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LOAN PORTFOLIO COMPOSITION OF ISLAMIC AND CONVENTIONAL BANKS PRE- AND POST-COVID-19 PANDEMIC? CASE OF INDONESIA

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ABSTRACT

This study investigates how the Covid-19 pandemic has affected the loan portfolio composition of Indonesian Islamic and conventional banks. By using a sample of 108 conventional and 9 Islamic banks, we find that conventional banks issued more consumption loans during the sample period. On the contrary, Islamic banks granted more investment loans than consumption loans. In addition, given limited support from the central bank, Islamic banks still increased their contribution to investment loans portfolio more rapidly during the COVID-19 pandemic. These results support the view that Islamic banks provide funding to long-term investment projects and may contribute more to sustainable economic growth. This finding could have policy implications for both Islamic banks and the government. Despite the fact that Islamic banking is in its infancy in Indonesia, it provides funding for the real economy. Regulators may assist the Islamic banking sector in developing risk management capacity in various sectors, including agriculture, manufacturing, trading, distribution, hotels, and restaurants. Furthermore, implementing a well-integrated policy framework that includes monetary, fiscal, and financial services can also assist in optimizing the momentum of economic recovery after the pandemic despite global supply disruptions, the Russian-Ukraine war, and climate change.

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I. INTRODUCTION

The SARS-CoV-2, commonly known as the Corona Virus, was discovered in the Chinese province of Wuhan in December 2019, quickly spread globally, and was declared a pandemic by World Health Organization (WHO) in March 2020. Governments worldwide reacted to the unprecedented threat to people's health and economic well-being by introducing several interventions. Mobility restrictions were imposed in the shape of social distancing measures and lockdowns to restrict the spread of the virus. Governments introduced several monetary and fiscal stimuli to ease the resultant halt in economic activity.[1] Still, the COVID-19 pandemic took a heavy toll on world economies and caused severe socio-economic problems.

The lockdowns and social distancing affected almost all sectors of the economy, especially those that were more reliant on social interactions such as tourism (Škare et al., 2021), hotel and lodging (Alonso et al., 2020), agriculture (Boughton et al., 2021), aviation and air travel (Suau-Sanchez et al., 2020; Sun et al., 2020; Iacus et al., 2020), and small and medium enterprises (Shafi et al., 2020). Resultantly, corporate sectors faced problems related to liquidity management (Almeida, 2021). On the strong push by central banks as a lender of last resort and fear of fund unavailability in the future, corporates draw funds in bulk using the available credit lines for liquidity management (Li et al., 2020). However, with the increase in the possibility of default risk during the pandemic (Nigmonov & Shams, 2021), risks in banking systems increased significantly (Rizwan et al., 2020; 2022). The macroeconomic response to the unprecedented challenges of COVID-19 helped alleviate the risk of financial sector instability. However, it is not yet clear how financial institutions dealt with the risk management challenges at the portfolio level. This study aims to examine the lending behavior of Indonesian Islamic and conventional banks during the COVID-19 pandemic with a specific focus on portfolio composition.

This paper is motivated by the literature related to bank lending behavior during crisis times when risk-averse banks redirect funds from high-risk avenues to relatively familiar or less risky loans when reconstructing their loan portfolios (Atahau & Cronje, 2020). We hypothesize that banks are likely to allocate more of their lending portfolios to familiar sectors where banks have robust risk management experience or to those which are less exposed to pandemic-related restrictions, regardless of their business model. However, the portfolio tilt is expected to be more pronounced among conventional banks due to the ease of implementing debt contracts. Specifically, this study investigates a) whether Islamic banks differ from conventional banks regarding their loan portfolio composition; b) how the COVID-19 pandemic impacted the loan portfolio composition; and c) which type of banks, Islamic or conventional, diverted their funds from one loan type to the other.

We used quarterly data of 9 Islamic and 108 conventional banks from 2017Q3 to 2021Q4. Our analysis focuses on three loan types: working capital, investment, and consumer loans. Working capital loans are capital used by corporate entities to meet their day-to-day business activities. Investment loans are issued to corporates

1 https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

for capital expenditures and capacity building. Meanwhile, consumption loans consist of mortgage loans, credit card lending, household loans, and loan for other non-business purposes.

Our empirical analysis is designed using propensity score matching. First, we harmonize the sample of Islamic banks with similar observations from conventional banks. Then, we conduct a difference-in-difference analysis to study the differential in the loan portfolio composition of Islamic and conventional banks in the overall sample during the sample period.

Our results show that Indonesian banks have shown positive average growth in the loan portfolio during the sample period. However, during the COVID-19 period, conventional banks have seen negative total loan growth. We also find that conventional banks provide more consumption loans, while Islamic banks are more involved in working capital and investment loans. Difference-in-difference analysis shows that Islamic banks issue statistically higher (lower) investment (consumption) loans than conventional banks. Regarding the impact of COVID-19 on portfolio composition, the empirical findings suggest that Islamic banks issued significantly higher investment loans than conventional banks. However, the higher proportion did not result in total loan portfolio growth for Islamic banks.

The findings that Islamic banks have seen higher loan portfolio shrinkage during the COVID-19 pandemic can be explained by the fact that Islamic banks in Indonesia are not included in the priority group of banks that the government gave stimulus assistance to during the pandemic. National conventional banks were the leading recipients of assistance during the COVID-19 pandemic. Furthermore, as shown by the results, Islamic banks are more involved in investment loans. While during the COVID-19 pandemic, there were lower investment opportunities available for investment loans due to lockdowns which may have caused lower portfolio growth of Islamic banks.

The findings of this study have several policy implications. For economic policymakers, it is important to understand that Islamic banks contribute more to capital formation by lending a major proportion of their loan portfolio for investment loans. Therefore, policymakers should devise policies supporting Islamic banks as their lending activities may increase business growth. These may include capacity building for risk management. For regulators, it is important to understand that Islami banks' business model is asset-backed, which minimizes asymmetric information between banks and businesses by providing sectoral economic updates. Therefore, investment lending by Islamic banks may have higher efficiency and efficacy. Finally, if Islamic banks had been provided government support during the pandemic, in that case, Islamic banks could have channeled resources to value-generated long-term projects and helped sustain recovery from the COVID-19 pandemic.

The rest of the paper is organized as follows: Section 2 reviews the impact of the COVID-19 pandemic and policy responses by Indonesia, section 3 reviews the relevant literature, section 4 explains the econometric model, section 5 discusses the data while results are discussed in Section 6. Section 7 concludes the paper.

II. IMPACT OF COVID-19 AND POLICY RESPONSES BY INDONESIA

Indonesia is the largest economy in Southeast Asia and the 17th largest in the world in terms of nominal GDP, with a volume of 1.29 trillion USD.[2] The Indonesian economy has a major contribution from services sectors which contribute almost 45%, followed by a little more than 38% from the industrial sector, while almost 14% comes from the agriculture sector. In terms of economic share, the financial and insurance sector contributes about 4.5% to the economy.[3] In the 1997 Asian crisis, the Indonesian economy suffered negative 13% growth during 1998 alone. The Indonesian government devised policies such as taking custody of private sector assets by acquiring nonperforming bank loans and corporate assets through debt recomposition. Later, these assets were privatized. Shortly after the crisis, the economy recovered and grew from 4% to 6%. In 2012, Indonesia crossed India to become the second fastest growing economy in G-20 countries behind China. Since then, annual growth has remained around 5%.[4]

Despite strong economic fundamentals, Indonesia was no exception to the economic crisis that happened around the globe due to the COVID-19 pandemic. Indonesia suffered a negative growth of 2.7% in 2020, the most significant negative shock to its economy after the Asian crisis.[5] This negative economic shock is due to restrictive measures taken by the Indonesian government to contain the spread of the virus. The government implemented two sets of restrictions: large-scale social restrictions and enforcement of limitations on community activities. The first set of restrictions came into effect on March 31st, 2020, through government regulation 21/2020, allowing local governments to restrict people's mobility by initiating partial lockdowns in their localities. Under the second set of restrictions, constraints were implemented in the affected cities and districts. These constraint actions include 25% limitations on office staff capacity, online teaching, 50% limitation on religious gathering, 7 pm closure of shopping malls, and 25% limitation on restaurants' dining capacity. Furthermore, these restrictions were dynamic, and their severity depended upon the spread of COVID-19 cases.[6]

These restrictive measures affected businesses at large. Still, according to the IMF COVID-19 policy tracker,[7] the Indonesian economy dropped moderately by 0.7% in 2021 and is on its path to recovery. The economic recovery might be linked to the fiscal and monetary stimuli provided by the Indonesian government. Regarding fiscal policies, the government distributed almost 580 trillion IDRs, about 3.8% of GDP, as a part of the National Economic Recovery Program (PEN). This disbursement was to support the health care sector battling the COVID-19

2 https://www.imf.org/en/Publications/WEO/weo-database/2022/April/weo-report?c=536,&s=NGDP_RPCH,NGDPD,PPPGDP,NGDPDPC,PPPPC,PPPSH,NID_NGDP,NGSD_NGDP,LUR,LP,BCA,BCA_NGDPD,&sy=2020&ey=2027&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1

3 Indonesian Central Agency on Statistics (Badan Pusat Statistik) https://www.bps.go.id/

4 https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2016&locations=ID&start=2006

5 https://www.cnbcindonesia.com/news/20210205065151-4-221193/pertumbuhan-ekonomi-2020-207-terburuk-sejak-krismon-98

6 World Health Organization. (2021). COVID-19 health system response monitor: Republic of Indonesia. https://apps.who.int/iris/handle/10665/345179

7 https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

spread, social assistance to low-income households, unemployment benefits, tax relief, and permanent corporate tax rate reduction from 25% to 22%. Under the PEN initiative, state-owned enterprises and subsidiaries were provided benefits in capital injections, credit guarantees, and loan recomposition for SMEs. To help banks in credit creation, increase leverage, and provide working capital support to labor-intensive corporations, state funds were placed in selected commercial banks. In 2021, the government budgeted almost 700 trillion IDRs for the PEN initiative.

Regarding monetary and micro-financial policy initiatives, Bank Indonesia (BI) reduced the policy rate by a cumulative value of 125 bps from February to November 2020. Another 25-bps cut was given in February 2021. To ease liquidity conditions, BI also lowered the reserve requirements from banks, increased the duration of repo and reverse repo, introduced daily repo auctions, increased the frequency of FX swap auctions, and the size of weekly refinancing operations. BI also adjusted macroprudential regulations to improve liquidity conditions and bond market stability. With the presidential decree, BI started facilitating banks with liquidity assistance, purchase of government bonds in the primary market, and financing the deposit insurance agency (LPS) to resolve bank solvency problems. BI also took the initiative regarding facilitating the collaboration between the banking industry and Fintech companies to support digital payment in different sectors. Furthermore, Shariah-compliant instruments were also introduced to help support Islamic banks.

III. LITERATURE REVIEW

3.1. Financial Development, Economic Growth, and Exogenous Shocks

Classical literature on the directional relationship between financial and economic development is inconclusive. On the one hand, economists view the services of financial intermediaries as vital for innovation and economic growth (Schumpeter, 1911) and essential for the industrial revolution (Hicks, 1969). According to Levine (1997, p. 692), "the industrial revolution had to wait for the financial revolution." Other economists such as McKinnon (1973), Shaw (1973), Kapur (1976), Galbis (1977), and Mathieson (1980) recognize the key role that financial development plays in economic development.

On the contrary, several economists are skeptical about financial development's ability to lead to economic growth. Economists in this school of thought believe that enterprise development (Robinson, 1952) and economic development (Kuznets, 1955) lead to financial development. According to Lucas (1988), there is an over-emphasis on financial development. Similarly, Chandavarkar (1992) believes that no pioneer economists necessitate financial development for economic growth.

The third strand of literature supports the bi-directional relationship between financial and economic development. King and Levine (1993) show that financial development leads to economic growth at initial levels. However, Luintel and Khan (1999) argue that the empirical literature on this issue suffers from serious econometric problems ranging from omitted variables to estimation biases. The authors address these issues by applying a multivariate vector autoregression (VAR) framework to the data of 10 countries and find a bi-directional relationship between financial development and economic growth.

Although, as shown by the classic literature reviewed above, the relationship between financial development and economic growth is controversial, however, the role of banks in dealing with exogenous shocks, such as earthquakes, flooding, disruption of volcanos, the spread of diseases such as Ebola and the COVID-19 pandemic, is of paramount importance. These exogenous shocks present challenges of enormous scale to the nation. While and in the case of COVID-19, the impact was global across economies.

Credit demand often rises after exogenous shocks, resulting in a restriction on access to credit due to potential loan losses. (Berg and Schrader, 2012). Policymakers use credit provision as a recovery tool (Cortés, 2014; Gallagher and Hartley, 2017), building confidence and avoiding panic (Heide, 2004). There are, however, contrary arguments with empirical support showing a rise in nonperforming loans and a decline in profitability after the shock (Noth & Schüwer, 2018; Albuquerque and Rajhi, 2019). The policy response requires a balance between credit performance and liquidity provision to expedite the recovery process without jeopardizing the profitability of financial institutions (Celil et al., 2022).

Due to a higher possibility of a rise in default rates, crises are likely to increase the likelihood of bank failures. Therefore, banks will become more conservative and tend to lend only to those borrowers or sectors with previous experience and feel very confident about loan quality. Tsuji (1999) attributes comfort zone lending to the increase in bad loans in Japan caused by imposing restraints on new lending by Japanese banks during the early 1990s.

The response to the Covid-19 pandemic is no exception, where banks face a higher probability of loan losses due to a slowdown in economic activity while at the same time extending credit on the back of government stimulus to speed up the recovery. Moreover, during times of crisis, the banking models exhibiting specific characteristics may play a vital role in directing lending activities to restructure loan portfolios and build customer loyalty (Atahau & Cronje, 2020). It is an interesting case to evaluate the impact, resilience, and response of Islamic and conventional banks in terms of their lending activities and how their lending portfolio changed during the pandemic.

3.2. COVID-19 Pandemic and Islamic versus Conventional Banks: Impact, Resilience, and Response

Islamic banks are hailed for their contribution to the real economy and for avoiding losses during the global financial crisis due to their business model (Hasan & Dridi, 2011). Beck et al. (2013) explore the theoretical and operational differences between Islamic and conventional banks. According to the authors, significant theoretical distinctions exist between these two types of banking setups. Islamic banks follow Sharia rules that do not allow interest-based trading (income and expenditure) and only allow trading goods and services. Furthermore, speculation and dealing with specific illicit activities are prohibited. Profit and loss sharing is a critical part of Shariah-compliant finance, and it applies to both sides of the balance sheet, i.e., assets and liabilities.

The risk-sharing model leads to asset-backed financing using Islamic contracts, such as *Murabaha*, *Mudarabah*, *Musharakah*, etc. Literature shows that

the asset-backed model of Islamic banks initially provided them with resilience against the global financial crisis of 2007-09 (Farooq and Zaheer, 2015; Hassan & Aliyu, 2018). However, once the ripple effect of the financial crisis hit the economic fundamentals, Islamic banks also faced severe negative externalities (Hussien et al., 2019). As the COVID-19 pandemic is an exogenous shock to the real economy, it offers an opportunity to see if Islamic banks' response to the COVID-19 pandemic was different from conventional banks.

Literature is growing on the effect of COVID-19 on the relative resilience of Islamic and conventional banks. For instance, Ashraf et al. (2022) analyze Islamic and conventional bank data from the Gulf Cooperation Council (GCC) member states. They find that stock market investors have not considered Islamic banks any different than conventional banks during the economic shock of Covid-19. However, Aliani et al. (2022) study six GCC countries and report that stock prices of Islamic and conventional banks moved in the same direction during the pandemic; however, Islamic banks' stocks showed less volatility than conventional banks. Rizwan et al. (2022) study systemic risk vulnerabilities of Islamic and conventional banks in ten countries with systemically important Islamic banking sectors. Their results show similar systemic risk vulnerabilities of Islamic and conventional banks during the exogenously induced real economic shock of COVID-19.

Growing literature, such as reviewed above, exploits the stock market data and shows that investors do not consider that COVID-19 has affected Islamic banks differently. However, literature is quite scarce related to how banks responded to the crisis regarding their lending activities. Existing literature shows that banks change their lending behavior during economic crises, such as the global financial crisis of 2008-09 (Kapan & Minoiu, 2013) or natural disasters (Cortés & Strahan, 2017).

Dursun-de Neef and Schandlbauer (2021) study how European banks adjusted lending at the onset of the COVID-19 pandemic, emphasizing the existing capitalization. Their results show that worse-capitalized banks increased their lending during COVID-19, whereas better-capitalized banks significantly decreased their lending. Authors link their findings with the zombie lending literature, which says that banks with low capital find it beneficial to issue more loans during contraction times to avoid loan loss recognition and write-offs on their capital. Košak et al. (2015) also report a positive association between tier-1 capital ratio and bank lending growth during the global financial crisis. Their results show that this relationship is significantly more pronounced in developing countries.

Similar findings are reported by Cao and Chou (2022), who study the role of regulatory capital in the resilience of banks during the pandemic. Their results show that banks with higher capital ratios lent more conservatively during a crisis. Beck and Keil (2022) study the effect of COVID-19 on the lending behavior of US banks. Their results show an increase in lending to small businesses motivated by government-guaranteed loans to replace regular loans. Furthermore, they find that, even after controlling for borrower exposures, lenders more exposed to lockdown measures heavily relied on government-guaranteed loans. However, this evidence is from developed economies of Europe and the USA and focuses on conventional banks.

The most relevant study to our work is conducted by Atahau and Cronje (2020). They study the impact of the global financial crisis (GFC) on the loan portfolio recomposition of Indonesian banks with a special emphasis on bank ownership type. Their results show that Government-owned banks tend to focus on consumption loans, whereas foreign-owned banks outpace domestic-owned banks in financing working capital loans. After the GFC, government-owned banks increased their consumption loans significantly. As GFC was an endogenous shock, whereas the COVID-19 pandemic was an exogenous shock, a gap exists in the literature regarding bank loan portfolio recomposition during the pandemic. Furthermore, it is worth studying if the bank business model, which has profound implications for financial stability (Ashraf et al. 2016a), has affected the loan portfolio composition during the pandemic.

The Islamic finance model claims to promote equity and social well-being, but it does not come without its critics. Kabir et al. (2015) argue that some Islamic bank products that follow Shari'ah laws necessitate banks to take on additional risks. Albaity et al. (2022) argue that due to Islamic banks' inability to monitor Mudaraba financed projects, information asymmetry induces additional risks for Islamic banks. Furthermore, the specialized nature of the Islamic contract introduces complexity in risk management and default resolution (Lassoued et al., 2018). Furthermore, Islamic banks often carry larger liquidity reserves than their size to avoid systemic risk due to the absence of an effective last lender to resort facility (Ashraf et al. 2016b). As a result, on one side, Islamic banks may be risk averse to maintaining their financial stability, while on the other hand, more loans enhance their profitability. However, as Rizwan et al. (2018) point out that Islamic banks, when regulated similarly to conventional banks their risk-taking behavior do not differ significantly to comply with regulations. The dichotomy of financial stability and stronger intermediation makes the Islamic banks a special case for study.

COVID-19 is an exogenous shock and has increased the overall risk to businesses. It is plausible that risk-averse banks reduce their lending or avoid lending to those clients in the business sectors like micro-small-medium enterprises who were more exposed to pandemic-related shocks. This paper aims to unfold how the pandemic has affected the lending practices of Islamic and conventional banks and whether there is any difference in banks' risk-taking behavior due to differences in their business model.

IV. ECONOMETRIC METHODOLOGY

To evaluate whether Islamic banks differ in loan portfolio composition from conventional banks during and before the Covid-19 pandemic, we assess the treatment effect on Islamic bank lending growth and portfolio composition during the overall period and during the COVID-19 pandemic using a difference-in-differences (DiD) methodology. The main DiD regression is as follows.

$$LOAN_{it} = \alpha + \beta_1 Islamic_i + \beta_2 Size_{it-1} + \beta_3 LQ_{it-1} + \beta_4 Prof_{it-1} + \beta_5 CAP_{it-1} + \gamma T + \tau B + \varepsilon_{it} \quad (1)$$

where $LOAN_{it}$ is loan portfolio growth of bank i in quarter t and used as the outcome variable in DiD analysis. $Islamic_i$ is a dummy variable that takes the value of 1 if a bank is Islamic and 0 otherwise and is used as a treated variable in DiD analysis. $Size_{it-1}$ is one period lag of size, LQ_{it-1} is loan quality of bank i in year t-1. $Prof_{it-1}$ is profitability, and CAP_{it-1} is capitalization subscript i represents the bank, and t represents the quarter. α and ε_{it} are the constant and error terms, respectively. T and B are the vectors of time and bank fixed effects, along with γ and τ as their respective vector of coefficients.

To test if Islamic and conventional banks have differences in their lending behavior, $LOAN_{it}$ in equation (1) is replaced with a) working capital loans to total loans issued in quarter t, b) investment loans to total loans issued in quarter t, and c) consumption loans to total loans issued in quarter t by bank i.

To test if banks changed the weights of different types of loans in their loan portfolios during the COVID-19, $Islamic_i$ is replaced with $Islamic \times COVID_{it}$ dummy, which takes the value of 1 for Islamic banks in the COVID-19 period, 0 otherwise. Significance and sign of the coefficient β_1 tells the mean differential of the effect of the treated group.

Table 1 describes all the variables mentioned above. While Annex A provides the definitions of various loan categories.

Table 1.
Variable Description

Variable	Description
TL Growth	Logarithmic Growth of Total Loans
WC to TL	Working Capital to Total Loans Issued
INV to TL	Investment Loans to Total Loans Issued
CONS to TL	Consumption Loans to Total Loans issued
Size	Natural log of Total Assets
Loan Quality	Loan Loss Reserves to Total Loans Ratio
Profitability	Net Income to Total Assets Ratio
Tier 1 Capital Ratio	Tier 1 Capital Ratio
DD to TL	Demand Deposits to Total Loans ratio

4.1. Data

All Islamic and conventional banks reporting to Bank Indonesia for the period 2017Q3 to 2021Q4 are included in our sample. The total sample period is divided into the Covid-19 pandemic period starting in 2020Q2 and ending in 2021Q4. Two main reasons led us to treat 2020Q2 as the start of the COVID-19 period. One, Indonesian officials reported the first incident related to Covid-19 on March 2nd, 2020. Second, in March 2020, the WHO declared Covid-19 as a pandemic. By the second quarter of 2020, the impact of the pandemic was evident. The data is sourced from the Bank Indonesia data repository.

4.2. Descriptive Statistics

We provide descriptive statistics in two tables to better visualize the sample. Table 2 provides descriptive statistics for the entire sample and for Islamic and conventional banks separately. Table 3 presents summary statistics based on two sample periods: before and after the pandemic.

Table 2.
Descriptive Statistics

	Overall Sample			Conventional Banks			Islamic Banks		
Variable	**Obs.**	**Mean**	**Std. dev.**	**Obs.**	**Mean**	**Std. dev.**	**Obs.**	**Mean**	**Std. dev.**
TL Growth	1,667	0.14%	12.48%	1,537	0.39%	12.33%	130	-2.88%	13.91%
WC to TL	1,681	45.53%	31.13%	1,551	44.89%	31.46%	130	53.19%	25.68%
INV to TL	1,681	16.80%	20.29%	1,551	16.41%	20.41%	130	21.38%	18.34%
CONS to TL	1,681	38.46%	33.06%	1,551	39.66%	33.50%	130	24.14%	22.99%
Size	1,666	10.01	1.51	1,539	10.11	1.48	127	8.78	1.19
Loan Quality	1,681	2.36%	1.67%	1,551	2.30%	1.64%	130	3.11%	1.87%
Profitability	1,681	0.06%	3.73%	1,551	0.07%	3.73%	130	-0.04%	3.73%
Tier 1 Capital Ratio	1,681	25.26%	12.96%	1,551	25.10%	12.62%	130	27.13%	16.47%
DD to TL	1,681	22.35%	18.28%	1,551	23.47%	18.26%	130	8.99%	12.33%

Table 3.
Loans Portfolios before and during COVID-19

	Conventional Banks					Islamic Banks				
	Pre-COVID-19		**COVID-19**		**K-wallis**	**Pre-COVID-19**		**COVID-19**		**K-Wallis**
Variable	**Mean**	**Std. dev.**	**Mean**	**Std. dev.**		**Mean**	**Std. dev.**	**Mean**	**Std. dev.**	
TL Growth	1.71%	12.29%	-1.43%	12.15%	22.74***	-2.25%	14.62%	-3.77%	12.92%	0.127
WC to TL	45.85%	31.06%	43.55%	31.99%	2.651	53.87%	26.24%	52.23%	25.08%	0.191
INV to TL	16.94%	20.13%	15.68%	20.78%	6.543	20.22%	17.80%	23.01%	19.12%	0.864
CONS to TL	38.39%	33.22%	41.43%	33.84%	3.514*	24.64%	22.84%	23.43%	23.39%	0.049

During the sample period, total loans showed an average growth of 0.14%, predominantly associated with conventional banks, which showed an average growth of 0.39%. By contrast, Islamic banks posted a negative growth rate of 2.88%. Table 3 shows that Islamic and conventional banks had similar loan growth trends during COVID-19. During the pre-COVID-19 period, Islamic banks experienced negative growth of 2.25%, while conventional banks experienced positive growth of 1.71%. While the differences in means (K-Wallis) tests indicate that conventional banks' total loan growth slowed significantly during the COVID-19 period and dropped to negative 1.43%. By contrast, Islamic banks' total loans decline by 3.77% on average. As a whole, these descriptive statistics indicate relatively sluggish loan growth of Islamic banks throughout the whole period and during the COVID-19 period.

While examining the disbursed loans by type during the sample period, as explained in annex A, on average, 45.5% of banks' loan portfolios consist of working capital loans. Conventional banks have a slightly lower share (44.89%), while Islamic banks have a significantly higher share (53.19%). Table 3 shows a similar trend for conventional banks during pre and post-COVID-19, where working capital loans have a share of 43.55% and 45.85%, respectively. Working capital loans continued to dominate the portfolios of Islamic banks regardless of COVID-19. On average, Islamic banks have more than half of their loan portfolio consisting of working capital loans.

As far as investment loans are concerned, on average 16.80% of the loan portfolio is composed of investment loans. Conventional banks have a slightly lower average share of investment loans (16.41%) than Islamic banks (21.38%). This makes sense since Islamic banking is asset-backed and prefers investment loans. In spite of this, looking at the average values of investment loans pre- and post-COVID-19, it is evident that conventional banks increased their investment loans slightly (albeit statistically insignificantly), while Islamic banks' share decreased from 23.01% to 20.22%. This is quite counter-intuitive and may indicate Islamic banks' risk-averse nature.

In terms of consumption loans, conventional banks have 39.66% of total loans in their loan portfolio, while Islamic banks have a significantly smaller share of 24.1%. Conventional banks significantly decreased their percentage of consumption loans during the COVID-19 period while the share of consumption loans slightly increased. Overall, descriptive statistics of loan portfolios show that Islamic banks have a higher proportion of working capital and investment loans. In contrast, conventional banks have a higher investment in consumption loans. It is in line with the asset-backed business model of Islamic banks.

Looking at the bank-specific characteristics (control variables explained later), we observe that conventional banks are, on average, larger than Islamic banks. In terms of loan quality, the overall sample shows that 2.36% of total loans are covered by loan loss reserve. Conventional banks have almost similar average percentages, but Islamic banks have a 3.11% average value of loan loss reserves. It shows that Islamic banks are relatively more risk averse and thus allocate higher amounts to their loan loss reserves than conventional banks. In terms of profitability, an average bank in the sample has earned a .06% return on total assets. The average conventional bank has earned .07% on assets, while Islamic banks have a net loss of .04% on their assets.

Descriptive statistics show that sample banks are well capitalized, showing an average tier-1 capital ratio of more than 25%. Conventional banks have a similar average capitalization as the overall sample; Islamic banks are quite higher, with an average value of 27.13% capitalization. From the financing side, demand deposits show that the average bank in the sample has 22.35% of the total loan portfolio consisting of demand deposits. Conventional banks have, on average, 23.47%, while Islamic banks have a considerably lower value of almost 9% of demand deposits. It shows that, on average, conventional banks are aggressive in their reliance on demand deposits compared to Islamic banks.

Table 4 provides a correlation matrix of variables used in the analysis. Loan quality has a significantly negative correlation with total loan growth, suggesting

the careful nature of sample banks where they reduce their loan portfolios if their loan quality deteriorates. Profitability shows a significantly positive correlation with loan growth, suggesting profitable banks may go for higher loans by reinvesting their earnings. Tier-1 capital ratio and demand deposits to total loans ratio negatively correlate. A significant negative correlation exists among loan categories, suggesting the recomposition of bank loan portfolios. The correlation matrix also shows the significant negative (positive) correlation between size and working capital (consumption) loans. Capitalization also shows a significant positive correlation with working capital and investment loans, while a negative correlation with size. Demand deposit to total loan ratio correlates significantly with loan categories, size, and quality.

The above univariate analysis provides valuable insights; however, we still do not know if the changes in loan portfolio composition during the Covid-19 period are statistically different among conventional and Islamic banks.

Table 4.
Correlation Matrix

	Variable	1	2	3	4	5	6	7	8
1	TL Growth	1							
2	WC to TL	0.02	1						
3	INV to TL	0.03	-0.16*	1					
4	CONS to TL	-0.03	-0.74*	-0.32*	1				
5	Size	0.04	-0.1*	0.03	0.07*	1			
6	Loan Quality	-0.16*	-0.02	-0.03	-0.03	0.18*	1		
7	Profitability	0.09*	-0.02	0.03	-0.01	0.01	-0.01	1	
8	Tier 1 Capital Ratio	-0.07*	0.08*	0.09*	0.02	-0.35*	-0.01	-0.01	1
9	DD to TL	-0.06*	-0.22*	-0.15*	0.23*	0.19*	0.09*	-0.02	-0.01

V. RESULTS AND DISCUSSION

Islamic banks may reflect different bank-specific characteristics, like bank size and profitability, making comparison difficult. We use a propensity score matching approach and create a control group to ensure an apple-to-apple comparison of conventional and Islamic banks. The variable Treated equals one for Islamic banks and zero for conventional Banks. Following Rodnyansky and Darmouni (2017) and Gropp et al. (2019), bank characteristics are chosen to capture size, capitalization, loan quality, and deposit base.

Due to the small size of the treatment group, we matched each treated bank observation with one non-treated bank observation with replacement (matching ratio of 1:1). After the matching, we estimated the probit model on pre- and post-matching samples to verify the accuracy of propensity score matching in removing heterogeneity of treated and control group.

Table 5 reports the results of the Probit model estimation of the treated variable, which takes the value of 1 if the bank is Islamic and 0 otherwise. Model (1) shows results before propensity score matching for the whole sample. Results show that size, tier-1 ratio, and demand deposit to total loans ratio have a significantly negative association with the treated variable, suggesting that Islamic banks are

smaller in size, have a lower tier 1 capital ratio and demand deposits to total assets. The p-value of the model shows significance at the 1% level, suggesting that all coefficients are not equal to zero. For the propensity score matching, model (2) reports matching when total loan growth is used as the outcome variable. In models (3) to (5), working capital, investment, and consumption loans are outcome variables. All the models after the propensity score matching show insignificant coefficients for all the explanatory variables, with the p-value of the model test as insignificant. It shows that matched sample has bank observations from treated and control variables with similar characteristics. Hence, any difference in the outcome variable from DiD analysis must be due to the treatment effect.

Table 5.
Probit Estimation Before and After Propensity Score Matching. Islamic Bank Dummy Is Treated Variable

	(1)	(2)	(3)	(4)	(5)
VARIABLES	**Full Sample**	**TL Growth**	**WC to TL**	**INV to TL**	**CONS to TL**
Size (lag)	-0.360***	0.0873	0.0843	0.0843	0.0843
	(0.0482)	(0.0751)	(0.0778)	(0.0778)	(0.0778)
Loan Quality (lag)	20.56***	4.891	1.232	1.232	1.232
	(3.077)	(4.480)	(4.527)	(4.527)	(4.527)
Profitability (lag)	-0.265	2.414	0.972	0.972	0.972
	(1.285)	(1.861)	(1.882)	(1.882)	(1.882)
Tier 1 ratio (lag)	-1.536***	0.954	1.005	1.005	1.005
	(0.437)	(0.631)	(0.619)	(0.619)	(0.619)
Demand Deposit to Total Loans (lag)	-3.136***	-0.456	-1.106	-1.106	-1.106
	(0.475)	(0.889)	(0.802)	(0.802)	(0.802)
Constant	2.333***	-1.114	-0.932	-0.932	-0.932
	(0.502)	(0.765)	(0.785)	(0.785)	(0.785)
Observations	1,681	260	260	260	260
Matching	pre	post	Post	post	post
R-Squared	0.242	0.0151	0.0120	0.0120	0.0120
p-value for model test	0.000***	0.363	0.504	0.504	0.504

Table 6 reports the Difference-in-Difference results conducted on the matched sample of observations. Model (1) reports results when total loan growth is the outcome variable. Results show that Islamic banks have around 7.4% lower growth in total loans than conventional banks. However, statistically, this difference is not significantly different than zero. It shows that while other bank-specific factors are accounted for, Islamic banks are less likely to have lower total loan growth than conventional banks.

Model (2) reports results with a ratio of working capital loans to total loans issued during the quarter as the outcome variable. The result shows that the

average proportion of working capital loans of Islamic banks is 8% lower than conventional banks. However, as total loan growth outcome, statistically, this result is also insignificant. Model (3) uses investment loans to total loans issued as the outcome variable. Results show that the average proportion of investment loans in the total loan portfolio of Islamic banks is higher by 26.5% than the mean proportion of investment loans of conventional banks. Statistically, the differential is significant at a 1% level. It is in line with the asset-backed business model of Islamic banks, where they invest more in longer-term asset-oriented investment avenues to earn profits.

Model (4) reports results with the ratio of consumption loans to total loans issued as the outcome variable. Results show that the mean effect on the Islamic bank's consumption portfolio is almost -27%, which is statistically significant at a 1% significance level. This finding is not surprising considering the asset-backed business model of Islamic banks, consumption loans, which include mortgage loans, credit card loans, and other personal loans, are not well aligned. Consequently, Islamic banks invest significantly less in these avenues.

Table 6.
Difference-in-Difference Estimation

	(1)	(2)	(3)	(4)
VARIABLES	**TL Growth**	**WC to TL**	**INV to TL**	**CONS to TL**
Islamic Bank	-0.0704	-0.0790	0.265***	-0.269**
	(0.0798)	(0.132)	(0.0931)	(0.119)
Size (lag)	-0.0265	-0.0207	-0.00525	0.0228
	(0.0453)	(0.0679)	(0.0479)	(0.0615)
Loan Quality (lag)	0.0260	-3.453***	-0.207	3.488***
	(0.588)	(1.192)	(0.841)	(1.079)
Profitability (lag)	-0.592	0.589	0.328	-1.038
	(0.455)	(0.896)	(0.632)	(0.812)
Tier 1 ratio (lag)	0.417***	-0.540*	0.536***	-0.240
	(0.158)	(0.280)	(0.197)	(0.253)
Demand Deposit to Total Loans (lag)	-0.0158	-0.0968	-0.119	0.237
	(0.107)	(0.202)	(0.142)	(0.183)
Constant	0.216	1.073**	-0.176	0.258
	(0.343)	(0.532)	(0.376)	(0.482)
Observations	260	260	260	260
R-squared	0.445	0.590	0.503	0.652
Firm Fixed-Effect	YES	YES	YES	YES
Year Fixed-Effect	YES	YES	YES	YES
R-Squared Overall	0.445	0.590	0.503	0.652

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7 reports the results of the Probit model estimated for the treated variable that takes the value of 1 for Islamic banks in the COVID-19 period and 0 otherwise. Model (1) reports estimation results for the whole sample, while models (2) to (5) report results on observations obtained after propensity score matching. Model (1) show significant coefficients for size, loan quality, and demand deposit to total loans ratio. The p-value of the model test is significant at the 1% level, suggesting that all of the coefficients are not equal to zero. After the propensity score matching, all coefficients are insignificant separately and in combined form, as shown by the insignificant p-value of the model test.

Table 7.
Probit Estimation Before and After Propensity Score Matching. Islamic Bank Dummy Is Treated Variable

	(1)	(2)	(3)	(4)	(5)
VARIABLES	**Full Sample**	**TL Growth**	**WC to TL**	**INV to TL**	**CONS to TL**
Size (lag)	-0.226***	0.103	0.0675	0.0675	0.0675
	(0.0579)	(0.138)	(0.129)	(0.129)	(0.129)
Loan Quality (lag)	8.913**	7.648	-0.616	-0.616	-0.616
	(3.837)	(7.975)	(7.629)	(7.629)	(7.629)
Profitability (lag)	-1.498	-2.724	-0.363	-0.363	-0.363
	(1.574)	(3.176)	(3.163)	(3.163)	(3.163)
Tier 1 ratio (lag)	-0.341	-0.382	0.668	0.668	0.668
	(0.503)	(1.026)	(0.993)	(0.993)	(0.993)
Demand Deposit to Total Loans (lag)	-2.133***	-0.152	-0.465	-0.465	-0.465
	(0.552)	(1.185)	(1.072)	(1.072)	(1.072)
Constant	0.502	-0.968	-0.720	-0.720	-0.720
	(0.607)	(1.413)	(1.317)	(1.317)	(1.317)
Observations	1,681	108	108	108	108
Matching	pre	post	post	post	post
R-Squared	0.130	0.0175	0.00410	0.00410	0.00410
p-value for model test	0	0.759	0.987	0.987	0.987

Table 8 reports the Difference-in-Difference estimation results. A significant increase in investment loan proportion was observed among Islamic banks during COVID-19, while all other categories of loans decreased albeit statistically insignificantly. Economically, a 27.6% differential is observed in the mean investment values to total loans issued during COVID-19 by Islamic banks.

Overall, results show that Islamic banks have systemic differences in loan portfolios. Conventional banks are more involved in consumer financing, whereas Islamic banks focus on investment lending. During COVID-19, Islamic banks increased lending for investment purposes. The lockdown impact translates to relatively higher nonperforming loans on Islamic banks than conventional, which

is understandable as the corporate sector observed more severe difficulties during the pandemic. In addition, consumer lending may outperform business lending in nonperforming loans because of direct support from the government in terms of loan payment deferrals and income supplements during this pandemic.

Table 8.
Difference-in-Difference Estimation

	(1)	(2)	(3)	(4)
VARIABLES	**TL Growth**	**WC to TL**	**INV to TL**	**CONS to TL**
Islamic-COVID-19	-0.166	-0.0983	0.276*	-0.175
	(0.104)	(0.202)	(0.152)	(0.157)
Size (lag)	0.0363	-0.254	0.258	-0.0113
	(0.123)	(0.226)	(0.169)	(0.175)
Loan Quality (lag)	0.561	-5.169*	3.504	1.513
	(1.547)	(2.942)	(2.205)	(2.282)
Profitability (lag)	0.227	-0.0851	0.140	-0.437
	(0.788)	(1.455)	(1.091)	(1.128)
Tier 1 ratio (lag)	-0.0119	-0.222	0.330	-0.151
	(0.393)	(0.861)	(0.645)	(0.667)
Demand Deposit to Total Loans (lag)	-0.114	-0.199	-0.0713	0.262
	(0.163)	(0.312)	(0.234)	(0.242)
Constant	-0.310	3.338*	-2.384	0.161
	(1.042)	(1.950)	(1.462)	(1.513)
Observations	108	108	108	108
R-squared	0.704	0.699	0.573	0.785
Firm Fixed-Effect	YES	YES	YES	YES
Year Fixed-Effect	YES	YES	YES	YES
R-Squared Overall	0.704	0.699	0.573	0.785

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

VI. CONCLUSION

The COVID-19 outbreak brought unprecedented socio-economic challenges to the world. Globally, governments imposed mobility restrictions to prevent the spread of the virus. Economic activities halted, economic growth slowed, and the global economy lost around 4% in volume during 2020.

A growing body of literature shows that banks, which are a support sector to manufacturing and service industries, have also experienced a severe shock on assets and liabilities. Nevertheless, governments around the globe provided much-needed financial support to banks and other financial institutions by introducing several monetary and fiscal stimuli. Due to its exogenous nature and real economic consequences, the COVID-19 crisis differs from the global financial crisis of 2007-09. Due to this characteristic of the COVID-19 crisis, Islamic banks with their 'asset-backed' banking model can be evaluated as an interesting case study.

During the COVID-19 crisis in Indonesia, Islamic and conventional banks recomposed their loan portfolios. Compared with conventional banks, Islamic banks have a higher proportion of investment loans in their loan portfolios. Islamic banks increased their investment loan proportion even more than conventional banks during the COVID-19 crisis. It supports the notion that Islamic banks invest in long-term projects and follow asset-backed business models. Policy-wise, it can contribute to the sustainability and growth of the Indonesian economy.

Future research could take advantage of this research. There can be future research on credit risk (losses on loans), profitability, and efficiency to learn if the policy of providing more support to investment categories has helped Islamic banks sustain themselves in the long run. Policymakers can gain valuable insights from exploring these avenues.

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APPENDIX

Annex A:
Description of Loans by Type of Loans

Loan Types			Description
1) Working Capital			Loan given to the company as working capital
2) Investment			Loan for the purchase of capital goods and services used for the rehabilitation, modernization, expansion, and relocation of projects and or the establishment of new businesses
3) Consumption	3.a) Credit Card		Consumer loan via credit card
	3.b) Household	Housing	Loan for home ownership/ mortgage
		Apartment	Loan for flat/apartment ownership
		Shophouse/office	Loan for shop ownership
		Motor Vehicles	Loan for motor vehicles
		Household appliances	Loan for household appliances
		Unclassified	Unclassified household Loans
	3.c) Other Consumption		Other consumption loan apart from households, such as loan to non-business sectors

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