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Does excessive degrees of financial depth push hyper-inflation?

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Abstract

Purpose – Using an innovative threshold estimation technique, this paper provides new evidence on the relationship between finance and inflation with distinct levels of finance.
Design/methodology/approach – The sample consisted of 10 high inflation countries using time series data for the period of 1992–2020. These 10 countries recorded the world's highest inflation rates in 2017.
Findings – The findings demonstrate that there is a threshold effect on the finance–inflation relationship. Whilst the effects of finance are consistently positive for below and above the threshold models, financial depth above the threshold tends to aggravate the inflation level.
Practical implications – These results disclose that financial depth could be the cause of high inflation in the top 10 countries and thus, is not necessarily welcome as too rapid of a price increase may in turn reverse the prospect of economic growth. Searching and strategizing for the optimal level of financing is crucial in facilitating price stability and economic growth.
Originality/value – The authors believe that the effect of financial depth on inflation is characterised by being desirable to certain extent and undesirable if over-financing is beyond the optimum level. Therefore, in this study, the authors have introduced the threshold modelling as the potential strategy to connect financial depth and inflation.

Keywords Financial depth, Inflation, Threshold model
Paper type Research paper

1. Introduction

Finance [1] has been receiving considerable attention and consensus amongst economists regarding its vital contribution to economic development. By and large, all countries are in a rush to thrive with as much finance as possible to assist their economic development by various incentives. In the past decade, there has been a considerable effort made to more fully understand the contribution of finance towards economic growth. A more efficient financial system provides better financial services, and this enables an economy to increase its GDP growth rates. Empirically, many studies, such as Levine (1997), Levine *et al.* (2000), Beck and Levine (2004), Trew (2006), Demetriades and James (2011), Kar *et al.* (2011) and Yang and Liu (2016), have demonstrated a positive relationship between finance and economic growth. As a whole, all these studies suggest that a well-functioning financial market facilitates trading, diversifies and pools risk, mobilises savings, allocates resources and eases the exchange of goods and services. Therefore, it is widely accepted that finance is growth-enhancing and consistent with the propositions of "more finance (financial depth), more growth".

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However, economists have been increasingly interested in the risks associated with excessive degrees of financial depth (FIN), especially after the 2007–2008 global financial crisis and the doubts emerging about the FIN-driven growth models. It illustrates the possibilities that more FIN can directly and indirectly discourage saving, waste resources and encourage speculation, resulting in a misallocation of scare resources and under-investment (Law and Singh, 2014). On this important subject, Cechetti and Kharroubi (2012) and Law and Singh (2014) claimed that above a certain size of FIN relative to the growth in a domestic financial sector and size of the domestic economy is detrimental to economic growth. Arcand *et al.* (2015) indicated that the FIN curse phenomenon occurs because financial sectors compete with the rest of the economy for scarce resources. Therefore, FIN booms are not growth enhancing and are inconsistent with the propositions of "more financial depth, more growth". Likewise, Law *et al.* (2013) also discovered that more FIN may not result in increased growth due to political interference that may divert credit to unproductive or even wasteful activities.

In response to this, recent researchers have suggested that excessive financial growth may lead to macroeconomic instability, particularly the strength of inflationary pressures (Calza *et al.*, 2006; Bayoumi and Melander, 2008; Ramady and Kantarelis, 2009). As more FIN of private credit and liquid liabilities (LL) circulates in the economy, more goods can be purchased and aggregate demand increases which pushes prices upwards (Lipsey, 1999). Arguably, Ramady and Kantarelis (2009) suggested that the rapid expansion of FIN, particularly consumer credit, is fuelling inflation as domestic banks, flooded with government-driven money, supply expansion and expanded loan books. Likewise, Bayoumi and Melander (2008) highlighted that excess liquidity reduces the effectiveness of monetary policy transmission, especially affecting the demand side, to reach the targeted inflation. Thus, the role of monetary policy is to ensure that the excess demand would not create inflationary pressures, which would jeopardise the growth process (Bayoumi and Melander, 2008) [2].

Although risks to inflation from the global perspective remain on the downside, there is evidence that inflationary pressures are still accelerating in several countries. In particular, many emerging and developing countries have faced a substantial acceleration of inflation over the last few years. Specifically, Angola, Azerbaijan, Congo DR (henceforth, Congo), Venezuela, Ghana, Nigeria, Mozambique, Yemen, Argentina and Egypt were certainly the top 10 highest-inflation ranked countries, 2017. Figures 1 and 2 below demonstrate the trend of the level of FIN represented by domestic credit (DC) and inflation for these highest inflation countries. Figure 1 clearly indicates that the level of FIN of the top 10 inflation countries from the highest-inflation has been increasing rapidly over a period of time. These FIN trends have increased the supply of FIN available to undertake productive investment, thereby contributing to capital accumulation and the expansion of potential output (Crotty, 2009). Whilst rapid increases in FIN can facilitate economic growth, in some circumstances it can also cause macroeconomic instability.

From Figure 2, Venezuela, Angola, Mozambique, Nigeria and Azerbaijan have suffered the highest rise in the inflation rates, which were above three digits. It turns out that countries with high levels of FIN also have higher inflation rates. As argued by Rousseau and Wachtel (2001), excess bank liquidity often creates problems for the Central Bank and the economy. In the presence of excess liquidity, it becomes difficult to regulate the money supply using the required reserve ratio and the money multiplier. As a consequence, economy climbs, consumption rises and inflation is exacerbated.

Accordingly, a central objective of macroeconomic policies is to promote high economic growth via fostering optimal and efficient FIN, but keeping inflation at a low level. Surprisingly, there are limited studies in regards to this, such as Balderston (1989) and Zhang and Pang (2008), whilst we could not find any more recent study on this issue. Zhang and Pang (2008), for instance, observed a positive effect of excess liquidity on inflation via its

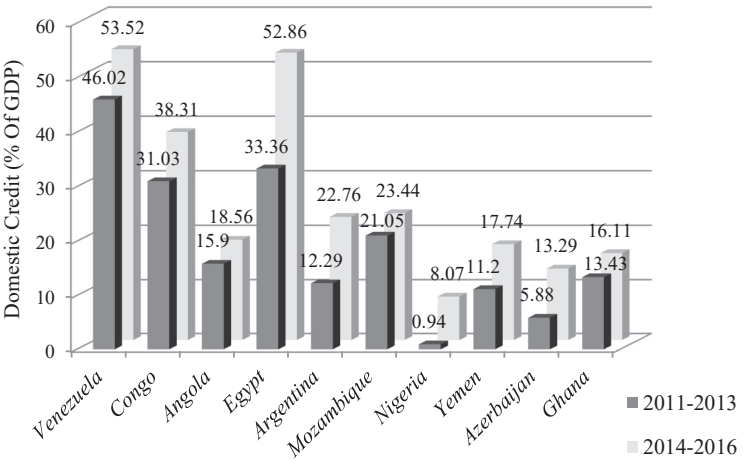

Figure 1.
Domestic credit in the high inflation countries

Source(s): World Bank (2022a, 2022b)

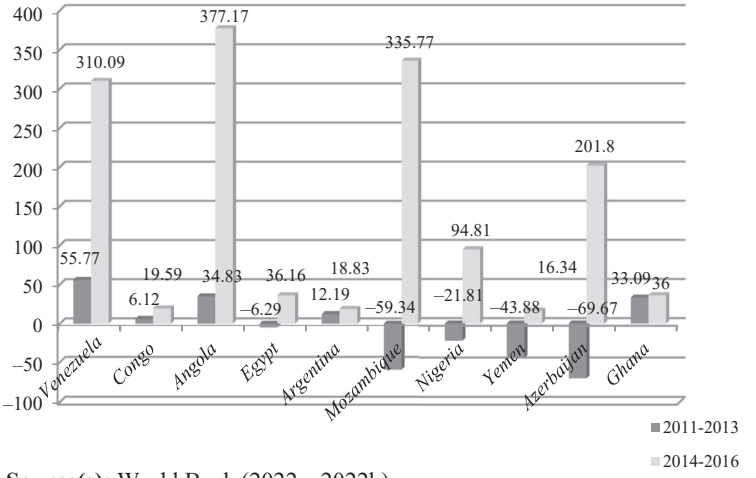

Figure 2.
Inflation in the high inflation countries

Source(s): World Bank (2022a, 2022b)

effect on stock prices, real estate prices, and consumer goods prices. The rest of the past studies on the inflation issue, which are relatively scarce, focused mainly on the adverse effect of inflation on the finance-growth nexus (Rousseau and Wachtel, 2001; Rioja and Valev, 2004; Rousseau and Yilmazkuday, 2009; Odhiambo, 2009; Huang *et al.*, 2010). At this stage, it is crucial to remember that inflation is not necessarily bad for the economic growth. In fact, mild inflation, around 2 to 3%, is considered as desirable and can be an incentive to producers to maintain or produce more. In other words, inflation can be a very critical source of economic growth. Conversely, disinflation may indicate that a country is in a slump. Therefore, the negative effect of finance on inflation, such as in the study by Zhang and Pang (2008), is actually expected and may not be an issue. This is particularly true when China's recent inflation rates have been below 3% since 2012. Therefore, the sudden surges of inflation in the

world's top 10 countries definitely needs urgent attention and our focus is more on whether there is an over-finance issue leading to rapid inflation. This is because, according to Mishkin (2000), inflation could be the primary target of monetary policy in any country, but the policy will only be effective with the presence of a strong institutional commitment to make the price stability as the primary goal of the Central Bank. Nevertheless, the poor quality of the institution has always been the problem in developing countries and, historically, they suffer monetary miss-management, such as failure to identify the optimal level of finance that gear up inflation but not much on economic growth.

Having the above argument, we believe that the effect of finance on inflation is characterised by being desirable to certain extent and undesirable if over-financing is beyond the optimum level. Therefore, in this study, we have introduced the threshold modelling as the potential strategy to connect FIN and inflation. The main objective of this study is to examine the relationship between FIN and inflation in 10 high-inflation nations using time series data from 1992 to 2020. The threshold regression approach proposed by Hansen (2000) is used to study 10 countries with high inflation. Few studies incorporate FIN and inflation in this context, and no empirical analysis has emerged for examining non-linear relationships. As a result, to the best of the author's knowledge, this is the first study to empirically analyse the nonlinear relationship between FIN and inflation, using the countries with high inflation. The findings of this study are believed to contribute to the current literature by testing non-linear threshold regression estimation and assisting the development of required policies and guidelines for countries, notably in the area of monetary policy suggestions.

The remaining organisation of this paper is as follows: The second section reviews past studies. The third section explains the methodology applied in this study. The fourth section discusses the findings and the final section concludes the study.

2. Literature review

There are a number of studies that have examined the link between inflation and economic growth (GDP). Economic growth plays a vital role in affecting inflation (Sowa and Kwakye, 1991; Sowa, 1994; Ericsson *et al.*, 2001; Moorthy and Kolhar, 2011). The results of those studies indicate that economic growth has a positive influence on inflation. In fact, this is the challenge in macroeconomic studies, where policy makers have to face a trade-off between high economic growth to combat unemployment but suffer rising inflation or vice versa. Economic growth reflects the optimal level of production in the economy and thus, inflation will accelerate as the GDP increases beyond its potential or capacity to produce domestically. On the other hand, if the GDP decreases below its natural level, inflation will decelerate as supplier's attempt to fill up the excess by reducing prices (Blinder *et al.*, 2008) [3].

Accordingly, Prasertnukul *et al.* (2010) conducted research to study the determinants of inflation in Asian economies during the 1990s. Higher levels of per capita GDP resulted in higher inflation levels in the emerging economies. This led to the fact that the per capita GDP in emerging economies is relatively low thereby not being able to achieve the expected results as in developed countries. Likewise, the importance of economic growth in determining the level of inflation has also been emphasised by Moorthy and Kolhar (2011). In Moorthy and Kolhar's (2011) analysis, the empirical evidence suggests that higher economic growth is associated with higher inflation in both low and high inflation countries. In the case of demand-side shocks, economic growth translates into an overall rise in prices which affects the inflation rate of all countries. Based on the empirical review, we agreed that the *GDP* has a significant positive relationship with inflation.

The second factor of inflation is related to interest rate studies (Barsky and De Long, 1991; Clarida *et al.*, 1999; Cologni and Manera, 2008; Adu and Marbuah, 2011; Mmasi, 2013; Ebiringa and Anyaogu, 2014; Anari and Kolari, 2016). For instance, Adu and Marbuah (2011)

tested the determinants of inflation in Ghana and confirmed that the real interest rates were negatively related to inflation. It implies that a decline in the magnitude of the interest will lead to a substantial increase in a number of borrowers. The higher amount of money people borrows, the more money people will spend and this will trigger undesirable inflation. In other words, the negative correlation between inflation and interest rates are transmitted through the demand in goods and labour markets (Tillmann, 2008). Similarly, Giordani (2004) claimed that as interest rates increase, the cost of production will also increase. Then, this increase is transferred from producers to consumers and ultimately inflation decreases.

In the case of the United States and Canada, Atkins and Coe (2002) found that the link between interest rates and inflation usually refer to the Fisher effect hypothesis, which suggests that inflation rates are highly and negatively correlated with interest rates. Considering loans as a major part of consumption, an increase in interest rates would reduce the aggregate demand and hence, reduce the inflation rate. The same conclusion applies to Tanzi (1980) and Patnaik *et al.* (2011). However, Mishkin (1992), Ghazali and Ramlee (2003), and Chu *et al.*' (2017) studies indicate that an additional decrease in the interest rate reduces the inflation rate. The viewpoint of a positive relationship between interest rates and inflation is also supported by Hossain and Mitra (2017), who claimed that a rise in the long-term interest rates on the US government bonds may escalate inflation due to increases in capital inflows. In short, we hypothesise that there is a significant relationship between interest rates and inflation.

A large number of studies have also tested the relationship between trade openness (TR) and inflation (Cottarelli *et al.*, 1998; Bowdler, 2003; Evans, 2007; Rajagopal, 2007; Hossain and Mitra, 2017; Agoba *et al.*, 2017; and others). These studies have found that TR plays a major role in increasing the level of inflation in both developed and developing countries. Rogoff (1985), Kim and Beladi (2005) and Mukhtar (2010) claimed that TR seems to affect inflation by affecting the outputs for advances and developed economies of the United States, Belgium and Ireland. These results may be due to the fact that the monetary authority enjoys a degree of power in international markets since foreign consumers have an inelastic demand for goods produced in their home countries. It is also possible that developing countries may be vulnerable to inflation as they rely heavily on exports and imports due to the role played by the exchange rates in their economies (Evans, 2007).

However, Romer (1993) found that the TR in a country can significantly reduce inflation if a country's trade level is high. Higher TR levels are likely to slow down inflation by fostering domestic productivity as a result of increased competition. At the same time, Batra (2001), Sachsida *et al.* (2003) and Wynne and Kersting (2007), who examined the effect of TR on inflation using econometric techniques, suggested that countries with more openness to trade enjoyed the greatest deduction in the inflation. Therefore, the results of such studies are, however, contradicting to earlier discussed findings, yet statistically significant. Hence, we hypothesise here that TR significantly affects inflation.

Nonetheless, to the best of our knowledge, there is little empirical evidence to confirm that there is a strong connection between finance and inflation with the exception of Calza *et al.* (2006), and Korkmaz (2015). These studies indicate that finance harms inflation and stimulates uncertainty. Calza *et al.* (2006) investigate the creation of financial imbalances and inflationary concerns, discovering that loan shortfalls can assist in the forecasting of inflation as it indicates how much bank lending in the economy is above or below the equilibrium level. A high loan overhang, for example, could indicate an excess of credit in the economy, which could indicate inflationary pressures. Similarly, Korkmaz (2015) investigated the effects of bank credits on economic development and inflation in a number of European countries. According to the empirical findings, another economic problem, namely inflation, can arise if the demand for goods and services produced in the economy rises in tandem with an increase in bank credits. Besides that, Korkmaz (2015) pointed out the fact that excessive finances

reduce the effectiveness of a monetary policy by affecting the targeted inflation. Increases in DC will generate more demand for investment and consumption and, finally, it will increase the price level by moving aggregate demand and supply upwards (Vo and Nguyen, 2017). In addition, it can be argued that when the Central Bank decides to raise liquidity in the market, undoubtedly it will reduce interest rates at the same time. Consequently, it will lead to more demand for money for expenditure and production, resulting in inflation. In contrast, several studies look at the impact of inflation on financial development rather than the impact of finance on inflation (Ehigiamusoe and Lean, 2018; Ehigiamusoe *et al.*, 2019, 2020, 2021). For example, Ehigiamusoe *et al.* (2021) analysed how inflation affected financial development in a panel of 125 countries over the 1981–2015 period. The researchers used credit to the private sector as a proxy for financial development and discovered that, while inflation had no effect on financial development in panel estimates, it does in country-specific estimates. In the case of West Africa, Ehigiamusoe *et al.* (2020) attempted to investigate the relationship between inflation and financial development. Using data from 1980 to 2014, the authors concluded that inflation has a detrimental impact on financial development in the West African region, and countries with higher inflation rates had less developed finance sectors. In a similar vein, Ehigiamusoe *et al.* (2020, 2021) investigated the relationship between inflation, economic growth and financial development, finding that inflation harmed financial development.

Despite the well-established literature in investigating inflation and finance, there is a lack of empirical studies that incorporated a nonlinear relationship between FIN and inflation. Yet, the precise nature of the linkages remains unclear and clouded by misleading assumptions. Hence, we carry out an in-depth investigation of the relationship between FIN and inflation. In this study, the impact of FIN on inflation is seen differently where we focus only on high inflation countries and become a non-linear quantitative study about inflation with respect to FIN within 10 high inflation countries. Also, the present study aims to investigate and confirm the FIN threshold in the FIN-inflation nexus.

3. Methodology

Hallman *et al.* (1991) has proposed a simplistic modelling of inflation, where the discrepancy between the actual price level and the equilibrium price level is the key determinant of inflation. The equilibrium price level or p-star (p^*) is determined by the level of money stock, the equilibrium velocity (v^*), and the potential output (y^*). Accordingly, Hallman *et al.* (1991) hypothesised that "Inflation is a monetary phenomenon" and found that p^* was the level of money and price together. Thus, the empirical model of this study was derived by the following standard p-star approach, which can be displayed as follows:

$$py = mv \tag{1}$$

Where p and y, price level of the product and quantity of the goods, respectively, equals the money supply (m) multiplied by its velocity (v). Further, as mentioned by Habibullah (1999), Eq. (1) was converted into logarithms (lower-case notation) and recorded at the time t as follows:

$$p_t + y_t = m_t + v_t \tag{2}$$

From Eq. (2), the price level can be expressed as:

$$p_t = m_t + v_t - y_t \tag{3}$$

Thus, the model can be written in the equilibrium price level (p^*) as:

$$p_t^* = m_t + v_t^* - y_t^* \tag{4}$$

Since, v^* is the equilibrium level of velocity and y^* is the real potential output. The p^* is defined as the long-run equilibrium price level with the current money stock which will emerge when the output and velocity are at their equilibrium levels. Thus, the leading indicator of inflation in this study was given by:

$$\pi_{t+1} = (1-\lambda)\pi_t + \lambda\Delta p_t^* - \alpha(p_t - p_t^*) + \xi_{t+1} \tag{5}$$

Where ξ_{t+1} was an *iid* shock with a zero mean. The computation of p_t^* required the estimation of the long-run velocity of circulation. Therefore, the long-run relationship of a money demand equation was used, which denoted the real money balances as $\widehat{m}_t = m_t - p_t$. So, the long-run equilibrium for the real money balances was written as:

$$\widehat{m}_t^{LR} = k_y y_t - k_i i_t \tag{6}$$

i_t was the opportunity cost of holding the money and the p^* indicator was defined as:

$$p_t^* = m_t - \widehat{m}_t^* = m_t - (k_y y_t^* - k_i i_t^*) \tag{7}$$

Where $\widehat{m}_t^* = m_t^* - p_t^* = k_y y_t^* - k_i i_t^*$ was the long-run equilibrium for the real money balances with output and opportunity cost, which were evaluated at their equilibrium values. Then, the price gap $(p_t - p_t^*)$ substituted in Eq. (5) was equivalent to the real money gap which measures the deviation of the real money balances from the long-run equilibrium level.

$$\widehat{m}_t - \widehat{m}_t^* = -(p_t - p_t^*) = \widehat{m}_t - (k_y y^* - k_i i_t^*) \tag{8}$$

Hence, the model was reconstructed as follows:

$$CPI_t = \theta_0 + \theta_1 Y_t + \theta_2 FIN_t + \theta_3 INT_t + \varepsilon_t \tag{9}$$

Where CPI_t, Y_t and INT_t represented the inflation (*annual %*), GDP (*constant 2010 US$*) and interest rate (*in percentage*), respectively. The money supply was proxied by FIN, which is measured by the ratio of LL and DC (Demetriades and Rousseau, 2011). Therefore, to examine the impact of FIN on inflation, it was required that the *FIN* be proxied by DC (*% of GDP*) and LL (*% of GDP*) as the financing measurement. According to De Gregorio and Guidotti (1995), these two proxies of FIN have a clear advantage over measures of real interest rates or monetary aggregates, such as *M1*, *M2* or *M3*, in that they more accurately represent the actual volume of the funds channelled to the private sector. Therefore, these two measurements are more directly linked to investment and economic growth.

$$CPI_t = \theta_0 + \theta_1 Y_t + \theta_2 FIN_t + \theta_3 INT_t + \varepsilon_t \tag{10}$$

We took Eq. (10) as a baseline specification. Whilst the specification was based on the synthesis between inflation and FIN, *TR* (Hossain and Mitra, 2017) has also been considered in this model.

To test the hypothesis, we argued that the following Eq. (11) was particularly well suited to capture the presence of the contingency effect and to offer a rich way of modelling the impact of FIN on inflation. Accordingly, we utilised the threshold regression approach suggested by Hansen (2000) to explore the nonlinear behaviour of FIN in relation to inflation [4]. The model was as follows:

$$CPI_t = \begin{cases} \theta_0 + \theta_1 Y_t + \theta_2^1 FIN_t + \theta_3 INT_t + \varepsilon_i, & FIN \leq \lambda \\ \theta_0 + \theta_1 Y_t + \theta_2^2 FIN_t + \theta_3 INT_t + \varepsilon_i, & FIN \geq \lambda \end{cases} \quad (11)$$

Where *FIN* was the threshold variable used to split the sample into regimes or groups and λ was the unknown threshold parameter. This type of modelling strategy allows the role of FIN to differ depending on whether *FIN* is below or above some unknown level of λ. In this equation, FIN acted as sample-splitting or threshold variables. The impact of FIN on inflation was ${\theta_2}^1$ for countries with a low regime and ${\theta_2}^2$ for countries with a high regime, respectively. It is obvious that under hypothesis ${\theta_2}^1 = {\theta_2}^2$, the model became linear and reduced to Eq. (10).

Initially, we tested the null hypothesis of linearity, H_0: ${\theta_2}^1 = {\theta_2}^2$, against the threshold model in Eq. (11). As the threshold parameter λ was not identified under the null, this became a non-standard inference problem and the Lagrange Multiplier (LM) or Wald test statistics, therefore, did not carry the conventional chi-square limits (Hansen, 1999, 2000). As an alternative, inferences were applied by calculating Wald or LM statistics for each possible value of λ and, consequently, basing the inferences on the supremum of the Wald or LM across all possible λs. Besides that, the limiting distribution of this supremum statistic was non-standard and relied on numerous model-specific nuisance parameters. Since tabulations were not possible, the inferences were conducted by a model based on bootstrap (Hansen, 1999). As a result, once an estimate of λ was obtained as the minimiser of the residual sum of the square computed across all possible values of λ, estimates of the slope parameters followed trivially as $\widehat{\theta_2^1}\ (\widehat{\lambda})$ and $\widehat{\theta_2^2}\ (\widehat{\lambda})$.

3.1 Data

In this study, to estimate Eq. (11), we utilised 10 countries, namely, Venezuela, Congo, Angola, Egypt, Argentina, Mozambique, Nigeria, Yemen, Azerbaijan and Ghana as the sample [5] The choice of countries and time was dictated by the world's highest inflation countries for three years and data availability, respectively. The countries were chosen because research on countries with higher inflation rates may provide a better hint about the role of FIN in explaining the linkage than research on other countries. Rather than pool the countries in a panel data, we estimated one model for each country with threshold estimation. This study used the annual time series data from 1992 to 2020 for the listed countries, which were obtained from the World Development Indicators (World Bank, 2022a) and Global Financial Development (World Bank, 2022b) [6]. Predominantly, two measures of banking sector development were utilised as measures of FIN, such as DC *and* LL. These two FIN indicators were expressed as a ratio to the GDP. Specifically, DC comprised private credit as well as credit to the public sector and LL measured the ability of banks to mobilise funds relative to the economy (Law and Sigh, 2014). These two variables are from the World Bank (2022b). Other variables included in the model were inflation (*annual %*), *GDP* (*constant 2010 US$*), real interest rate (*in %*) [7] and TR (*% of GDP*) which were obtained from the World Development Indicators (World Bank, 2022a).

4. Empirical result

The descriptive statistics, mean value, and standard deviation of the different variables for the individuals are given below in Table 1. The largest FIN (*DC* and *LL*) was in Egypt in 1994 and 1997; whereas, the lowest FIN was in Congo in 2007. In addition, the highest inflation was in Angola in 2016, whilst the lowest inflation was in Egypt in 1999. In Angola, after experiencing stable inflation during the period of 2012–2014, inflationary pressures emerged in 2015 and 2016 (Vines, 2016). Higher consumption and import taxes translated into higher

		INF (in %)	IR	Real GDP	DC	LL (% of GDP)	TO
Venezuela	Mean	2.20	−3.33	1,225.04	10.34	16.26	20.73
	SD	49.22	8.80	199.66	5.99	6.33	5.17
Congo	Mean	83.76	−18.45	361.44	2.12	4.87	11.28
	SD	182.52	3.76	429.96	1.87	1.27	2.51
Angola	Mean	92.22	−29.59	3,614.57	9.09	13.38	16.29
	SD	125.31	15.80	771.90	2.22	7.11	8.744
Egypt	Mean	9.51	−7.21	3,258.62	5.67	7.78	10.57
	SD	9.19	2.29	416.43	12.25	1.06	2.76
Argentina	Mean	12.75	−9.95	6,928.30	13.45	5.44	19.55
	SD	4.95	17.09	115.79	2.71	1.27	8.81
Mozambique	Mean	14.85	−8.04	2,817.48	14.75	16.74	14.11
	SD	28.82	7.25	178.21	2.43	1.41	3.44
Nigeria	Mean	15.96	−1.79	1,197.48	19.81	2.29	17.26
	SD	32.88	12.50	454.12	3.36	1.52	2.91
Yemen	Mean	5.33	−21.56	1954.71	13.20	2.37	17.52
	SD	10.05	12.65	118.07	2.53	1.56	9.21
Azerbaijan	Mean	19.22	−7.84	3,626.25	6.72	17.15	23.78
	SD	48.56	17.16	377.07	1.38	2.98	4.07
Ghana	Mean	79.85	−3.84	1,453.97	19.78	19.54	19.11
	SD	192.35	6.20	207.13	2.33	3.19	6.87

Table 1.
Descriptive statistics

Note(s): Std. dev. indicates standard deviation, *INF* indicates inflation, *GDP* indicates real *GDP*, *DC* indicates domestic credit, *LL* indicates liquid liabilities, *IR* indicates interest rate, *TO* indicates trade openness

prices for various consumption goods of food, beverages, and fuel (Vines, 2016). Regarding the lowest inflation in Egypt, inflation rates were relatively high during the 1980s before dropping substantially in 1990 due to adoption of the Economic Reform and Structural Adjustment Programme (ERSAP). The key objective of the ERSAP was to eliminate imbalances and distortions in Egypt's economy by transforming it to a market-based economy and to restore the country's creditworthiness (Ahmed, 2018). Along with the ERSAP and structural adjustment policies, inflation rates decreased substantially from 20% in 1991 to 8% in 1999 and enhanced the credibility of the monetary policy (Ahmed, 2018).

Table 2 reports the results estimating Eq. (11) for individuals using two FIN indicators. The statistical significance of the threshold estimate was estimated by the *p*-value calculated using the bootstrap method with 1,000 replications and a 15% trimming percentage. Referring to model 1, where the FIN measured was DC, the point estimate of the bootstrap *p*-values indicated that the test of no threshold effect could be rejected for all of the countries. Thus, as shown in all of the countries, the sample was split into two regimes.

Based on model 1, the point estimate of the threshold value was 20.47 for Venezuela, 1.05 for Congo, 5.13 for Angola, 49.29 for Egypt, 15.72 for Argentina, 21.97 for Mozambique, 12.47 for Nigeria, 5.24 for Yemen, 5.58 for Azerbaijan and 12.493 for Ghana. For instance, the threshold value for Venezuela was 20.47 with a corresponding 95% confidence interval [12.46, 21.43]. Having established the existence of a first sample split, we also tested whether the high FIN could be split further into sub-regimes. The bootstrap *p*-values were somewhat different in the second sample split which suggested that only a single threshold in Eq. (11) was adequate for all of the countries.

Model 2 presents the results of the repeated analysis in Table 3, which used LL as an alternative proxy for FIN. As shown in all of the countries, the test of the threshold was highly significant with a range of bootstrap *p*-values of 0.00–0.07 and the sample was split into two regimes. For example, referring to Mozambique, the point estimate of the threshold values

	Model 1 [FIN = Domestic Credit]				
	(1) Venezuela	(2) Congo	(3) Angola	(4) Egypt	(5) Argentina
First sample split					
1. LM test for no threshold	8.48	4.59	5.36	7.53	6.57
2. Bootstrap *p*-value	0.01***	0.01***	0.01***	0.05**	0.01***
3. Threshold estimate	17.42	2.65	2.76	2.29	11.72
4. 95% confidence interval	(10.05, 20.50)	(2.19, 5.05)	(1.13, 9.46)	(1.20, 9.24)	(10.31, 20.12)
Second sample split					
1. LM test for no threshold	5.25	7.97	4.22	3.27	2.65
2. Bootstrap *p*-value	0.32	0.19	0.26	0.31	0.12
	(6) Mozambique	(7) Nigeria	(8) Yemen	(9) Azerbaijan	(10) Ghana
First sample split					
1. LM test for no threshold	11.14	4.43	10.40	4.83	13.39
2. Bootstrap *p*-value	0.05**	0.05**	0.01***	0.05**	0.05**
3. Threshold estimate	19.58	15.47	7.55	6.57	12.13
4. 95% confidence interval	(9.30, 21.02)	(10.32, 19.50)	(6.19, 10.43)	(4.42, 9.58)	(7.20, 18.23)
Second sample split					
1. LM test for no threshold	4.81	3.24	5.02	2.27	5.18
2. Bootstrap *p*-value	0.21	0.61	0.11	0.18	0.29

Note(s): H_0: no threshold effect
Asterisks **, and*** denote the 5%, and 1% levels of significance, respectively

Table 2.
Threshold estimates of finance

	Model 2 [FIN =Liquid Liabilities]				
	(1) Venezuela	(2) Congo	(3) Angola	(4) Egypt	(5) Argentina
First sample split					
LM test for no threshold	15.27	9.17	6.23	6.19	7.47
Bootstrap *p*-value	0.01 ***	0.01***	0.05**	0.05**	0.05**
Threshold estimate	19.50	7.53	11.30	7.88	8.62
95% confidence interval	(11.01, 22.42)	(3.81, 11.21)	(7.30, 12.50)	(5.80, 17.05)	(6.227, 16.62)
Second sample split					
LM test for no threshold	7.10	5.13	9.80	2.69	4.16
Bootstrap *p*-value	0.44	0.61	0.18	0.91	0.77
	(6) Mozambique	(7) Nigeria	(8) Yemen	(9) Azerbaijan	(10) Ghana
First sample split					
LM test for no threshold	6.62	8.27	12.78	7.78	6.31
Bootstrap *p*-value	0.01***	0.05**	0.05**	0.01***	0.05***
Threshold estimate	16.51	17.69	11.62	13.69	13.00
95% confidence interval	(9.57, 22.54)	(10.26, 20.79)	(9.68, 14.08)	(11.58, 18.25)	(9.64, 16.41)
Second sample split					
LM test for no threshold	4.10	4.56	5.19	4.36	3.21
Bootstrap *p*-value	0.23	0.60	0.30	0.27	0.31

Note(s): H_0: no threshold effect
Asterisks **, and*** denote the 5%, and 1% levels of significance, respectively

Table 3.
Threshold estimates of finance

was 31.190 with a corresponding 95% confidence interval [19.47, 31.19]. The threshold values were quite close to the threshold value where the FIN measure was DC. Again, we tested whether the high FIN could be split into sub-regimes, as was tested in the case of DC. In our data sets, the bootstrap *p*-values for the second-sample split were insignificant and the results revealed that only a single threshold was sufficient. Therefore, amongst the two FIN indicators, both had the strongest evidence that there were single thresholds in the regression.

Once the existence of a threshold was established, the next enquiry became how the FIN indicator, such DC and LL, affected inflation. Turning to Table 4, it presents the empirical results of Eq. (11) with DC as the measure of FIN. Since the data favoured a threshold model, we focused on the threshold model specification for all of the countries. In both two models, the estimated coefficient on the DC was consistent with the theory. FIN has a positive effect on inflation both below and above the threshold. Although the impact of FIN on inflation remains positive at both threshold levels, it exerts higher inflation pressure when FIN is above the threshold level. This finding lends credence to our earlier explanation that a country's inflation tends to be higher when its level of FIN exceeds a certain threshold. In the case of excessive credit growth, it has been discovered that aggregate demand tends to rise beyond the framework of potential output, resulting in inflation. For example, a 1% increase in FIN below and above the threshold level leads to 0.12% and 0.34% inflation, respectively, according to the findings. This empirical evidence supports the findings of Calza *et al.* (2006) and Korkmaz (2015) that excessive credit accumulation in the economy is associated with higher inflation. As a result, while FIN has a beneficial impact on inflation at both threshold levels, it exerts more inflationary pressure when FIN exceeds the threshold level.

Moreover, turning to Model 1, all of the estimated coefficients on the *GDP*, interest rate, and TR were consistent with past studies. The coefficient on the GDP was positive and statistically significant for all of the countries regardless of whether they were below or above the DC threshold. Effectively, the findings disclosed that a 1% increment in GDP raises the inflation rate by 0.02% and 0.08% considering both Nigeria and Egypt countries, respectively. The economic growth reflects the optimal level of production in the economy and thus, inflation will accelerate as the *GDP* increases beyond its optimal level (Moorthy and Kolhar, 2011; Aurangzeb and Haq, 2012). In other words, the *GDP* also acts as a demand-side factor, where a rise in the *GDP* leads to higher purchasing power that triggers the need for higher aggregate demand and causes upward pressures on prices. This finding is in line with Ericsson *et al.* (2001), Armesh *et al.* (2010) and Moorthy and Kolhar (2011) on the influence of economic growth on inflation and found that economic growth drives inflation in rising countries.

The coefficient of the interest rate was negative and a significant determinant of inflation at convenient levels. These results indicate that at a lower level of interest rate, inflation increased for all of the countries, which was consistent with Mishkin (1988), Barth and Ramey (2001) and Ghazali and Ramlee (2003). The result obtained in this study substantiates the arguments that a decline in interest rates will lead to a substantial rise in a number of borrowers. Consequently, the higher the amount of money people borrow, the more money people will spend and cause undesirable inflation. Similarly, Ebiringa and Anyaogu's (2014) and Anari and Kolari's (2016) research findings indicate that low-interest rates spur inflation because the low cost of borrowing increases demand and raises inflation. In contrast, the TR variable was positive and statistically significant in escalating inflation in both regimes, except for Egypt and Mozambique. As a result of such trade outcomes, one increase in trade raises the inflation rate by 0.22% in the context of Congo. But in respect to a negative impact on inflation, TR was found to lead to diversification which may lower the aggregate inflation by reducing the price shocks.

Table 5 presents the results of the repeated analysis, which used LL as an indicator of FIN. Interestingly, the findings were similar to those obtained using DC, reported in Table 4.

Table 4.
Regression results using domestic credit as a threshold variable [DV: CPI]

	OLS without threshold	(1a) Venezuela Regime 1 *DC* < 17.42	Regime 2 *DC* > 17.42	OLS without threshold	(2a) Congo Regime1 *DC* < 4.59	Regime 2 *DC* > 4.59	OLS without threshold	(3a) Angola Regime 1 *DC* < 11.30	Regime 2 *DC* > 11.30
Constant	3.18* (1.15)	2.24 (1.50)	3.28* (1.56)	3.90* (2.18)	2.36* (2.27)	−4.56 (2.29)	6.10* (1.90)	2.77* (1.23)	6.79* (2.90)
GDP	0.12* (0.06)	0.12* (0.06)	0.16** (0.07)	0.03* (0.01)	0.25* (0.11)	0.39* (0.15)	0.02* (0.01)	0.03* (0.01)	0.04* (0.01)
DC	0.08* (0.04)	0.10* (0.05)	0.16* (0.02)	0.15* (0.07)	0.25* (0.12)	0.31* (0.14)	0.04* (0.02)	0.04* (0.02)	0.12* (0.04)
INT	−0.02* (0.01)	−0.02* (0.01)	−0.03* (0.02)	−0.04* (0.02)	−0.19* (0.07)	−0.05 (0.02)	−0.03* (0.01)	−0.16* (0.04)	−0.17* (0.07)
TR	0.03* (0.01)	0.05* (0.02)	0.05* (0.01)	0.02* (0.01)	0.08* (0.04)	0.25* (0.12)	0.05* (0.02)	0.03* (0.02)	0.07* (0.02)
R-sq	0.54	0.51	0.65	0.71	0.62	0.83	0.76	0.85	0.92
Heteroskedasticity test (*p*-value)	0.69	–	–	0.68	–	–	0.86	–	–
No. observation	28	15	13	28	11	17	28	6	22

	OLS without threshold	(4a) Egypt Regime1 *DC* < 2.29	Regime 2 *DC* > 2.29	OLS without threshold	(5a) Argentina Regime 1 *DC* < 11.72	Regime 2 *DC* > 11.72	OLS without threshold	(6a) Mozambique Regime 1 *DC* < 19.58	Regime 2 *DC* > 19.58
Constant	0.89* (0.36)	0.50 (0.26)	2.70* (1.25)	2.83* (1.52)	1.80* (0.90)	2.33* (1.20)	1.89* (0.90)	2.10* (0.85)	3.25 (1.5)
GDP	0.08* (0.03)	0.04* (0.02)	0.06* (0.03)	0.06* (0.03)	0.02* (0.01)	0.04* (0.02)	0.02* (0.01)	0.02* (0.01)	0.04* (0.02)
DC	0.03* (0.01)	0.02* (0.01)	0.08* (0.03)	0.14* (0.05)	0.09* (0.03)	0.22* (0.08)	0.02* (0.01)	0.05* (0.02)	0.06* (0.03)
INT	−0.02* (0.01)	−0.03* (0.01)	−0.06* (0.02)	−0.02* (0.01)	−0.02* (0.01)	−0.12* (0.04)	−0.03* (0.01)	−0.11* (0.04)	−0.14* (0.06)
TR	−0.03* (0.01)	−0.03* (0.01)	−0.05* (0.02)	0.03* (0.01)	0.06* (0.02)	0.09* (0.04)	−0.04* (0.02)	0.07* (0.03)	−0.09* (0.03)
R-sq	0.62	0.85	0.78	0.81	0.72	0.92	0.68	0.79	0.83
Heteroskedasticity test (*p*-value)	0.52	–	–	0.63	–	–	0.79	–	–
No. observation	28	20	78	28	17	11	28	10	18

(*continued*)

Table 4.

	OLS without threshold	(7a) Nigeria Regime1 $DC < 15.47$	Regime2 $DC > 15.47$	OLS without threshold	(8a) Yemen Regime1 $DC < 7.55$	Regime2 $DC > 7.55$	OLS without threshold	(9a) Azerbaijan Regime1 $DC < 6.57$	Regime2 $DC > 6.57$
Constant	6.12* (3.20)	5.32* (2.30)	4.23* (1.52)	5.30 (2.40)	−2.09* (1.10)	2.16 (1.11)	2.32 (1.20)	2.03 (0.90)	2.19* (1.03)
GDP	0.02* (0.01)	0.02* (0.01)	0.03* (0.01)	0.06* (0.02)	0.02* (0.01)	0.02* (0.01)	0.02* (0.01)	0.08* (0.04)	0.10* (0.03)
DC	0.06* (0.02)	0.03* (0.01)	0.08* (0.02)	0.02* (0.01)	0.06* (0.02)	0.14* (0.06)	0.06* (0.02)	0.03* (0.01)	0.06* (0.02)
INT	−0.03* (0.01)	−0.04* (0.02)	−0.06* (0.03)	−0.14* (0.06)	−0.08* (0.04)	−0.10* (0.04)	−0.03* (0.01)	−0.09* (0.03)	−0.11* (0.04)
TR	0.04* (0.02)	0.11* (0.05)	0.19* (0.09)	0.03* (0.01)	0.03* (0.01)	0.02* (0.01)	0.02* (0.01)	0.02* (0.01)	0.03* (0.01)
R-sq	0.64	0.92	0.87	0.78	0.80	0.56	0.82	0.68	0.61
Heteroskedasticity test (p-value)	0.73	–	–	0.63	–	–	0.63	–	–
No. observation	28	16	12	28	20	18	28	9	19

	OLS without threshold	(10a) Ghana Regime1 $DC < 12.13$	Regime 2 $DC > 12.13$
Constant	1.29 (1.14)	−3.20* (1.60)	2.91* (1.25)
GDP	0.02* (0.01)	0.06* (0.02)	0.11* (0.03)
DC	0.05* (0.02)	0.02* (0.01)	0.04* (0.02)
INT	−0.04* (0.02)	−0.08* (0.03)	−0.06* (0.03)
TR	0.03* (0.01)	0.03* (0.01)	0.02* (0.01)
R-sq	0.72	0.74	0.65
Heteroskedasticity test (p-value)	0.56	–	–
No. observation	28	11	17

Note(s): The standard errors are reported in parentheses (white corrected for heteroskedaticity). The results correspond to the trimming percentage of 15%. Asterisks * denote significance of at least a 10% critical value

Table 5.
Model 2 regression results using liquid liabilities as a threshold variable [DV: CPI]

	OLS without threshold	(1b) Venezuela Regime 1 *LL* < 19.50	Regime 2 *LL* > 19.50	OLS without threshold	(2b) Congo Regime1 *LL* < 7.53	Regime 2 *LL* > 7.53	OLS without threshold	(3b) Angola Regime 1 *LL* < 10.32	Regime 2 *LL* > 10.32
Constant	4.41* (2.30)	2.91* (1.40)	3.02* (1.20)	−1.82* (0.88)	2.60 (1.23)	−3.41* (1.62)	1.89* (0.86)	2.03* (0.69)	1.39* (0.56)
GDP	0.10* (0.05)	0.08* (0.03)	0.10* (0.03)	0.03* (0.01)	0.04* (0.02)	0.06* (0.03)	0.02* (0.01)	0.04* (0.02)	0.02* (0.01)
DC	0.04* (0.02)	0.02* (0.01)	0.04* (0.02)	0.08* (0.03)	0.02* (0.01)	0.08* (0.02)	0.04* (0.02)	0.11* (0.05)	0.14* (0.07)
INT	−0.02* (0.01)	−0.06* (0.02)	−0.08* (0.02)	−0.19* (0.06)	−0.12* (0.05)	−0.20* (0.09)	−0.02* (0.01)	−0.04* (0.02)	−0.06* (0.02)
TR	0.03 * (0.01)	0.05* (0.02)	0.13* (0.06)	0.02* (0.01)	0.08* (0.02)	0.11* (0.03)	0.03* (0.01)	0.05* (0.02)	0.08* (0.02)
R-sq	0.63	0.79	0.69	0.72	0.82	0.86	0.94	0.85	0.98
Heteroskedasticity test (*p*-value)	0.49	–	–	0.63	–	–	0.52	–	–
No. observation	28	10	18	28	12	16	28	13	15

	OLS without threshold	(4b) Egypt Regime1 *LL* < 7.88	Regime 2 *LL* > 7.88	OLS without threshold	(5b) Argentina Regime 1 *LL* < 8.62	Regime 2 *LL* > 8.62	OLS without threshold	(6b) Mozambique Regime 1 *LL* < 16.51	Regime 2 *LL* > 16.51
Constant	1.68 (1.32)	−2.12 (0.99)	−2.59 (1.40)	2.14* (1.10)	2.17 (1.5)	1.56 (0.56)	2.25* (0.87)	2.13* (0.92)	3.20 (1.20)
GDP	0.02* (0.01)	0.02* (0.01)	0.04* (0.02)	0.02* (0.01)	0.02* (0.01)	0.04* (0.01)	0.02* (0.01)	0.03* (0.01)	0.05* (0.02)
DC	0.04* (0.02)	0.03* (0.01)	0.08* (0.03)	0.08* (0.02)	0.10* (0.05)	0.21* (0.09)	0.02* (0.01)	0.02* (0.01)	0.08* (0.02)
INT	−0.07* (0.02)	−0.07* (0.02)	−0.16* (0.05)	−0.03* (0.01)	−0.03* (0.01)	−0.06* (0.03)	−0.06* (0.02)	−0.10* (0.04)	−0.19* (0.06)
TR	−0.02* (0.01)	−0.04* (0.02)	−0.06* (0.02)	0.04* (0.02)	0.04* (0.02)	0.05* (0.02)	−0.03* (0.01)	−0.06* (0.02)	−0.02* (0.01)
R-sq	0.74	0.72	0.86	0.68	0.72	0.89	0.65	0.89	0.92
Heteroskedasticity test (*p*-value)	0.69	–	–	0.52	–	–	0.89	–	–
No. observation	28	17	11	28	19	9	28	18	7

(*continued*)

Table 5.

	OLS without threshold	(7b) Nigeria Regime1 $LL < 17.69$	Regime2 $LL > 17.69$	OLS without threshold	(8b) Yemen Regime1 $LL < 11.62$	Regime2 $LL > 11.62$	OLS without threshold	(9b) Azerbaijan Regime1 $LL < 13.69$	Regime2 $LL > 13.69$
Constant	4.32* (2.25)	2.66* (1.23)	2.15 (1.20)	2.17 (1.42)	3.45* (2.55)	2.50* (1.25)	1.59 (0.96)	2.52* (0.85)	2.33* (1.56)
GDP	0.02* (0.01)	0.03* (0.01)	0.04* (0.02)	0.02* (0.01)	0.04* (0.02)	0.06* (0.03)	0.02* (0.01)	0.03* (0.01)	0.04* (0.02)
DC	0.03* (0.01)	0.04* (0.02)	0.10* (0.05)	0.09* (0.04)	0.03* (0.01)	0.04* (0.02)	0.11* (0.05)	0.08* (0.02)	0.12* (0.05)
INT	−0.06* (0.02)	−0.02* (0.01)	−0.04* (0.01)	−0.10* (0.05)	−0.08* (0.03)	0.10* (0.03)	−0.03* (0.01)	−0.06* (0.03)	−0.08* (0.02)
TR	0.02* (0.01)	0.11* (0.04)	0.15* (0.05)	0.03* (0.01)	0.03* (0.01)	0.04* (0.01)	0.09* (0.04)	0.05* (0.02)	0.04* (0.02)
R-sq	0.82	0.89	0.86	0.63	0.79	0.69	0.53	0.48	0.79
Heteroskedasticity test (*p*-value)	0.59	–	–	0.56	–	–	0.48	–	–
No. observation	28	14	14	28	17	11	28	12	16

	OLS without threshold	(10b) Ghana Regime1 $LL < 13.00$	Regime 2 $LL > 13.00$
Constant	2.26* (1.20)	1.86 (0.82)	2.15* (0.89)
GDP	0.02* (0.01)	0.05* (0.01)	0.04* (0.01)
DC	0.09* (0.04)	0.02* (0.01)	−0.06* (0.03)
INT	0.03* (0.01)	0.05* (0.02)	0.11* (0.04)
TR	−0.04* (0.02)	−0.08* (0.02)	−0.09* (0.04)
R-sq	0.57	0.92	0.98
Heteroskedasticity test (*p*-value)	0.86	–	–
No. observation	28	18	10

Note(s): The standard errors are reported in parentheses (white corrected for heteroskedaticity). The results correspond to the trimming percentage of 15%. Asterisks * denote significance of at least a 10% critical value

The empirical findings of a non-linear relationship between inflation and FIN still hold. Specifically, the estimated LL coefficients below and above the threshold were detrimental to inflation, as was found in the case of DC, except for Ghana. It is worth noting that a rising liquidity above the threshold can reduce the effectiveness of the monetary policy transmission mechanism. The reason is that, better aggregate demand raises lending rapidly and then increases the risk of inflation pressure. In fact, in the below the threshold regime, an increase of LL responded with an increase in inflation. However, how is it possible to have financial growth at above the threshold without accelerating inflation, specifically in Ghana? As argued by Krause and Rioja (2006), there can be a point where a more financial sector ensures an effective monetary policy through more influence over the policy decisions on the money demand and supply in the economy. This enables the Central Bank to be focused on achieving its price stability objectives.

As put forward by the recent findings, all of the estimated coefficients on the *GDP*, interest rates and TR were constant with model 1. The coefficients on the *GDP* and *TR* were positive in all of the countries and statistically significant. However, the interest rate had a significant negative impact on inflation below and above the estimated LL threshold. On the whole, from the analytical result, it can be concluded that inflation responded similarly to FIN when considering regime differences. However, above the threshold, FIN had a much greater association with inflation than below the threshold. This supports the view that excessive financial growth fosters a higher inflation rate by stimulating aggregate demand.

5. Conclusion

This paper has attempted to provide new evidence on the non-linear relationship between FIN and inflation using the time series data from 10 high-inflation countries covering the period of 1992–2020. This study applied the approach which was proposed by Hansen (2000) to capture a rich dynamism in the relationship between FIN and inflation. The empirical results indicate that there is a FIN threshold in the FIN -inflation nexus. When FIN is below the threshold, FIN exerts a positive effect on inflation. This indicates that inflation will increase with the rise in FIN. However, if the level of FIN exceeds the threshold, although the impact of FIN on inflation remains positive, it exerts higher pressure on inflation. The results are robust to two measures of FIN.

Additionally, the empirical result suggests that more FIN is definitely not always better and it allows an economy to harm the inflation. When the Central Bank increases the level of FIN, interest rates tend to fall and the quantity demanded for goods and services also increases at every price level. This leads to the increase in aggregate demand (see Figure A1 in Appendix) which causes a proportional increase in the price level. Following this phenomenon, increased attention to the policy not only focuses on macroeconomic stability but also on financial stability. Recently, the International Monetary Fund (IMF) promoted the idea that the Central Bank may follow an integrated inflation targeting (IIT) in which the Central Bank has an explicit financial stability mandate and the policy interest rate responds directly to rapid financial growth (Agénor and da Silva, 2014). An important instrument of this IIT is the increase in the Central Bank's refinancing rate. The increase in the refinance rate raises the banks' borrowing costs which induces them to raise the lending rate. Therefore, the increase in the lending rate tends to induce households to save more and spend less, thereby leading to a reduction in the aggregate demand. IIT is also known as flexible inflation targeting, in which the policy interest rate reacts directly to excessive rapid credit growth, and the central bank holds an explicit financial stability mandate. Additionally, the government can encourage research and development (R&D) by offering financial support incentives to the firms. It can also directly encourage R&D in a specific area of interest to the firm that is not currently being addressed by the market. Investing in R&D can result in new products and technologies, and more productive and competitive shifts in the long-run

aggregate supply (LRAS) to the right. Hence, in the long run, investing in R&D as a supply-side policy will lead to a lower price level and reduce inflationary pressures.

This research work has two limitations. First, the use of data to measure FIN is DC and LL. It is essential to take other measures of FIN, such as private sector credit and commercial bank assets. Second, the study aimed to include a large number of countries from various regions and income levels, but the data available did not permit this. In the future, studies should encompass a wide range of countries and other measures of FIN.

Notes

1. The word "finance" refers to financial development, which means some improvements in producing information about possible investments and allocating capital, monitoring firms and exerting corporate governance, trading, diversification, management of risk, mobilisation and pooling of savings, easing the exchange of goods and services.
2. Rousseau and Wachtel (2002) offered several channels by which inflation may impede economic growth. Directly, inflation increases transactions and information costs, inhibiting investment and entrepreneurship. Indirectly, high inflation will discourage any long-term financial contracting. To make things worse, the causality can be bi-directional and if it truly happens, will continue to worsen the situation.
3. Nevertheless, this is only true if a GDP decrease is not due to the rising cost of production, which will only lead to stagflation. Stagflation is a situation where reduction in the GDP is accompanied by inflation, and not deflation. This was actually, we believe, the phenomenon facing most high-inflation countries under this study.
4. The purpose of this estimation strategy is to provide new evidence that sheds light on the impact of financial depth on inflation because the threshold approach has not been examined in past studies. Besides that, the threshold estimation developed by Hansen (2000) allows the parameter estimates to vary depending on the threshold value (Alfada, 2019).
5. Congo refers to the Democratic Republic of Congo. We retained Congo for simplicity in presentation and to avoid confusion if stuck with the abbreviation of DRC.
6. The end and started year is dictated by the availability of data on finance.
7. According to Mishkin (1981, p. 1), "the movements in the real interest rate are central to the discussion of the transmission mechanism of the monetary policy in the standard IS-LM paradigm as well as in modern macro econometric models".

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Appendix

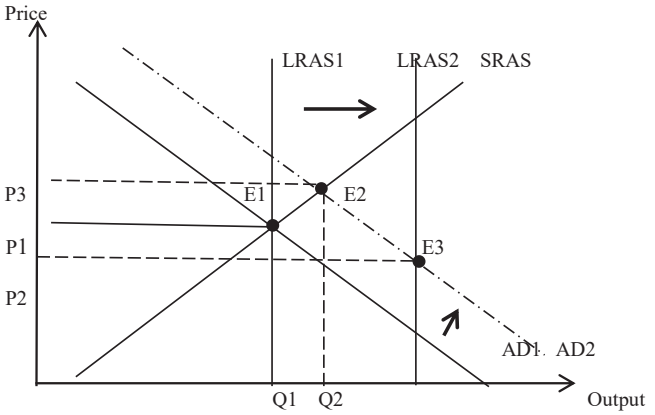

Figure A1.
Inflationary Pressures from a Shift in the Aggregate Demand (AD)

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