

POLICY RATES PASS-THROUGH IN INDONESIA'S DUAL BANKING SYSTEM: DOES BUSINESS CYCLE MATTER?

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ABSTRACT

This paper examines the pass-through of the policy rate to conventional and Islamic bank rates during the recessionary and expansionary episodes for the case of Indonesia. Applying an error-correction modelling to monthly data from June 2014 to April 2021, our findings confirm that the interest rate pass-through is sensitive to the business cycle for both conventional and Islamic banks. The policy rate pass-through to deposit rates is higher during the recession for both banking types. We also note that the lending rates of conventional banks fully adjust to the policy rate in the recessionary phase. The findings for Islamic financing rates are interesting. Namely, they tend to move inversely with the policy rates during the expansionary period. Meanwhile, depending on the rates, they are either over-responsive or less responsive during the recessionary phase. Finally, the degree of short-run adjustment in most banking rates is not influenced by the business cycle. These findings suggest that Islamic banking rates are less synchronized to the monetary policy rate, indicating that sharia-based banking barely supports counter-cyclical monetary policy.

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I. INTRODUCTION

1.1. Background

Understanding the monetary policy transmission process is crucial for guiding monetary policy decisions and assessing policy effectiveness (Atkin & La Cava, 2017). Theoretically, monetary policy is propagated through several transmission channels, among which are interest rate, credit, exchange rate, and asset price channels (Cevik & Teksoz, 2013; Boivin, Kiley & Mishkin, 2010). According to the interest rate channel, which is generally considered as the main channel, the changes in monetary policy would first affect bank rates. Since bank financing rates are a key determinant of components of aggregate demand in particular household consumption of durable goods and firms' investment, the changes in financing rates would lead to changes in the aggregate demand and subsequently real output and the price level. This interest rate channel is normally depicted as:

↓ Policy rate → ↓ bank rates → ↑ investment, consumption → ↑ AD → ↑ GDP, P

where AD is aggregate demand, GDP is real gross domestic product and P is the price level. As may be discerned from the above transmission, the effectiveness of the monetary policy hinges crucially on the extent to which the policy rate is passed through the bank rates, the so-called interest rate pass-through (henceforth IRPT). More specifically, For the monetary policy to be effective in influencing real economic activity, the IRPT must be complete and symmetric (Hofmann & Mizen, 2004; Apergis & Cooray, 2015; Handayani & Kacaribu, 2021).

The recent emergence of Islamic banking in many countries has stimulated much interest in especially its role in the monetary transmission mechanism. Unlike interest rate instruments in conventional banking, Islamic banking adopts the profit/loss sharing, margin, fee, or equivalent rates in their financial transactions (Ascarya, 2012). Given the demarcation of Islamic banking from interest rates and its close tie to the real sector, the pass-through of the policy rate to Islamic banks may be different. Thus, for countries where Islamic banking has assumed a prominent role such as Indonesia, the question as to how Islamic banks respond to the policy rate would be of great interest, particularly to monetary authorities. While there are many studies that have examined the responses of Islamic bank financing to changes in the interest rate (the so-called credit channel), studies on interest rate pass-through is limited and their findings are at best mixed. Thus, our current understanding of the IRPT to Islamic banks remains incomplete.

In views of this, the present paper analyzes the IRPT to Islamic banks in a dual banking system, i.e. Indonesia. In contributing to the limited literature on Islamic banking IRPT, our analysis covers three main aspects. First, as in many empirical studies on Islamic banking, we take a comparative perspective by examining the IRPT to both conventional and Islamic bank rates. Second, we look at various bank rates, which include money market rates, deposit rates (demand deposits, savings deposits and time deposits at various maturities) and lending/financing rates (Working Capital, Investment and Consumption). Thus, our analysis is more comprehensive than existing studies on the issue for Islamic banks. Finally, we also assess whether the IRPT depends on the phases of the business cycle. In the literature, various studies have noted that the effect of monetary policy is

asymmetric with regard to the phases of the business cycle (Aragon & Portugal, 2009). The impact of monetary policy on output is more substantial during the recession in the U.S., Germany, France, Spain, Austria, and Belgium (Garcia & Schaller, 2002; Dolado & Maria-Dolores, 2006; Peersman & Smets, 2001; Kaufmann, 2002). Jannsen et al. (2019) also finds that the effect of monetary policy is substantially different during the financial crisis than those in stable times. Other studies further note that the interest rate monetary policy channel is ineffective during the period of high uncertainty (Bernanke, 1983; Dixit & Pindyck, 1994). We add to this literature by bringing the Islamic banking perspective into the focus.

The rest of the article is organized as follows. Section II presents the literature review. The methodology is presented in Section III. Section IV discusses the empirical results and Section V concludes.

II. LITERATURE REVIEW

While the interest rate channel of monetary transmission mechanism is well acknowledged, how effective and strong the channel in transmitting monetary policy impulses to the real sector remains a matter of debate and of empirical inquiry. As the strength of this channel depends fundamentally on the IRPT (Gregor, Melecky & Melecky, 2019; Hofmann & Mizen, 2004; Apergis & Cooray, 2015). i.e. the degree to which the policy rate is passed through to bank rates, many studies have made attempts to quantify the magnitudes of the pass-through. The literature is voluminous covering both individual countries as well as groups of countries. In general, existing studies tend to suggest different degrees of pass-through across countries, across banks and even across times. They note that there may be various factors that influence the IRPT, among which include economic and market conditions and adjustment costs (Sander & Kleimeier, 2004; Stiglitz & Weiss, 1981; Holton & Rodriguez d'Acari, 2018; Avouyi-Dovi et al., 2017; Chong, 2010; Zulkhibri, 2012; Handayani & Kacaribu, 2021; and Li, Si & Ge, 2021).

Normally, central banks perform countercyclical monetary policy in responses to the business cycle. That is, they cut the interest rate during the recessionary period to stimulate the economy and raise the interest rate during the expansionary period to prevent overheating (Takáts, 2012). Yet, interestingly, the business cycle itself can potentially affect the IRPT. While many studies have found the pass-through to be asymmetric across the business cycle or be different during the downturns, the evidence is still inconclusive as to whether the pass-through is higher or lower during recession or crisis periods. For instance, several studies have confirmed that the interest rate pass-through is weakened during the global financial crisis for the cases of Europe and the USA (Karagiannis, Panagopoulos & Vlamis, 2010; Hristov, Hülsewig & Wollmershäuser, 2014; Aristei & Gallo, 2014). These studies note that the IRPT had been complete before the crisis but has turned incomplete since the crisis started. By contrast, Humala (2005) find that the magnitude of Argentina's IRPT is higher for all interest rates during the financial crises. Furthermore, other studies report that the crisis period had no significant effect on the degree or speed of IRPT in the Malaysia and Turkey cases (Yüksel & Özcan, 2013; Hussain & Nahar, 2016).

Unlike the conventional banking system, Islamic banking follows the Sharia principle, which prohibits the practice of interest or Riba (Abedifar, Ebrahim, Molyneux & Tarazi, 2015). Islamic banking adopts a profit-loss sharing system based on the profit/loss occurring in the debtor's business. Abedifar et al. (2015) classify transactions in Islamic banking, which is based on *Fiqh Muamalah*, into three categories, namely debt-based financing, lease-based financing, and profit-sharing or lost financing (PSL). This practice makes Islamic banking more dependent on the real sector (Fikri, 2018) and reduces the risk of the creditors and debtors during a time of uncertainty (Bilgin, Danisman, Demir & Tarazi, 2021).

In dual banking regimes, where the typical conventional money market is more developed, and interest rate system is dominant, there is a tendency of a spillover effect to Islamic banks funding costs from conventional bank rates, to profit-sharing investment account (PSIA) return and to Islamic banks credit costs (Cevik & Charap, 2011). The early stage of Islamic banks' development is often characterized by the lack of Islamic finance equivalent to money market and government bond rates as reference rates to Islamic banks credit rates. Consequently, Islamic banks tend to link the rate of Murabaha and Ijarah contracts to conventional interest rates (Zaheer, Ongena & van Wijnbergen, 2013).

Conventional and Islamic banking are fundamentally different. While conventional banking uses the interest system, Islamic banking uses profit/loss sharing (Ryandono, 2006; Ascarya, 2007). This characteristic is expected to affect how conventional and Islamic banking systems administer their respective banking rates and respond to the monetary policy rate changes. Nevertheless, Zulkhibri (2018) and Omer (2019) find that although Islamic banks are assumed to be interest-rate free, their lending behavior's responses to the policy rate change are similar to conventional banks.

Some studies have been carried out to compare the responses of Islamic and conventional banks to monetary policy changes. Akhatova, Zainal & Ibrahim (2016) find significant response of credit and financing in conventional and Islamic banks to the change of monetary policy. In addition, when the interest rates increase, Islamic financing is likely to respond faster than conventional banks. Kassim, Majid & Yusof (2009) and Aysan, Disli & Ozturk (2018) also discover that credit and loans in Islamic banks are more responsive to the change in monetary policy compared to their conventional counterparts. The study conducted in Pakistan by Omer (2019) examines the policy rate pass-through to conventional banks and Islamic banks. He finds a similar pass-through of policy rate to retail prices of both banks types. By contrast, Caporale et al. (2020) argue that the response of Islamic banks' credit to policy rate changes is not as sensitive as conventional banks' credit. However, both responses have become more similar in recent years.

In Indonesia, for the conventional bank case, Handayani & Kacaribu (2021) note that switching the benchmark rate from BI Rate to 7-Day Repo Rate (7DRR) has improved the IRPT to the money market rate. However, the pass-through to deposit and lending rates have turned incomplete. In addition, lending rates respond asymmetrically during the monetary tightening and easing. The monetary policy transmission through the interest rate channel is also significant in the Islamic bank system in Indonesia (Sukmana, 2015; Audah & Kasri, 2020). Ascarya (2012) investigates the monetary policy transmission via Islamic and conventional

banks to inflation and output. He notes that conventional rate is propagated to inflation and output while Islamic rate fails to do so. Moreover, conventional policy rate shock brings negative and permanent impacts on inflation and output; meanwhile, Islamic policy rate shock brings positive and permanent impacts on inflation and output in Indonesia.

Although the number of Islamic banks is growing, the research on the IRPT in Indonesia's Islamic banking is still limited. Zulkhibri & Sukmana (2017) use panel data of Indonesian Islamic banks between 2003 and 2014 and find that Islamic banks' financing is insensitive to the change of monetary policy rate. Furthermore, Hafidh (2021) demonstrates that the transmission of monetary policy changes to the real sector, i.e., inflation, is weaker in Islamic banking as compared to conventional banking. However, none of the studies has explored the behavior of IRPT in conventional and Islamic banking during recession or expansion periods. Therefore, we contribute to the literature by comparing the IRPT in Indonesia's dual banking system during the different phases of the business cycle.

III. METHODOLOGY

3.1. Data

We compile monthly data covering the period from June 2014 to April 2014. Three sets of bank rates are considered. These are the money market, deposit, and lending/financing rates. The specific rates for both Islamic and conventional banks are given in Table 1 below. As for the monetary policy rate, we employ the benchmark interest rate announced regularly by Bank Indonesia. Finally, to identify the phases of the business cycle, whether the economy is in recession or in expansion, we use the output gap estimated using the standard Hodrick-Prescott (HP) Filter. The filter decomposes a time series into a scalar trend (long-term trend) and a cyclical component. Suppose, a time series variable y^t , for $t=1,2,\dots,T$, consist of a trend (y^T) and cyclical (y^C) components, $y_t = y^T + y^C$. Following Hodrick-Prescott (1997), the filter is given by:

$$\left\{ \sum_{t=1}^T (y_t - y_t^C)^2 + \lambda [(y_{t+1}^C - y_t^C) - (y_t^C - y_{t-1}^C)]^2 \right\}$$

where λ is a smoothing constant to penalize the variation in the growth rate of the scalar trend component. As Hodrick & Prescott (1997) propose, the common practice is that the value of quarterly data is 1600. We use quarterly data of Real GDP from the IMF database.

Table 1.
Banking Rates and Its Data Source

Banking System	Banking Rates' Group	Proxy of Banking Rates	Data Source
Conventional Banking	Money market rate	Interbank Call Money	Indonesian Economics and Financial Statistics, BI
	Deposit rates	Demand Deposit	Indonesia Banking Statistics, OJK
		Saving Account	
		Time Deposit:	
		1-Month	
Islamic Banking	Deposit yield rate or equivalent/ distribution/ fees/ bonuses	3-Month	Sharia Banking Statistics, OJK
		6-Month	
		12-Month	
		Working Capital	Sharia Banking Statistics, OJK
	Financing rates	Investment	
		Consumption	

Sources: Indonesian Economics and Financial Statistics, Indonesia Banking Statistics, and Sharia Banking Statistics published monthly at the Bank Indonesia (BI) and Indonesian Financial Service Authority (OJK) websites.

3.2. Empirical Models

Following Chong (2010), Liu, Margaritis & Qiao (2016), and Handayani & Kacaribu (2021), the present paper employs the two-step Error Correction Model (ECM) to examine the policy rate pass-through to both Islamic and conventional bank rates. The model incorporates asymmetry in the responses bank rates to monetary policy rates change during the contractionary and expansionary periods.

In the first step of ECM, we set up the following long-run equation that links bank rates to the monetary policy rate:

$$IR_t = \alpha_0 + \alpha_1 PR_t + \alpha_2 D + \alpha_3 D * PR_t + \varepsilon_t \quad (1)$$

where IR_t represents bank rates (conventional and Islamic banking), PR_t is the policy rate, t denotes time, and ε_t is the error term. D is the business cycle dummy variable, which takes the value of 1 if the period is in recession and 0 otherwise.

As explained above, we identify recession using the HP-filtered output gap, where negative output gap signals recession.

In (1), the coefficient α_0 represents intermediation cost or margin, which comprises mark-up and marginal cost. Furthermore, α_1 measures the long-run interest rate pass-through during the expansion period. We expect α_0 and α_1 to be positive. The parameter α_2 measures the change in the intermediation cost or margin during recession. Finally, α_3 captures the difference in the pass-through between the recessionary and expansionary periods. In other words, while α_1 measures the long-run interest rate pass-through during the expansion period, $\alpha_1 + \alpha_3$ measures the pass-through during the recessionary period. Note that the IRPT is complete when they are statistically indistinguishable from (*one-to-one*) and incomplete (over-complete) when they are less than (more than) one. Finally, when the movement of banking rates as the response of monetary policy rates is showing opposing behavior, we label it as reverse adjustment.

In estimating equation (1), we first conduct the unit root test of the residual term to check the presence of cointegration (Valadkhani & Anwar, 2012). Then, after verifying their long run relation, we apply Wald Test to establish whether the long-run interest rate pass-through is complete or not. When the economy is not experiencing a recession, the null hypothesis is $H_0: \alpha_1 = 1$ and the alternative hypothesis is $H_1: \alpha_1 \neq 1$. However, in the recessionary phase, we test the hypotheses $H_0: \alpha_1 + \alpha_3 = 1$ against $H_1: \alpha_1 + \alpha_3 \neq 1$. Moreover, another Wald test is also performed to check the hypothesis $H_0: \alpha_1 = \alpha_1 + \alpha_3$ against $H_1: \alpha_1 \neq \alpha_1 + \alpha_3$ which represent the change in long-run IRPT between different phases of the business cycle.

Then, in the second stage of the ECM model, the short-run dynamics of banking rates are analyzed. The focus is on the speed of adjustment and the direct pass-through. The short-run dynamics, as well as the adjustment, is captured by the following equations:

$$\Delta IR_t = \beta_1 \Delta PR_t + \beta_2 \varepsilon_{t-1} + \beta_3 D * \Delta PR_t + \beta_4 D * \varepsilon_{t-1} + \mu_t$$

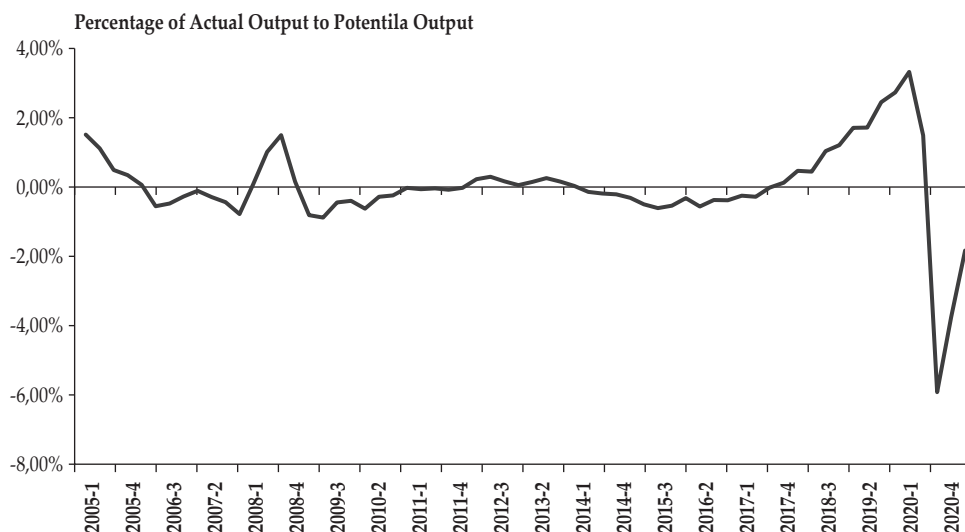
where Δ symbolizes the first difference operator and μ_t is the error term. The variable ε_{t-1} is the residual from equation (1) and describes the divergence of the interest rate from its long-run equilibrium level in the previous period. The parameter β_1 denotes the magnitude of immediate pass-through. In addition, coefficients β_2 represents the speed of adjustment when the economy is in expansion. The dummy of recession is also incorporated in (2) to capture the differences in the short-term relationship between the policy rates and interest rates during recessionary and expansionary conditions. Coefficient β_3 measures the difference in the degree of IRPT in the short-run while parameter β_4 different in error-correction adjustment speed during the expansion period as compared to those during the recessionary period.

Furthermore, we calculate the Mean Adjustment Lag (MAL) as suggested by Liu et al. (2016) for the expansionary and contractionary period. MAL describes a combination of magnitude and adjustment speed of short term pass-through. MAL in expansionary period is calculated as $(1 - \beta_1) / \beta_2$, while in recessionary period it is computed as $(1 - (\beta_1 + \beta_3)) / (\beta_2 + \beta_4)$.

IV. RESULTS AND ANALYSIS

4.1. Business Cycle

Figure 1 illustrates the output gap in Indonesia during the period 2005 to early 2021. As may be noted from the figure, Indonesia entered into the contractionary phase from 2014 to June 2017, followed by an expansionary phase from July 2017 to March 2020. Due to Covid-19 Pandemic, Indonesia experienced a contractionary episode that started in April 2020 until the end of the observation study, April 2021.



Source: Author's Calculation

Figure 1.
The Output Gap in Indonesia (2005-2021)

4.2. Correlation Analysis

Before examining the long-run relationship between the policy rate and banking rates, we analyze their pairwise correlations. From the correlation coefficients presented in Table 2, we find some interesting results. In general, the policy rate is more correlated with conventional banking interest rates than the Islamic banking rates. Further, banking rates of both conventional and Islamic banking tend to correlate more with the policy rate during the contractionary phase. We may also note that, during the expansionary phase, the deposit and financing rates of Islamic Banking are inversely related to the policy rate. Finally, among the rates considered in this study, the money market rates are most correlated with the policy rate. Then, among the deposits, demand deposit rates are the least correlated with the policy rate while, among the fining rates, lending or financing rates for consumption have the lowest correlation with the policy rate.

Table 2.
Correlation Analysis

A. Conventional Banking			B. Islamic Banking		
Benchmark Monetary Policy Rate					
(1)	(2)	(3)	(4)	(5)	(6)
Proxy of Interest Rate	Expansionary Phase	Contractionary Phase	Proxy of Interest Rate	Expansionary Phase	Contractionary Phase
Money Market					
Interbank Call Money	0.955*	0.903*	Sharia Interbank Call Money	0.462*	0.855*
Deposit Rates/ Yield Rate or Equivalent					
Demand Deposit	-0.132	0.801*	Demand Deposit Mudharabah	0.536*	-0.208
Saving Account	-0.605*	0.885*	Saving Deposit Mudharabah	-0.527*	0.952*
Time Deposit			Time Deposit Mudharabah		
1-Month	0.921*	0.941*	1-Month	-0.138	0.972*
3-Month	0.790*	0.949*	3-Month	-0.092	0.977*
6-Month	0.683*	0.957*	6-Month	-0.497*	0.939*
12-Month	0.2806	0.949*	12-Month	-0.276	0.947*
Lending Rates/ Financing Rates					
Working Capital	-0.394*	0.930*	Working Capital	-0.652*	0.893*
Investment	-0.285	0.913*	Investment	-0.701*	0.928*
Consumption	-0.738*	0.751	Consumption	-0.503*	0.784*

The Table provides information on the correlation coefficient based on Pearson correlation estimation between each type of administered banking interest rate to benchmark monetary policy rate during the expansionary and contractionary phases. Columns (2) and (3) present the correlation coefficient matrix for the conventional banks while columns (5) and (6) deliver information on the correlation coefficient for the Islamic banks. *= significant at 5%

4.3. The Long-Run Relations

We first conduct the Augmented Dickey-Fuller (ADF), the Phillips-Perron (PP), and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests to check the stationarity of the series. The results, which are presented in Table 4, generally suggest all rates are non-stationary integrated of order (1).

The estimation results of long-run equation (1) are presented in Table 4. As suggested by Rousseas (1985), the parameter α represents the intermediation cost or margin. Our results show that the margins of Islamic banking are generally higher than those of conventional banking for both deposit and lending or financing margins. Except for the demand deposit margin, all the time deposit and saving deposit margins are higher for deposit rates. The time deposit mudharabah rate is 6.35%, while the time deposit rate is 5.12% on average. Likewise, for lending or financing rates, lending rates for conventional banking range from 10% to 14%, lower than financing rates in Islamic banking, which range from 12% to 15%. This

finding collaborates Ibrahim & Law (2019) for Malaysia and Trinugroho, Risfandy & Ariefianto (2018) for Indonesia.

From the results, we argue that although Islamic banks operate under distinct institutions, an interest-based monetary policy instrument we use as policy rate reference has been passing through to Sharia banks rates. Our results provide empirical evidence of a spillover effect that has been suggested by previous literature (Cevik & Charap, 2011; Zaheer et al., 2013; Hamza & Saadaoui, 2018).

Table 3.
Unit Root Tests

Variable	ADF		PP		KPSS	
	Levels	First Difference	Levels	First Difference	Levels	First Difference
Benchmark Monetary Policy Rate	-2.57	-2.02	-1.46	-13.15***	0.53**	0.11
A. Conventional Banking						
Money Market						
Interbank Call Money	-0.42	-11.28***	-1.95	-14.09***	0.61**	0.11
Deposit Rates						
Demand Deposit	0.57	-11.89***	0.085	-11.68***	0.94***	0.24
Saving Account	1.98	-7.64***	1.88	-7.68***	1.11***	0.75**
Time Deposit						
1-Month	-0.16	-5.32***	0.17	-5.38***	0.98***	0.18
3-Month	-0.65	-3.93***	0.08	-3.97***	1.06***	0.17
6-Month	-0.56	-2.72*	0.21	-4.03***	1.06***	0.16
12-Month	-0.00	-3.75***	0.71	-5.77***	0.98***	0.24
Lending Rates						
Working Capital	0.93	-8.51***	0.67	-8.55***	1.10***	0.19
Investment	1.77	-4.47***	1.24	-8.87***	1.10***	0.27
Consumption	-0.10	-2.50	0.83	-6.97***	1.04***	0.51**
B. Islamic Banking						
Islamic Money Market						
Sharia Interbank Call Money	-3.43**	-10.11***	-3.06**	-18.20**	0.78***	0.07
Deposit Yield Rate or Equivalent/Distribution/Fees/Bonuses						
Demand Deposit Mudharabah	-3.56	-13.14***	-3.44**	13.17***	0.49**	0.11
Saving Deposit Mudharabah	-2.58	-8.15***	-3.84**	-15.06***	1.14***	0.51**
Time Deposit Mudharabah						
1-Month	-1.03	-9.19***	-1.16	-14.34***	1.16***	0.12
3-Month	-1.23	-9.18***	-1.44	-15.12***	1.13***	0.13
6-Month	-1.13	-9.52***	-1.04	-16.58***	1.17***	0.09
12-Month	-1.24	-12.36***	-1.55	-12.83***	1.18***	0.07
Financing Rates						
Working Capital	-1.29	-13.70***	-1.76	-13.70***	1.20***	0.10
Investment	-0.66	-9.07***	-0.60	-16.84***	1.10***	0.07
Consumption	-0.77	-12.03***	-0.99	-12.18***	1.10***	0.16

This table presents the unit root test of the variables according to the three methods, namely Augmented Dickey-Fuller (ADF), Phillips-Perron (PPP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS). The null hypothesis for ADF and PP tests are that the series are non-stationary (contain unit root); conversely, the null hypothesis of the KPSS test assumes that the series are stationary (no unit root). *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

The coefficient of the dummy variable, α_2 , shows negative signs and is significant for almost all rates both in conventional and Islamic banking. This result shows that there is substantial reduction in bank margins when the economy is in the contractionary phase. In conventional banking, the reduction in the margins of deposit rates is around 0.5% to 3.7% while the drop in those of rates is 4.5% to 5.1%. Meanwhile, the reduction in margins is approximately 3.4% to 5.06% for deposit rates and around 4.14% to 7.8% for financing rates for Islamic banking. Thus, on average, the drop in the margins during the contractionary phase is larger for Islamic banks. This indicates that bank intermediation cost or margin in Islamic banking is more responsive to the business cycle.

Turning to our main theme, we may note asymmetric responses of banking rates to the policy rate by both conventional and Islamic banks. This finding does not support the previous study by Omer (2019) in Pakistan, although he does not control the business cycle of the economy. Columns (7) and (8) present the Wald statistics for testing whether the IRPT is complete for respectively the expansionary and contractionary phases. The null hypothesis in column (7) is $H_0: \alpha_1=1$ and in column (8), $H_0: \alpha_1+\alpha_3=1$. From the tests, several findings are notable.

First, for the money market rate, the IRPT tends to be different for Islamic banks and conventional banks. Complete adjustment occurs during the contractionary phase in conventional banking. Meanwhile, in Islamic banking, the complete adjustment occurs in the expansionary phase. Second, during the contractionary phase, almost all of the time deposit rates fully adjust to the monetary policy change while demand deposit and saving deposit adjust less than one-to-one to policy rate change in conventional banking. Similar behavior also exists in Islamic banking, except for long-term time deposits (12-month time deposits). Further, complete pass-through is found in lending rates in conventional banking, except for the consumption rates. While for financing rates in Islamic banking, the rates are either oversensitive or less sensitive in responding to the monetary policy change in the contractionary period. In contractionary episodes, when the economy is typically under pressure, monetary authority usually responds by introducing monetary loosening; most conventional bank rates adjust completely even though they are quite sluggish. Meanwhile, most Islamic bank rates, although adjust faster, are either stickier or over elastic. These suggest that since short-term deposit rates in both regimes are relatively lower, there is no wider space to adjust when the policy rate is accommodative. Meanwhile, with the longer-term deposit rates being relatively higher rates, banks take the opportunity to pull down the rates as an adjustment to the monetary policy loosening to reduce overall cost in adverse economic situations.

Lending rates are completely adjusted to reference rates since banks face relatively lower debt demand growth in contractionary periods, thus arguably pushing down the lending rates as the same proportion to the monetary policy rate decreases. Since financing rates in Islamic banks have persistently higher rates, when banks experience sluggish financing demand, Sharia banks should maintain their competitiveness by cutting their financing rates more than policy rate reduction. Moreover, in recessionary episodes when demand and supply of funds are distorted, banks tend to prefer more secure financial instruments like relying on central bank or government bond instruments in managing their

liquidity, while Islamic banks have limited options for sharia-based liquidity instruments in the market. This is arguably responsible for the divergent behavior between conventional and Islamic banks rates in responses to policy rate changes. This finding also supports the study by Hamza & Saadaoui (2018), who state that monetary policy rate change significantly influences the level of Islamic bank financing, which may be due to the excess sensitivity of financing rates in Sharia-based banks.

During the expansionary period, all deposit rates do not fully adjust to policy rate change. Incomplete reverse adjustment occurs for demand and saving deposit rates in conventional banking and mudharabah time deposit rates in Islamic Banking. These findings suggest that demand and saving deposit rates are stickier in responding to monetary policy changes during expansionary and contractionary periods. When the economy performs well (expansionary phase), time deposit rates tend to be less sensitive to monetary policy; even the reverse adjustment behavior is found in Islamic banking for time deposit rates. In expansionary periods that are typically characterized by tighter monetary policy, most deposit rates in conventional banks adjust incompletely, which indicates non-competitiveness in the deposit markets (Rosen, 2002; Zulkhibri, 2012).

Further, except for the lending rate for consumption, complete pass-through is found in conventional banks' lending rates. While for financing rates in Islamic banking, the rates are either oversensitive or less sensitive to changes in monetary policy during the contractionary period. Interestingly, in the expansionary period, lending rates and financing rates for working capital, investment, and consumption are inversely related to policy rate changes. This finding is consistent with the previous studies that the degree of policy rate pass-through to consumer lending rates seems to be the lowest as compared to other types of lending rates (Gregor et al., 2009; Handayani & Kacaribu, 2021).

The shift in the pass-through is also observed across the business cycle phases. The positive and significant estimated coefficient of the interaction between policy rate and recession dummy, i.e. α_3 , for all deposit rates and lending rates or financing rates suggest the increased pass-through during the contractionary period. In other words, the pass-through to these rates is lower during the expansionary phase. In the same token, banking rates become unresponsive or rigid as monetary policy changes during the period of expansion. This finding also confirms the correlation analysis results, that banking rates have a higher correlation or are more linked to monetary policy rate in the contractionary period.

Further, the magnitude of long-run pass-through is found to be asymmetric, as demonstrated by the significant of the Wald statistics for all banking rates, presented in column (9) with the null hypothesis, $H_0: \alpha_1 = \alpha_1 + \alpha_3$. This means that the degree to which the banking rates respond to the policy rate change is different between the expansionary and contractionary phases for both conventional and Islamic banking.

4.4. Short-Run Dynamics

The short-run dynamics of banking rates is presented in Table 5. In conventional banking, our findings are consistent with Handayani & Kacaribu (2021); the

significant estimated coefficients of contemporaneous change in policy rate are found only in money market rates, short-term time deposit rate, and lending rate for investment. A similar rate behavior is also found in Islamic banking. This means that the monetary policy change has no direct and immediate influence on most deposit and lending or financing rates in conventional and Islamic banking during the expansionary period. We also find the coefficients for the interaction between the recession and policy rate to be insignificant in almost all conventional and Islamic banking rates. This suggests that the business cycle does not affect the immediate or short run impact of policy rate on bank rates for both types of banks.

We further analyze the adjustment speed of banking rates, as reflected by the estimated coefficients of the error correction term presented in column (3). The significant and negative signs are present in almost all banking rates in both banking regimes. This indicates the existence of mean-reverting behavior in banking rates in both conventional and Islamic banking regimes in Indonesia. In the money market, the adjustment in the interbank call money rate of conventional banking is faster than sharia interbank call money of Islamic banking, with the adjustment speed of 83% and 41%, respectively.

Furthermore, the speed of adjustment for deposit rates is higher in the Islamic banking regime than in the conventional one. The speed rate ranges from 21.4% to 75.38% in Islamic banking and 9.15% to 42.92% in conventional banking. The pattern is also similar for lending and financing rates; the financing rates of Islamic banking adjust faster than the lending rate of conventional banking regime, with the rate of speed ranging from 20.68% for financing rate for working capital to 36.82% for financing rates for consumptions and ranging from 2.39% for lending rate for working capital to 6.63% for lending rate for consumption. In addition, in conventional banks, the adjustment lag (absolute value of MAL) of the interest rates increases in the contractionary period except for Interbank Call Money and Saving Deposit. As for the Islamic banking rates, the adjustment lag of money market rate and mudharabah saving deposit decrease in the recessionary period. In general, conventional bank rates adjust more sluggishly as compared to the Islamic bank rates. We suspect that Islamic bank rates have a wider gap to the market equilibrium rates than those in conventional banks; thus, when there is a reference rate shift, they amend the gap immediately, as suggested by Handayani & Kacaribu (2021).

Lastly, we find that the contractionary and expansionary phases do not significantly affect the speed adjustment. We find that the estimated coefficients of the interaction term shown in column (4) are not significant for all rates for both conventional and Islamic banking regimes in Indonesia.

V. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

This paper empirically examines the responses of banking rates of both conventional and sharia banking regimes to changes in monetary policy during contractionary and expansionary episodes for the case of Indonesia. We find evidence that the long-run monetary policy rate pass-through depends on the phases of the business cycle. On average, the degree of policy rates pass-through to deposit rates

in the contractionary period is improved in conventional and Islamic banking. Meanwhile, full pass-through occurs for lending rates of conventional banking in the contractionary phase. By contrast, financing rates of Islamic banking are observed to be over-responsive for working capital and investment financing rates and less responsive for consumption financing rate during the contractionary phase and move inversely to the policy rate during the expansionary phase.

Further, the short-run adjustment analysis finds that the policy rate has no direct and immediate impact on most banking rates, both in conventional and Islamic banking. Banking rates in sharia banking adjust faster to a policy rate change compared to those in conventional banking. Lastly, we conclude that business cycle episodes in Indonesia do not affect the immediate or short-run pass-through to most banking rates.

The change and unsynchronized behavior of banking rates, mainly those of sharia-based banks during the recessionary period brings out the challenge to the monetary policy management to stabilize the economy. Furthermore, this phenomenon reiterates the inability of Islamic banking to support counter-cyclical policy measures to smooth the economy or accelerate economic recovery from recession in Indonesia.

5.2. Recommendation

The empirical findings suggest the divergent response of banking rates in conventional and Islamic banking to monetary policy rate change. We argue that this is due to imperfect market competition and the depth of money market instruments. Since most Islamic banks' rates adjust incompletely and behave asynchronously to the policy rates, promoting policy that could improve market competition in the Islamic banks by encouraging expansion or inviting more players to enter this business is needed to improve scale efficiency. Further, consumers' preference towards Islamic bank products and services is generally due to religious sentiment (Feroz & Siddiqui, 2018; Sari, Wibowo & Suprpto, 2015; Januri et al., 2021). This condition arguably could offer the Islamic banking management space to incite moral hazard and create a business environment that hinders Islamic banks from pursuing efficiency and productivity orientation. Strengthening the capacity building for employees and management as well as enhancing supervision, assistance, and assessment for the Islamic bank industry is needed.

Moreover, promoting various sharia-based financial instruments for Islamic banking could improve the ability of Islamic banking to manage their liquidity to reduce risk, and the central bank could enhance the liquidity framework for Islamic banks to promote effective liquidity management for Islamic banks in Indonesia. Lastly, financial sector stakeholders (regulators, supervisors, business players) should work together to enhance financial literacy and education to promote more rational consumers, which could reduce asymmetric information and create better competition in the financial sector.

Note that we used a linear model in observing the degree of monetary policy rate pass-through to banking rates. Improvement can be made in future research by employing the model that captured the asymmetric adjustment of banking rates

to a tightening or loosening monetary policy. A nonlinear model can be applied to further examine the presence of a nonlinear relationship between the policy rate and banking rates. Furthermore, a more rigorous study is needed to uncover the factors that account for those mentioned Islamic banking rates behavior towards monetary policy rate.

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APPENDIX

Table 4.
Long-Run Estimation Results for the Conventional and Islamic Banking

Interest Rate (IR)	α_0	α_1	α_2	α_3	R2	F-statistic H0: $\alpha_1=1$	F-statistic H0: $\alpha_1+\alpha_3=1$	F-Statistic H0: $\alpha_1=\alpha_1+\alpha_3$	ADF	PP	Pass through in Expansionary Phase	Pass through in Contractionary Phase
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
A. Conventional Banking												
Money Market Rate												
Interbank Call Money	0.5321** [2.0462]	0.9112*** [17.5211]	-0.3858 [-1.3018]	0.0955 [1.6109]	0.9518	2.9126* [1.6109]	0.0560	2.5949	-8.4611***	-8.4612***	Incomplete adjustment	Complete adjustment
Deposit Rates												
Demand Deposit	2.2341*** [42.8868]	-0.0107 [-0.9370]	-0.5102*** [4.8506]	0.1170*** [5.2605]	0.6032	7818.271***	2193.967***	27.6725***	-4.7322***	-4.8293***	Reverse Incomplete Adjustment	Incomplete adjustment
Saving Account	1.9018*** [9.2635]	-0.1063** [-2.5879]	-1.8523*** [-7.9173]	0.4321*** [9.2329]	0.7625	725.8454***	900.7178***	85.2473***	-1.4107	-4.2649***	Reverse Incomplete Adjustment	Incomplete adjustment
Time Deposit												
1-Month	3.7557*** [17.6164]	0.4905*** [12.1428]	-2.4042*** [-4.3124]	0.6054*** [4.9685]	0.8379	159.0911***	0.695640	24.6859***	-5.7939***	-6.0156***	Incomplete adjustment	Complete adjustment
3-Month	4.8372*** [18.7413]	0.3168*** [6.4195]	-3.7763*** [-5.7927]	0.9497*** [6.5856]	0.8296	191.5945***	3.8692*	43.3701***	-5.8672*	-5.9889***	Incomplete adjustment	Over Complete adjustment
6-Month	5.3322*** [18.4597]	0.2849*** [4.9051]	-3.3130*** [-5.7203]	0.8467*** [6.6909]	0.8330	151.5193***	1.3720	44.7680***	-5.8025***	-5.9339***	Incomplete adjustment	Complete adjustment
12-Month	6.5262*** [30.7163]	0.048515 [1.1409]	-3.1503*** [-7.3773]	0.8258*** [9.0208]	0.8488	500.7183***	2.4029	81.3741***	-5.7374***	-5.8861***	Incomplete adjustment	Complete adjustment

Table 4.
Long-Run Estimation Results for the Conventional and Islamic Banking (Continued)

Interest Rate (IR)	α_0	α_1	α_2	α_3	R2	F-statistic H0: $\alpha_1=1$	F-statistic H0: $\alpha_1+\alpha_3=1$	F-Statistic H0: $\alpha_1=\alpha_2+\alpha_3$	ADF	PP	Pass through in Expansionary Phase (12)	Pass through in Contractionary Phase (13)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Lending Rates												
Working Capital	11.1870*** [20.2813]	-0.1323 [-1.1998]	-4.7084*** [-7.4905]	1.1607*** [9.2301]	0.8203	105.3542***	0.2201	85.1953***	-5.2651***	-5.5206***	Reverse Incomplete Adjustment	Complete adjustment
Investment	10.8153*** [38.1728]	-0.0961* [-1.8909]	-4.5253*** [-8.4938]	1.0901*** [10.0891]	0.7993	465.0390***	0.0039	101.7894***	-1.3970	4.9603***	Reverse Incomplete Adjustment	Complete adjustment
Consumption	14.4807*** [40.7299]	-0.4968*** [-7.8030]	-5.1486*** [-8.7153]	1.2493*** [11.2970]	0.6612	552.7421***	7.4890***	127.6229***	-1.9078	-2.5048	Reverse Incomplete Adjustment	Incomplete adjustment
B. Islamic Banking												
Islamic Money Market												
Sharia Interbank Call Money	-0.4373 [-0.5139]	0.9781*** [5.8874]	-1.2348 [-1.2194]	0.3129 [1.6107]	0.6224	0.0173	8.3532***	2.5944	-6.0584***	-5.9968***	Complete adjustment	Over Complete adjustment
Deposit Yield Rate or Equivalent/Distribution/Fees/Bonuses												
Demand Deposit Mudharabah	1.4375*** [5.8981]	0.2112*** [4.1365]	0.6945* [1.9713]	-0.2420*** [-3.1699]	0.3241	238.5619***	329.6096***	10.0484***	-4.5107***	-4.5223***	Incomplete adjustment	Incomplete adjustment
Saving Deposit Mudharabah	2.5388*** [19.8684]	-0.0997*** [-3.9296]	-3.4023*** [-8.5301]	0.9004*** [9.7642]	0.7973	1878.584***	5.0482**	95.3414***	-2.0441	-7.3109***	Incomplete adjustment	Incomplete adjustment

Table 4.
Long-Run Estimation Results for the Conventional and Islamic Banking (Continued)

Interest Rate (IR)	α_0	α_1	α_2	α_3	R2	F-statistic H0: $\alpha_1=1$	F-statistic H0: $\alpha_1+\alpha_3=1$	F-Statistic H0: $\alpha_1=\alpha_2+\alpha_3$	ADF	PP	Pass through in Expansionary Phase (12)	Pass through in Contractionary Phase (13)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Time Deposit Mudharabah												
1-Month	6.0936*** [18.5442]	-0.0893 [-1.4243]	-4.4876*** [-8.4829]	1.0893*** [9.4416]	0.8125	301.3109***	0.0000	89.1443***	-5.7991***	-5.8825***	Reverse Incomplete Adjustment	Complete adjustment
3-Month	6.3274*** [9.5583]	-0.0907 [-0.7525]	-4.8574*** [-6.1218]	1.1697*** [7.3904]	0.7882	81.88164***	24.0166***	54.6185***	-6.2799***	-6.3783***	Reverse Incomplete Adjustment	Over Complete adjustment
6-Month	6.9158*** [18.6319]	-0.2854*** [-3.8751]	-5.0618*** [-8.7583]	1.1870*** [9.4351]	0.7474	304.5865***	0.9301	89.0220***	-5.1587***	-5.1071***	Reverse Incomplete Adjustment	Complete adjustment
12-Month	6.0681*** [14.3701]	-0.1682** [-2.0333]	-4.2067*** [-7.4346]	0.9898*** [8.3462]	0.7426	199.3173***	4.4105**	69.6594***	-4.9726***	-5.0408***	Reverse Incomplete Adjustment	Incomplete adjustment
Financing Rates												
Working Capital	15.7662*** [34.7438]	-0.5226*** [-6.1930]	-7.8069*** [-8.5061]	1.8730*** [9.6370]	0.6994	325.5370***	4.0056**	92.8720***	-4.5578***	-4.6178***	Reverse Incomplete Adjustment	Over Complete adjustment
Investment	12.9682*** [33.4771]	-0.4798*** [-6.7777]	-7.7044*** [-9.8556]	1.8357*** [11.2798]	0.7693	436.9689***	5.8986**	127.2338***	-5.0353***	-5.1276***	Reverse Incomplete Adjustment	Over Complete adjustment
Consumption	12.1838*** [33.7685]	-0.3012*** [-4.3223]	-4.1492*** [-8.3458]	0.9675*** [9.7157]	0.6003	348.5316***	22.0222***	94.39617***	-3.4010**	-3.8722***	Reverse Incomplete Adjustment	Incomplete adjustment

The Table reports the result of the long-run estimation of the policy rate pass-through to the interest rate based on equation (1). Panel A describes results for conventional banking and Panel B presents results for Islamic banking. Columns (1) to (3) represent the interest rate variables, constant intermediation margin, and magnitude of long-run pass-through, respectively. The change in the intermediation margin, as well as the size of long-run IRPT in the contractionary period, are captured in Columns (4) and (5). Column (6) shows the value of adjusted R2. Columns (7) to (9) mentioned the Wald tests' results of complete long-run IRPT in the expansionary period, complete long-run IRPT in the expansionary period, and change in long-run IRPT between expansionary and contractionary period, respectively. Columns (10) and (11) report the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) tests to detect the unit root in the residuals of equation (1). The types of IRPT in the contractionary and expansionary periods are reported in Columns (12) and (13). The *t*-values are stated in the parentheses. *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

Table 5.
Short-Run Dynamics the Conventional and Islamic Banking

Interest Rate (IR)	β_1	β_2	β_3	β_4	C	Adjusted R^2	MAL (E)	MAL (C)	Adjustment Speed During Expansionary Phase	Adjustment Speed During Contractionary Phase
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
A. Conventional Banking										
Money Market Rate										
Interbank Call Money	1.0497*** [12.3340]	-0.8352*** [-3.7721]	-0.0431 [-0.4187]	-0.1450 [-0.6508]	-0.0020 [-0.0716]	0.835	0.0595	0.0067	-83.52%	-98.02%
Deposit Rates										
Demand Deposit	-0.0300 [-1.1432]	-0.4292*** [-8.5350]	0.0092 [0.3009]	0.2886** [2.3367]	-0.0069 [-1.0558]	0.119	-2.3998	-7.2603	-42.92%	-14.06%
Saving Account	-0.0055 [-0.2769]	-0.0043 [-0.0947]	0.0071 [0.3336]	-0.0033 [-0.0662]	-0.0132*** [-4.2399]	-0.049	-233.8372	-131.3684	-0.43%	-0.76%
Time Deposit										
1-Month	0.2535*** [4.9557]	-0.3112*** [-4.0474]	-0.1927*** [-3.1862]	0.3180*** [3.7513]	-0.0546*** [-4.3918]	0.225	-2.3988	138.1176	-31.12%	0.68%
3-Month	0.0915 [1.6242]	-0.1957*** [-3.2707]	-0.0718 [-1.1695]	0.1890*** [2.9632]	-0.0667*** [-5.6052]	0.073	-4.6423	-146.3134	-19.57%	-0.66%
6-Month	0.0630 [1.3598]	-0.1533*** [-3.1909]	-0.0391 [-0.7277]	0.1365** [2.4950]	-0.0557*** [-4.9385]	0.071	-6.1122	-58.1012	-15.33%	-1.68%
12-Month	-0.0042 [-0.0857]	-0.0915** [-2.2304]	0.0483 [0.8448]	0.0705 [1.2443]	-0.0395*** [-3.6412]	0.009	-10.9749	-45.5190	-9.15%	-2.10%
Lending Rates										
Working Capital	0.0525 [1.3635]	-0.0239 [-0.5195]	-0.0528 [-1.2608]	0.0172 [0.3399]	-0.0430*** [-5.3940]	-0.033	-39.6444	-149.2985	-2.39%	-0.67%
Investment	0.0963** [2.0354]	-0.0285 [-0.8281]	-0.0793 [-1.6099]	0.0393 [1.0139]	-0.0422*** [-6.1602]	0.048	-31.7088	91.0185	-2.85%	1.08%
Consumption	-0.0600 [-1.3374]	-0.0663* [-1.6955]	0.0529 [1.1422]	0.0528 [1.3266]	-0.0295*** [-4.3470]	0.070	-15.9879	-74.6000	-6.63%	-1.35%

Table 5.
Short-Run Dynamics the Conventional and Islamic Banking (Continued)

Interest Rate (IR)	β_1	β_2	β_3	β_4	C	Adjusted R^2	MAL (E)	MAL (C)	Adjustment Speed During Expansory Phase	Adjustment Speed During Contractionary Phase
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
B. Islamic Banking										
Islamic Money Market										
Sharia Interbank Call Money	1.7660*** [3.5736]	-0.4101** [-2.0877]	-0.7427 [-1.4395]	-0.4898** [-2.1451]	-0.0258 [-0.3114]	0.415	1.8678	0.0259	-41.01%	-89.99%
Deposit Yield Rate or Equivalent/Distribution/Fees/Bonuses										
Demand Deposit Mudharabah	-0.3560** [-2.4191]	-0.7538*** [-3.5447]	0.4696*** [2.7295]	0.4360* [1.8428]	0.0049 [0.1537]	0.262	-1.7989	-2.7892	-75.38%	-31.78%
Saving Deposit Mudharabah	0.1107* [1.8646]	-0.2140** [-2.1984]	0.0279 [0.3791]	-0.1089 [-0.8121]	-0.0482** [-2.3010]	0.277	-4.1556	-2.6677	-21.40%	-32.29%
Time Deposit Mudharabah	-0.0226 [-0.2918]	-0.4399** [-2.6450]	0.1695* [1.6808]	0.3319* [1.9479]	-0.0462** [-2.2292]	0.098	-2.3246	-7.8991	-43.99%	-10.80%
1-Month	-0.0884 [-0.4851]	-0.5931*** [-4.2319]	0.2399 [1.2099]	0.4467** [2.5393]	-0.0526 [-1.4095]	0.199	-1.8351	-5.7958	-59.31%	-14.64%
3-Month	-0.0145 [-0.1005]	-0.6421*** [-4.6707]	0.1606 [0.9552]	0.5447*** [3.2973]	-0.0430 [-1.4577]	0.130	-1.5800	-8.7669	-64.21%	-9.74%
6-Month	0.1022 [0.5190]	-0.4127** [-2.7873]	0.0332 [0.1590]	0.2999* [1.8007]	-0.0315 [-1.0712]	0.115	-2.1754	-7.6649	-41.27%	-11.28%
12-Month										
Financing Rates										
Working Capital	0.1793 [0.7715]	-0.2068** [-2.4622]	-0.0204 [-0.0906]	0.0271 [0.2133]	-0.0662 [-1.4245]	0.057	-3.9686	-4.6806	-20.68%	-17.97%
Investment	0.1300 [1.1172]	-0.2483** [-2.1801]	0.0206 [0.1218]	0.0569 [0.4313]	-0.0491 [-1.2869]	0.073	-3.5038	-4.4378	-24.83%	-19.14%
Consumption	0.1080 [0.8433]	-0.3682** [-2.6139]	-0.0620 [-0.3885]	0.2151 [1.3917]	-0.0129 [-0.4065]	0.094	-2.4226	-6.2312	-36.82%	-15.31%

This Table provides the estimation results of short-run IRPT by using equation (2). Column (2) represents the degree of short-run IRPT. Column (3) denotes the speed of adjustment in the expansionary period. Column (4) presents the change in short-run IRPT over the different business cycles. Change in the speed of adjustment in the contractionary phase is described in Column (5). Columns (7) to (9) present adjusted R^2 , Mean Adjustment Lag in an expansionary phase (MAL (E)), and MAL in the contractionary phase (MAL (C)), respectively. Lastly, the percentage of adjustment speed during the expansionary and contractionary phases are reported in Columns (10) and (11). The t -values are stated in the parentheses. *** = significant at 1%, ** = significant at 5%, * = significant at 10%.

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