Socio-economic recovery from the Covid-19 pandemic: Macroeconomic impacts and policy issues in Mongolia

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Abstract

This paper examines macroeconomic impacts of Covid-19 and policy issues for recovery in Mongolia, a developing and commodity-exporting economy, by estimating a Bayesian structural vector autoregression on quarterly data. Our estimates suggest that China's GDP and copper price shocks respectively account for three-fifths and one-fifths of the drop in real GDP in 2020Q1. The recovery observed for 2020Q2-2021Q1 is also primarily due to positive shocks to the variables. However, the 'W-shaped' recovery is now expected instead of 'V-shaped' due to the domestic outbreak of Covid-19, leading to domestic adverse shocks. The paper also provides policy recommendations for sustainable, inclusive, and resilient recovery from the Covid-19 pandemic.

Keywords: Covid-19, demand and supply shocks, macroeconomic policy, Bayesian analysis.

JEL classifications: C32, E6, E27, E32, I15.

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1. Introduction

Covid-19 has triggered an extraordinary global economic shock, causing synchronized disruptions in economic activity, and exacerbated socio-economic vulnerabilities across the world. The pandemic has affected emerging markets and developing economies (EMDEs) through various channels. The channels may include domestic health crisis, disruptions in supply chains (production, trade, and travel), uncertainty-induced reductions in spending and investment, unfavorable terms of trade shock in addition to a plunge in remittances from abroad, a tightening of financial conditions in domestic and global markets, with resulting a sharp reversal in capital flows and higher pressures on the exchange rate and credit spreads (Harjes et al. 2020). Moreover, designing policies for promoting a sustainable, inclusive, and resilient recovery from the Covid-19 pandemic has been a big challenge facing policy makers today.

In the context, this paper examines macroeconomic impacts of Covid-19 and policy issues for recovery in Mongolia, a developing and commodity-exporting economy. In particular, the paper aims to answer questions such as what happened during the pandemic, what is next? To analyze effects of the Covid-19 pandemic, we decompose movements in key macroeconomic variables by extracting supply and demand shocks in the global economy, domestic real sector, credit market, labor market, exchange rate shock, and conventional, unconventional monetary policy and fiscal policy shocks.

The paper contributes the literature by providing a comprehensive analysis on the impact of various external and internal market-specific supply and demand shocks in the broader macroeconomy, including the financial market, real sector, and labor market. Therefore, the analysis helps policymakers to design socio-economic policies during the pandemic adequately. In such sense, the paper can be supplement to implementation of donors' country partnership strategy for Mongolia, which are explicitly focused on the country recover from the Covid-19 pandemic and laying resilient foundations for inclusive and sustainable growth.

Recent papers attempt to quantify the macroeconomic impacts of Covid-19 using different shock identifications. Ludvingson et al. (2020) examine the impact of the pandemic using costly and deadly disaster series by assuming that past natural disasters are local and come and go quickly, while Covid-19 is a global, multi-period event. Bekaert et al. (2020) study the effects of the pandemic by extracting aggregate demand and supply shocks from real-time survey data on inflation and real GDP. Guerrieri et al. (2020) claim that economic shocks associated with Covid-19 may have features like supply shocks that trigger changes in aggregate demand more significantly than the shocks themselves. Baqaee and Farhi (2021) argue that Covid-19 is a messy combination of disaggregated sectoral supply and demand shocks propagating through supply chains to create different cyclical conditions in other parts of the economy. Our empirical approach aligns with the argument since our VAR system includes all variables (i.e., external sector, real sector, financial sector, labor market, monetary and fiscal policies) capturing potential transmission channels of Covid-19 in EMDEs. For example, as the Covid-19 pandemic is global in nature, foreign gross domestic product (GDP), consumer price index (CPI), and commodity prices are included to capture the spillover effect of global demand, supply, and terms of trade shocks.

Only a few papers have investigated the international spillover effects of the pandemic to EMDEs through changes in commodity markets and China's economy. Based on a global Bayesian VAR model with five major economic blocs (the US, China, the euro area, other advanced economies, and other emerging market economies), Kohlscheen et al., (2020) show that the macroeconomic spillovers and spillbacks of pandemic-type recessions are substantial. Adam et al., (2021) find that the disruption of domestic economic slowdown from early and stringent lockdowns is augmented by the global economic slowdown, which has reduced countries' import capacity, and which means a severe squeeze on domestic absorption in sub-

Saharan Africa. Sawada and Sumulong (2021) find that the impact of Covid-19 in developing Asian economies has been significant, and these impacts primarily originate from declines in domestic demand and tourism, and global spillovers. Coulibaly (2021) assesses spillover effects of Covid-19 on the consumer price index (CPI) for West African Economic and Monetary Union (WAEMU) and finds that the confirmed cases, world food, and oil prices positively affect the CPI. Barrett et al., (2021) investigate the possible persistent effects (scarring) and the channels of the Covid-19 pandemic, and find that deep recessions often leave long-lived scars, particularly to productivity. They highlight that EMDEs are expected to suffer more scarring than advanced economies, while degree of expected scarring varies across countries, depending on the structure of economies and the size of the policy response. Wang and Han (2021) examine spillover effects of the US economic slowdown induced by the Covid-19 pandemic on energy, economy, and environment in other countries. They show that the pandemic has caused a sharp decline in carbon emissions and energy consumption in the US, having a more significant impact on embodied energy exports of Canada, China, Mexico, the European Union, and Russia. Joffre and Luvsandorj (2020) find that the impact of Covid-19 on businesses in Mongolia has been severe; smaller businesses were hit harder than larger ones, and businesses reacted by reducing costs, laying off workers, and among micro and informal business, by reducing household expenditure. Ha et al., (2021) find that decline in global inflation during the pandemic (the 2020 global recession) was most muted and shortest-lived of the global recessions over the past 50 years and the increase in increase since May 2020 has been the fastest. They also show that the decline in global demand from January-May 2020 was four-fifths driven by the collapse in global demand and another one-fifth driven by plunging oil-prices, with some offsetting inflation pressures from supply disruptions.

Recent policy papers focus on reforms for the Covid-19 recovery and resilience. Global prominent thinkers and scholars agree that many of the problems we will face in the next decade will simple be more extreme versions of the those that we already confront today. Thus, we need to take action to resolve the existing problems and bring about fundamental change. ADB (2021a) highlights that pandemics' burden falls disproportionately on poor and marginalized populations and importance of socio-economic response to control the virus, restart economies, and stay on track to achieve the Sustainable Development Goals (SDGs). The ADB compendium emphasizes four main themes, such as tackling the impact of Covid-19, protecting the poor and vulnerable, accelerating digital transformation, and bouncing back together, to build a future that can better ensure sustainable, inclusive, and resilient growth. Based on policy lessons from Asia and the Pacific's experience in dealing with shocks, Huang and Saxena (2021) conclude that i) focusing on economic growth alone is not enough; ii) rising inequality and environmental challenges increased the region's vulnerabilities; and iii) the post-pandemic recovery in Asia and the Pacific should place the 2030 Agenda for Sustainable Development at the center. Moreover, they emphasize that designing policy response to cope with Covid-19 and to recover (i.e., increasing investments in the SDGs, reducing inequalities, providing decent work, and greening economic activities and financial systems) is an opportunity for us to embrace course correction and pursue a more inclusive, greener, and more resilient future. OECD (2021) stresses that the pandemic exposes long-standing structural weaknesses in our economies and widening gaps in living standards among countries, regions, and people, and argue that policymakers can shape the recovery to boost growth, enhance resilience and inclusiveness, and improve environmental sustainability. UNDP (2021) highlights structural issues, including an overreliance on commodities, migrant labor, low levels of diversification, dual labor markets and inefficient social protection systems, will hamper long-term resilience unless reforms can be addressed in Central Asia. The reports argues that public policy reforms on health governance, public financial management, social protection, the use of technology for delivery of government services, and labor market policies with a gender focus are needed to build greater resilience to socio-economic shock both from Covid-19 and from the ongoing impacts from climate change. Ganum and Thakoor (2021) warn that there is a risk that growth could be lower for longer, with a setback to development as Covid-19 has exacerbated economic and social vulnerabilities across Sub-Saharan Africa.

Thus, they argue that post-pandemic reforms, including improving governance, products markets, and factor accumulation, become even more important, especially with constrained scope for fiscal and monetary stimuli.

Several papers also address long-lasting effects of Covid-19 on inequality and poverty. Benedek et al., (2021) find the evidence that the Covid-19 pandemic has pushed millions into extreme poverty and shrunk resources available for spending on achieving SDGs. They estimate that on average the public and private sectors will together have to spend 14 percent of GDP additionally every year between now and 2030 to meet the SDGs in key sectors UNESCAP report (2021) highlights that the Covid-19 pandemic caused unprecedented socio-economic disruptions, likely to have considerable adverse effects on human capital accumulation and productivity in Asia and the Pacific. The report also points that the poor and vulnerable groups were disproportionately affected, resulting in a surge in poverty and a widening of inequality gaps, and pre-existing vulnerabilities can amplify shocks and make recoveries more difficult. Furceri et al., (2021a) show that i) major epidemics of the last two decades have been followed by increases in inequality; and ii) the extent of fiscal consolidation in the years following the onset of these pandemics has played an important role in determining the increase in inequality. Furceri et al., (2021b) find that the pandemics, much smaller in scale than Covid-19, have led to increases in the Gini coefficient, raised the income share of higher-income deciles, and lowered the employment-to-population ratio for those with basic education compared to those with higher education. They provide some evidence that the distributional consequences from the Covid-19 pandemic may be larger than those flowing from the historical pandemics, and larger than those following typical recessions and financial crises.

The rest of the paper is structured as follows. Section 2 presents a benchmark specification of structural Bayesian VAR model for the Mongolian economy. Section 3 describes the data used in this paper and reports the main findings of the benchmark estimations. Section 4 concludes the paper with policy recommendations for Covid-19 socio-economic recovery.

2. A Structural VAR model for the Mongolian economy

Structural vector autoregression (SVAR) models have been extensively used to examine the impacts of macroeconomic shocks. Therefore, we employ the Bayesian SVAR model with Normal-Wishart prior employed by Gan-Ochir (2021)[2]. The SVAR describing the dynamics of economic relations takes the form

$$\mathbf{A}\mathbf{y}_t = \mathbf{B}\mathbf{y}_{t-1} + \mathbf{u}_t \tag{1}$$

for $\mathbf{y}_t$, which is a $n \times 1$ vector of observed variables at date $t = 1, \dots, T$, $\mathbf{A}$ is an $n \times n$ matrix summarizing their contemporaneous structural relations, $\mathbf{y}_{t-1}$ is a $(k \times 1)$ vector (with $k = mn + 1$) containing a constant and m lags of $\mathbf{y}$ $((\mathbf{y}'_{t-1}, \mathbf{y}'_{t-2}, \dots, \mathbf{y}'_{t-m}, 1)')$, $\mathbf{B}$ is an $k \times k$ matrix summarizing constants and lagged structural relations, and $\mathbf{u}_t$ is $n \times 1$ vector of structural shocks that are assumed to be i.i.d. $\mathcal{N}(0, \mathbf{D})$ and mutually uncorrelated (i.e., $\mathbf{D}$ is diagonal). Further details of the model including variables in the system and used Bayesian techniques can be seen from the paper of Gan-Ochir (2021).

As our empirical analysis involves a more extensive data set, we estimate the model using the Bayesian approach, which helps to deal with the over-parameterization problem by imposing prior beliefs on the parameters. Bayesian estimation and shock identification are made using the BEAR toolbox, a flexible MATLAB routine developed by Dieppe et al., (2018).

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[2] In this paper, we estimate the same model using the extended data covering the period 2006Q3-2021Q2.

3. Data, choice of hyperparameters, and empirical results

3.1 Data

Our benchmark VAR is estimated in (log) levels over the sample period 2006Q3- 2021Q2. Since quarterly data of labor market is only available from the third quarter of 2006. In the benchmark specification, the vector of endogenous variables, $\mathbf{y}_t$, comprises the following 15 variables: The log of seasonally adjusted China real GDP (GDP_{CH}), the log of China CPI (CPI_{CH}), the log of the copper price index (P_{copper}), the log of oil price index (P_{oil}), the log of FDI inflows (FDI), the log of seasonally adjusted real government expenditure (GEXP), the log of seasonally adjusted domestic real GDP (GDP), the log of domestic CPI (all items, 2015=100) (CPI), the log of the nominal exchange rate (expressed in MNT/USD) (ER), the log of the (annual) policy rate (PR), the log of central bank's domestic assets excluding other assets (DA), the spread between the lending rate and policy rate (SP), the log of bank loan outstanding (L), the log of seasonally adjusted total employment (EMP) and the log of national average wage (W).

China's GDP and China's CPI are observed from FRED economic data of the Federal Reserve Bank of St. Louis[3], while copper price index and Brent crude oil price index are collected from the Primary Commodity Price System of IMF database. Domestic GDP, CPI, government expenditure, total employment, and national average wage are retrieved from the National Statistical Office. All remaining data are obtained from the Statistical Bulletin of the Bank of Mongolia (BOM).

3.2 Choice of hyperparameters

Values typically found in the literature are chosen for the overall tightness, $\lambda_1 = 0.14$ and the lag decay, $\lambda_3 = 2$. As suggested by Bobeica and Hartwig (2021), the choice of higher degree of prior shrinkage helps to mitigates the problem of changing parameters after adding the COVID-19 observations. For the autoregressive coefficient prior, δ_i, we set $\delta_i = 0.8$ as selected by Sznajderska and Kapuściński (2020) for quarterly data. Lag length is determined based on the formal Bayesian model comparison, where the ratio of posterior probabilities is used as the main criteria. Log marginal likelihoods for $\mathcal{M}_1$:BVAR(1), $\mathcal{M}_2$:BVAR(2), $\mathcal{M}_3$:BVAR(3), and $\mathcal{M}_4$:BVAR(4) are 241.92, 235.62, 236.67, and 233.28, respectively, hence log of posterior ratios are found as $log_{10}(R_{12}) = 6.30$, $log_{10}(R_{13}) = 5.25$ and $log_{10}(R_{14}) = 8.64$. According to Jeffrey (1961)'s guideline, there is decisive $\mathcal{M}_1$ model, thereby lag length is selected as $m = 1$. BVAR(2) and BVAR(3) models are also estimated, and results have been robust, as shown in Section 4. The total number of iterations of the Gibbs sampling algorithm is selected as 10000, and 5000 iterations discarded as burn-in iterations.

3.3 Empirical results

In this section, the following questions are answered: How did macroeconomic shocks in the economy move during the Covid-19 pandemic? and What shocks drive the economic recession during the pandemic?

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[3] China's real GDP is calculated as a ratio of seasonally adjusted current price GDP in China (CHNGDPNQDSMEI) to CPI, all items for China, index 2015=100 (CHNCPIALLQINMEI), both data are collected from FRED economic data of Federal Reserve Bank of St. Louis.

[4] Dieppe et al. (2018) suggest setting λ_1 for the normal-Wishart prior at a smaller value than for the Minnesota prior to compensate for the lack of extra shrinkage from λ_2, which controls tightness on cross-variable parameters in the case of Minnesota prior. Our choice of $\lambda_1 = 0.1$ is much smaller compared to the value of $\lambda_1 = 0.2$ selected by Sznajderska and Kapuściński (2020) for the Minnesota prior.

As the triangular factorization scheme is utilized, structural shocks are identified using a simple recursive ordering. Regarding the ordering of variables in the VAR, most exogenous (endogenous) variables are placed first (last), and relationships among variables in New Keynesian structural models are used as the main criteria. The ordering is set as follows: P_{copper}, P_{oil}, GDP_{CH}, CPI_{CH}, FDI, $GEXP$, GDP, CPI, PR, DA, L, SP, EMP, W, and ER. The ordering is entirely in line with Jacobs and Rayner (2012), Kremer (2016), and Sznajderska and Kapuściński (2020). The identification helps to isolate demand and supply shocks in the global economy, domestic real sector, credit market, and labor market. Baqaee and Farhi (2021) highlighted that separating demand shortfalls from supply constraints is important since demand and supply-constrained sectors respond differently to policies. Policies that boost demand by lowering interest rates or increasing government spending worsen problems of inadequate supply, leading to inflation. Likewise, policies that boost supply by relaxing lockdowns or providing liability exemptions are ineffective at restoring activity when applied to demand-constrained sectors.

We first examine the time series of the identified structural shocks before discussing macroeconomic shocks' dynamic effects and transmission mechanism. Examining the shocks' time series should help interpret their exact source more carefully and assess whether the estimated innovations capture the significant changes in the global and domestic economy. Figure 1 presents the median time series of the shocks. As the aim of this paper, we focus more on the pandemic period (2020Q1-2021Q2).

The identified shocks capture the dates of critical events that happened during the pandemic. It implies that our identification strategy is plausible. The Covid-19 outbreak caused by the SARS-COV-2 virus was triggered in December 2019 in China. Because of lockdown and troubles in supply chains, Covid-19 severely disrupted the Chinese economy in the first quarter of 2020. As the pandemic continues to spread globally, commodity markets are harshly affected in the first two quarters of 2020. For instance, copper price and oil price respectively fall by 10 and 70 percent in the first half of 2020. The shock in copper price is moderate compared to the observed during the Global Financial Crisis (GFC), while the shock in oil price has been a historically large negative shock in the market. Copper and oil prices have respectively increased by 40 and 47 percent for the period 2020Q3-2021Q2. Thanks to effective lockdown measures and strong stimulus measures, the Chinese economy has quickly recovered starting from the second quarter of 2020. However, inflation shock driven by supply factors has been mild in China during the pandemic. As the global economy has started to recover, copper and oil prices have increased since the second quarter of 2020. In the case of Mongolia, the mining sector, particularly a few large projects, receive the central portion of FDI inflows. FDI inflows on the ongoing projects shrank in the first three quarters of 2020. The developments are well reflected in the identified external shocks.

For the domestic variables, the economy has faced a sharp recession during the pandemic. The government implemented prompt measures to contain the spread of the virus, such as social distancing and border closures starting from February 2020. These have proven successful, as there was no reported community transmission until the mid of November 2020. However, the economic costs though were significant. The falls in export and domestic demand led to a 9.7 percent contraction in GDP in the first half of 2020. As a result of no reported domestic transmission (i.e., weaker Covid-19 restrictions), the domestic economic activity recovered in last three quarters of 2020.

Figure 1. Time series of identified macroeconomic shocks
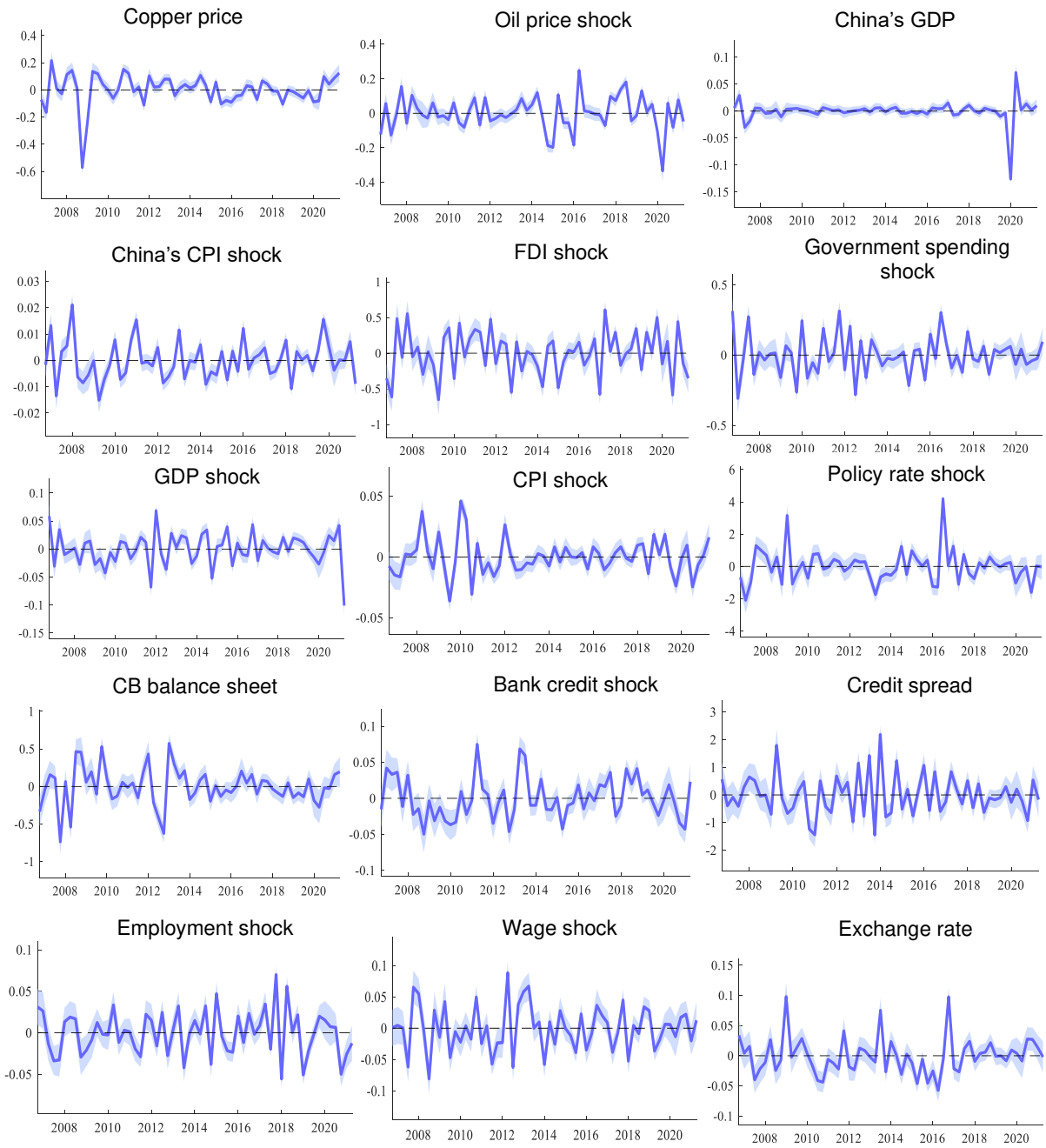
Note: Figures show median values of structural shocks, together with the 68 percent confidence interval of the posterior distributions.

Covid-19 restrictions in businesses, disruptions at the Mongolia-China border, changes in household consumption behavior and decreases in young livestock are well captured in the dynamics of GDP shocks. Due to disrupted supply chains of local foods and imported goods, consumer prices have increased since 2020Q4, and the increases in prices driven by the supply factors are captured in the CPI shocks.

Fiscal and monetary policies have loosened significantly to maintain stability and protect the most vulnerable. On the fiscal policy front, the Ministry of Finance introduced a fiscal stimulus package, including reducing the social security contribution, increases in the universal transfer program (known as child money), health spending, one-off cash handout of 105 USD for each citizen, the one-off bonus of 18 USD for fully vaccinated adult, and 12-months exceptions for

7

all households and enterprises on electricity, water, and waste bills. The Bank of Mongolia (BOM) has cut policy rates by 500 basis points, reduced the reserve requirement by 4.5 percentage points (reflected in series of expansionary policy rate shock since 2020Q1), suspended the debt-service-to-income ceiling on consumer loans, and provided targeted long-term operation (TLTRO) to the banking sector, engaging quasi-fiscal operations including providing liquidity for mortgage loans, loans to gold extraction companies, purchasing bonds issued by state owned companies (Erdenes Mongol LLC and Erdenes Tavan Tolgoi JSC) as permitted under Covid-19 laws. The series of expansionary central bank balance sheet shocks since 2020Q1 have reflected these unconventional monetary policy measures.

The BOM has taken temporary forbearance measures for the financial sector, softening asset classification requirements, extending maturities on consumer and mortgage loans, and restructuring business loans in the banking sector. These measures have reduced pressure on borrowers and banks. However, the credit crunch in the banking sector continued throughout 2020. It has been captured in both bank credit and credit spread shocks. The government has started to implement 'MNT 10 trillion Comprehensive Plan for Health Protection and Economic Recovery' since March 2021. As the end of August 2021, MNT 3.5 trillion loans, equivalent to 18 percent of total loans outstanding, have been issued as part of the plan. As the result of the subsidized loans, bank loans have sharply increased since 2021Q1, reflected in the bank credit shocks.

The domestic Covid-19 outbreak that began in November 2020, however, has disrupted the labor market. Employment has fallen by 7.4 percent between 2020Q3 and 2021Q2. The identified employment and wage shocks capture the recent changes in the market.

Based on the identified shocks, we analyze the evaluation and drivers of GDP, consumer prices, bank credit and employment during the pandemic using historical decomposition analysis, which breaks down variations of key variables over time in terms of structural shocks. Shock decomposition allows policymakers to identify which markets are mainly being affected by external shocks or lack of demand and adequately design and target policies to minimize the effects of the pandemic. The analysis clearly shows that the 'V-shaped' economic recovery that Mongolia's policy makers obsessed over last year did not eventually materialize. As the cyclical component of real GDP fell in 2021Q2 to the level of 2020Q2, the current policy challenge is how to achieve 'W-shaped' recovery (also known as double-dip recessions).

Historically, external shocks in copper price and China's GDP shock have driven business cycle fluctuations in Mongolia (Figure 2.A). As this paper focuses on the macroeconomic effects of Covid-19, we concentrate on the period 2020Q1-2021Q2. The China GDP, copper price, and oil shocks have caused a sharp fall of domestic output in 2020Q1. In addition to external demand from China, the shock may also partially reflect the suspension of coal and crude oil exports. As the Chinese economy has recovered and border restrictions have left, adverse effects of the shock on domestic GDP have declined starting from 2020Q2. However, continued sharp falls of copper and crude oil prices in 2020Q2 have slowed the domestic recovery. The recent rises in commodity prices and positive developments in the Chinese economy have contributed to the recovery of the domestic economy. Thanks to the favorable developments, the year-on-year growth of real GDP was 6.3 percent in the first half of 2021. These results suggest that the international spillover effects of Covid-19 passing through changes in the commodity market and the Chinese economy have been vital in the case of Mongolia.

Figure 2. Historical decomposition of stochastic component of GDP, in percent

A) Contribution of external shocks
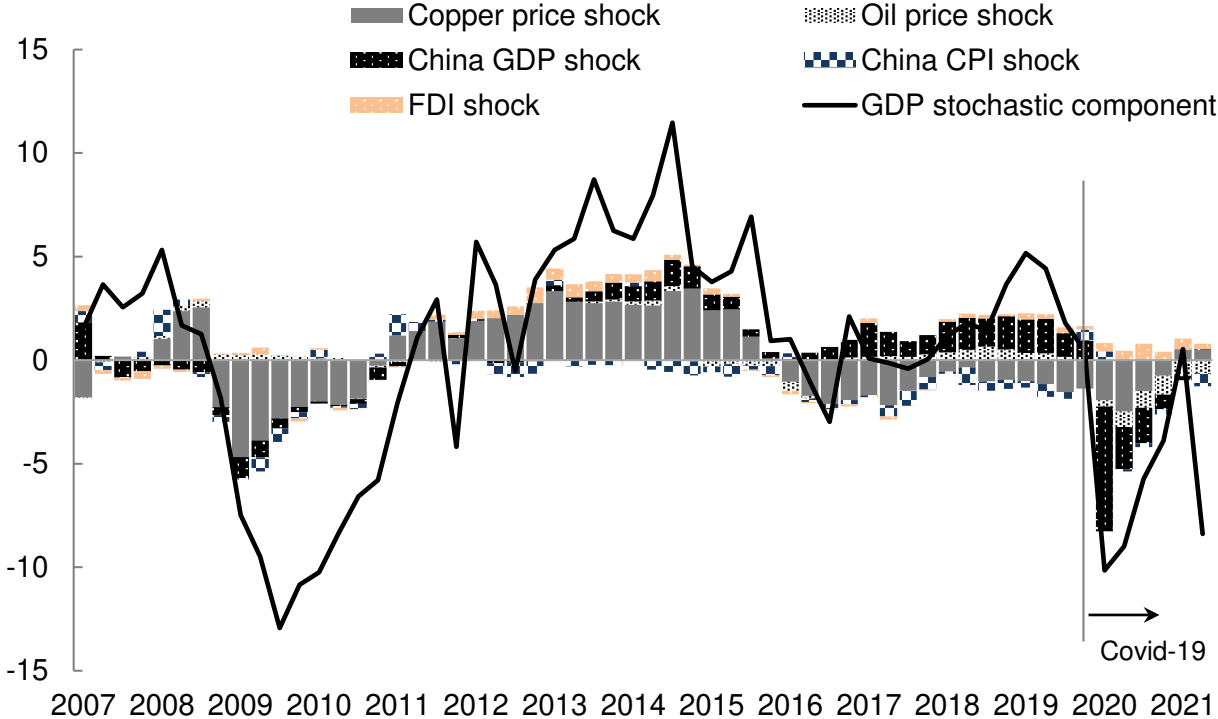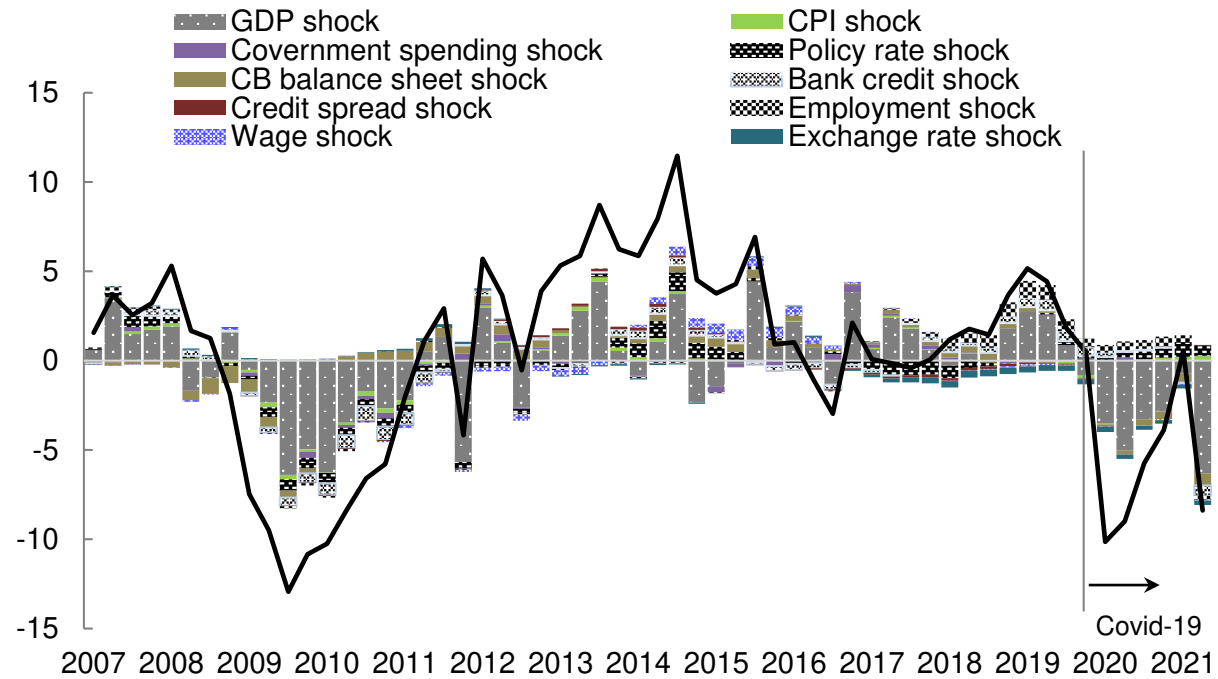

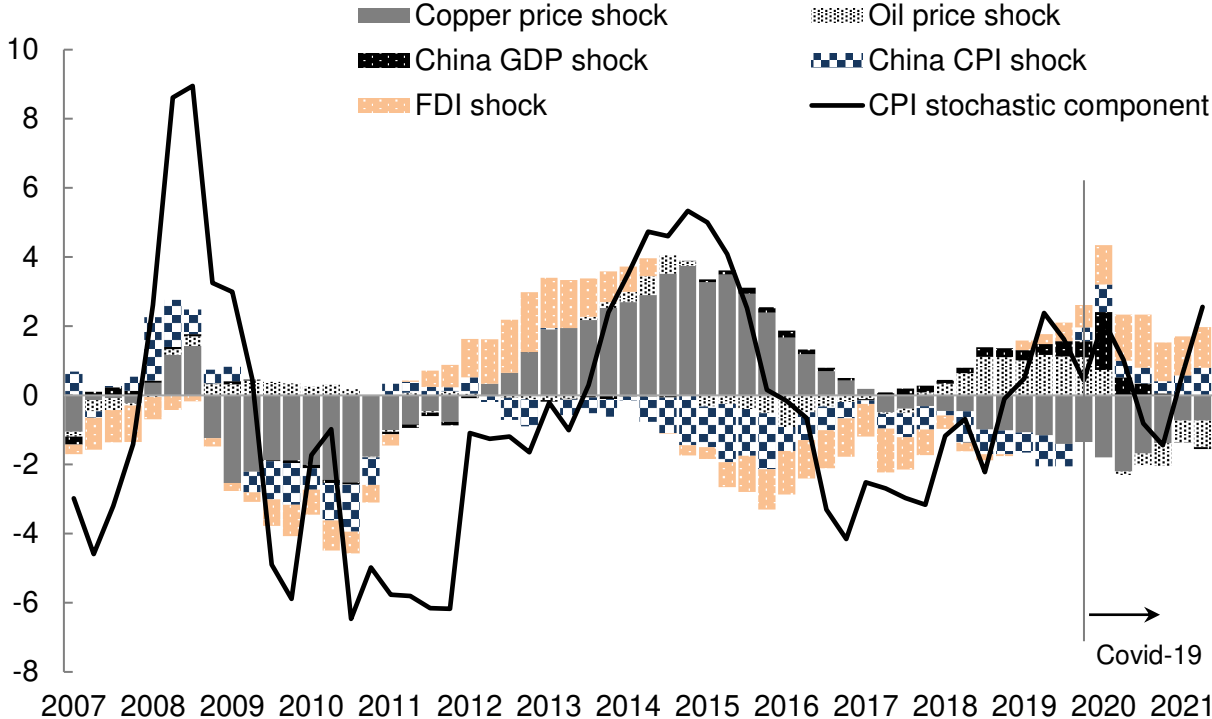
B) Contribution of domestic shocks

Figure 3. Historical decomposition of stochastic component of CPI, in percent

A) Contribution of external shocks

Legend:
- Copper price shock
- Oil price shock
- China GDP shock
- China CPI shock
- FDI shock
- CPI stochastic component

B) Contribution of domestic shocks

Legend:
- GDP shock
- CPI shock
- Covernment spending shock
- Policy rate shock
- CB balance sheet shock
- Bank credit shock
- Credit spread shock
- Employment shock
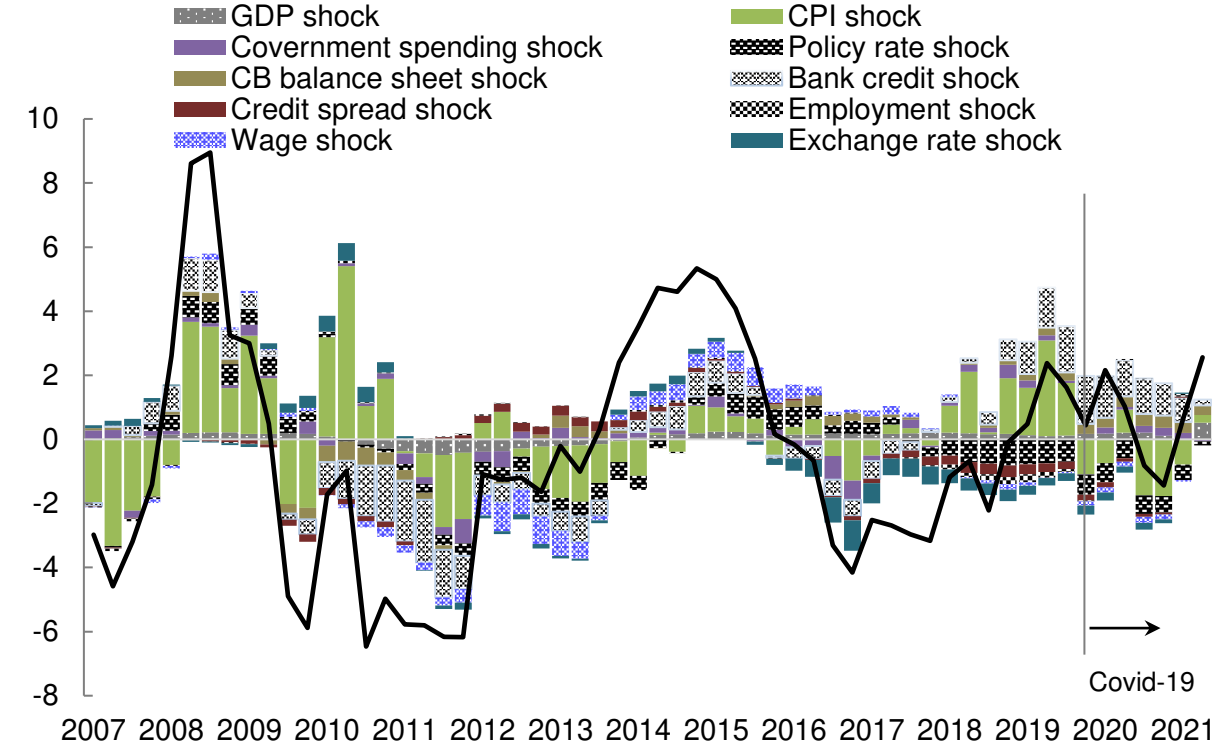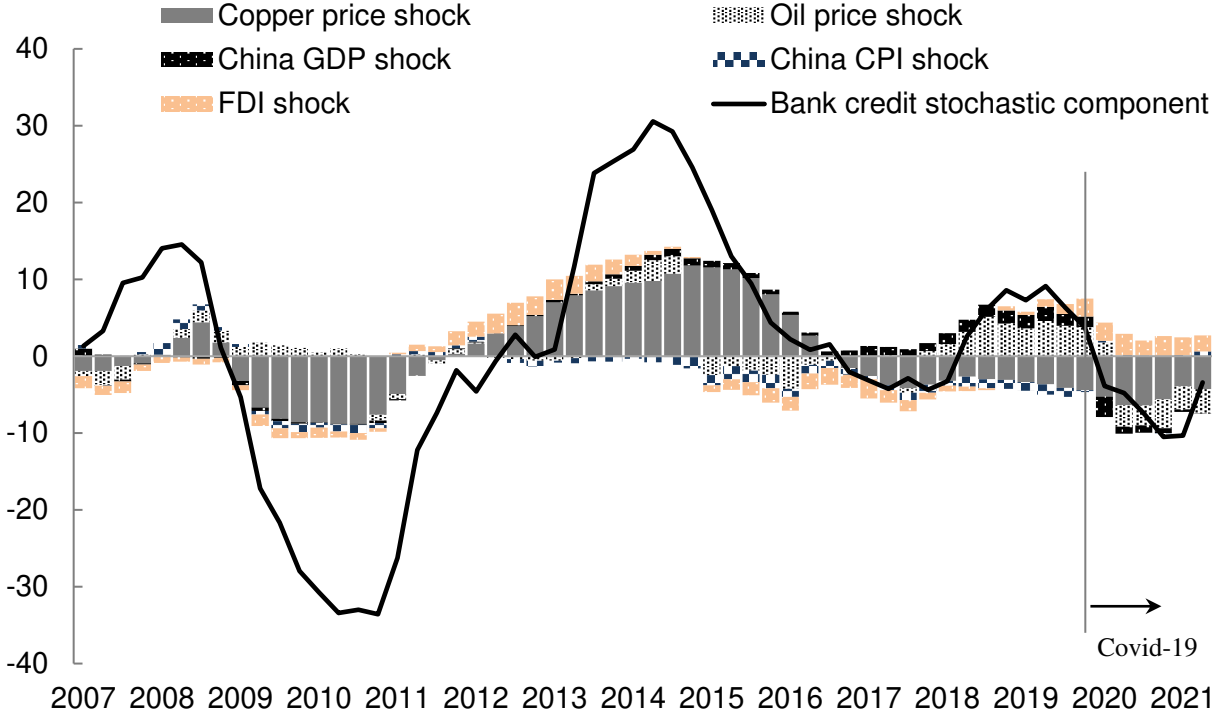- Wage shock
- Exchange rate shock

Figure 4. Historical decomposition of stochastic component of bank credit, in percent

A) Contribution of external shocks

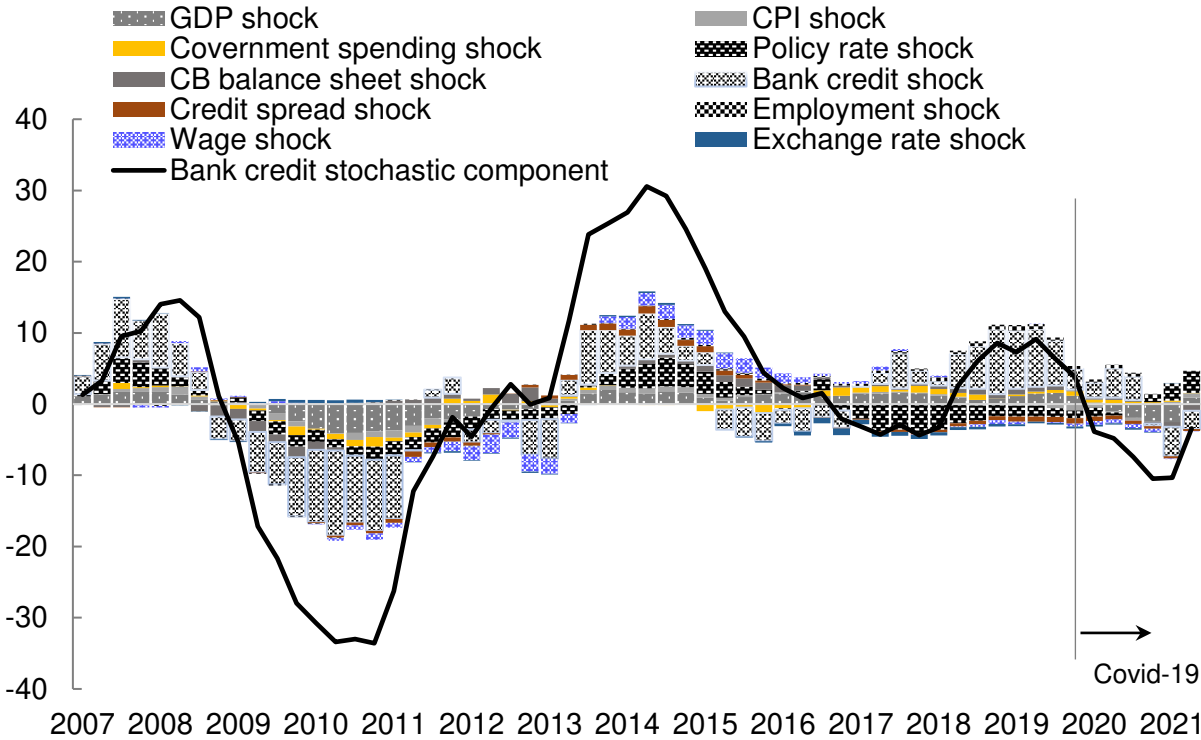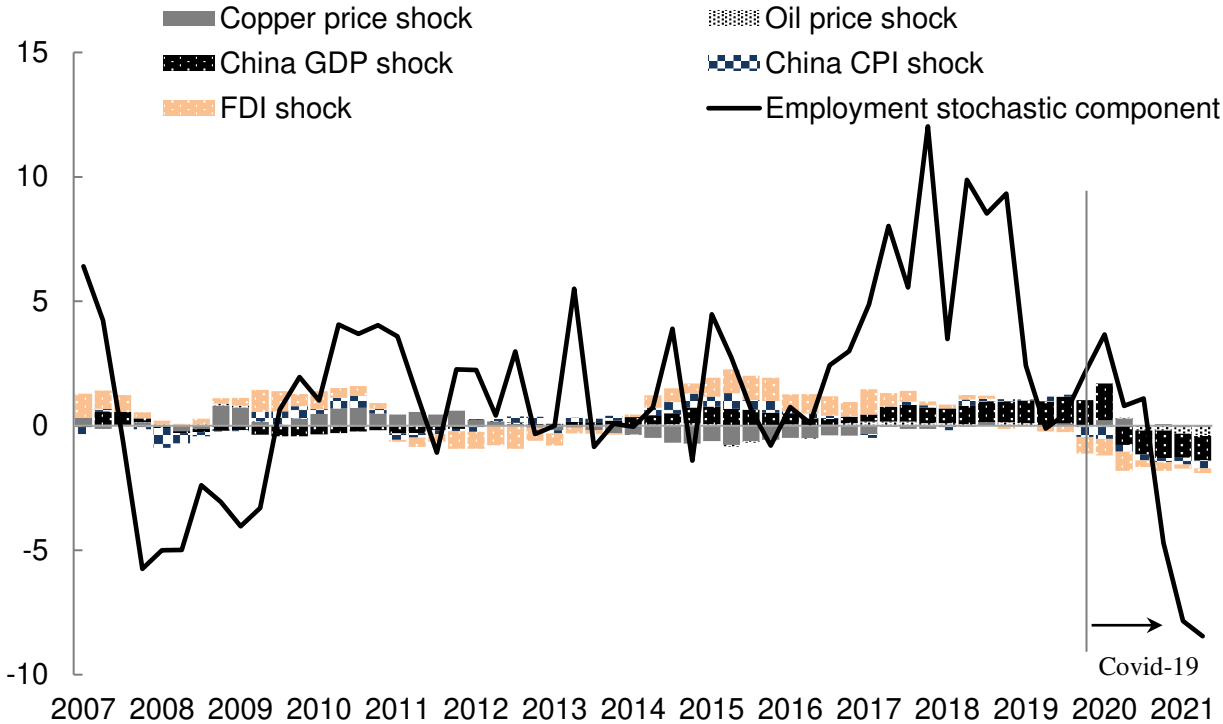
B) Contribution of domestic shocks

Figure 5. Historical decomposition of stochastic component of total employment, in percent

A) Contribution of external shocks

Legend:
- Copper price shock
- Oil price shock
- China GDP shock
- China CPI shock
- FDI shock
- Employment stochastic component

B) Contribution of domestic shocks

Legend:
- GDP shock
- CPI shock
- Covernment spending shock
- Policy rate shock
- CB balance sheet shock
- Bank credit shock
- Credit spread shock
- Employment shock
- Wage shock
- Exchange rate shock
- Employment stochastic component
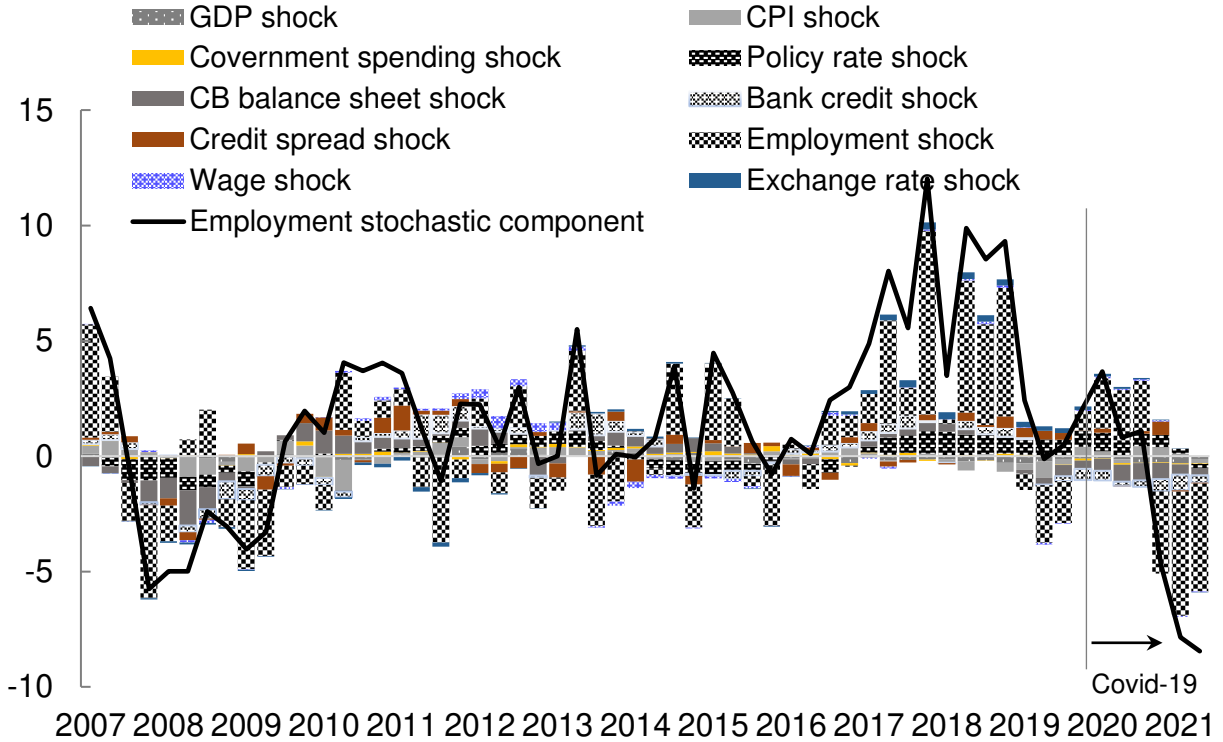
Among domestic shocks, the demand shock in the real sector has significantly affected the sharp fall of GDP in 2020Q1 (Figure 2.B). The shock reflects loss of income during the pandemic, cancellation of national holidays, school closures, domestic travel ban, cancellation of flights to and from overseas (i.e., disruption in tourism sector), restriction of services and community activities, disruptions at the Mongolia-China border and heightened uncertainty reducing spending. Negative contributions of the shock have remained at a higher level for the first four quarters of Covid-19, but it reduced in 2021Q1. Due to heightened restrictions of business activities, disruptions at the border and decrease in young livestock, the huge negative shock have driven the fall of real GDP in 2021Q2. It implies that the domestic outbreak of Covid-19 has changed the shape of recovery to the 'W-shape'. Other domestic shocks' contributions have been minor, and policy rate shock has positively contributed to the GDP since 2020Q2. Therefore, the economic recovery observed for 2020Q2-2021Q1 has reflected the rising demand for export from China, higher copper prices, and the loosening of macroeconomic policies. However, there is no solid evidence that unconventional monetary policy measures have significant effects on the real GDP.

The decline in the cyclical component of CPI during the 2020 recession was the most muted and shortest-lived of any of the three recessions over the past 15 years and the increase in CPI since 2021Q1 has been one of the fastest (Figure 3). Both external and domestic shocks have played a critical role in CPI dynamics during the pandemic. China GDP, China CPI, and FDI shocks have led to the rise of CPI in 2020Q1. Since the China GDP shock partially reflects the closure of Mongolia-China borders, the negative shock in 2020Q1 has significantly contributed to the increase in consumer prices. The decline in the cyclical component of CPI from 2020Q2-2020Q4 was mainly driven by plugging oil and copper prices. As crude oil prices fell in the first half of 2020 and the domestic petroleum prices have been controlled until the beginning of July 2021, the oil price shock contributed to lower inflation for 2020Q2-2021Q2. Negative contributions of copper price shocks on CPI dynamics have raised over the period 2017Q2-2020Q2, while its effects weakened since 2020Q3 as copper price increases. Among the domestic shocks, bank credit shock positively affected CPI in the first five quarters of the pandemic, while negative supply shocks in the real sector have contributed to higher CPI for 2020Q2 and 2021Q2. The policy rate shocks have decreased the CPI, while the unconventional monetary policy measures have positively contributed to the CPI over the period. The findings suggest that the subsidized loan programs under 'MNT 10 trillion Comprehensive Plan for Health Protection and Economic Recovery' may increase the inflation pressures.

Though GDP has recovered for 2020Q2-2021Q1, disruptions in credit and labor markets have been continued in the domestic economy. A phenomenon observed during Covid-19 in the domestic economy is a disruption in the bank credit (Figure 4). Hence, it is important to study which shocks have affected the bank credit dynamics for the period. Negative copper price, crude oil price, and China GDP shocks have initially led to the bank credit crunch, while FDI shocks have positive contributed to the bank credits. Credit supply shock had no significance on bank credit over the period, however, credit demand and GDP shocks have negatively affected the bank credit for 2020Q4 and 2021Q1. This result is in line with the fact that banks had excess liquidity; however, their risk aversion was heightened uncertainty due to Covid-19. As a policy response to the disruption in the credit market, the government and Bank of Mongolia jointly have been implementing the economic recovery plan, basically based on the subsidized loans, since March 2021. In addition, the loosening of conventional monetary policy has positively contributed to the bank credit since 2020Q4. As a result of the policy measures, the bank credit has started to rebound from 2021Q1.

Currently, there is no sign of labor market recovery. External shocks have negatively affected employment during the pandemic (Figure 5.A). Domestic shocks, including generous supports from the government to the private sector and policy measures have contributed to the moderate impact of the pandemic on the labor market for the first three quarters of 2020.

Several strict lockdowns and restrictions, following the first domestic contagion recorded on 11 November 2020, have led to the sharp fall in employment in 2020Q4-2021Q2, and the labor market recession has been mainly driven by labor demand shocks (Figure 5.B).

4. Conclusions and policy recommendations

This paper has examined the macroeconomic impacts of Covid-19 and policy issues for recovery in a developing and commodity-exporting economy. Using Mongolia as a representative case study, the paper estimates Bayesian structural VARs with normal-Wishart prior including key domestic macroeconomic variables (i.e., variables of the real sector, financial market, and labor markets) and global economic activity, commodity prices and FDI.

We find strong cross-border spillover effects of Covid-19 passing through changes in commodity markets and the Chinese economy on the Mongolian economy. Our results show that the recession (i.e., drop in real GDP) in the beginning of the pandemic is mainly driven by China's GDP, copper price, and oil shocks. The real sector recovery observed for 2020Q2-2021Q1 is primarily driven by positive shocks to commodity prices and China's GDP. Similar results can be expected in commodity-rich economies where external shocks play an important role in business cycle fluctuations.

However, the V-shaped economic recovery that Mongolian authorities obsessed over last 12 months did not eventually materialize as adverse domestic demand shocks, reflecting lockdowns, restrictions and disruptions at the border, unfavorably hit the economy in 2021Q2. Particularly, because of the domestic outbreak of Covid-19 (i.e., the second wave of Covid-19), we can predict the 'W-shaped' recovery only if policy measures adequately address the ongoing challenges. The decline in the cyclical component of CPI during the 2020 recession was the most muted and shortest-lived of any of the three recessions over the past 15 years and the increase in CPI since 2021Q1 has been one of the fastest. Disruption in labor market have been sustained, while there is a sign of recovery in the credit market. As a result of the government interventions in the credit market, the bank credit has started to rebound from 2021Q1, however the interventions may have long-lasting adverse effects on foreign exchange reserves (or nominal exchange rate) and consumer prices.

Overall, economic turmoil and labor market dislocations from the Covid-19 pandemic continue in the Mongolian economy, despite extraordinary policy supports. The economy remains vulnerable to shocks caused by Covid-19. The continued uncertainty about the duration of the health crisis affects all aspects of the recovery path. Key questions facing policymakers are how to achieve a sustainable, inclusive, and resilient socio-economic recovery from the pandemic and how to minimize persistent damage (scarring) that may result from this crisis. Policy measures should be guided by the principles of timeliness and fiscal sustainability, targeted to those who need it, and proportionate to the level of the shock.

Based on the current economic situation and empirical results, we argue that policies aimed at the following are needed:

- *Strengthening vaccination success and tackling the impact of the pandemic.* As protecting both lives and livelihoods is the immense task, policy makers need to craft policy responses that can mitigate economic costs of Covid-19 crisis while minimizing risks to society. Effective vaccines would be a life saver, for businesses and jobs as well as lives. Hence, within 1-2 years, vaccine policy is going to be the most important health and economic policy. As end of August 2021, about 65 percent of total population had been fully vaccinated, which allows the authorities to weaken Covid-19 related economic restrictions. As suggested by global health experts, further easing of restrictions on industry, community and the economy is possible when 70 and 80

percent full vaccination target is reached. However, vaccine efficacy, effectiveness, and protection against new variants of Covid-19 raises a new challenge, and the government may need to seriously consider these factors when implementing booster doses of Covid-19 vaccines.

- *Protecting the poor and vulnerable, and addressing inequality*. Though the Government's social protection policies including untargeted cash transfers to children and adults and writes off of utility costs (water, heat, *electricity* and waste bills) of households and businesses for 13 months have contributed to buffer the Covid-19 impacts and reduce household food insecurity, they also lead to worse outcomes such as spiking food prices, lower-skilled people hesitate to work, thereby driving unemployment and exhausting fiscal space for efficient public investments. Moreover, there is no fiscal space to continue the measures at the form of current practice, and the attempt of continuation may lead to high fiscal deficit and debt distress. Therefore, the government needs to allocate budgets and implement policies to support employment rather than social welfare transfer. In the direction, policy makers need to perform social protection reforms focused on better-targeted supports for affected households and firms within the permission of fiscal space. Moreover, public programs to provide income support to the poor affected by the pandemic could be aimed at projects that support adaptation (e.g., irrigation and haymaking). It is time to use fiscal instruments (e.g., introducing effective luxury tax and progressive tax) in addressing the rise in inequality that is likely to result from the pandemic.

- *Encouraging employment and supporting productivity*. As the fall in employment is mainly driven by adverse labor demand shocks, active worker reallocation policies such as hiring incentives, job search-and-matching assistance, and retaining programs help job finding and on the job occupational switches by those still in employment. The subsidized loan program may provide some employment support and hiring incentives for firms as explained by the government, however its effectiveness on the employment is not clear. In addition, ensuring adequate resources for health care, early childhood development programs, and education will help mitigate long-term individual earnings losses and damages to aggregate productivity. Policies to promote competition, innovation, and technology adoption would also lift productivity growth.

- *Ensuring financial stability*. Experience from past recessions underscores the importance of avoiding financial distress as non-performing loans (NPLs) increase after the recessions, worsening balance sheets of banks and constraining financial intermediations. Hence, measures supporting credit provision should be gradually lifted while ensuring balance sheet resilience and adequate buffers. As bank credit growth has reached double digits and predicted to increase further, the government intervention in the credit market and BOM's quasi fiscal operations must be phased out. The directed loans[5] limit the ability of banks to operate independently and may produce higher NPLs in the future.

- *Maintaining price stability*. Inflation hurts the poor relatively more than the rich. Households in the bottom deciles spend a larger share of their disposable income on food consumption. Higher food prices are likely to have the greatest negative effect on poverty. As consequences of the pandemic, domestic food and imported good prices have rapidly increased since March 2021. The higher inflation reduces the household's real consumption, thereby negatively affecting the GDP growth. Moreover, there is a

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[5] With directed loans, we mean those loans that are typically granted to selected borrowers at interest rates lower than the market interest rates.

high risk that inflation will remain above the central bank's six percent target over the next one year. Given the current economic situation, the role of expansionary monetary policy in stimulating employment and real household expenditure is limited, while it may lead to demand-pull inflation, the upward pressure on prices that follows a shortage in supply. As maintaining price stability is a primary objective of the Bank of Mongolia, monetary policy should be tightened, including phase out of ongoing quasi-fiscal operations and gradual increase in policy rate to maintain macroeconomic stability. The policy measures to resolve the descriptions at Mongolia-China border and increase food supplies would help to reduce the supply-driven inflation. The anti-inflation policy is line with protecting the poor and reducing inequality, and helps anchoring of inflation expectations, a necessary condition for central banks to maintain price stability.

- *Accelerating digital transformation*. When the Covid-19 pandemic broke out, much of the world moved online, accelerating a digital transformation. The digital transformation brings new tools and opportunities to cope with the current crisis and to overcome longer-term development challenges. In developing countries, this crisis represented an opportunity to accelerate a digital transformation process and catch up with more modern business and technological practices, which can increase economic integration, productivity, and welfare. The Covid-19 crisis may have boosted momentum to undertake the reforms necessary to ensure the benefits of the digital transformation. The digital transformation can i) boost productivity growth by promoting production transformation; ii) improve well-being through social inclusion of families, workers, and students by offering many opportunities for accessing better public services and improving the quality of jobs and skills; and iii) allow public institutions to improve governance and rebuild trust by bringing greater transparency and openness. Supporting growth opportunities related to the accelerated shift to e-commerce and increasing digitalization of the economy will have positive spillovers and hence help diversification.

- *Securing a green recovery*. A green recovery is key to ensuring a more sustainable, inclusive, and resilient return to growth and development during and after Covid-19. Hence, policymakers need turn this crisis into opportunity by securing greener and more climate-resilient economy. Today, global leaders agree that the treat of climate change is one of the most important problems, hence come to a consensus that urgent actions will be critical to achieve the goal of reducing clime risks. Climate change is already a key driver of rising poverty, accelerating spread of disease, and worsening food security, and becomes a key financial risk. As Mongolians say "a dop in the ocean is helpful, and when a drop is collected, it becomes an ocean", the authorities should thus create a green recovery and educate the public about climate change risks. In this sense, policymakers need to support green, rather than brown, activities through fiscal and financial instruments[6]. Implementing a green recovery in Mongolia may require taking three key steps: i) building mechanism that can produce a lasting shift toward ecosystem resilience; ii) implementing targeted policy interventions focused on the green growth opportunities; and iii) identifying sustainable sources of financing for green growth opportunities (ADB 2021b). Increased spending on sustainable infrastructure has strong multiplier effects. In the short term, it can help the world

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[6] For example, public investment projects could focus on boosting climate-smart infrastructure, adopting climate-smart technologies and avoiding carbon-intensive investments. Crisis support for carbon-intensive industries/firms could require commitments to emissions targets and/or ab equitable transition to a low-carbon economy. Another important step is to promote green and sustainable financing by considering financing additional climate spending with green bonds, mobilizing private finance for green investment, and requiring banks that receive public support to disclose the climate readiness of their portfolio.

economy recover from the effects of the pandemic by creating jobs and investment opportunities. In the medium term, it can spur innovation, create new sources of growth, and reduce poverty and inequality while delivering cleaner air and water. Moreover, the authorities may consider deploying industrial and other policies to spur climate-friendly innovation, including digitalization, new material, and production processes, with focus on the coordination of policy areas and on long-term policies and policy planning.

- *Boosting investment in SDGs.* Given recent sharp decline in investment, greater boost is needed for financing to support growth, development goals, and structural change, including rapid urbanization. Achieving SDGs is vital for a recovery that leads to greener, more inclusive economies, and stronger, more resilient societies. The post-Covid-19 recovery will need to be investment-led as aggregate demand, income and trade will continue to remain largely disrupted. Hence, public investment in sustainable and resilient infrastructure, particularly a green infrastructure push (e.g., nature-based solutions, clean energy and industry, sustainable cities, digital technologies etc.) can help crowd-in private investment while mitigating the impact on poor. To guide the recovery, relationships between markets and governments must be rebalanced, with governments playing a more central role in the economy through public investments, redistribution of incomes from rich to poor, and regulation of industry to ensure environmental and social sustainability. Major investment is needed to replace aging and polluting infrastructure and address infrastructure deficits and structural change. The authorities need to identify and publicly announce principles for selecting projects and programmes. The main criteria to prioritize the types of investment projects for the next phase of the recovery may include environmental benefits, job creation, promoting local sustainable production and consumption, resilience benefits, targeted investments, timeliness and feasibility, and fair distribution of costs and opportunities.

- *Ensuring debt sustainability.* Though greater investment and fiscal stimulus is needed to counter the effects of the pandemic, it is important to manage debt and deficits over the medium term. The Covid-19 crisis poses a great challenge to fiscal sustainability in developing countries, including Mongolia. With soaring fiscal deficits and plummeting revenues, public debt ratios intend to increase, reaching above 60 percent. The high debt ratio may adversely affect to sovereign credit rating and raise the interest rate of external financing. Hence, guaranteeing debt sustainability and increasing fiscal space will therefore play a fundamental role in responding to the crisis and providing resources to build back better during the recovery. Fiscal discipline and priorities will be an important factor for the recovery.

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