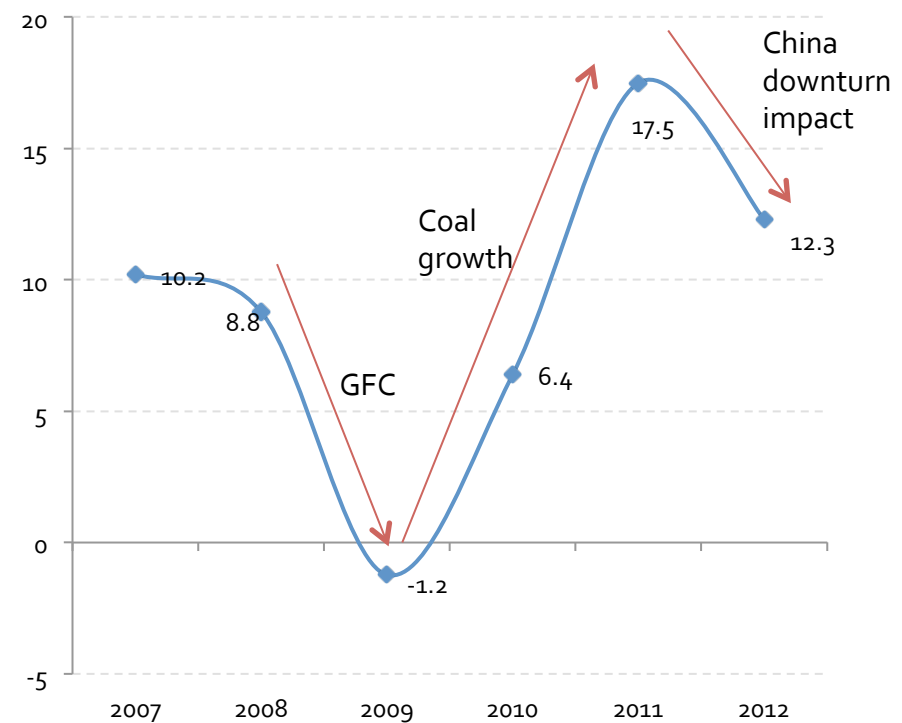
Domestic Sectors

Mining sector impact on GDP

Real GDP (MNT trillion, 2010 prices)



Real GDP growth (% , y-o-y)



Before 2010, Erdenet was the main contributor to the mining sector. Since 2010, coal sales have increased significantly based on exports from MAK Chinhua, SGS Ovoot Tolgoi, Mini TT, ETT (East Tsankhi) and Ukhaa Khudag. Mining sector's impact on service[^], construction^{^^} and external sector^{^^^} is high. As the result net tax increased significantly

*Net tax included VAT, excise tax from vodka & tobacco and taxes on foreign trade

[^]Directly: most of mining sector's suppliers in service sector. Indirectly: most of consumption is contributed to service sector (whole and retail trade mostly) based on money inflow from abroad (mining export revenue and investment to mining)

^{^^}Infrastructure development based on mining

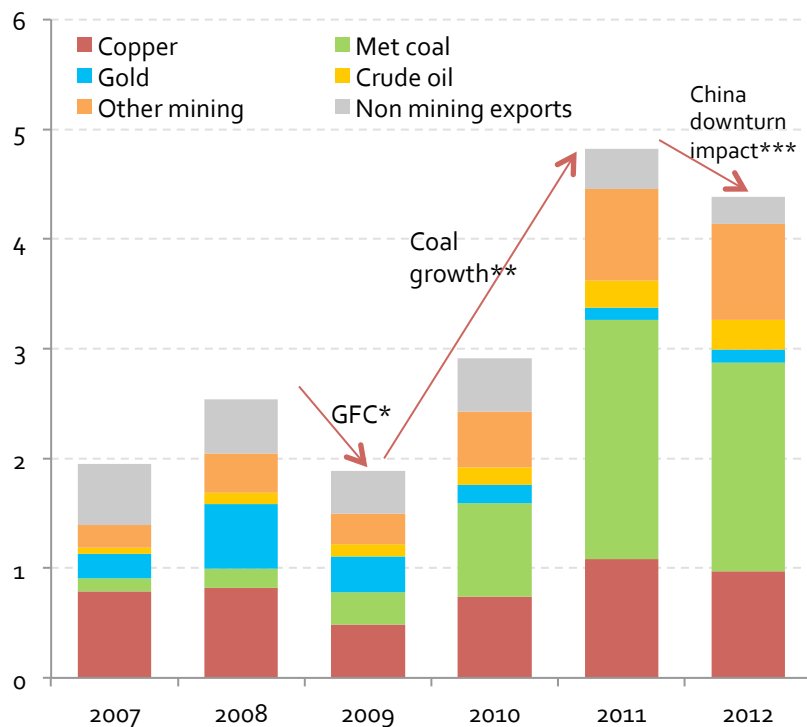
^{^^^}Mining export contributed around 90% of export and mining equipment and trucks import' share is high in total import of Mongolia

Although the mining sector is the main contributor to export revenue, import purchases by this sector is high due to the lack of domestic companies that produce final goods such as fuel, electricity and other machinery and equipment

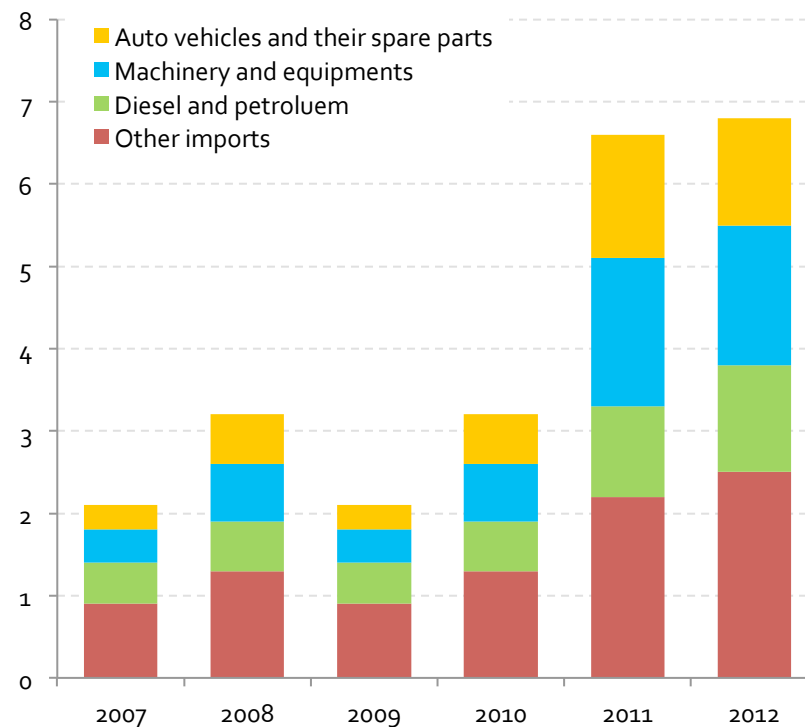
External Sectors

Mining sector impact on external sector

Exports (US\$ billion)



Imports (US\$ billion)



The mining sector contributes the dominant share of total exports. About 80 per cent of mineral exports is made up of coal, copper and gold. Mining related imports (mostly trucks, mining equipment, electricity, fuel) have increased significantly in the past few years as the number of new mining projects grew quickly.

*Copper price declined by 70% after reaching a peak in July 2008 at the height of the global commodity boom

**New big coal mining projects and coal price structural change in 2011 (Before structural change (2010) Border average price is US\$50/t, After it US\$100/t)

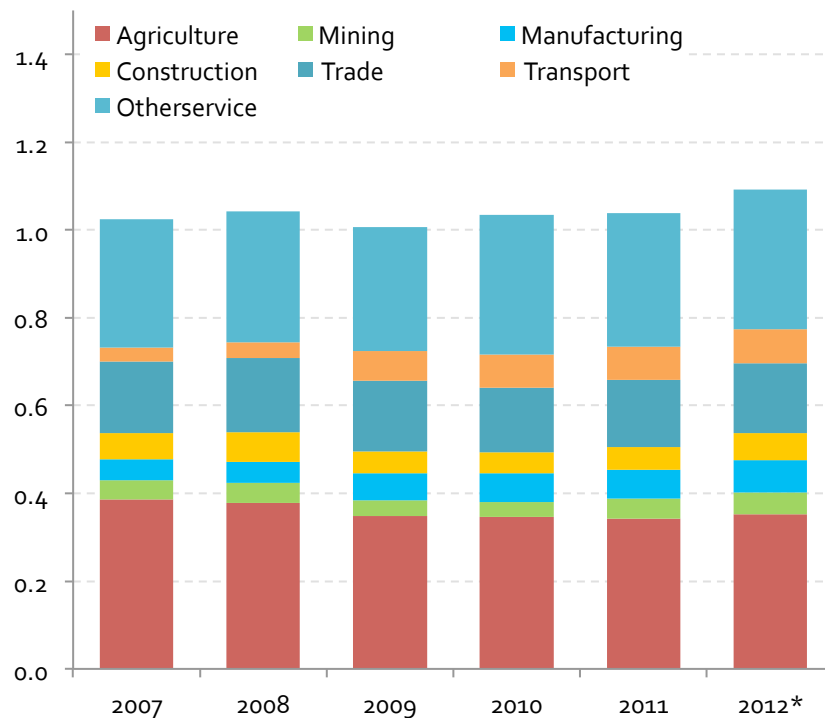
***Coal border price declined by 15%, Copper border price declined by 13% relative to 2011

Although the mining sector is not a labour intensive sector, impact on average wages is high

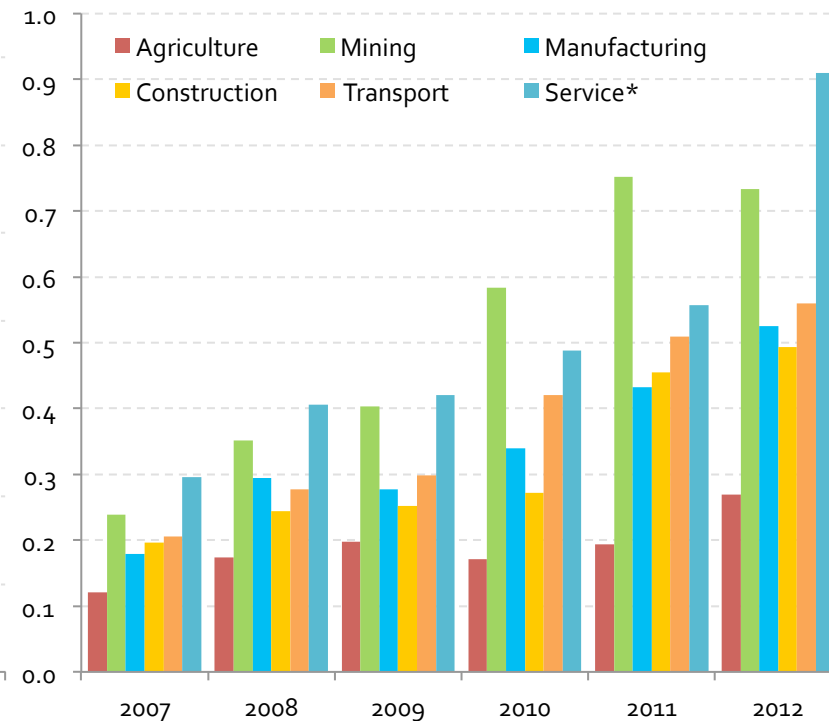
Households

Mining sector impact on households

Number of employees (million persons)



Monthly average wage (MNT million)



Average salary in the public service increased by ~60% compared to 2011 (highest growth in education and health sector).
Average salary in the mining sector fell in 2012 due to the China downturn impact on coal prices.

* Electricity, whole sale and retail trade, hotels and restaurant, financial and insurance, public administration, education

Only mining projects already operating will continue to operate and all exploration projects will be closed given the new mineral law's significant impact on FDI

Assumptions : Mining production value (US\$ billion, 2007 prices), by commodity and project type

1

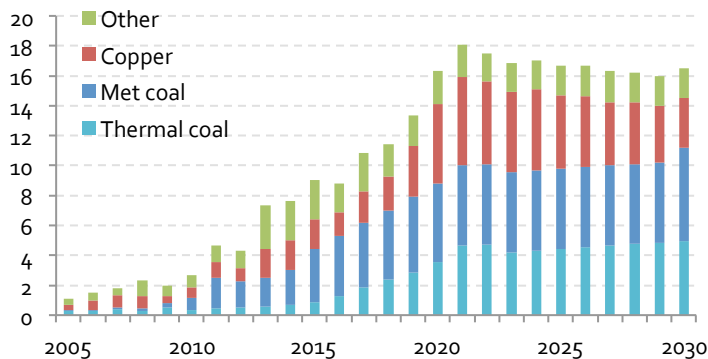
Mining production

2

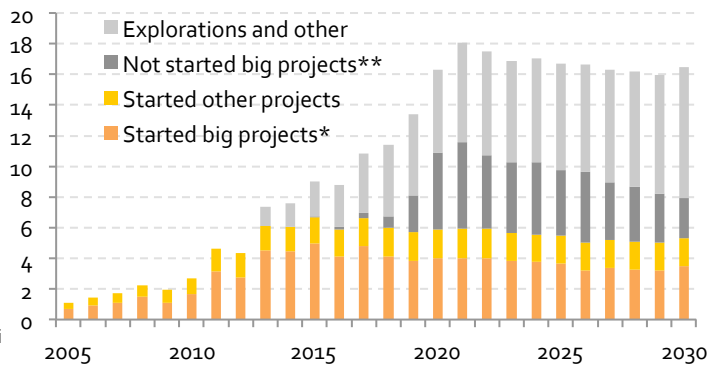
Mining prices

Existing mineral law scenario

By commodity type

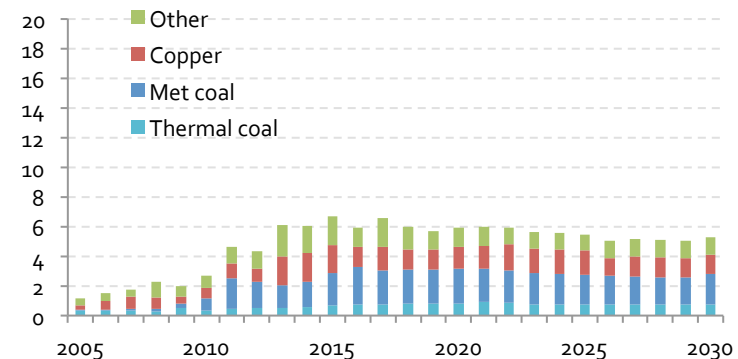


By project type

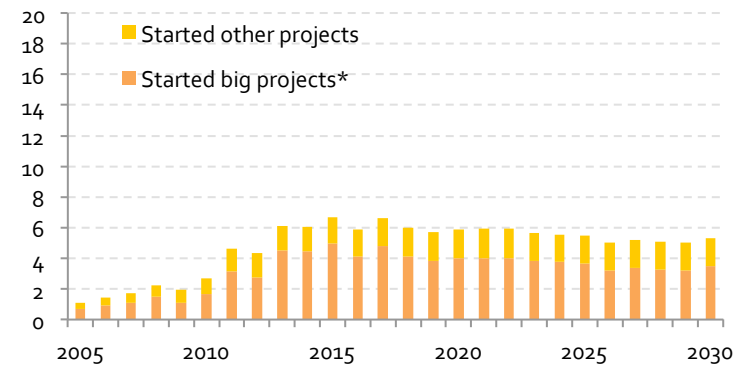


New mineral law scenario

By commodities



By project type



*EMC, OT open pit, TT East Tsankhi
 **OT underground, TT West Tsankhi

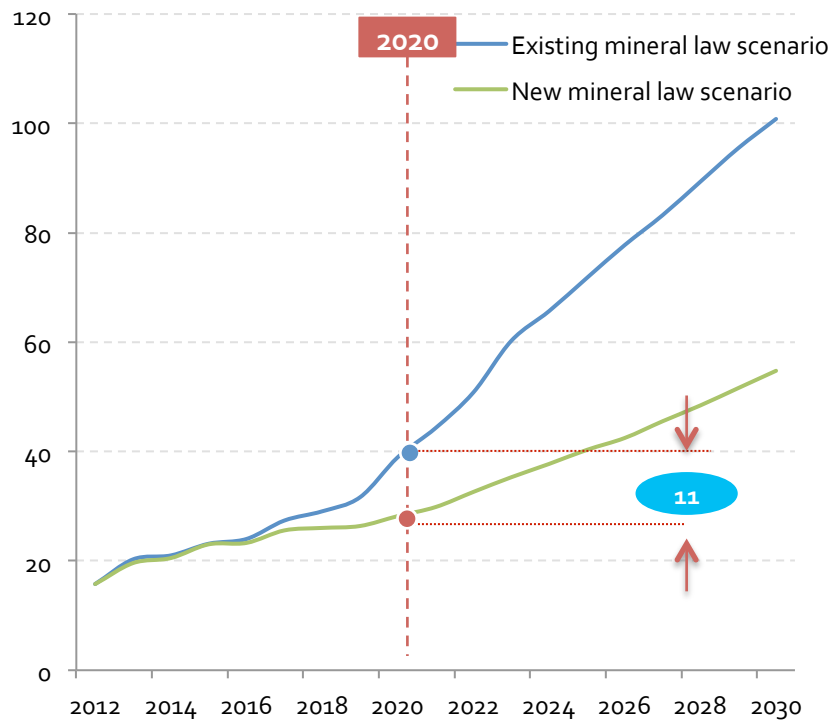
Mongolia's thermal coal was used in domestic consumption (power and heating) only before 2012. Exports of this product commenced in November 2012

New mineral law impact on GNP is lower than the impact on GDP due to the high foreign direct investment in the mining sector in Mongolia

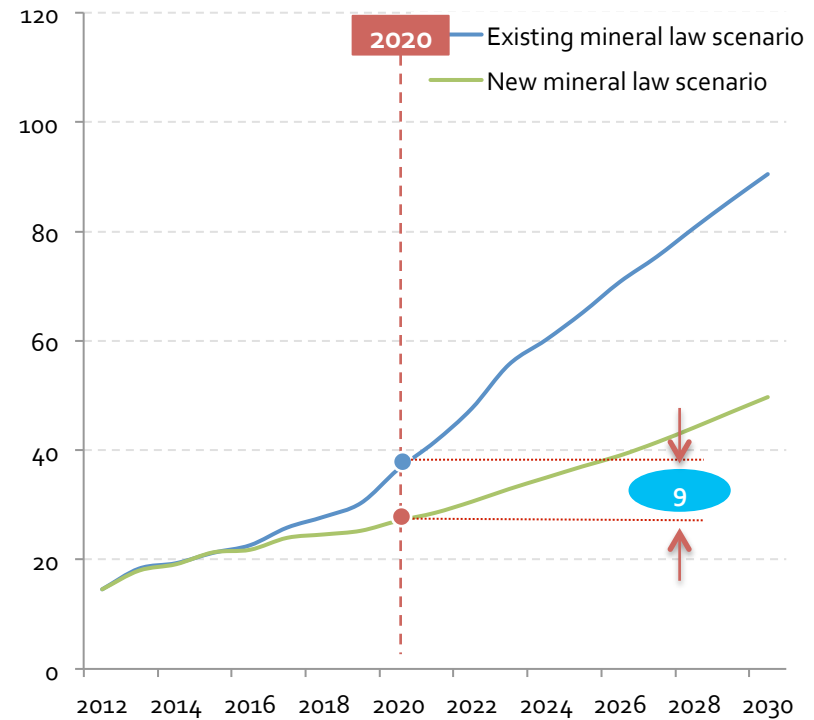


New Mineral law impact on the GNP vs. GDP

Real GDP (MNT trillion, 2013 price)



Real GNP (MNT trillion, 2013 prices)



Over the period 2013-2030, new mining law scenario total impact on GNP will be at MNT 308 trillion compared with the total impact on GDP of MNT 358 trillion in today's prices

Summary Findings



Economic Indicators (MNT trillion 2013 prices)

	Now: 2012	By 2020 we expect:	
		Existing mineral law scenario	New mineral law scenario
Real GDP	15.7	38.9	28.2
Exports	6.0	21.2	8.4
Imports	9.4	26.7	11.2
Real exchange rate	1.0 (index)	1.1 (index)	0.7 (index)
Real wage (purchasing power)	1.0 (index)	2.5 (index)	1.8 (index)
Tax revenue from mining	1.1	4.2	1.3
Total tax revenue	4.7	11.7	8.3
Real GNP	14.5	36.5	27.1

The world is divided into 10 economies in MINCGEMv2



1. Mongolia	6. Russia
2. China	7. Rest of Europe
3. Japan, Korea and Taiwan	8. North America
4. India	9. South America
5. Rest of Asia and Oceania	10. Middle East and North Africa

Each economy is divided into 20 production sectors

1. Thermal Coal	11. Livestock
2. Coking Coal	12. Fishing and Forestry
3. Oil	13. Processed Food
4. Gas	14. Copper refining and manufacturing
5. Copper concentrate	15. Other Manufacturing
6. Gold	16. Electricity
7. Other minerals	17. Transport
8. Coke	18. Construction
9. Nuclear & petroleum fuel	19. Public Administration, Defense, Health and Education
10. Crops	20. Services

DESCRIPTION OF EACH SUMMARY OF LAW IMPLICATIONS



- **HIGHER OWNERSHIP REQUIREMENT** _ (1) 75%, 51% or 34% of the shared capital of the company holding a Mining Licence, must be a Mongolian Citizen
- **IMPRACTICAL REQUIREMENT FOR LOCAL INVOLVEMENT** _ (1) 60% local procurement required – unable to be supported by existing market; (2) Community cooperation agreements required for prospecting and exploration tenements
- **PROHIBITION OF HIGH GRADING MINING** _ (1) If companies are required to mine the entire reserve without regard to the commercial value of the extracted mineral it will act as a deterrent to investment in the industry. The definition should include an economic/commercial cutoff.
- **REDUCED FINANCIAL INCENTIVE FOR INVESTMENT** _ (1) The new legislation provides for DDAs to be negotiated for strategic deposits only; (2) Upfront payment of closure costs - requires a deposit of a huge sum of the money tying up capital for the life of the project; (3) Royalty structure (separate piece of legislature)
- **REDUCED SECURITY OF TENURE** _ (1) Minerals of strategic importance/percentage of state equity/equity obtained free of charge (An investor may incur significant costs in exploration and appraisal risk that the GOM will take an unspecified interest in the project)
- **PROHIBITIVE MINIMUM EXPLORATION EXPENDITURE REQUIREMENTS** _ (1) prohibitive min expenditure (US\$ 100K) for all but the most successful projects. Mongolian and international juniors not likely to be able to meet min spend requirements.
- **LACK OF TRANSPARENCY IN THE LICENSE PROCESS** _ (1) tender process – prone to corruption. Ability to increase royalties; may be tendency to place this above other criteria such as capacity and experience. Where a tender is rejected or blocked, it locks up potentially prospective ground for up to 4 years.