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How is monetary policy transmitted to the Human Development Index?

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Abstract. Identifying the monetary policy transmission channels to the Human Development Index (HDI) is a matter of great concern for analysts and economic policy decision takers, dealing with social welfare in the less developed countries. The exploration of those transmission mechanisms, using the conventional structural Autoregressive methodology, with Cameroon data from the World Bank, Beac and UNDP, on the period from 1990 to 2015, points out that HDI reacts significantly to the monetary policy impulses in a two years delay, through two channels: the "income-consumption channel" and "credit-consumption channel". In addition, it appears that inflation has a negative effect on the HDI.
Keywords. Monetary policy, Transmission channels, Human Development Index, Cameroun, VAR, Credit, Final consumption.
JEL. E52, E58, E51, E54, O15, O23, D60.

1. Introduction

Through which channel(s) does monetary policy transmit its effects to the Human Development Index (HDI)? This issue is a matter of concern for public policy makers dealing with social welfare in developing countries. Indeed, each nation aims to improve the living conditions of its populations. Therefore, any economic policy has an ultimate goal to achieve the optimal social well-being (Tinbergen, 1972). In theory, monetary policy pursues four (4) objectives: economic growth, price stability, full employment and external balance (Kaldor, 1958). However, this "magic square" of objectives is no longer sufficient to assess the level of development that economic policy is supposed to improve for a nation. The limits of GDP as an indicator of economic performance and social well-being have been highlighted by Stiglitz *et al.* (2009) and Valérie (2009). Many institutions such as the Organization for Trade and Economic Development (OECD) and European Union thus prefer a sustainable development indicator capable of measuring and promoting economic progress. The HDI is therefore used to assess more significantly the level of development of nations. This indicator has become the most widely used measure of economic development since its adoption in the 1990s by the

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United Nations Development Program (UNDP), following the work of Sen (1999, 1979, & 1976).

Theoretically, monetary policy can influence social welfare (Romer & Romer, 1999). It's therefore necessary for policymakers to identify the mechanisms through which the monetary policy impulses of the central bank propagate on human development, as measured by the HDI. The monetary policy transmission to the HDI target is a great matter of concern, because this composite index incorporates ethical considerations in the assessment of well-being and the measurement of economic development. It takes into account the National Income per capita, the Gross Enrollment Rate (primary, secondary and higher) and Life Expectancy at birth. As a relevant causal relationship has been detected between monetary policy and the HDI by Ekomane (2019), it's therefore interesting to find out the channels through which such a policy is transmitted. More precisely, it is a question of identifying the mechanisms through which the manipulation of the instrumental variables of monetary policy affects the HDI, in the sense of an improvement or a deterioration of social welfare. Such a perspective will help enlighten public decision-makers on the possibilities of monetary policy to boost a dynamic and inclusive human development.

By definition, monetary policy is the set of decisions of public authorities to regulate the quantity and the circulation of money in the economy, aiming to restore the macroeconomic equilibriums when they are not achieved by the market forces. It ensures the proper financing of the economy, while promoting the stability of the financial system and the supervision of credit institutions. Monetary policy then transmits its effects on the real economy through several channels: the interest rate channel, the channel of other assets prices (stocks, bonds, etc.), the exchange rate channel and the credit channel (Mishkin, 1996). But, during the recent years, following the financial crisis of 2007/2010, these channels have lost their effectiveness (Stiglitz, 2013; Artus, 2014). Moreover, the relationship between monetary variables and the HDI is not yet the subject of further analysis. It therefore appears necessary to explore the mechanisms by which monetary policy can act on the HDI, considered nowadays as the most representative quantitative indicator of social welfare.

To achieve this objective, a macroeconomic methodological approach, based on time series is used, with autoregressive vector modeling. Two indicator variables of monetary policy are used: the central bank key rate i and the broad money supply $M2$. The transmission variables tested are: bank credit CR, Household's Final Consumption Cs, National income Y and the inflation rate INF. The IDH is retained as the target variable. The data used come from the World Bank's Development Indicators (WDI) (2017) and UNDP statistics for the IDH. The rest of the work concerns the literature review (2), the model test (3), the findings and the discussions (4).

2. Literature review

Fundamentally, money is an endogenous factor of production, which can generate technological innovation (Schumpeter, 1911). It can have a great influence on the economic development through the capital it generates (McKinnon, 1963). In addition, monetary policy decisions affect household's income and hence their poverty level (Ferreira *et al.*, 1999). Since Easterlin's paradox (1974), the question of improving collective well-being through an overall increase in income had already arisen. But, we now know that a variation in the quantity of money, through monetary policy, affects social well-being, in the short and long term (Romer & Romer, 1999) in cross-section over several countries. Also, as a monetary phenomenon, inflation worsens poverty and income inequality, because it affects the poor more than the rich (Easterly & Fischer, 2001). In this case, an inflation-reducing monetary policy improves the quality of life of the poor in Latin America (Ganuza & Taylor, 1998).

By choosing the general price level as an indicator of the living standard, Fielding (2004) shows that the asymmetric impact of monetary policy between the rich and the poor is confirmed in the West African Economic and Monetary Union (WAEMU)'s countries. There is, in fact, a positive linear correlation between inflation, income inequalities and poverty (Crowe, 2006; Albanesi, 2007). Moreover, an increase in the interest rate worsens poverty according to Kang *et al.*, (2013) in the case of South Korea. In East Africa, the political regime is a differentiator in the transmission of monetary policy to the real sector (Berg *et al.*, 2013). In poor countries, trade dependency degrades the HDI, through channels such as low economic growth, macroeconomic instability and political instability (Nkurunziza & Komi, 2017). In low-income countries, the monetary policy transmission to social welfare takes place mainly through the bank lending channel, but the effectiveness of this channel is limited, due to the narrowness and imperfections of their financial system (Montiel, 2015).

However, targeting HDI is more on the art of the Central Bank, and less on the science of monetary policy, which assumes methodological efficiency (Mishra & Montiel, 2013). In the case of India, the VAR method reveals that a restrictive monetary policy leads to an increase in the lending interest rate of banks, thus reducing bank lending, but with insignificant effects on real product and income inflation (Mishra *et al.*, 2016). In the context of an emerging market, the analysis of the monetary policy transmission, using an error correction vector model, on monthly data for the period from 1997 to 2009, pointed out two mechanisms: the exchange rate channel and the short-term interest rate channel (Bhattacharya *et al.*, 2010). In the Euro zone, monetary policy produces heterogeneous effects on households, through the interest rate and indirect income channels, depending on the distribution of their income and the composition of their wealth (Ampudia *et al.*, 2018). In this specific case, the indirect income channel is of greater importance, especially for households with the least liquidity. In this context, an expansionary monetary policy reduces

household income inequalities through macroeconomic channels (employment, wages) and financial channels (asset prices, profits) as demonstrated by Samarina & Nguyen (2019). There are, however, risks of weakening the overall effect through financial channels.

From a New Keynesian Model extended to the inequality channel, using the Rawls' collective utility function, Aerosa *et al.* (2016) find that a Rawlsian monetary policy leads to the following optimal responses: (i) less aggressive monetary tightening, but inducing a more pronounced fall in investment after a monetary shock; (ii) an easing of monetary policy after an increase in public spending and (iii) a more pronounced fall in the interest rate after a positive shock on total factor productivity. A contractionary interest rate shock increases inequality, while inflation and the output gap fall. But under scarcity of skilled agents, monetary policy is weakened, while fiscal policy produces a more relevant impact on the economy (Areosa & Areosa, 2016). Likewise, based on data from the United States and Italy, Auclert (2017) identifies three channels of the transmission of monetary policy on consumption, taking into account the redistributive effect. These are the income heterogeneity channel, the Fisher channel of unexpected inflation, and the real interest rate channel. It confirms the effectiveness of these channels in amplifying the effects of monetary policy, according to the households' marginal propensity to consume.

Analyzing the monetary policy transmission also shows that, in Australia, a lower cash rate stimulates household spending and housing investment, partly through increasing the households' wealth and cash flow (Atkin & La Cava, 2017). This is because changes in the cash borrowing rate affect other interest rates in the economy, which in turn affect economic activity and inflation. In sub-Saharan Africa, Saxegaard (2006) assesses the effects of monetary policy by considering the two situations of bank over-liquidity and under-liquidity. He concludes that monetary policy innovations have a low impact on GDP and inflation, especially in over-liquid Nigeria and Uganda, confirming the weak influence of the central bank on the behavior of banks in these countries. These effects are also weak in the countries of the CEMAC zone, whether the banking system is over-liquid or under-liquid. The break in the monetary policy transmission chain in sub-Saharan Africa is due, in part, to a weak effect of bank lending rates and the supply of credit on aggregate demand according to Lungu (2008).

All of this previous work highlights the relationship between monetary policy and social welfare, using impact variables such as poverty, inflation, consumption and income inequality. While relevant, they do not specifically target human development as measured by the *HDI*. Likewise, they are not primarily interested in the transmission of monetary policy to such an indicator. Identifying the monetary policy transmission channels to the *HDI* is therefore of triple interest: analytical, epistemological and political. From an analytical point of view, this initiative brings out a renewal of thought by detecting new channels of transmission of monetary

policy towards a new target: the HDI. From an epistemological point of view, the "fight for development" is preferred to the "fight against poverty" observed in previous works. From a political point of view, monetary policy is no longer just cyclical. By targeting development through the HDI, it fits into a long-term perspective as an instrument of structural economic policy. The prospect of the economic emergence of the least developed countries reinforces the interest of such a choice of strategy.

3. Methodology

The analysis carried out is macroeconomic and uses time series, in an autoregressive vector (VAR) model. This is in common use in assessing the transmission effectiveness of monetary policy, in most countries and within the OECD, IMF or World Bank. Prior statistical tests of stationarity, causality and cointegration are carried out, before the analysis of the VAR.

3.1. General description of VAR

The VAR method consists of representing the economy as a vector composed of macroeconomic variables, having regressive effects on each other. By adopting the presentation used by Mishra *et al.* (2016), X_t represents a column vector of n endogenous variables at time t; A_0 an nxn matrix of contemporary interactions between endogenous variables; A (L) an nxn matrix of the coefficients of the lag operator L and ε_t, a column vector of structural monetary policy shocks. The VAR then takes the following form:

$$A_0 X_t = A(L)X_{t-1} + \varepsilon_t \quad (1)$$

Since the reduced form of the VAR makes it possible to better detect the dynamic effects of monetary policy shocks on endogenous macroeconomic variables, it is obtained by transforming equation (1), such as:

$$X_t = A_0^{-1}A(L)X_{t-1} + A_0^{-1}\varepsilon_t; \quad (2)$$

By setting $B(L) = A_0^{-1}A(L)$ and $u_t = A_0^{-1}\varepsilon_t$, the equation (2) becomes:

$$X_t = B(L)X_{t-1} + u_t . \quad (3)$$

This equation presents a vector of endogenous variables, expressed as a function of their own lagged values. It therefore constitutes an autoregressive vector (VAR), while u_t, the matrix of random shocks, is a linear combination of ε_t. The coefficients of B(L) can be estimated by the ordinary least squares method. However, these coefficients are not sufficient to describe the dynamic effects of monetary policy shocks on endogenous macroeconomic variables. It is therefore necessary to determine the influence of these structural shocks using the relation

$$u_t = A_0^{-1}\varepsilon_t .$$

The variance-covariance matrix of the residuals of the VAR is then given by:

$$\Omega = \mathrm{E}_t u_t u_t' = \mathrm{E}_t(\mathrm{A}_0^{-1}\varepsilon_t\varepsilon_t'\mathrm{A}_0^{-1}) = \mathrm{A}_0^{-1}\mathrm{A}_0^{-1\prime}. \quad (4)$$

3.2 Empirical estimation of VAR

The application of this methodology to research the transmission channels from monetary policy to the HDI involves the specification of the VAR model, the choice of variables, data sources and the study period.

3.2.1 Specification of the VAR model and choice of variables

This VAR specification borrows from the New Keynesian Model (NKM) as presented by Das *et al.*, (2015). This model includes five (5) variables: the GDP gap $\tilde{y}_t$, the inflation rate π_t, the real exchange rate $\tilde{e}_t$, the bank lending interest rate i_t^L and the key rate of the central bank i_t; hence the model $X_t = (\tilde{y}_t, \pi_t, \tilde{e}_t, i_t^L, i_t)'$.

From this model, and taking into account the specific variables for the implementation of the BEAC's monetary policy in the CEMAC zone, it seems judicious to use the central bank's key interest rate i_t and the inflation rate π_t, before introducing the broad money supply aggregate $M2$, the bank lending CR_t, the household final consumption C_t, the national income Y_t and the Human Development Index at time t, HDI_t. As the bank lending interest rate, i_t^d did not have a conclusive relationship with the other variables in our preliminary tests, it was not retained; hence the following model:

$$X_t = (HDI_t, C_t, INF_t, Y_t, CR_t, M2_t, i_t)'.$$

This choice of variables is justified for two reasons. The first reason relates to the objective pursued by the analysis: to identify the channels of transmission from monetary policy to the HDI. The second reason is the taking into account of the specificities of the BEAC's monetary policy implementation strategy, where the bank lending (CR) and money supply aggregates ($M2$) constitute intermediate objectives.

3.2.2 Sample period and data

The data used are annual time series covering the period 1990 to 2015. This 25-year period takes into account the availability of quantified data on the HDI, according to the annual classification of the UNDP. It is sufficient to generate significant results. The statistical data on the monetary and real variables used over this same period come from the World Bank and the BEAC, in the case of Cameroon analyzed here. They are presented as follows, according to their sources (WDI, BEAC and UNDP);

C_t: Household Final Consumption expenditure in current CFA Francs, (WDI, 2017), line 114781, NE.CON.PRVT.CN;

$M2_t$: Broad Money, in billions of Constant Local Currency, CFA Francs: line 114 353 FM.LBL.BMNY.CN (WDI, 2017), including fiat, scriptural and quasi money;

Y_t: Gross Domestic income in billions of Constant Local Currency unit, CFA Francs: line 114 732 NY.GDY.TOTL.KN (WDI, 2017);

INF_t: inflation, Consumer Price Index (CPI) (base 100 in 2010), Line 114 457. FP.CPI.TOTL (WDI, 2017);

i_t : Central bank's main interest rate, BEAC statistics [link], statistiques monétaires;

CR_t : Gross Domestic Credit, BEAC statistics [link], statistiques monétaires;

HDI_t : Human Development Index, classification of the United Nation Development Program (UNDP, 2017).

4. Findings and discussions

These results and their interpretation come from the preliminary statistical tests and the test of the VAR model.

4.1. Statistical test results

Three statistical tests were carried out: the stationarity test, the cointegration test and the Granger causality test.

4.1.1. Stationarity test of the model variables

The Augmented Dickey Fuller (ADF) unit root test according to Dickey & Fuller (1981) on the variables of the model yielded the results summarized in Table 1 below.

Table 1. *ADF Unit Test Results*

Variables	i_t	$M2_t$	CR_t	Y_t	C_t	INF_t	HDI_t
Ordre d'intégration	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)

Source: Our results.

All the selected series ($i_t, M2_t, CR_t, Y_t, C_t, INF_t, HDI_t$) are stationary in first difference, therefore integrated of order 1.

4.1.2. Johansen cointegration test

The Johansen (1991) cointegration test gave the results summarized in Table 2 below.

Table 2. *Johansen Cointegration Test Results*

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.997594	144.7170	48.87720	0.0000
At most 1 *	0.968589	83.05436	42.77219	0.0000
At most 2 *	0.860732	47.31253	36.63019	0.0020
At most 3 *	0.826093	41.98169	30.43961	0.0012
At most 4	0.570342	20.27436	24.15921	0.1542
At most 5	0.487725	16.05344	17.79730	0.0897
At most 6	0.363226	10.83217	11.22480	0.0586
At most 7	0.134476	3.466093	4.129906	0.0743

Notes: Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level; * denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.

Source: Our results

The result of the Johansen cointegration test reveals the existence of four (4) cointegration equations at the 5% significance level. This result reinforces the idea of a possibility of combining the chosen variables, to make it an explanatory model of the HDI by the other variables of the model. It is therefore possible to construct a relevant relationship between the indicator variables of monetary policy, the real macroeconomic variables and the IDH. The meaning and degree of influence of monetary policy dummy variables on the HDI remains to be detected. This is the purpose of the causality test below.

4.1.3. Granger causality Test

The results of the causality test by the method of Granger (1969) are presented in Table 3 below.

Table 3. *Granger Causality Test Results*

Pairwise Granger Causality Tests			
Sample: 1990 2015; Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
HDI does not Granger Cause Cs	25	0.25215	0.6206
Cs does not Granger Cause HDI		10.0954	0.0044
Y does not Granger Cause Cs	25	4.52620	0.0448
Cs does not Granger Cause Y		23.5285	8.E-05
i does not Granger Cause CR	25	5.19980	0.0326
CR does not Granger Cause i		0.04270	0.8382
INF does not Granger Cause CR	25	4.80919	0.0392
CR does not Granger Cause INF		0.04070	0.8420
M2 does not Granger Cause CR	25	8.12296	0.0093
CR does not Granger Cause M2		1.07362	0.3114
HDI does not Granger Cause i	25	0.72428	0.4039
i does not Granger Cause HDI		6.40473	0.0190
Y does not Granger Cause i	25	1.96904	0.1745
i does not Granger Cause Y		4.62811	0.0427
INF does not Granger Cause HDI	25	8.27969	0.0087
HDI does not Granger Cause INF		0.18240	0.6735
M2 does not Granger Cause HDI	25	24.0967	7.E-05
HDI does not Granger Cause M2		0.06929	0.7948
Y does not Granger Cause HDI	25	12.6036	0.0018
HDI does not Granger Cause Y		0.05343	0.8193
Y does not Granger Cause INF	25	0.08606	0.7720
INF does not Granger Cause Y		8.25780	0.0088

Source: Our results.

The causality test reveals the existence of a causality between the Central bank's key interest rate i and the bank lending CR, $(i \Rightarrow CR)$. Moreover, the national income Y causes the Final Consumption Cs, $(Y \Rightarrow Cs)$; and Final Consumption, in turn, influences the HDI, $(Cs \Rightarrow HDI)$, with a delay of one year. We also notice that the key rate i causes national income, $(i \Rightarrow Y)$. Direct causalities are also detected between the central bank's key rate i and the HDI, on the one hand, $M2$ and HDI on the other hand, then finally between the national income Y and the HDI. The Granger causality test reveals interesting causalities consistent with economic analysis. These

causalities are decisive in identifying the transmission channels from monetary policy to the HDI. It emerges from these results that monetary policy has an effect on human development represented by the HDI. It remains to specify the meaning and extent of this influence in order to identify, more precisely, the channels of transmission of this policy to the HDI. This is the purpose of the VAR test, the results of which are presented below.

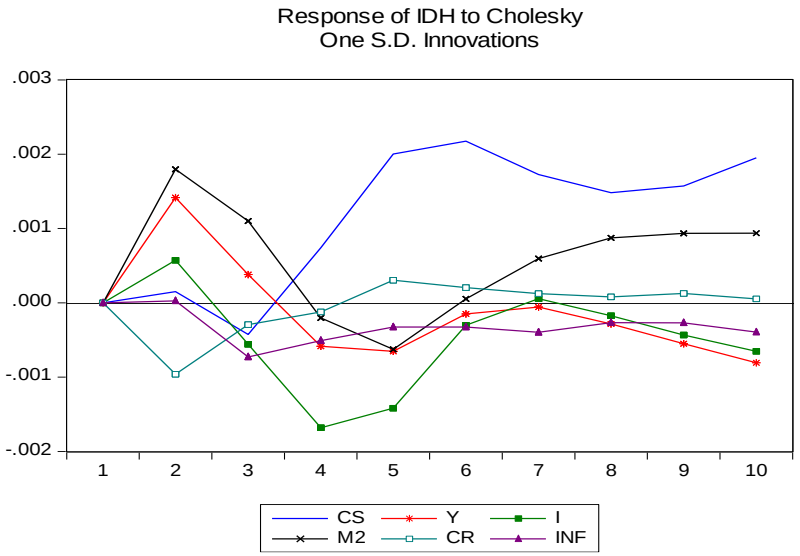
4.2. The VAR Test Results

The results of the VAR Test are summarized in the following regression equation:

$$HDI_t = 0.42 * HDI_{t-1} + 5.32E^{-06} * Cs_{t-1} + 1.00E^{-05} * Y_{t-1} - 4.35E^{-05} * INF_{t-1} + 1.31E^{-05} * CR_{t-1} + 4.67E^{-05} * M_{t-2} \quad (5)$$

4.2.1. HDI response to monetary policy impulses

The VAR test reveals that human development as measured by the HDI is positively, significantly and sustainably influenced by three variables: the Final Consumption Cs, the household income Y and money supply $M2$, delayed by two years, in the case of Cameroon. We also note that inflation has a negative impact on social welfare. Chart 1 below thus illustrates the HDI response to an impulse on each of these variables.



Graph 1. *HDI Response to Monetary Policy Impulses*
Source: Our results.

Chart 1 above shows that an impulse on the central bank key rate i, leads to an improvement in the HDI, which starts to decline in the second period, before fading in the fourth period. It also reveals that an impulse on Final Consumption Cs on the one hand, or on income Y on the other hand, has a very significant and long-term positive effect of on the HDI. The

analysis also shows that an impulse on the $M2$ money supply significantly increases the IDH in the short and medium term, while inflation INF has a negative long-term effect. All these results lead to identifying the monetary policy transmission to the HDI.

4.2.2 Identification of the monetary policy transmission channels to HDI

The results of the causality tests and the VAR above help identify the transmission channels from monetary policy to the HDI. By using the central bank's key rate i and the money supply $M2$ respectively as monetary policy indicators, and from the successive causalities detected on these variables, two transmission channels emerge from the analysis: the income-consumption channel and the credit-consumption channel.

a) The Income-Consumption channel

The "income-consumption channel" thus detected means that a monetary policy acting by lowering the key rate i improves the households' income Y; hence an increase in their Final Consumption Cs which falls under the HDI. Indeed, the successive causalities between certain variables retained and the behavior of the VAR model reveal the following: a fall in the central bank's key rate i (in case of expansionary monetary policy) improves household income Y; hence an increase in their final consumption Cs of goods and services that improve their social well-being, represented by the HDI. Schematically, this channel looks like this:

$$i \downarrow \Rightarrow Y \uparrow \Rightarrow Cs \uparrow \Rightarrow HDI \uparrow \quad (6)$$

Moreover, an expansionary monetary policy, acting through direct intervention of the central bank, consists in increasing the quantity of money $M2$ in circulation in the economy, which leads to an improvement in national income. The result is an increase in consumer spending C_s that improves the HDI; hence the following diagram (2):

$$M2 \uparrow \Rightarrow Y \uparrow \Rightarrow C_s \uparrow \Rightarrow HDI \uparrow \quad (7)$$

The initial impulse in this case may also come from unconventional monetary policy measures, including "quantitative easing" or "credit easing".

b) The Credit - Consumption Channel

The second transmission mechanism from monetary policy to the HDI identified in these results is the "Credit - Consumption Channel". It reveals that an expansionary monetary policy, reflected by the fall in the central bank's key rate i, induces an abundant supply of bank lending CR , leading to an increase in households final consumption Cs which improves the HDI; hence the following diagram (3) :

$$i \downarrow \Rightarrow CR \uparrow \Rightarrow Cs \uparrow \Rightarrow HDI \uparrow \quad (8)$$

On the other hand, the analysis reveals that an expansionary monetary policy, acting through an increase in the supply of $M2$ money, can also lead to an increase in the supply of credit and therefore to an increase in the level of household final consumption; which raises the level of human development. Schematically, this channel looks like this:

$$M2 \uparrow \Rightarrow CR \uparrow \Rightarrow Cs \uparrow \Rightarrow HDI \uparrow \quad (9)$$

Final Consumption appeared as a central variable, essential in the monetary policy transmission channels towards the IDH, thus identified.

c) The negative impact of inflation on Human Development

The results of the analysis further reveal a direct causation between the rate of inflation and the HDI. In the event of worsening inflation INF_t, following an irrelevant or ineffective monetary policy, there follows a depreciation of national income Y, leading to a loss of the purchasing power of households. The result is a drop in their consumer spending Cs and therefore a degradation of the HDI, synonymous with reduced social welfare of the nation. This path shows that inflation degrades social welfare, even if, in general, it is rather well controlled in the case of Cameroon. This direct and negative influence of inflation on the IDH is schematically as follows:

$$INF_t \uparrow \Rightarrow HDI \downarrow \quad (10)$$

The transmission delay of monetary policy to the HDI then must be specified.

4.1.3. The HDI's delay of reaction to Monetary Policy

The results of the causality test indicate that the HDI reacts two years late to a monetary policy impulse on the $M2$ broad money supply. The decisions of the monetary authorities are therefore transmitted to social welfare within a two years period. This result is supported by that of the Cholesky test, which presents the reaction of each real variable, and in particular the HDI, to an impulse on the indicator variables of monetary policy.

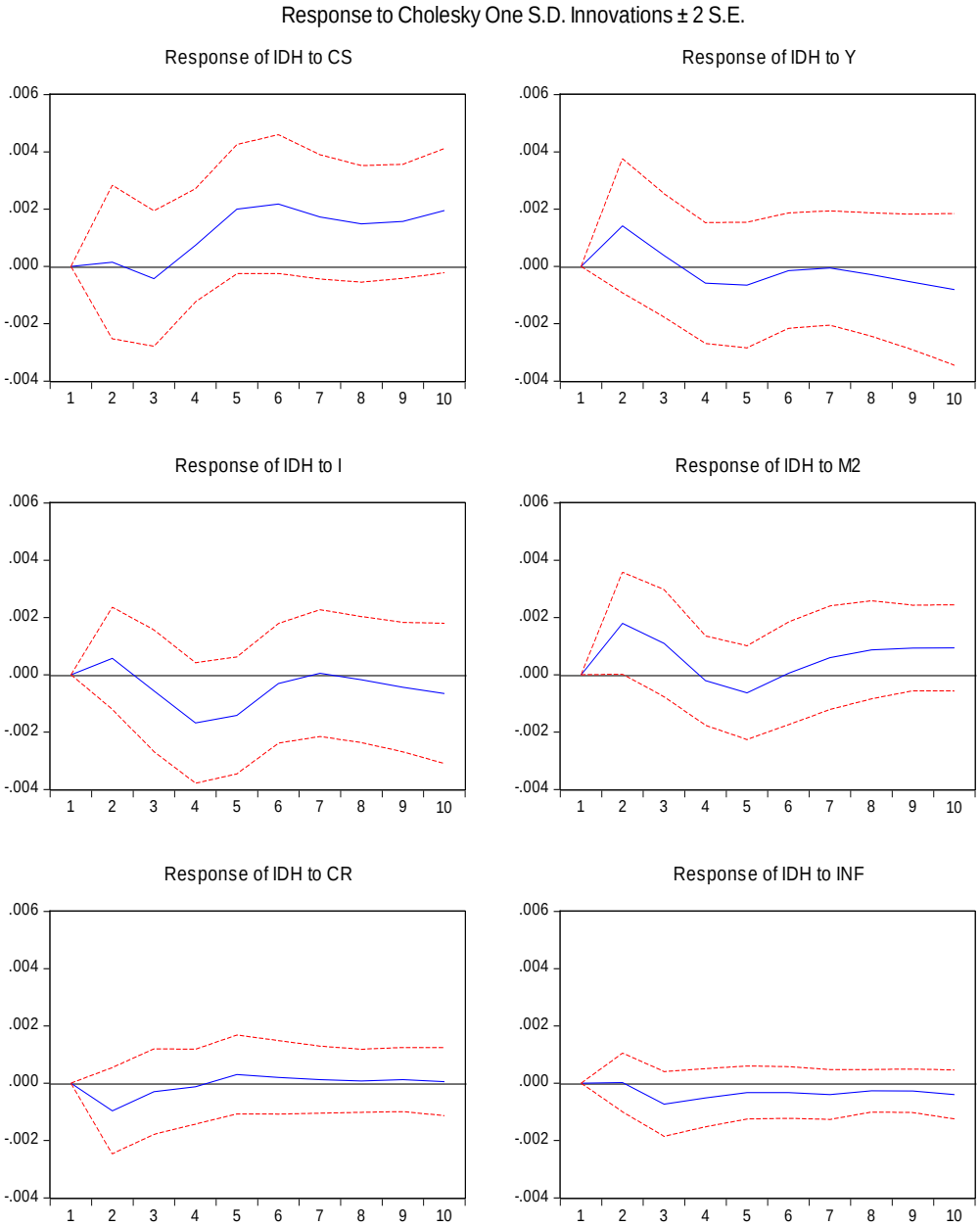
5. Conclusion

Analysing the monetary policy transmission to the HDI, using the structural VAR method, has identified two transmission channels: the "income-consumption channel" and the " credit-consumption channel". The first acts as follows, in case of an expansionary monetary policy: a fall in the key rate i or a direct intervention by the central bank, by increasing the money supply $M2$, improves national income Y, which (through a wealth effect) leads to a positive shift in the households Final Consumption Cs, leading to an improvement of human development, represented by the HDI. In the second channel, an expansionary monetary policy causes an

increase in the credit supply that leads to an increase in the final consumption of goods and services; the result is an improvement in the social welfare represented by the HDI. These two transmission channels reveal that the Final Consumption of households Cs is a central variable in the transmission of monetary policy to human development. The results also show that the money supply has a direct and positive impact on the HDI, while inflation contributes to its degradation. However, it should be noted the low level of the HDI reaction coefficients compared to the various indicator variables of monetary policy in the case of Cameroon. It therefore seems wise to recommend that the public authorities make use of expansionary monetary policies likely to increase the level of income and access to credit of the populations. This wealth effect would allow them to access consumer goods and basic social services that are represented in the HDI (education, health, nutrition, etc.) so as to raise their standard of living. Channels of transmission of such a monetary policy towards human development in a developing country have thus been made available to decision-makers. But already, the possibility and effectiveness of the use of monetary policy to improve human development (measured by the HDI) has been demonstrated. The HDI is thus emerging as a potential and relevant target for a monetary policy geared towards economic development.

These results are close to those of Romer & Romer (1999) then of Feirreira *et al.*, (1999) who detect the influence of monetary policy on the poor and those of Mishra *et al.*, (2016) which characterize the transmission of the monetary policy in developing countries based on the case of India. They are also close to those of Montiel (2015) from which we know that in low-income countries, the monetary transmission to social welfare takes place mainly through the bank lending channel, but it has a limited effect, due to the narrowness and imperfection of their financial system. The particularity of this work lies in the transmission of monetary policy to the HDI as a new target and not only on income and consumption. In perspective, a comparative study of the money-HDI relationship at the international level should be carried out, in order to identify its specificities by country or group of countries. Moreover, since the HDI can also be improved as an indicator for measuring the human development, it would be advisable to associate other indicators with monetary policy by integrating other more qualitative aspects of assessment into the analysis of the living standard to better assess the targeting of social welfare.

Appendix



Appendix 1. HDI response to monetary policy innovations.
Source: our results.

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