



Review Article

Central Bank Transparency and Capital Market Reaction: A Systematic Review

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ABSTRACT

In an expansive test of nations over distinctive geographic districts and over a long period of time, we discover restricted nation and variable-specific impacts of central bank straightforwardness on figure exactness and their scattering among an expansive set of proficient figures of monetary and macroeconomic factors. More communication indeed increments estimate mistakes and scattering. So the aim at this study is a systematic review of central bank transparency and capital market reaction. This study was conducted using a systematic review. At first all papers (n=165) related to keywords (capital market reaction and central bank transparency) searched for Persian and English databases; Google, Google scholar, PubMed covering the period from 2012 through 2022 was performed. Then all qualitative and quantitative papers related to central bank transparency selected and analyzed (n=28). As a result to inclusion and exclusion criteria, papers related to central bank transparency were found and analyzed (n=28). Predefined inclusion and exclusion criteria were: papers related to central bank transparency, papers were Persian and English, types of papers were original and all the papers were free full text. In the initial search, 165 papers were found that after reviewing the titles and abstract articles and removing repetitive and not related, 54 possible related articles were investigated. Of these, 31 papers were omitted from the abstract because of lack of access to the original article and lack of sufficient information. Finally, 28 papers were included in the study.

There are very few studies that have examined the effect of central bank transparency on capital market turmoil. The effect of central bank transparency on the domestic capital market has not been studied. There is no agreement in the literature on theoretical discussions on whether increasing central bank transparency affects capital market turmoil. In foreign research, we can also refer to the study of Dinser and Eichengreen (2007) who have studied this effect empirically using the main transparency index. The present systematic review shows that almost whole of papers on central bank transparency and capital market reaction highlighted similar findings concerning monetary policy decisions.

1 Introduction

In an expansive test of nations over distinctive geographic districts and over a long period of time, we discover restricted nation and variable-specific impacts of central bank straightforwardness on figure

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exactness and their scattering among an expansive set of proficient figures of monetary and macroeconomic factors. More communication indeed increments estimate mistakes and scattering [75].

Until not so long back, central financiers accepted that money related approach choices ought to take the markets by astonish in arrange to attain most extreme affect. Within the final two decades, there has been a move to an approach of expanding straightforwardness with regard to objectives, methodologies, and the premise on which choices are made. This advancement is closely connected to expanded central bank autonomy (CBI), which calls for a balance within the frame of straightforwardness and responsibility. Financial benefits are regarded another key reason for enhanced transparency. As summarized by Freedman and Laxton, it is by and large accepted within the central managing an account community that giving more data almost money related approach may increment its viability. This see is based on hypothetical and observational inquire about that emphasizes the significance of desires approximately money related approach as a key component in deciding intrigued rates and other resource costs.

By bringing advertise behavior in line with money related approach destinations, the probability of strongly varying sees on arrangement activities is diminished. In turn, more certainty approximately when the central bank will set the arrangement rate and its greatness can decrease the instability of showcase intrigued rates, increment the central bank's use over longer-term intrigued rates, and smoothen the joining of approach activities into resource costs. Essentially, [8] contends that the major reason of communicating with the markets is to condition desires almost future financial policy. To transmit the central bank to the open and to markets, and change within the viability of financial arrangement through more prominent straightforwardness requires proactive and well-planned communication. Subsequently, an incredible bargain of consideration has been paid to the way central banks show their key messages (for occasion, [8,46]).

It is expected that central banks will communicate more actively after than before the crisis [8].

Parallel to the shifts within the hone of central keeping money toward more visit communication and more prominent straightforwardness, a growing body of writing has risen. In hypothesis, both positive and negative impacts are likely. Observational work has been centered on swelling, monetary markets, or private figures. A common finding is that straightforwardness and communication decrease instability in budgetary markets, upgrade the consistency of up and coming rate choices, and offer assistance accomplish the financial arrangement objectives, vindicating the switch to more noteworthy our paper contributes particularly to the observational connection between straightforwardness, communication, central bank plan, and private figures. In a broader setting, we offer experimental comes about for the hypothetical writing on the social esteem of data (see, for occurrence, [72, 47])

We run board relapses to look at whether expanded straightforwardness and heightens communication by central banks influence the quality and the cross-sectional conveyance of estimates. The address postured is closest to those of [8, 32, 71, 74,75]. Be that as it may, we amplify the examination along different critical measurements and give compelling proves that's in differentiating with the literature. Transparency covers broadly the strategic, long-term orientation of the central bank toward openness which is subject to only a few changes over time, such as policy objectives, the publication of forecasts, voting records, etc. Communication, on the other hand, focuses on the tactical, flexible aspects in the provision of more detailed and fine-tuned information to the public and the markets [74].

Not at all like past considers, which have in common a compelled number of advanced economies (at most around 30) and by and large brief periods of recognitions and assess variables, the data set we compiled grants us to broaden the scope of the ask in terms of the number of countries, their heterogeneity, the period of examination, and the variables to be forecasted. At long last, our data set as well licenses us to account for a couple of basic monetary events, such as the Mind blowing Control, the money related crisis, and the around the world withdraw, as well as the impressive alterations to central

bank sharpens in their wake—in particular, forward course. We as well analyze the effect of extension focusing on [68].

However, it is important to distinguish the pre-crisis from the post-crisis period. In fact, before the financial crisis, more intense communication lowered the errors in inflation and short-term interest rate forecasts. After the crisis, we find strong evidence that more communication increased the errors in forecasts of inflation and short-term interest rate forecasts and also increased the dispersion of real GDP and long-term interest rate forecasts. Increased transparency had a beneficial effect on the accuracy and dispersion of forecasts before the crisis, but this effect notably weakened after the crisis [54]

Although the effect of communication and transparency on this dimension is important, there may be many other beneficial (or harmful) effects of giving public speeches or being transparent on, for instance, accountability, the public's understanding of monetary policy, and trust in the central bank.

2 Materials and Methods

In this study, a systematic review of all researches conducted on determining the relation of capital market reaction and central bank transparency according to previous studies during 2012-2022 was used. The method of presentation of data in this work includes the determination of the problem under study, data collection, analysis and interpretation of findings.

The above-mentioned protocol as a criterion for searching the papers was used. There was a time limit for conducting electronic searches (2012-2022). To access the information requested from the studies related to our title by using some keywords (capital market reaction, and central bank transparency) searched for E Google, Google scholar, PubMed and Embase. Inclusion and exclusion criteria were: papers related to capital market reaction or central bank transparency, papers were Persian and English, types of papers were original and all the papers were free full text. In order to maximize the search comprehensiveness, the list of sources for all articles related to the subject was handled in a handy manner to find other possible sources.

The main inclusion criterion of articles into this structured review was papers published in Persian and English that examined the capital market reaction and central bank transparency. If there were multiple reports from a study, the most complete one would be chosen. In cases where the full text of the article was not available, the information in the abstract was used, and if the abstract of the article did not provide enough information, that article was excluded from the study.

To select papers and data collection, the subjects of all papers reached by two of the contributors to the study and repetitive papers were omitted initially, so the subject and abstract of the remaining papers were carefully examined and papers with no criteria for entering this structured review were omitted. Finally, the full text of the probably associated papers was investigated; eligible papers were chosen and omitted from the non-relevant ones. At final, associated to inclusion and exclusion criteria 28 papers were found and analyses.

Data were collected based on study characteristics, measures of capital market reaction, central bank transparency. The PRISMA guidelines were followed in performing this systematic review. To avoid subversion, extraction, and evaluation of the quality of papers was done by two independent researchers. If the papers were not submitted, the reasons for refusing it were mentioned. In cases where there was a controversy between the two researchers, the review was done by a third person. In the next step, the information about the selected papers includes the name of the first author, the year and place of the study, the year of the publication, the sample size, general characteristics of the samples, and the reported results in the study. The form has been pre-registered. For quantitative qualitative evaluation of papers, a systematic review of the choice bias (random sequence generation and allocation concealment) implementation (blindness of participants and evaluators), diagnosis (statistical analysis blindness),

sample loss out of the study after randomization, and reporting (selective outcomes report). For this purpose, the risk of bias tool of the Cochrane collaboration group was used.

We excluded papers according to inclusion criteria such as papers related to capital market reaction and central bank transparency central bank transparency, papers were Persian and English, types of papers were original and all the papers were free full text that the information depicts on the Fig. 1.

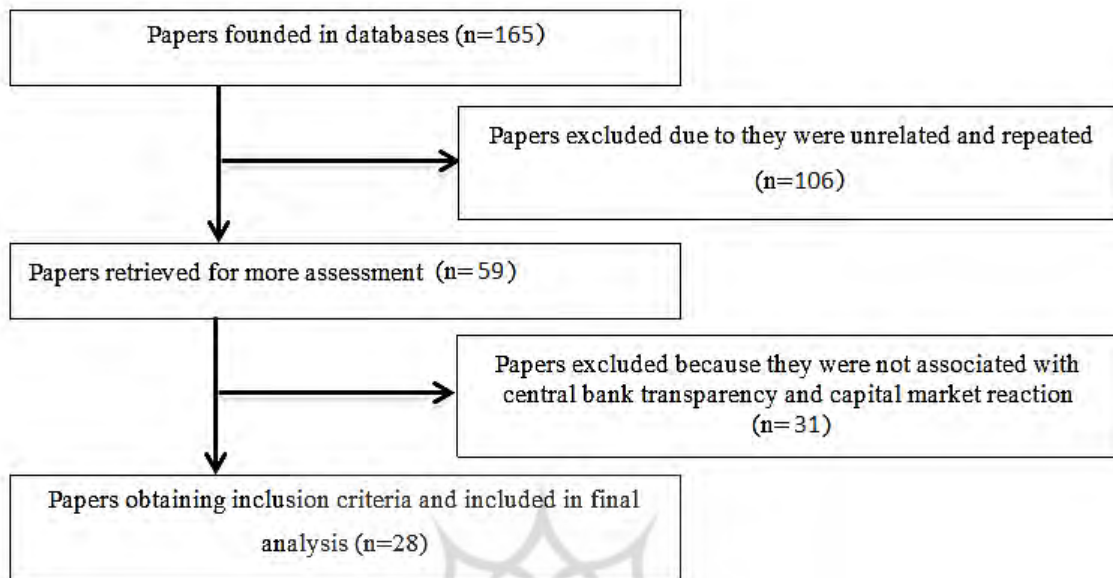


Fig. 1: The Selection Process of Papers Included in This Work

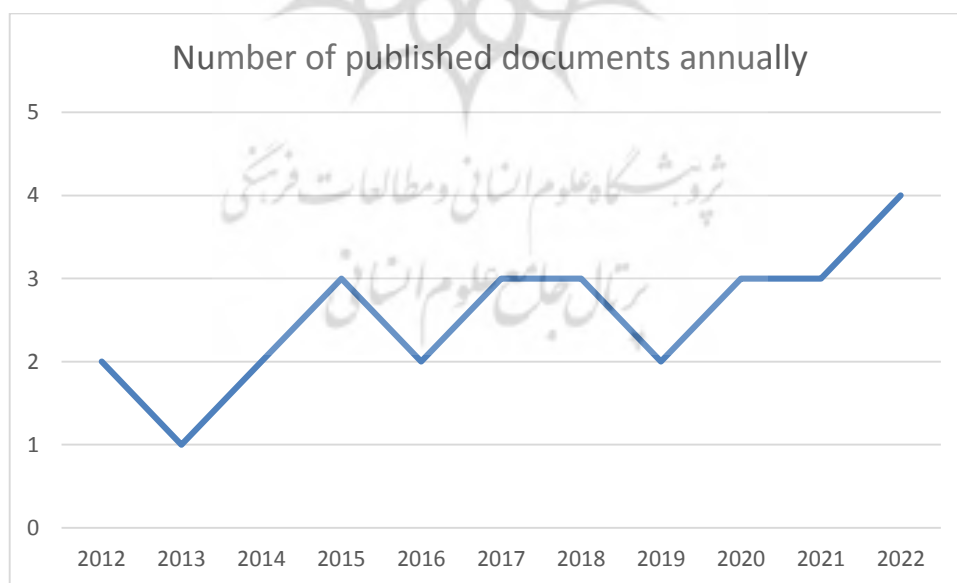


Fig. 2: Trends of Annually Published Documents.

Table 1: Journals of Used Articles by Country

journal	publisher	country	Number of articles
Journal of Money, Credit, and Banking	Wiley	USA	1
Review of Economics and Statistics	MIT Press	USA	1
Economic Systems	Elsevier	NETHERLANDS	1
Review of Economic Studies	Oxford University Press	ENGLAND	1
Open Economies Review	Springer	NETHERLANDS	1
American Economic Review	American Economic Association	USA	1
Economia Politica	Springer	SWITZERLAND	1
Economic Modeling	Elsevier	NETHERLANDS	1
European Journal of Political Economy	Elsevier	USA	1
Journal of Financial Intermediation	Elsevier	NETHERLANDS	1
Review of Financial Studies	Oxford University Press	ENGLAND	1
International Economics and Economic Policy	springer	GERMANY	1
Journal of Economic Dynamics and Control	Elsevier	NETHERLANDS	1
Journal of Common Market Studies	Wiley	USA	1
International Economic Review	Wiley	USA	1
Journal of International Economics	Elsevier	NETHERLANDS	1
International Journal of Finance and Economics	Wiley	USA	1
Journal of Banking and Finance	Elsevier	NETHERLANDS	1
Structural Change and Economic Dynamics	Elsevier	NETHERLANDS	1
International Finance	Wiley	USA	2
Research in International Business and Finance	Elsevier	NETHERLANDS	2
Journal of International Money and Finance	Elsevier	ENGLAND	2
International Journal of Central Banking	The Association of the IJCB	GERMANY	3

3 Results

3.1 Review of Literature

Central banks over the past two decades have become more transparent by providing a lot more detailed information on various aspects of their policies. This raises the question about how systemic risk is affected by greater central bank transparency.

On the one hand, Wu et al, examined a more transparent central bank may benefit market participants, because it can increase the information available to investors, which is conducive to improving the accuracy of their expectations and decisions. [104]

On the other hand, steering market expectations by providing more information may lead to confusion among financial institutions, because few can fully understand the whole connotation. Therefore, Van der Crujisen et al. put forward the view of optimal central bank transparency, believing that it is constructive to provide more information in the case of a low degree of transparency, but when optimal transparency is exceeded, too much information may be harmful. [89]

Conversely, Andrieş et al. show that the relationship between central bank transparency and systemic risk is linear, and that greater central bank transparency leads to more systemic risk. [5]

Dinser and Eichengreen, examined the factors affecting central bank transparency for all countries in

the world (except Afghanistan, Bolivia, Chad, and Ecuador) during the period 1998-2005 using regression analysis. They found that transparency is higher in more developed countries. They found evidence that there is an optimal level of transparency for central banks, and the positive consequences of transparency until it reaches the optimal level will be seen at a declining rate. [27]

Dinser and Eichengreen, used instrumental variables (IV) and the Generalized Torque (GMM) method to investigate whether there is a decreasing return on transparency. For this purpose, they studied all countries of the world (except Afghanistan, Bolivia, Chad and Ecuador) during the period 1998-2006. The optimal transparency of the central bank is checked by adding the square phrase in the transparency index (transparency intensity) to determine the downside of transparency returns. The results show that increasing transparency in the most central banks has the strongest effect on inflation volatility, and evidence of declining returns for transparency has been found. [28]

Finel and Lord, found in their study that optimal central bank transparency is moderate transparency. The results for all countries of the world (except Afghanistan, Bolivia, Chad and Ecuador) and during the period 2005-2006 showed that outside this point, two situations may occur: Individuals may give unrealistic importance to their predictions. Or they may be confused by the sheer volume of information. The potential consequences of these two are to reduce the quality of private sector inflation forecasts.

Weber, examined the impact of central bank transparency on inflation as well as capital market turmoil for OECD countries during the years 1998-2010. In this study, the transparency index of the central bank of Dinser and Eichengreen, has been used. Using the Generalized Torque (GMM) method, he found that transparency significantly reduces inflation rates. Increasing the transparency of the central bank also has a negative and significant effect on capital market turmoil. [31, 96]

Papadamo, Sidiraples, and Spirometers, examined the effect of monetary policy transparency and exchange rate volatility on capital market volatility. Using panel data from 36 countries during the period 1998-2005, they found that increasing central bank transparency reduced exchange rate volatility, which in turn reduced capital market volatility.

Eckler and Litek, examined the effect of central bank transparency on capital market volatility using panel data on 62 currencies during the period 1998-2010. The results showed that increasing access to information on monetary policy objectives reduces capital market volatility.

3.2 Central Bank Transparency

The idea of central bank transparency has been used in various meanings. Dinser and Eichengreen interpret monetary policy transparency as information symmetry between the central bank and the private sector. [31]

Scholars for a long time have believed that monetary policy and financial stability are interrelated. Most discussions on this connection are from the perspectives of interbank interest rates, asset prices, and liquidity. However, current monetary policy not only changes key interest rates, but also includes communication. [98]

Central banks were at first reluctant to make monetary policy transparent, because they wanted to minimize their responsibilities and maximize their prestige, but over the past two decades they have changed their attitude a lot. [42]

Blinder et al. (2017) identify two key factors for the positive shift in the monetary policy operations of central banks from mystery to transparency - accountability and economic efficiency. [8]

In addition, some scholars highlight that increasing central banks' transparency is not only helpful to enhance their reputation and credibility, but also to avoid policy ineffectiveness problems caused by time inconsistency [68]

Scholars have conducted a lot of research on the advisability of central bank transparency but the results

are inconclusive. Most scholars believe that higher central bank transparency helps market participants recover and maintain confidence in the financial system through stabilizing public expectations and improving market efficiency, so as to reduce financial markets' fluctuations [67]

For example, Kia highlights that a higher degree of central bank transparency could reduce post-event risk and pre-event risk, and the findings of Papadamou et al. show that higher central bank transparency leads to a steadier decline in stock returns, which is of great benefit to financial stability. The increase of central bank transparency may also cause systemic risk to rise. [78]

For example, Andrieş et al. find that greater central bank transparency creates incentives for banks to engage in risky activities that increase individual contribution to the risk of the banking system. [5]

Different from their opinions, Dincer et al. highlight that central banks should maintain appropriate transparency. Van der Crujisen et al. and Horváth & Vaško also believe that there is an optimal value for central bank transparency, beyond which more information tends to mislead investors. From the above viewpoints, the effect of central bank transparency on financial system is highly controversial. [29], [89]

Production fluctuations refer to the deviation of production from its trend. Capital market turbulence is the standard deviation of changes in the relative values of GDP. Turbulence index is an index that changes over time and has a cluster property; That is, although actual changes in production values may be uncorrelated; But second-order conditional moments may be time-dependent. Thus, turbulence is related to second-order torque and refers to changes that are slippery and volatile; whereas, fluctuations are related to the first-order torque and refer to the condition in which the frequency of a quantity changes.

There are very few studies that have examined the effect of central bank transparency on capital market turmoil. The effect of central bank transparency on the domestic capital market has not been studied. There is no agreement in the literature on theoretical discussions on whether increasing central bank transparency affects capital market turmoil. In foreign research, we can also refer to the study of Dinser and Eichengreen who have studied this effect empirically using the main transparency index. [27]

The move towards greater transparency by central banks has worked well; but, can there be an optimal level of transparency, or in other words, can the benefits of transparency be maximized at one level and then reduced?

Effinger and Geratz have identified five aspects of central bank transparency, including political transparency, economic transparency, procedural transparency, policy transparency and operational transparency. Political transparency refers to revealing the goals of monetary policy to the people. Economic transparency focuses on the economic information used in monetary policy. Procedural transparency about the decision-making process for monetary policy (including policy reviews and voting records. Policy transparency refers to immediate disclosure and explanation of policy decisions [53]. Operational transparency is related to the steps taken to implement the policies adopted by the central bank. Given that the Dinser and Eichengreen transparency index includes these five aspects, it can be said that the possible differences between the 32 countries studied are largely taken into account in the five aspects of the index.

3.3 The Importance of Central Bank Transparency

There are two main reasons for increasing the transparency of central banks. First, transparency can be seen as another aspect of central bank independence. Society demands transparency from independent legal institutions. This is an essential prerequisite for accountability and accountability.

Accountability is a natural consequence of increasing the central bank's authority. If monetary policy-makers have instrumental independence, there is no direct way for the public to control or influence

central bank metrics; therefore, monetary policymakers desperately need to explain and justify policy decisions as independence increases [33]

Central banks in choosing their tactics more freely and gaining more authority in setting and pursuing goals, transparency acts as a mechanism by which the public can evaluate the central bank's actions in terms of compliance with its obligations and powers. Another reason for the increase in central bank transparency in recent years is that from an economic point of view, certain degrees of central bank transparency are desirable. Many studies show that transparency increases welfare and can lead to better economic consequences. In fact, increasing the transparency of the central bank is part of the overall trend of increasing the transparency and efficiency of government institutions in response to public pressure to make the government more accountable to the public.

3.4 Optimal Transparency

Central bank transparency can not only affect capital market turmoil; there must also be an optimal level of transparency. If full transparency means disclosure of all economic policies that the central bank considers; In that case, full transparency is certainly not the best choice; because in the worst case, the information can be misleading, saturating, incomplete, irrelevant or incomprehensible. Also, full openness can expose central banks to political pressure.

Fonder Kreijssen, Effinger, & Hogdine found that a high level of transparency can lead people to think that the central bank is uncertain about economic conditions, which will exacerbate the turmoil. Nevertheless, the optimal state is the degree of transparency between zero and full openness. In this article, the square term of central bank transparency (also called transparency) is used to achieve optimal transparency.

3.5 The Role of Transparency and Credibility in Monetary Policy

The previous example illustrates that monetary policy primarily works through expectations about future changes in short-term interest rates. It is therefore useful to think of any interest rate decision as "the first step along a path", as [8]. In other words, it is not so much current short-term interest rates which define the stance of monetary policy. What matters is what financial market participants expect the future path of short-term interest rates to be, as well as the consequences of that path on financial markets and ultimately on the real economy.

Setting the interest rate at official board meetings is therefore only one part of conducting monetary policy. The other part relates to the release of information that affects market expectations. Monetary policy is really conducted whenever a central bank releases information that affects markets' expectations about the future path of short-term interest rates and about the expected effects of that path on the economy. Monetary policy could therefore be defined as the process of managing expectations about the future path of the monetary policy instrument and the probable effects of that path on the economy. In this context, transparency is a crucial element of a successful monetary policy strategy.³ If a central bank wants to implement its monetary policy strategy efficiently, it should communicate its intentions and expectations to financial markets and to the public as clearly as possible. In other words, based on its assessment of the available data, it should lay out the likely direction of the monetary policy path as well as the expected economic effects of that path. Central bank transparency then allows markets to better anticipate the future path of short-term rates, the effect of this path on other financial market prices and ultimately the impact on the real economy. The monetary policy transmission process is thus rendered more efficient.

Transparency has a second advantage: It reduces uncertainty and may therefore lead to lower volatility in various financial markets. If markets can better anticipate the behaviour of a central bank and the

effects of monetary policy, there should be less scope for monetary policy surprises, better anchored inflation expectations, less monetary policy-induced volatility in asset prices and ultimately less macroeconomic volatility.

Less volatility should translate into a lower risk premium and may thus promote investment and positively affect economic growth. Lower risk premiums also lead to higher asset prices. Indeed, throughout the world and for most asset classes, there seems to be a trend in recent years to higher valuations. These higher valuations can probably partly be attributed to the reduction of the risk premium due to lower expected volatility. To the extent that market participants correctly gauge a reduction in the risk premium, higher asset valuations can be expected to endure and represent lasting wealth creation.

There is a third reason why central bank transparency has become pertinent. With the world's capital stock growing faster than the world's economies, real effects attributable to asset prices are becoming more important.⁴ On the one hand, this is good news, as it creates wealth and strengthens the transmission process of monetary policy. On the other hand, a sudden increase in asset price volatility could have more adverse consequences for the real economy than what we might infer from past experience. If that is so, central banks clearly have an incentive to avoid becoming the source of unnecessary asset price volatility. The growing importance of balance sheet considerations in monetary policy only reinforces the importance of transparency in central bank communication.⁵

Finally, let me make an obvious but nonetheless crucial point, even if it goes beyond today's topic. Transparency is a valuable good in its own right. For good reasons, central banks are powerful and for the most part politically independent institutions. Moreover, the officials who run central banks are typically appointed for lengthy terms and are difficult to remove from their positions. Transparency is a crucial element in creating democratic legitimacy for politically independent institutions whose actions can have wide-ranging consequences for a country's citizens and its elected government. As former Fed Chairman Alan Greenspan (1996) said ten years ago, it "cannot be acceptable in a democratic society that a group of unelected individuals are vested with important responsibilities, without being open to full public scrutiny and accountability."

Transparency is of little use if markets and the public do not believe what a central bank says. Credibility is therefore a condition that is a *sine qua non* for a successful monetary policy. How can credibility be established? [8] summarises credibility as a "painstakingly built up history of matching deeds to words". A long history of actually matching deeds to words, of honest communication and a reputation for delivering price stability will therefore ensure central bank credibility. In practice, only a small number of central banks can draw on a sustained history of successful monetary policy, amongst them, the Federal Reserve, the Bundesbank and the Swiss National Bank. Fortunately, in recent years, an increasing number of central banks are rapidly accruing credibility in that painstaking process referred to by Alan Blinder. [34]

When we think about expectations, transparency and credibility in the context of monetary policy, it is important to remember that they cannot and should not be substitutes for action.

3.6 How do Financial Markets Affect Monetary Policy?

As I mentioned at the outset, the link between monetary policy and financial markets is not a one-way street. Financial market prices reflect market expectations about future economic developments, such as inflation, output, and the likely course of monetary policy. It is therefore natural and appropriate for central banks to evaluate closely the information contained in market prices. In other words, market expectations can and should influence the setting of monetary policy. However, central banks must exercise caution in using the information extracted from market expectations as an input to formulating monetary policy.

My previous comments illustrate that the more credible and the more transparent a central bank is; the more market prices will reflect the central bank's own expectations about the future. In other words, the information value of financial market prices for monetary policy purposes decreases to the extent that they no longer reflect an independent evaluation by millions of market participants about probable future developments in the economy and in financial markets.

An example may illustrate the potential pitfalls of a central bank relying excessively on market expectations in formulating policy. Consider a country with a liquid inflation-indexed bond market. In principle, these bonds reflect what the market expects inflation to be in, say, ten years time. Now, imagine a highly credible and transparent central bank with an inflation target of 2%. If the credibility of this particular central bank is such that, no matter what it does in the short run, market participants believe that inflation in the long run will remain solidly anchored at 2%, then the 10-year inflation-indexed bond will always reflect an expected inflation rate of 2% in ten years' time.

If the central bank takes excessive comfort from the fact that market expectations reflect stable inflation expectations, it may over time deviate from the optimal policy path. At some point, markets will detect the policy error. In such an admittedly extreme scenario, the likely reaction of the market place would be a sudden adjustment of inflation expectations with a corresponding costly loss of credibility for the central bank. [38]

This example illustrates what [8] calls the "dog chasing its tail" problem: Financial markets look for guidance from the central bank, the central bank looks for guidance from financial markets, and both parties temporarily lose sight of the underlying factors determining inflation, namely the output gap in the short to medium-run, and money growth in the long-run. To avoid this trap, central banks should exercise due caution when making use of financial market expectations. Financial markets provide useful information for a central bank in search of the optimal monetary policy path. But, as [52] recently put it, central banks must ensure that they do "not end up merely executing the expectations developed in the market". The information about expected future developments reflected in market prices must be continuously cross-checked against a wide range of monetary and economic indicators in what amounts to a "checks and balances" approach to monetary policy.

3.7 The Impact of Central Bank Transparency on Systemic Risk as a Market Reaction

When central banks change from "confidential" to "open", more information disclosure by the them enables the public to form more accurate expectations of economic development trends, which are conducive to reducing financial markets' volatility. [30], [104]

However, when a large amount of information fills the market, more information will lead to confusion and deteriorate people's prediction quality. The effect of central bank transparency is likely to be influenced by the quality of macro-prudential regulation. For example, when a country suffers from problems in information disclosure, it is difficult for the public to fully trust the information released by the central bank at the beginning. Increasing information disclosure is likely to lead to market chaos. However, after the public gradually trusts the "transparent" central bank, increasing central bank transparency will still play a positive role in reducing confusion.

Based on the systematic review of research literature, the impact of central bank transparency on systemic risk is assessed using the *Ordinary Least Square* method with bank fixed effects (*OLS FE*). The baseline model has the following form:

$$Risk_{ij,t} = \beta_0 + \beta_1 \times Central\ Bank\ Transparency_{j,t-1} + \beta_2 \times Bank\ controls_{ij,t-1} + \beta_3 \times Macro\ controls_{j,t-1} + \delta_i + \phi_t + \epsilon_{ij,t} \quad (1)$$

The dependent variable, $Risk_{ij,t}$, is represented in a first step by the contribution to systemic risk of

bank i from country j in year t . In a second step, the dependent variable takes the form of individual risk of bank i from country j in year t . *Central Bank Transparency* $_{j,t-1}$ is the main regressor of interest and is associated with the central bank of country j at $t-1$. *Bank controls* $_{ij,t-1}$ represent differences in risk profiles and business strategies among banks (the logarithm of total assets, as proxy for size; the ratio of equity to total assets, as proxy for solvability; net loans to total assets as proxy for specialization; customer deposits to total liabilities, as proxy for the funding structure; and, the return on average assets, as proxy for performance) at $t-1$. We also use country-level controls (*Macro controls* $_{ij,t-1}$) to account for the heterogeneity across different banking systems and macroeconomic environment (central bank assets to GDP, GDP per capita growth, inflation and the Lerner index as proxy for competition within the banking market). To control for unobserved heterogeneity, we add country fixed effects (δ_i) and year fixed effects (ϕ_t).

$\varepsilon_{ij,t}$ is an error term corresponding to bank i from country j in year t .

Further, we include three regulatory indices (Central Bank Independence, Central Bank Involvement in Supervision, and Regulatory Quality Index)⁹ in a *Difference-in-Differences* approach, as below:

$$\begin{aligned} Risk_{ij,t} = & \beta_0 + \beta_1 \times Central\ Bank\ Transparency_{j,t-1} + \beta_2 \times Central\ Bank \\ & Transparency_{j,t-1} \times Regulatory\ index_{j,t-1} + \beta_3 \times Regulatory\ index_{j,t-1} + \quad (2) \\ & \beta_4 \times Bank\ controls_{ij,t-1} + \beta_5 \times Macro\ controls_{j,t-1} + \delta_i + \phi_t + \varepsilon_{ij,t} \end{aligned}$$

We construct dummy variables that take the value of 1 if the regulatory indices are greater than the median value of the entire sample and 0 otherwise and interact them with the *Central Bank Transparency* variable. Central Bank Independence Index is an updated version of Cukierman et al. (1992)'s index by Bodea and Hicks (2015). The measure is composed of four dimensions relating to appointment, dismissal, and term of office for the head of the central bank; the resolution of conflicts between the executive branch and the central bank; the objectives of the central bank and the rules limiting lending to the government. Higher values are associated with a greater independence of the central bank. Central Bank Involvement in Supervision Index captures the roles taken by the central banks in supervising financial institutions and is provided by Masciandaro and Romelli (2017). The indicator takes the minimum score in countries where no supervisory responsibilities are assigned to the central bank, and the maximum score otherwise. [2], [5], [12], [84]

This paper discusses whether central bank independence can moderate the effect of central bank transparency on systemic risk. According to this systemic review the moderator CBI has two kinds of effects on the U-shape relationship between CBT and systemic risk. The dimensions included are as follows: (i) involvement of the central bank in the banking sector supervision; (2) the sharing of supervision among the central bank and other authorities; (3) central bank is responsible only for the banking supervision; (4) central bank is responsible for a unified supervision of the banking and insurance sectors; (5) central bank is responsible for a unified supervision of the banking and securities markets sectors; and, (6) central bank is responsible for a unified supervision across of the entire financial sector. Regulatory Quality Index is provided by World Bank (World Governance Indicators database) and captures perceptions of the government's ability to formulate and implement sound regulatory policies that promote private sector development.

4 Discussion and Conclusion

We utilize the foremost comprehensive degree of central bank straightforwardness in terms of nation

and time scope based on an expansion of the multiple-dimensional straightforwardness list of [7] displayed by [30]. The file incorporates five measurements: political straightforwardness, financial straightforwardness, procedural straightforwardness, approach straightforwardness, and operational straightforwardness. Each measurement covers three questions—for occasion, does the central bank have an express objective? Does the central bank unveil macroeconomic models? Does the central bank distribute voting records of their board individuals? The file has yearly perceptions from 1998 to 2010 for 120 central banks.⁶ A score for each central bank between (least straightforwardness) and 15 (most extreme straightforwardness) can be gotten. We degree straightforwardness by the upgraded values of Dincer and Eichengreen, which expands the perceptions detailed in [29] by four more a long time, until 2014.

Proponents of transparency believe that transparency is a useful tool that helps central banks to be able to guide and manage market expectations. Public expectations about the goals and tools of monetary policy have a significant impact on the current and future state of the economy. The central bank's communication policies will help households and businesses better understand, recognize, and anticipate monetary policy and able to respond appropriately to future policy decisions and information. This result is in line with the theories of proponents of transparency such as [30, 38, 87]. Therefore, the central bank's communication policies and greater transparency can be a two-pronged tool, while it can effectively inform and message the monetary policymaker by creating public knowledge and by managing and coordinating the expectations of brokers. Increase the central bank's ability to influence economic outcomes and increase the efficiency of monetary policy. Mistakes are transferred to the market due to their coordinating role in managing expectations and cause a gap between the fundamentals of the economy and market expectations from the state of the economy and lead to a lack of appropriate resources [73]; Therefore, in low-income countries where economic agents have more uncertainty about the state of the economy and the probability of central bank error increases due to more information, institutional, etc. restrictions, the central bank should be more obsessed with how to inform and communicate with economic agents. And optimal communication policy can be a degree of non-transparency. Accordingly, they do not consider short-term deviations from the target to indicate a lack of commitment, and do not quickly raise their inflation expectations and, consequently, the demand for wage and price increases and adjust accordingly; Therefore, if, despite greater transparency, the central bank's credibility increases and the expectations of economic actors are in line with the central bank's future actions, any change in monetary policy will have significantly less destructive effects. In contrast, in low-income countries, where central banks generally do not have a good reputation, economic actors are unsure. Inflation is what is taken from the central bank's signal and considers the possibility of inflation worse than what is inferred from the central bank's information about inflation targets, and also makes it more likely that the central bank will deviate from its goals and plans; Therefore, inflation expectations will not be in line with the goals and trends of the central bank and the cost of de-inflation will increase. In general, the effects of central bank transparency on inflation fluctuations vary for low-income and high-income countries. The effect of central bank transparency on the stability of the economy, and especially on the management of expectations, depends on the reputation of the central bank and the commitment of the monetary authority to maintain low and stable inflation. Given that different countries in revenue generally differ in terms of governing institutional framework, quality of governance, and central bank independence, it seems that in high-income countries with more committed and independent central banks, central bank transparency can have the effect of economic stability. Increase; But in the case of low-income countries, where central banks generally lack sufficient independence and are less able to meet their obligations, more central bank transparency has the opposite effect on

the central bank's reputation for controlling private sector expectations. Of the countries, greater transparency increases economic instability; therefore, in order to strengthen the effectiveness of the central bank's transparency in controlling inflation fluctuations, the central bank needs to be credible and independent so that it can commit to committed policies on future inflation and, in this case, influence inflation variability by controlling inflation expectations. In addition, reforming the central bank's institutional structure to improve the quality of governance and central bank independence can play an important role in the central bank's credibility by reducing inflationary bias, reducing monetary authorities' efforts to deflation, and thus, with greater transparency, the central bank can fluctuate. Control inflation and make it possible to achieve lower inflation.

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