

Bibliometric Literature Review on Exchange Rate: A Future Research Agenda

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Abstract

This study aims to conduct a bibliometric citation and content analysis of the scholarly literature on the behavior and dynamics of the exchange rate (5,295 articles) over the past 85 years between 1935-2020. This research identifies five different research streams such as (i) Dynamics of the exchange rate; (ii) Exchange rate volatility using the autoregressive model; (iii) Relationship between exchange rate and interest rate; (iv) Impact of exchange rate volatility on growth, trade, and investment; (v) Effects of exchange rate fluctuation on firms earning management. In addition to these research streams, the influential articles, authors, journals, organizations, and countries have been evaluated through network diagrams. Finally, sixteen future research questions have been developed through content analysis.

Keywords:

Exchange rate; volatility; behavior; content analysis; bibliometric citation analysis

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INTRODUCTION

Many researchers highlighted international trade imbalances as the more significant reason for the current account deficit that needs an exchange rate adjustment (Bouakez & Kano, 2008; Freund & Warnock, 2007; Huntington, 2015). The hindrance of determining the floating exchange rate in post-1973 with monetary policy, purchasing power parity, and the portfolio model rose plausibly (Meese & Rogoff, 1983). Similarly, the empirical finding of Kesriyeli et al. (2005) suggested that flexibility and economic openness generate current account equilibrium. In this vein, Winkler et al. (2004) analyzed the European Central Bank, stating that most dollarized countries have difficulty maintaining the sustainability of trade balance. In addition, Calvo & Reinhart (2002) investigated inconsistency between the classification of exchange rate regimes used by the IMF and exchange rate regimes applied in certain countries.

Investors, banks, and brokerage houses are more interested in generating huge profits as they invest enormous amounts in international foreign exchange markets that need forecasting of the exchange rate. A huge amount of scattered literature is available on the behavior and dynamics of the exchange rate. Different authors are working on the same pitch to identify the exact white-noise in the exchange rate volatility. This study undertakes a bibliometric citation analysis and content analysis of 5,295 articles from 1935 to 2020 to grab the literature's richness on behavior and exchange rate dynamics (Zupic & Čater, 2015; Sommer & Wohlrabe, 2016; Bahoo et al., 2020).

This study contributes to the literature on behavior and dynamics of the exchange rate by answering three different questions. First, what are the top research streams on the behavior and dynamics of the exchange rate? Second, what are the most influential articles, journals, authors, countries, organizations, and relationships? Third, what are future research inquiries on the behavior and dynamics of the exchange rate?

METHODS

The techniques adopted in the study are bibliometric and content analysis. In bibliometric analysis, this research will use two techniques. First, this research will use citation analysis. Second, this study will also use co-citation and co-occurrence analyses (Bahoo et al., 2019). In addition, traditional content analysis is used to understand the content of articles (Carter et al., 2017; French & Vigne, 2019).

The explanation of the bibliometric analysis key terms and techniques adopted in the study shows in Table 1, following other studies (Agramunt et al., 2020; Terán-Yépez et al., 2020). The first step is the delimitation of the field of study, which is the analysis of the behavior and dynamics of the exchange rate. Secondly, the ISI Web of Knowledge (WOS) database is selected as it contains high-quality journals. In the search engine, 19 different keywords of the exchange rate with fluctuation, monetary policy, interest rate were used to cover the whole literature on the topic. This search gave 6,448 articles on economics and finance, whose titles and abstracts were reviewed to withdraw irrelevant articles. The final sample was made up of 5,295 articles on the

behavior and dynamics of the exchange rate between August 1935 to November 2020. Finally, productivity analysis and scientific mapping were undertaken to offer the leading indicators of bibliometric analysis. In particular, Vosviewer software was used to show the scientific mapping of citation and co-occurrence analysis.

Table 1. Key Methodological Concepts and Sample Selection Process

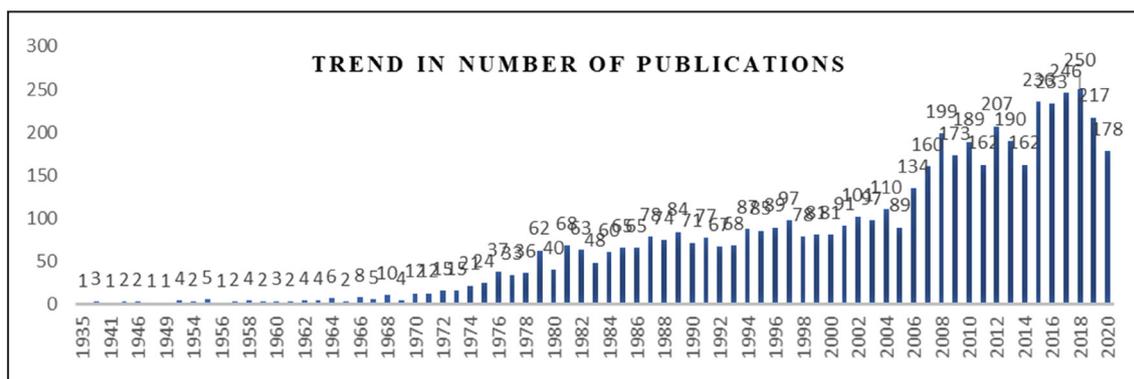
Terms	Details
Co-Citation Analysis	When two articles are cited in a pair by a third one. They are thought to have something in common
Co-occurrence Analysis	This term defines the keyword analysis which is depend on repetition of words
Literature	
Pexc	Total number of articles published on Behaviour and Dynamics of Exchange
TLC	It represents the Total Local Citations which denotes total number of times an article is cited by others in the similar sample
TLC/t	It shows total local citation per year which is calculated by TLC divided by time (See. Mauro 1995).
Sample Selection Process for bibliometric analysis	
Definition of the field of study	Behavior and Dynamics of Exchange Rate
Database	ISI Web of Knowledge
Search formula	(i) Content analysis of different papers on exchange rate in international finance in used to identify the keywords (ii) Create synonyms for exchange rate (iii) 19 Keywords are used on exchange rate "Exchange rate, foreign exchange, currency exchange, conversion rate, exchange value, rate of change, gear box, rate appreciation, national currency, trade places, speed change, currency fluctuation, fixed exchange rate, commodity exchange, spot rate, pledge rate, floating rate, managed rate, variation rate"
Key Filter Used	(i) Search filters: Topics (Search keywords of exchange rate in Author's, Title and Abstract). (ii) Articles Category: Economics (iii) Type of papers and language: Articles and English (iv) Period of Search :1935 to 2020
Initial Sample	6,448
Final Sample	5,295

RESULT AND DISCUSSION

Figure 1 shows the statistics of articles published each year in the literature on the behavior and dynamics of the exchange rate. The more remarkable improvement in the publication is seen in the year 1990, indicating that investors are more interested in the international market, which forces the scholars to conduct more research on the behavior and dynamics of the exchange rate.

Figure 1 shows the statistics of articles published each year in the literature on the behavior and dynamics of the exchange rate. As can be seen, the trend is increasing during the period, showing the research community's interest in the research field. The greater improvement in the number of publications is seen in 2002, when the number of articles exceeds a hundred, which indicates that investors are more interested in the international market, forcing scholars to conduct more research on the behavior and dynamics of the exchange rate.

Figure 1. Publication Trend on Behavior and Dynamics of Exchange Rate (1935 – 2020)



Source: Web of Knowledge

Regarding scientific production, 1,545 journals have published 5,295 articles on the field. In Table 2, the top twenty journals with a greater number of citations and articles published on the topic. In both rankings, the Journal of International Economics offers a greater number of publications and citations that indicate prominent and quality research on the exchange rate because it has a direct or indirect impact on the world's overall economy. On the other hand, the Journal of Policy Modelling has fewer publications on exchange rate behavior and dynamics.

Table 2. Most Influential Journals on Behaviour and Dynamics of Exchange Rate

Rank	Name of Journal	Pexr	Name of Journal	TLCR
1	Journal of International Economics	229	Journal of International Economics	10456
2	Applied Economics	224	American Economic Review	4483
3	Economics Letters	174	Journal of Monetary Economics	3254
4	Applied Economics Letters	142	Economic Journal	2038
5	Economic Modelling	115	European Economic Review	1941
6	Open Economies Review	109	International Monetary Fund Staff Papers	1833
7	European Economic Review	91	Journal of Banking & Finance	1832
8	International Monetary Fund Staff Papers	87	Applied economics	1650
9	International Review of Economics & Finance	86	Economics letters	1638
10	Journal of Banking & Finance	85	Journal of Development Economics	1596
11	Journal of Macroeconomics	81	Journal of Money Credit and Banking	1405

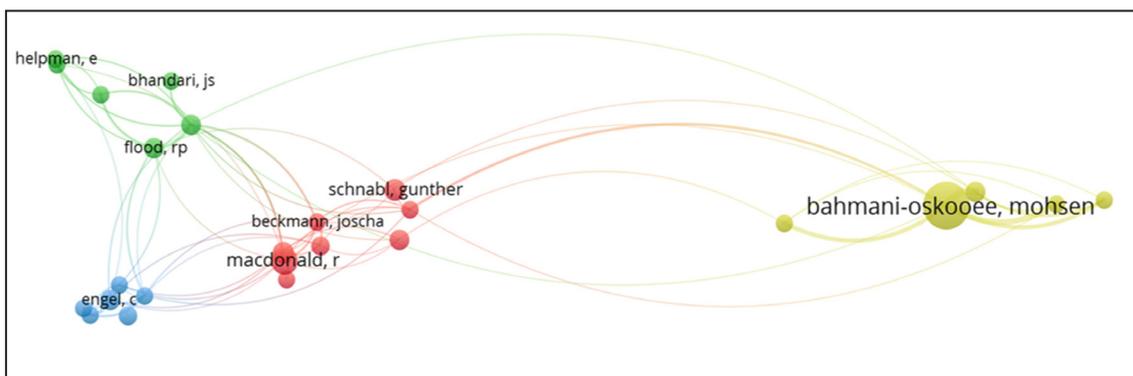
Rank	Name of Journal	Pexr	Name of Journal	TLCR
12	World Economy	80	Economic Modelling	1222
13	Economic Journal	70	International Review of Economics & Finance	818
14	Journal of Development Economics	70	Journal of Macroeconomics	796
15	Review of World Economics	70	Journal of Policy Modelling	717
16	American Economic Review	67	Canadian Journal of Economics	646
17	Journal of Monetary Economics	67	Applied Economics Letters	619
18	Journal of Money Credit and Banking	65	World Economy	604
19	Emerging Markets Finance and Trade	65	Open Economies Review	592
20	Journal of Policy Modelling	62	Review of World Economics	472

This research uses VOS-Viewer software to identify the most influential authors, countries, organizations, and networks among them. This software took WOS data as input and generated output of the most influential authors, countries, and organizations through which the top twenty are selected. The results are in Tables 3 and 4 and the network among them in Figures 2, 3, and 4. Table 3 shows the 20 most influential authors based on leading publications and citations during the last 85 years from 1935- to 2020. Six thousand five hundred seventy-four authors wrote the 5,295 articles that made up the total sample of articles. Figure 2 exhibits the citation network of authors.

Table 3. Most Influential Authors on Behaviour and Dynamics of Exchange Rate

Articles	TLC/t
(Dornbusch 1976)	33.69
(Meese & Rogoff 1983)	31.35
(Phillips 1958)	22.69
(Patton 2006)	18.29
(Bates 1996)	17.73
(Longstaff 1995)	15.13
(Reinhart 2004)	14.52
(Obstfeld & Rogoff 1995)	12.94
(Gali & Monacelli 2005)	12.00
(Andersen et al, 2003)	9.98
(Frenkel 1976)	9.13
(Engle 1990)	8.75
(Flood 1984)	8.65
(Evans & Lyons 2002)	8.19
(Andersen & Chiriaeva 2007)	8.13
(Lothian & Taylor 1996)	7.96
(Krugman 1991)	7.69
(Campa 2005)	7.46
(Frankel & Froot 1987)	7.38
(Calvo 1993)	7.35

Figure 2. Citation Networks between Authors



The citation analysis also reveals 121 countries publishing with 5,295 articles on the behavior and dynamics of the exchange rate in which the top 20 are ranked (Table 4). Based on a greater number of citations and publications, developed countries have more interest in investment in international markets, creating greater research on the exchange rate as it has a direct or indirect impact on the firm, investors, and economy of the country. In the position of the top 20 countries, the USA provides a greater contribution in evaluating the volatilities in the exchange rate to get maximum benefit in the foreign exchange market. Although there is little contribution to developing countries in the exchange rate literature due to insufficient resources, Figure 3. International Monetary funds and different organizations had played a crucial role in the exchange rate research as figure 4 indicates the citation network between the author's organizational affiliations.

In order to identify the research direction on the exchange rate, keyword network analysis is conducted to identify the most repeated words related to the exchange rate. Figure 5 gives the keyword networks that depend on word repetition, showing the associated research areas. Our findings indicate that the most influential and repeated keywords are Exchange Rate, Prices, Models, Volatility, Monetary Policy, Exchange Rate Regimes, Trade, Time Series, Cointegration. On the other side, the keyword with a minor appearance cost, s fit, devaluation, volume, and real.

Co-citation analysis (Cainelli et al., 2012; Rath & Wohlrabe, 2016; Aria & Cuccurullo, 2017; Paltrinieri et al., 2019) and content analysis (Bahoo et al., 2020; Gaur & Kumar, 2018) are undertaken to evaluate the research streams in the past literature on the behavior and dynamics of the exchange rate. Firstly, the top thirty-five cited papers are extracted, which are listed under each research stream in Table 5. Secondly, traditional content analysis on these articles is conducted to understand the content of the articles (Bahoo et al., 2020). This qualitative and quantitative process explain the five different research streams on behavior and dynamics of exchange rate (i) Dynamics of the exchange rate (ii) Exchange rate volatility using autoregressive model (iii) Relationship between exchange rate and interest rate (iv) Impact of exchange rate volatility on growth, trade, and investment (v) Effects of exchange rate fluctuation on firms earning management.

Table 4. Most Influential Countries and Institutions Publishing on Behaviour and Dynamics of Exchange Rate

Country	Pexr	Institutions	Pexr
Usa	1508	International Monetary Fund	190
England	465	University of Wisconsin	99
Germany	270	NBER	77
People r china	266	National Bureau of Economic Research	74
France	209	CEPR	59
Canada	207	Harvard University	49
Australia	204	Centre for Economic Policy Research	34
Japan	156	World Bank	34
Turkey	147	European Central Bank	32
Spain	126	Australian National University	31
Taiwan	125	University of Nottingham	31
South korea	106	University of British Columbia	28
Italy	105	University of California, Berkeley	28
Czech republic	84	Monash University	27
Belgium	81	University of Warwick	27
Brazil	78	Columbia University	26
Switzerland	77	University of Chicago	24
Malaysia	73	Complutense University of Madrid	24
Scotland	71	University of Pennsylvania	24
Netherlands	70	Deakin University	23

Figure 3. Citation Networks Between Countries

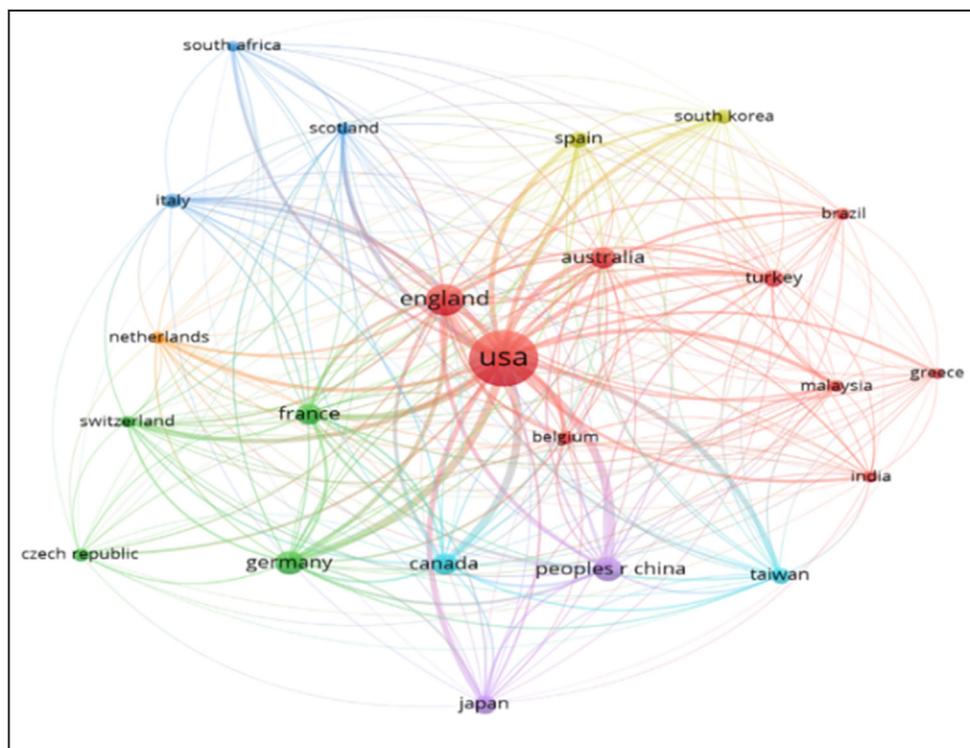


Figure 4. Citation Network Between Author's Organizational Affiliations

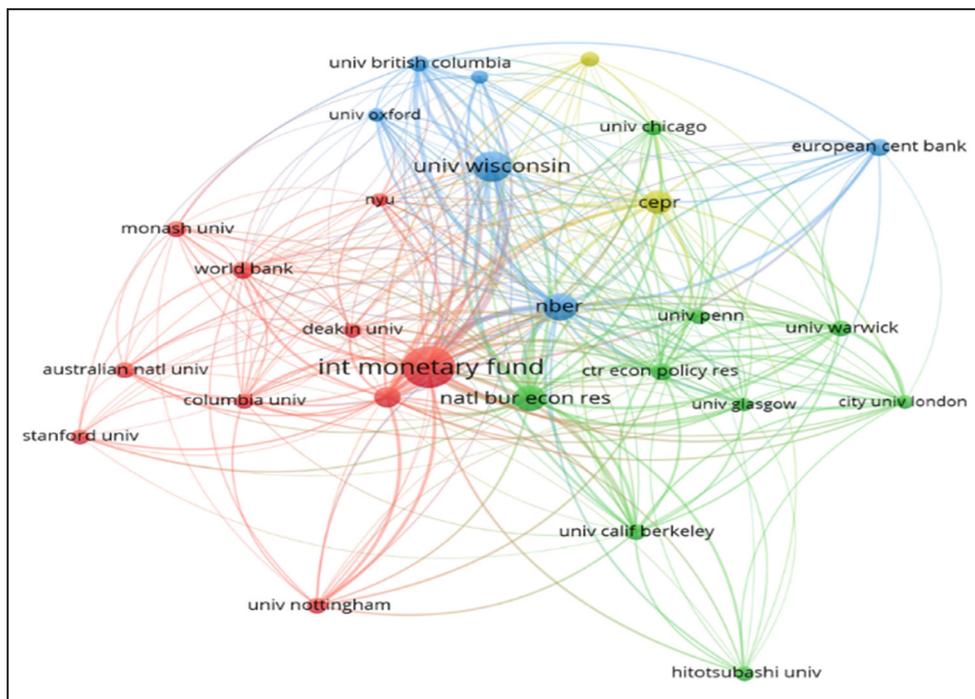
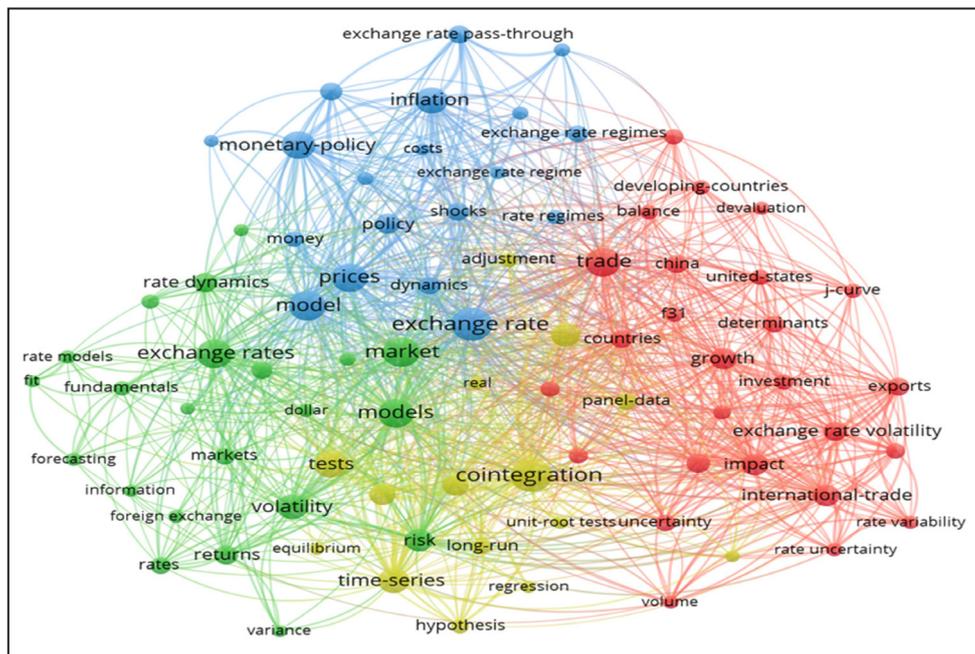


Figure 5. Network of Co-occurrence of Keywords



These five research streams are associated with each other. The first dynamics of the exchange rate (Andersen et al., 2003; Bekaert, 1994; Betts, 2000; Dumas, 1992; Diebold, 1989; Evans & Lyons, 2002; Jorion, 1990; Jorion, 1995; Lothian & Taylor, 1996; Müller et al., 1990) help to detail the volatility in the exchange rate. Secondly, the research stream on exchange rate volatility using autoregressive models (Bates, 1996; Diebold, 1990; Domowitz, 1985; Engle, 1990; Froot, 1990; Hsieh, 1989; Meese &

Rogoff, 1983; Patton, 2006) predicts the random walk-in behavior of exchange rate. The third provides the relationship between the exchange rate and interest rate (Devereux, 2003; Frenkel, 1976; Gali & Monacelli, 2005; Kim & Roubini, 2000; Meese & Rogoff, 1988; Zhou & Mahdavi, 1996).

Fourth, the research stream assesses the impact of exchange rate volatility on growth, trade, and investment (Aghion et al., 2009; Kouri, 1976; Levy-yeyati & Sturzenegger, 2003; Levy-yeyati & Sturzenegger, 2005; Mussa, 1979), help to determine the better investment plans in future. According to our results, the fifth research stream based on the effects of exchange rate fluctuations on firms earning management (Bartov & Bodnar, 1994) needs more attention from different researchers.

We use bibliometric citation and content analysis to identify future research questions (Bahoo et al., 2020). Firstly, we develop a citation map using the top 35 papers. Secondly, we used concepts, development, and elements methodology to create future research questions in the most influential articles that were published in 2018, 2019, and 2020 to escape citation bias. Finally, we put ideas into future research studies that can evaluate the exchange rate volatility in the future presented in Table 6.

Table 5. Key Papers (Citation Map of Literature)

Stream	Stream Title	Key Articles in Each Stream
1	Dynamics of exchange rate	Andersen et al, (2003), Bekaert (1992), Betts (2000), Dumas (1992), Diebold (1989), Evans & Lyons (2002), Jorion (1990), Jorion (1995), Lothian & Taylor (1996), Muller (1990)
2	Exchange rate volatility using autoregressive model	Bates (1996), Diebold (1990), Domowitz (1985), Engle (1990), Froot (1990), Hsieh (1989), Meese (1983), Patton (2006)
3	Relationship between exchange rate and interest rate	Devereux (2003), Frenkel (1976), Gali & Monacelli (2005), Kim & Roubini, (2000), Meese & Rogoff (1988), Zhou (1996)
4	Impact of exchange rate volatility on growth, trade and investment	Aghion et al. (2009), Kouri (1976), Levy-yeyati (2003), Levy-yeyati (2005), Mussa (1979)
5	Effects of exchange rate fluctuation on firms earning management	Bartov & Bodnar (1994)

Table 6. Future Research Questions

Reference	Research Questions
Casarin et al. (2018)	Does Markov-switching vector autoregressive (VAR) model for contagion analysis on financial markets with stochastic correlation efficient?
Gil-Alana and Carcel (2020)	Is fractional cointegration vector autoregressive (FCVAR) technique statistically efficient for dealing exchange rates or other financial series?
Njindan Iyke (2020)	What is the impact of permanent exchange rate uncertainty on real consumption on the short run?
Usman and Elsalih (2018); Ahmed et al., (2018)	What is the impact of exchange rate pass through on macroeconomic indicators using threshold model?
Wen et al. (2018)	Does reserve of crude oil has any impact on the exchange rate?
Guzman et al. (2018)	What is the best competitive and effective multiple real exchange policy to promote economic development?

Reference	Research Questions
Aloui et al. (2018)	How to reduce the lag of the interactive effects between exchange rate volatility and inflation in oil producing countries to enhance the effectiveness of monetary policy in managing inflation
Byrne et al. (2018)	What are the possible ways to account for the time-variation in the coefficients of exchange rate forecasting regressions?
Bahmani-oskooee & Gelan (2018)	What is the impact of the real exchange-rate volatility on disaggregated trade flows in the short and long run?
Fratzscher et al. (2019)	Do foreign exchange interventions impact more permanently on exchange rates?
Bulut (2018)	How can we investigate the predictive power of the information using Google Trends-Based Forecast for exchange rates after the Great recession?
Tang and Yao (2018)	What is the relationship between stock prices and exchange rate in different financial markets to prevent systematic financial risks?
Kumar (2019)	What is the possible avenue to import crude oil and pay in local currency to minimize the effect on the trade balance?
Piccotti (2018)	What are the alternative information structures and their nature that provide guidance in forecasting/determining exchange rate puzzle?
Sharma and Pal (2018)	What are the effects of exchange rate on bilateral trade using disaggregated higher frequency data?
Boubakri et a. (2019)	What is the impact of volatility spread on real exchange rate in financialized commodity markets?

CONCLUSION

Forecasting exchange rate volatility is one of the crucial aspects of international trade and finance. This paper aims to outline the literature on behavior and dynamics of the exchange rate and has a significant impact on economic growth and development. The exchange rate has been studied in various forms (Conversion Rate, Exchange Value, Rate of Change, Gearbox, Speed Change, Fixed Exchange Rate, spot Rate, managed Rate, pledge Rate, Floating Rate). The exchange rate has been specifically associated with exchange rate movements/ fluctuations, intervention and pass-through have been associated with by-literal trade flows, importing and exporting of crude oil, stock prices, real consumption, unemployment, information structure, financialized commodity markets, and monetary policy/regimes under inflation targeting. Hence, it makes it relevant to understand the behavior and dynamics of the exchange rate in the literature from the web of knowledge database using bibliometric citation and content analysis. Based on the findings, the authors recommend working on a similar scholarly contribution by extracting the data from other renowned and authentic databases such as Scopus.

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