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The impact of central bank independence on the cost of capital: a cross-country analysis

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Abstract

The theory of central bank independence is clear, but there is limited evidence to support the benefits. In this study, we investigate whether central bank independence impacts the cost of capital. We perform a cross-country panel data analysis of 23 developed and 17 emerging countries in this study and find international variations in the cost of capital associated with varying degrees of central bank independence. Specifically, we find that central bank independence reduces the country's equity risk premium. Further analysis shows that central bank independence has pronounced effects in reducing the cost of capital in emerging countries. Our study suggests that greater central bank independence results in lower levels of cost of capital. This study findings are consistent with alternative cost of capital measures, and also robust to a quasi-natural experiment using a difference-in--differences, placebo test, hierarchical cluster, and the Newey-West standard error. Overall, the results of this study suggest that a country's government attracts foreign investors by strengthening central bank independence.

Keywords: central bank independence, monetary policy, cost of capital, international portfolio investment

JEL: E5, E6, F3, G11, G15, G31

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1. Introduction

Is central bank independence (CBI) important when evaluating investment opportunities? An appraisal of investment opportunity or an assessment of the cost of capital provides information to investors regarding the projection of the investment's risks and return. We show in this paper that central bank independence affects the cost of capital, and hence central bank independence is significant in cross--border investment. The central bank's influence on the economy and financial system in a country is unquestionably important. Most countries provide the best allocation and prioritise the banking sector in the country to minimise financial market contagion risk in the global economy (Castiglionesi 2007). The central bank controls the money supply and interest rates in addition to supporting open market activities and regulating requirements of the reserve. A credible monetary policy can maintain financial stability, reduce inflation, lower unemployment, and strengthen economic prosperity. In addition to financial stability, central bank activity can influence foreign exchange rates (Eichengreen 1998; Blinder 1998; Maxfield 1997).

Due to divergent policy preferences between central bank authorities and political governments, central bank independence has become crucial (Goodman 1989). The central bank's independence is characterized by its capacity to govern and control monetary policy instruments without political influence. The European Central Bank (ECB) defines central bank independence as a safeguard against the temptation to manipulate monetary policy. Eijffinger and de Haan (1996) demonstrate that central bank independence is influenced by a broad range of economic and political factors, including inflation, public choice, and the time inconsistency problem of monetary policy. The optimal level of central bank independence is described as a balance between credibility and flexibility of monetary policy while maintaining price stability (Cukierman 1994).

The extant literature suggests that the firm's capital structure and investment decisions are influenced by country-specific factors along with firm-specific ones (Demirguc-Kunt, Maksimovic 1999; Booth et al. 2001; Claessens et al. 2001; Bancel, Mittoo 2004). Investors expect the yield on new investments to be greater or equal to the cost of capital employed to finance the investment. Investing in foreign countries often carries additional costs, hence foreign investors expect a premium to cater for this additional risk (Bodnar, Dumas, Marston 2003). The actions of the central banks may affect investor returns during transitions in monetary policy, and central bank independence may enhances policy credibility. A rise in the key interest rate, for example, triggers an increase in the short-term market rate. Soaring interest rates reduce the money supply, causing inflation to shrink. On the other hand, low interest rates increase money in circulation, grow the demand in the economy and accelerate growth, while inflation goes up. Inflation and interest rates influence the cost of capital, and a rise in the cost of capital limits the availability of investable assets to investors. Independent central banks may strengthen price stability or fiscal discipline in countries by improving the rule of law, and reducing restrictions on investment, and press freedom; this can convey a reliable signal to potential investors (Bodea 2013; Broz 2002; Keefer, Stasavage 2003).

Prior studies have examined the relationship between the central bank and the capital market (Förch, Sunde 2012; Jubinski, Tomljanovich 2013; Papadamou, Moïse, Eleftherios 2014; Papadamou, Sidiropoulos, Spyromitros 2017), central bank independence (CBI) and financial stability (Klomp, de Haan 2009, 2010a, 2010b; de Haan, Kooi 2000; Dincer, Eichengreen 2014), and CBI and economic performance (Barro, Gordon 1983; Rogoff 1985; Arnone et al. 2007; Agoba et al. 2017; Kokoszczyński,

Mackiewicz-Łyziak 2020). However, there are scant studies on the relationship between central bank independence and the cost of capital. This study will fill the gap and extend the current literature. This study will contribute to policy formulation and decision-making processes, given the significant impact that central bank policies have on the cost of capital. These policies exert influence liquidity conditions, interest rates, market sentiment, and inflation expectations. Decisions made by central banks are attentively monitored by corporations, investors, and politicians for their effects on the cost of capital and overall economic circumstances.

To that end, we complement the numerous studies and extend the literature concerning the central bank, financial market, and the economy (see de Haan, Kooi 2000; Klomp, de Haan 2010b; Arnone, Romelli 2013; Dincer, Eichengreen 2014; Agoba et al. 2017; Kokoszczyński, Mackiewicz-Łyziak 2020; Kwabi, Boateng, Du 2020) by documenting that CBI is an important deciding factor on the cross--country variations of the cost of capital via impact on cross-border equity portfolio. We show that countries with a higher CBI have a lower cost of capital even after adjusting for other country-specific determinants as well as the effects of country and year, using data from 40 countries from 2001 to 2014. Our study confirms that countries with a lower cost of capital are associated with higher CBI, which attracts more international equity portfolio investors to the host country. This study unveils the diverse role of the central bank regarding international portfolio diversification. We extend the literature on central banking by showing that the consequences of the integrity of financial institutions as a central bank have far-reaching consequences on the economic condition of a country. Our study advocates for the strengthening of central banks and similar institutions in developing and emerging countries since this can attract international equity portfolio investments. We also advance the literature in terms of methodological robustness by employing quasi-natural experiments using the difference in differences (DiD), placebo test, hierarchical cluster analysis, fixed effects and double clustering regressions, and the Newey-West regression with standard error.

The rest of the paper is organized as follows. Section 2 reviews related literature and hypothesis development. Section 3 describes the data employed in the study. Section 4 discusses the empirical results. Section 5 is the conclusion.

2. Related literature and hypothesis development

2.1. Central bank independence and monetary policy

The independence of a central bank (CBI) refers to the bank's capacity to develop and implement monetary policy instruments without political intervention. In other words, national governments may place constraints on monetary policy preference over their political agenda and short-term political gain. Central bank independence evaluates the degree to which central banks are free from government control. However, the degree of CBI is not the same across countries around the globe as is the regulatory framework or the strength of the country's prevailing democracy. Prior studies have emphasised the importance of a good regulatory environment for financial stability (Horvitz 1995; Wall, Eisenbeis 1999). A stable and reasonable level of inflation is achievable by protecting monetary policy from political interference (Klomp, de Haan 2009; Berger, Kißmer 2013). An independent central bank's monetary policy would have a true effect on the economy that acts more predictably and

fosters market stability, which eventually contributes to a country's prosperity (Arnone et al. 2007). Bernhard (1998) defines the operational independence of the central banks as the power to control and oversee monetary policy tools. CBI also includes the central bank's power to allocate personnel independently, issue and buy financial instruments, and give policy guidance without any political or government intrusion (Eijffinger, de Haan 1996). Within central bank independence, the central bank's personnel ensures that the government has no influence on the members of the board of directors or key personnel within the institution. On the other hand, a financially independent or financially strong central bank refers to the fact that the bank has adequate resources to achieve its primary policy objectives. A central bank is said to have policy independence if it has the capacity to select monetary policy instruments or set its goals and objectives without restrictions from the government (Debelle, Fischer 1994).

The rationale for the central bank's independence stems from two analytical perspectives in particular; the time inconsistency concept and the principal-agent structure. The concept of time inconsistency based on analytical techniques is based first on the conservative approach and then on the central banker's agent theory approach (Kydland, Prescott 1977; Barro, Gordon 1983; Rogoff 1985; Walsh 1995). The concept of time inconsistency suggests that the government has a suboptimal inflation bias. Independent central banks use monetary policy to maintain inflationary stability rather than to achieve governments' social welfare aims (Rogoff 1985). Rogoff (1985) demonstrated that inflationary bias can be minimized by delegating monetary policy tools to an independent central bank. Walsh (1995), on the other hand, recommends the establishment of the principal-agent structure to incentivise central bankers to address the issue of inflation bias. Walsh argues that implementing a contract that penalises central bankers when inflation deviates from the optimal level can be reduced inflation bias. Walsh (1995) claims that the fundamental principle of this concept is that the principal (government) selects an agent (central bank) and enters into an agreement to limit the incentives that the bank confronts while conducting monetary policy. To achieve good macroeconomic outcomes in the economy, the independence and transparency of the central bank are crucial (Arnone et al. 2007). Bernanke (1993), on the other hand, suggests that empirical examination of the quantitative importance of the money and credit channel can be limited. The author suggests that the Federal Reserve can affect the long-term real interest rate and that investment reacts significantly to changes in real interest rates in the United States.

2.2. Central bank independence and cost of capital

Monetary policy and the state of the economy have a bi-directional interaction and influential effect. Interest rates, inflation, and currency exchange rates all have a considerable influence on capital investment and planning decisions. Kuttner and Posen (2001) show that appointment of a central bank governor has an impact on exchange rates and bond values. Kuttner and Posen (2001) argue that the market reacts strongly to key appointments linked to lower-level central bank independence. Moser and Dreher (2010) demonstrate that the higher-rate central bank governors turnover has an impact on stock market yields. Förch and Sunde (2012) argue that stock market returns are favourably connected to central bank independence however, political independence is far less significant than central bank economic independence.

The existing study suggests that increasing central bank independence reduces stock market volatility since there is a positive association between central bank independence and transparency in the capital market (Papadamou, Moïse, Eleftherios 2014; Papadamou, Sidiropoulos, Spyromitros 2017). In recent years, central banks' functions have expanded beyond monetary policy formulation that include setting investor expectations on financial markets through speeches, reports, and policy positioning. Using intraday data, Jubinski and Tomljanovich (2013) find that soon after the FOMC minutes are issued, the Federal Reserve pursues a restrictive (expansive) monetary policy that intensifies market volatility. In this line, Kurov (2012) demonstrates that higher conditional volatility in stock yields is positively associated with monetary policy statements.

Monetary policy and economic conditions interact, and central bank independence may enhance policy credibility and economic growth. Studies show that the capital market and the cost of capital is a crucial consideration when making international investments (Chatelain, Teurlai 2004). The extant research consists of several diverse observations regarding the influence of central bank independence on the cost of capital. Existing studies (Alesina, Summers 1993; Cukierman, Webb, Neyapti 1992) show that central bank independence has no effect on the risk premium on the shift of the real interest rate. In contrast, Spiegel (1998) claims that the Bank of England reform in 1997 reduced inflation expectations as well as long-term bond yields. On the other hand, Moser and Dreher (2010) demonstrate that the spread of sovereign bonds in emerging countries is a consequence of the central bank governor's turnover. Maxfield (1997) demonstrates that there is a statistically significant association between legal independence and the share of private investment in GDP growth. Studies show that political pressure enhances the possibility of governments' capacity and desire to repay loans, allowing them to obtain more credit in the market and lower the cost of capital (Schultz, Weingast 2003).

Considering the implicit significance of CBI in capital budgeting and investment decisions, the specific impact of central bank independence on the cost of capital still remains unexplored. As a result, we hypothesise that central bank independence lowers the cost of capital in a host country.

3. Data and variables

This study employed a panel dataset of 40 countries for the period from 2001 to 2014, including 23 developed and 17 emerging countries. We have organized the country group following the World Bank and UNDP framework. The panel is restrictive and the country's inclusion and exclusion are conducted based on data availability.

3.1. Dependent variable – the cost of capital

This section explains the different data sources and the cost of capital proxies employed in this study, as well as CBI and the control variables that might have cross-sectional and longitudinal variation with the cost of capital (CoC). The sample period of our analysis is from 2001 to 2014, the analysis included data from 40 countries. We estimate the cost of capital using four measures that are extensively used in the finance literature (Jewel, Livingston 1998; Lau, Ng, Zhang 2010; Damadoran 2014; Masood, Bashir,

Sahi 2017; Kwabi, Boateng, Adegbite 2018). In this study, we employ four costs of capital proxies; historical rate of return (*HRRtn*), country equity risk premium (*CERP*), dividend yield (*DivYld*), and sovereign credit-risk rating (*CRRsk*).

The historical rate of return (*HRRtn*)

We use the historical realised rate of return (*HRRtn*) following the empirical studies (Fama, MacBeth 1973; Lau, Ng, Zhang 2010; Kwabi et al. 2016; Kwabi, Boateng, Adegbite 2018). This is the historical average of the excess return on a country's markets over government Treasury bonds. The key advantage of capturing the expected risk premium using actual market returns in the past is that the long-term average premium reverses to the mean. In developed markets with extensive historical data, the *HRRtn* measure performs well as a cost of capital proxy. It may, however, be troublesome in certain emerging markets when historical return data is substantially shorter, resulting in lower average standard errors. We used Damodaran's (2012) country equity risk premium processes to address that concern, which assesses sovereign default spreads and adjusts for equity risk relative to the expected return on bond markets.

Country equity risk premium (*CERP*)

To substantiate the impact of CBI using the historical rate of return we employ the country's equity risk premium (*CERP*), following the existing study (Kwabi et al. 2016; Kwabi, Boateng, Adegbite 2018). *CERP*, as an alternative cost of the capital measure, supports CBI's effect on historical realised market returns. The approach employed by Damodaran is used to calculate the country's risk premium (Damodaran 2012). From the perspective of requiring additional country equity risk premiums for equity investment allocation in a specific market, it is better than using a mature stock market as a benchmark. Using the United States as the base mature country and the S&P 500 as the representative stock market, Damodaran (2012) developed a country equity risk premium measure.

Dividend yield (*DivYld*)

Variations in dividend yield are induced by changes in growth expectations, according to several studies (Bekaert, Harvey 2000; Fama, French 2002; Bhattacharya, Daouk 2002; Hail, Leuz 2006), and such fluctuations are more significant in emerging countries than in developed countries. To address this concern, we employ dividend yield (*DivYld*) as an alternative measure for the cost of capital, which is consistent with previous work in the finance literature (see Bekaert, Harvey 2000; Lau, Ng, Zhang 2010; Kwabi et al. 2016, Kwabi, Boateng, Adegbite 2018). Data on this was sourced from Bloomberg and the World Federation of Exchanges.

Sovereign credit risk rating (*CRRsk*)

We employ an additional measure of the cost of capital, sovereign credit risk ratings a popular measure that has been adopted by prior studies. Investors use sovereign credit ratings to assess the risk associated with a country's capital markets (see Jewel, Livingston 1998; Kwabi et al. 2016). Fundamentally, the range

of sovereign country credit ratings represents a country's economic and financial risk volatility. On the other hand, because the historical rate of return gauges previous shocks and potential in a nation's market based on chronological past data, we believe that using historical equity risk premium estimation can resolve sovereign country credit risk difficulties and drawbacks. In effect, the cost of capital in a country is positively connected to credit ratings, according to existing literature. The sovereign credit rating index, according to Hail and Leuz (2006), is intrinsically related to the cost of capital. Furthermore, Bhattacharya and Daouk (2002) believe that credit ratings of nations, particularly developed countries, are credible indicators of portfolio returns in terms of potential volatility. We get national credit risk assessments from Damodaran's website using 10-year-denominated government bonds in local currency. Following current literature (see Reeb, Sattar, Alle 2001), we convert the qualitative credit ratings into numerical values on a scale of 1–22. We assign a value of 1 to AAA = 1, AA+ = 2, and AA = 3. In our case, we made it to D = 22.

3.2. Independent variable – central bank independence

Several measures of central bank independence (CBI) have been offered in existing studies (see Grilli, Masciandaro, Tabellini 1991; Cukierman, Webb, Neyapti 1992; Pollio, Guillen 2005; Bodea, Hicks 2015; and Garriga 2016). In this study, we employ a central bank independence dataset from Garriga (2016), which represents the level of accountability in monetary policy execution. Following Cukierman, Webb and Neyapti (1992), Garriga (2016) compiled the most comprehensive dataset comprising yearly data from 1970 to 2012 for 182 developed and emerging countries. Several studies have used the CBI data (see Grilli, Masciandaro, Tabellini 1991; Cukierman, Webb, Neyapti 1992; Polillo, Guillén 2005; Bodea, Hicks 2015; Garriga 2016). The CBI Index comprises 16 weighted elements divided into four sub-sections. The first sub-section is CEO or governor tenure, appointment, and dismissal (weight 0.20); the second is policy decisions without government interference (weight 0.15); the third is central bank objectives and price stability (weight 0.15), and the fourth is a limitation on the government lending (weight 0.50). The CBI scale for each component ranges from 0 to 1, with values closer to 1 indicating greater independence and values closer to 0 implying larger government dependence. The prime objective of the central bank independence index is to increase independence from executive control. Monetary policy outcomes would be optimal when the central bank is independent of a country's political government. This implies that economic projection information will be made accessible to the public to encourage home and foreign debt and equity investors to make informed investment decisions in a host country.

3.3. Control variables

The risk-return dynamics impact the flow of investment in a country; a country would be in a challenging position to attract foreign investors if there is a high prevalence of financial and economic risk (Smimou 2014). Therefore, we employ financial risk in our model (*FinRsk*), and we sourced the data from PRS (ICRG – International Country Risk Guide) to control country-specific risk.

Existing studies suggest that macroeconomic factors influence investor decisions through risk--return dynamics (see Hymer 1976; Boyd, Levine, Smith 2001; Gumus, Duru, Gungor 2013; Waqas, Hashm, Nazir 2015). To control for this, we employ interest rate (*IntRst*), inflation (*Infltn*), net interest margin (*NtIntMrgn*) and GDP growth rate (*GDP growth*) data sourced from World Bank database. Economic freedom stimulates the financial environment, fosters fresh concepts, and expands production capabilities (Soo-Wah et al. 2010; Chortareas, Garza-García, Girardone 2012). Increases in trade, capital investment, and the invention of new goods all contribute to economic advancement, as do lower costs of production and improved ways of doing things. As a result, a country's cost of capital is influenced by economic freedom. Therefore, we employ investment freedom (*InvstFrdm*), monetary freedom (*MoneFrdm*), government integrity (*GovIntgrt*), and property right (*PropRight*) data obtained from the Heritage Foundation.

The cost of capital is also affected by market performance (Gilchrist, Natalucci, Zakrajsek 2007). It is supposed that the greater the expected market performance, the higher the cost of equity capital. We, therefore employ S&P equity index data (*EqIndx*) from the WB database, and financial market efficiency (*FmEff*) data from the IMF database to control for these effects. A declining Z-score may indicate trouble ahead and give a simpler conclusion than a plethora of ratios, therefore, investors may consider evaluating the Z-score of invested countries occasionally. We thus employ banking Z-score (*Zscore*) data from Bankscope.

4. Empirical results

4.1. Summary statistics

Table 1 presents the univariate analysis that compares the mean cost of capital proxies (*HRRtn, CERP, DivYld*, and *CRRsk*) in developed countries (Panel A) and emerging countries (Panel B). In terms of central bank independence, it appears that developed countries have more independent central banks relative to emerging countries. The average CBI, score for both developed and emerging countries is 64.92%. The average score for developed countries is 73.26% while the average CBI score for emerging countries is 53.64%, the emerging countries are about 11.28% below the overall average.

The mean cost of capital proxies in developed countries *HRRtn* = 4.65%, *CERP* = 5.26%, *DivYld* = 2.88% and *CRRsk* = 2.60. On the other hand, the emerging countries of *HRRtn* = 12.98%, *CERP* = 7.96%, *DivYld* = 3.00% and *CRRsk* = 8.16%. In line with theoretical expectations, emerging countries are associated with higher risk rating scores (*CRRsk*) and higher degrees of *HRRtn, CERP* and *DivYld*. In effect, investors require a premium for the higher risk of investing in emerging countries. The mean suggests that emerging countries have higher returns associated with a higher risk premium. Put together, this implies *ceteris paribus* the cost of capital in developed countries is lower than that of emerging countries. Seemingly emerging countries may attract more foreign investors; however, the threat of risk compared to return could discourage investors.

Table 2 reports summary statistics for control variables at the country level employed in the analysis. *IntRt* ranges substantially between 1.21% in Japan and 21.37% in Peru and the highest record of *Infltn* in Turkey is 15.22% and the lowest *Infltn* in Japan is 0.01%. This indicates that economic volatility in emerging countries is higher compared to developed countries. In terms of political stability, emerging

countries have lower *PolStb* relative to developed countries. Switzerland has the highest *PolStb* of 95.29%, whereas Israel has the lowest score of 12.25%. This suggests that there are often high levels of political instability in emerging countries, a phenomenon which could discourage foreign investors.

4.2. Correlation metrics

The correlation matrix of the dependent, key independent, and control variables is shown in Table 4. CBI is substantially associated with the cost of capital proxies, as expected by the hypothesis. The unreported variance inflation factors mean value is less than 10 (minimum = 1.25; maximum = 11.08). Typically, mean values of Variance Inflation Factor (VIF) over 4 are considered as the existence of the issue of multicollinearity. The VIF of the variables is shown in Table 12. The correlation between CBI and cost of capital measures is relatively low. This implies that there is no issue with multicollinearity between the independent and control variables employed in the analysis.

4.3. Multivariate regression analysis

This section tests whether central bank transparency leads to a decrease in the cost of capital. We begin the analysis by examining whether central bank transparency has varying impacts on the cost of capital (*CoC*). To prevent the possibility of any non-stationarity, we perform the regression using the first difference CoC_{lt}. In this study, we employ the Fisher-type panel unit root test (ADF) to test stationarity, and the outcome rejects the null hypothesis at a 1% level, indicating no unit roots in the dataset. The unit root test result is shown in Table 13. The t-statistics are derived from double-clustered standard errors at the country and year levels. We estimate the results using equation (1).

$$\Delta CoC_{lt} = \alpha + \beta_1 \cdot \Delta CBI + \beta_2 \Delta ctls_{lt} + \beta_3 \cdot TFE_t + \beta_4 CFE_j + \varepsilon_{lt} \quad (1)$$

where:

ΔCoC_{lt} represents the first difference in the cost of capital of country l at time t,
$ctls_{lt}$ is a vector of the control variables of country l at time t,
TFE and *CFE* are time (year) and country fixed effects respectively.

Cost of capital (CoC) using the historical rate of return (*HRRtn*)

In Table 5, model 1 examines the relationship between central bank independence (*CBI*) and historical rate of return (*HRRtn*). The OLS result of model 1 shows strong evidence that a higher degree of *CBI* reduces *HRRtn*, lowering the cost of capital. The coefficient of *CBI* is negative and is statistically significant at the 1% level. The coefficient of *CBI* is -0.093 (t-statistics = -4.32). The result provides compelling evidence that central bank independence reduces the cost of capital, which is consistent with the assumption that lower historical realised return lowers the cost of capital (Lau, Ng, Zhang 2010; Kwabi et al. 2016; Kwabi, Boateng, Adegbite 2018). This implies that governments could stimulate interest from foreign investors by improving the independence of their central banks.

Cost of capital (*CoC*) using country equity risk premium (*CERP*)

Model 2 in Table 5 examines the link between central bank independence (*CBI*) and country equity risk premium (*CERP*). The OLS result of model 2 provides significant evidence that a higher degree of *CBI* decreases *CERP*, lowering the cost of capital. The coefficient of *CBI* is negative and is statistically significant at the 1% level. The coefficient of *CBI* is -0.013 (t-statistics = -2.98). The results show that central bank independence lowers the cost of capital. *CBI* may reduce *CERP*, which is consistent with the existing study that a lower country risk premium reduces the cost of capital (Damodaran 2012; Kwabi et al. 2016; Kwabi, Boateng, Adegbite 2018).

Cost of capital (*CoC*) using dividend yield (*DivYld*)

In Table 5, we examine the relationship between central bank independence (*CBI*) and dividend yield (*DivYld*) model 3. The OLS result of model 3 provides compelling evidence that a higher degree of *CBI* reduces *DivYld*, lowering the cost of capital. The coefficient of *CBI* is negative and is statistically significant at the 1% level. The coefficient of *CBT* is -1.192 (t-statistics = -2.92). Our results demonstrate that central bank independence lowers the cost of capital, which is consistent with the study that a lower cost of capital is a result of a lower dividend yield (Lau, Ng, Zhang 2010; Kwabi et al. 2016; Kwabi, Boateng, Adegbite 2018).

Cost of capital (*CoC*) using sovereign credit risk rating (*CRRsk*)

Model 4 in Table 5 examines the association between central bank independence (*CBI*) and sovereign credit risk rating (*CRRsk*). Model 4's OLS result demonstrates convincingly that a higher degree of *CBI* decreases the sovereign credit risk rating (*CRRsk*), lowering the cost of capital. The coefficient of *CBI* is negative and is statistically significant at the 1% level. The coefficient of *CBI* is -0.388 (t-statistics = -7.04). Our findings suggest that central bank independence decreases the cost of capital, which is consistent with the proposition that a lower sovereign credit risk rating lowers the cost of capital (Jewel, Livingston 1998; Kwabi et al. 2016).

4.4. Robustness checks

In this section, we perform several robustness tests. Our baseline regression could suffer from endogeneity as a result of reverse causality, to ensure the roboustness of our model, we conduct further analyses. Foreign investors may put pressure on the government to demand the central bank be more independent. For instance, Cukierman (2008) postulates that globalization and the removal of controls on cross-border capital flows have contributed to central bank independence.

Quasi-natural experiment using difference-in-difference (DiD)

The global financial crisis has been employed to perform a quasi-natural shock experiment, emphasising the importance of CBI for increased financial market supervision. We can account for the impacts of

time-invariant country-level factors while addressing the impact of CBI by conducting this study. We consider 2007 as the year of the financial crisis and 2010 as the year of the European debt crisis, we use Eurozone countries as treatment variables to identify treatment groups and control groups. We specify the DiD approach to estimate the test as follows.

$$Cost\ of\ Capital = \alpha + \beta_1 policy + \beta_2\ year\ dummy_t + \beta_3\ policy \times after\ fiscal\ crisis + \beta_4\ controls + \varepsilon_{it} \quad (2)$$

where, β_1 and β_3 are the policy changes in the country group, β_2 year effects and ε_{it} is the error term.

Table 6 demonstrates the results of a quasi-natural experiment involving the financial crisis, in which countries went out of equilibrium on average, as the crisis sparked the urge for regulatory and supervisory action by central banks, emphasising the critical role of the central bank's independence.

In Table 6, the coefficient of *Post2007 · Eurozone* and *Post2010 · Eurozone, HRRtn, CERP,* and *CRRsk* is negative, while *DivYld* is negative and statistically significant at a 10% level. This indicates that historical return, equity risk premium and dividend yield in Eurozone countries were reduced after 2007 and 2010. As columns (4), and (8) show, credit risk rating in countries of the Eurozone increased at a significant level after 2007 and 2010. This indicates that the impact and shocks of the financial crisis on credit risk rating in Eurozone countries was greater than in other countries. Overall, the findings suggest that the global financial crisis strengthened central bank independence and lowered the cost of capital.

Placebo test

In this session, we conducted a placebo test to determine the validity of our uncertainty measure. This is due to concerns that central bank independence may allow for other forms of interference. Although our baseline model includes several control factors, a bias may still exist due to omitted explanatory variables (Drobetz et al. 2018). If the CBI estimates high impacts when interactively applied to non-treated countries, non-treated economic sectors, or different dates of the intervention, the intrinsic validity of the conclusions derived in the baseline model would be constrained. In other words, if the estimated effect fell within the range of placebo effects, our confidence in the strong influence of central bank independence on the cost of capital in 40 countries would be severely undermined. Each sample from a certain country is resigned within the same country using the placebo test. We may evaluate the placebo effects and estimations for central bank independence using P-values determined using dummy, randomly allocated country units (Castillo et al. 2015; Datta, Doan, Iskandar-Datta 2019). Table 7 includes measures of general economic and political instability, which might influence central bank independence as well as the cost of capital. The average coefficient estimate of debt home bias and debt foreign bias on phoney central bank independence is statistically insignificant. As anticipated, our primary findings survive the placebo testing.

Hierarchical clusters analysis

The study continues with a more specific test based on each of the 40 countries' patterns of central bank independence. According to Arbolino, Boffardi and Ioppolo (2019), we offer an additional

robustness test that the selection of geographical areas where central bank independence has stimulating implications on capital costs was not reliant on ex-ante determined administrative divisions. For example, independent of their economic groups, the central banks of certain countries may be influenced by a similar environment due to the cultural, bilateral, or trade agreements they share. Economic groupings may not be homogenous groups in which within-group country similarity is minimised and between--group country dissimilarity is maximised. To address this concern, we employ hierarchical cluster analysis to identify the differences and similarities across the sample countries, dividing a collection of data into subsets known as clusters depending on their similarities (Ward 1963; Szekely, Rizzo 2005).

We initially determine that the 40 countries are organised into two main clusters using the mean of all the variables for each country as our input feature based on the dendrogram using the average linkage approach (Figure 1). Countries included in cluster 1 are Spain, Switzerland, New Zealand, Germany, Norway, Finland, the Netherlands, Belgium, Singapore, Italy, Ireland, Canada, Sweden, Hong Kong, the United States, Australia, Chile, Austria, Poland, Hungary, the United Kingdom, Portugal, Japan, Israel, Denmark, and France. In cluster 2 the countries are Egypt, Argentina, Turkey, Malaysia, Peru, Brazil, Mexico, Russian Federation, South Africa, Greece, China, and India. Group 1 (cluster 1) consists of 26 countries, whereas group 2 (cluster 2) consists of 11 countries. When we compare the coefficient difference between groups, the impact of *CBI* on the cost of capital is considerably different between these two groups. The coefficient of group 1 is *HRRtn* -0.0222, *CERP* 0.0163, *DivYld* -0.9679, and *CRRsk* 2.4550, whereas, cluster 2 has a coefficient of *HRRtn* -0.1624, *CERP* -0.0266, *DivYld* 2.5671 and *CRRsk* 1.7601.

Cross-sectional analysis of economic development regions

While we analyse group 1 and group 2 in Table 8, which are separated by the average linkage approach, to address the issue in this session, we also study developed and emerging countries in Table 9. By examining these two groups of countries individually, we would like to determine whether the same effects on central bank independence apply to both developed and emerging countries.

When we compare the differences in coefficients between developed and emerging countries, we find that the influence of *CBI* on the cost of capital differs dramatically between these two groups of countries, with developed countries the coefficients are *HRRtn* -0.0222, *CERP* 0.0153, *DivYld* -1.3563, and *CRRsk* 2.6232. Whereas the coefficients of *HRRtn* -0.1.689, *CERP* -0.0364, *DivYld* -0.4334 and *CRRsk* 3.8039 is for emerging countries.

Fixed effect and double cluster regression

We want to determine the influence of central bank independence on the cost of capital by regressing data with fixed effects for each country to eliminate the cross-sectional connection between central bank independence and cost of capital measures. In the main tests, we consider the impact of central bank independence and other macroeconomic/political variables on the cost of capital using OLS estimations. To address the issue of heteroskedasticity further, we employ fixed-effect regression models to reduce spurious correlations caused by macroeconomic and political factors in central bank independence and cost of capital measures. We then present OLS regression using a two-way cluster which is based on country-year.

The results of the fixed effect model and double clustering model are shown in Table 10. When the outcomes of OLS and fixed effects are compared, the coefficient of *CBI* is strongly related to the cost of capital when the OLS and fixed effect (FE) models are regressed. However, it is statistically insignificant when the FE robust models have been used.

Table 10 shows that double cluster regression results control for country-year at the aggregate level. The coefficients of *CBI* are negative at statistically significant compared with FE robust model. The results of double cluster regression support our main findings in Table 5.

Newey-West standard error method

In this section, we provide robustness to our baseline results using the Newey-West estimator. The Newey-West standard error model is a robust estimator that is particularly accurate in the presence of heteroskedasticity and autocorrelation (Newey, West 1987). Furthermore, when there is a lagged value of an indicator in the panel dataset, this method is very consistent. The Newey-West standard error model approach may also be used to deal with the correlation of errors across observations. We present the results in Table 11. The coefficients on *CBI* are not significantly different from our baseline results, these suggest that our results are robust.

The coefficient of *CBI* is negative and is at a statistically significant level. The coefficient of *CBI* at 1% level on *HRRtn* is -0.93 (t-statistics = -2.87), *DivYld* -1.192 (t-statistics = -2.85) and *CRRsk* is -3.880 (t-statistics = -4.24). However, the coefficient of *CBI* at 5% level on *CERP* is -0.013 (t-statistics = -2.36).

5. Conclusion

Central banks have enormous influence over financial markets. Central banks are national organisations in charge of monetary policy, such as money circulation, as well as regulating the nation's banking system and providing other financial services. The basic purpose of all central banks is to promote economic stability within their jurisdiction, and so they influence a country's financial market and economic condition. Following the 2008 financial crisis, central banks worked tirelessly to strengthen the fragile global economy by employing their regulatory capacity and remarkable initiative.

This study's findings indicate that central bank independence (CBI) is crucial for a host country since it lowers the cost of capital, promotes investment, and supports economic growth and employment. This evidence that regulatory quality improves, protects the investor and strengthens the financial market through central bank independence. This study supports the theoretical viewpoint that central bank independence and transparency influence equity portfolio allocation by strengthening institutional quality (Kwabi, Boateng, Du 2020).

Our research contributes to the body of knowledge in several ways. This is the first empirical study that we know of that examines the link between central bank independence and the cost of capital (*CoC*). Primarily this study extends the literature on international financial management and will provide a deeper understanding of monetary policy principles and international portfolio management. Secondly, this study contributes to the central bank literature by showing central bank independence has a varying impact on the cost of capital. Our study also joins the call for policy responses targeted at stronger institutions in developing countries. Finally, the findings of this research will contribute to the monetary policy development to attract more foreign investors to a host country.

Due to data constraints, this study is confined to the years 2010–2014; nonetheless, it is still incredibly relevant as perhaps it is the first study to explore the link between central bank independence and the cost of capital. Since central bank independence is linked to lower inflation rates and stable economic environments, it aids policymakers in designing frameworks that promote economic stability and the resulting lower cost of capital. Moreover, the dynamics of central bank independence and cost of capital are vital in forming laws and regulations. Furthermore, countries with lower capital costs are more competitive globally, and fostering central bank independence can enhance their attractiveness to foreign investors and boost economic growth. Considering the changes in the global financial system and monetary policy, we propose that research be conducted using updated data such as the 'impact of central bank transparency on the global cost of capital', which may provide a more precise understanding of the link between central bank independence and the cost of capital.

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Appendix

Eplanation of abbreviations

BusnsFrdm – business freedom,
CBI – central bank independence,
CBT – the central bank transparency index (scaled 1–15, a higher score is more transparent),
CERP – the country equity risk premium based on adding the sovereign risk default premium to the equity risk premium of a base country (the United States),
CRRsk – the sovereign credit rating-based risk converted to numbers (scaled 1–22, a higher score is more risk),
DivYld – the dividend yield measured as the total amount of stock dividend of a country as a percentage of the market capitalization of the country,
FmEff – the financial market efficiency,
EqIndx – S&P equity index data,
FinRsk – the financial risk index developed by PRS (ICRG),
FmAcc – the financial market access index developed by the IMF,
GDPgrowth – GDP growth, a yearly percentage change,
GovDbt – government debt to GDP (% of GDP),
GovIntgrt – government integrity,
HRRtn – historical rate of return – the growth rate of the annual average stock market index,
Infltn – inflation – a yearly percentage change,
IntRst – interest rate,
InvstFrdm – investment freedom,
MoneFrdm – monetary freedom index data developed by the Heritage Foundation,
NetIntMrgn – net interest margin (lending rate less deposit rate),
PolStb – political stability,
PropRight – property right,
Zscore – banking Z-score.

Table 1
Summary statistics of dependent and key independent variables

Country	Panel A: Developed countries					Country	Panel B: Emerging countries				
	HRRtn%	*CERP%*	*DivYld%*	*CRRsk*	*CBI %*		*HRRtn%*	*CERP%*	*DivYld%*	*CRRsk*	*CBI%*
Australia	1.64	5.12	3.95	1.29	35.36	Argentina	30.35	16.40	4.11	16.50	75.16
Austria	2.56	4.91	2.17	1.00	85.65	Brazil	24.35	9.77	3.61	11.79	43.53
Belgium	3.79	5.51	3.28	2.29	85.65	Chile	12.70	6.36	3.16	5.14	73.31
Canada	2.62	4.97	2.46	1.14	47.24	China	-5.67	6.35	2.76	5.43	56.16
Denmark	7.08	4.89	1.64	1.00	59.21	Egypt	7.50	8.88	5.05	11.14	48.88
Finland	2.31	4.89	3.39	1.00	85.65	Hong Kong	14.10	5.92	3.28	3.71	38.20
France	4.63	4.89	3.36	1.14	85.65	India	21.42	8.90	.	11.36	29.50
Germany	4.68	4.89	2.54	1.00	85.65	Israel	2.59	6.37	3.69	5.57	51.51
Greece	9.98	6.16	3.05	8.29	79.56	Korea, Rep.	10.54	6.53	1.43	6.36	41.06
Hungary	17.71	6.43	2.50	7.43	88.15	Malaysia	7.50	6.68	3.34	7.29	50.78
Ireland	2.31	5.00	1.94	4.07	85.65	Mexico	22.65	7.10	1.77	8.29	63.83
Italy	2.51	6.27	3.93	3.79	79.56	Peru	12.52	8.00	3.62	10.29	79.78
Japan	7.22	6.09	1.52	4.36	54.60	Qatar	14.22	6.17	4.80	4.93	46.62
Netherlands	3.82	4.86	3.47	1.00	85.65	Russian Fed.	2.32	7.96	2.20	9.64	68.25
New Zealand	5.04	4.90	4.05	1.29	47.95	Singapore	14.29	5.16	2.99	1.14	45.60
Norway	9.31	4.86	3.25	1.00	40.97	South Africa	7.02	6.79	3.05	7.00	35.28
Poland	-1.29	6.32	2.69	6.29	83.31	Turkey	22.22	11.98	2.12	13.21	64.50
Portugal	-1.18	5.91	3.34	5.43	79.56						
Spain	2.32	4.90	3.77	2.79	85.65	**Country**	**Panel C. Average of both groups of the country**				
Sweden	8.27	4.87	2.73	1.14	77.67		*HRRtn%*	*CERP%*	*DivYld%*	*CRRsk*	*CBI%*
Switzerland	5.79	4.83	2.10	1.00	73.20	Average of both	8.19	6.41	2.93	4.96	64.92
United Kingdom	3.81	4.78	3.10	1.07	90.91	Developed countries	4.65	5.26	2.88	2.6	73.26
United States	1.90	4.78	1.91	1.00	62.58	Emerging countries	12.98	7.96	3	8.16	53.64

Table 2
Summary statistics of control variables

Country	Panel A. Developed countries												
	IntRst	*NetIntMrgn*	*Infltn*	*PolStb*	*FinRsk*	*GDPgrowth*	*MoneFrdm*	*InvstFrdm*	*GovIntgrt*	*PropRight*	*EqIndx*	*Zscore*	*FmEff*
Australia	5.08	2.00	2.86	80.86	6.88	3.00	83.94	75.36	86.76	90.00	11.38	14.93	0.79
Austria	3.61	2.04	2.05	90.22	7.88	1.42	83.71	74.29	79.96	90.00	12.72	20.92	0.40
Belgium	3.80	1.32	2.05	75.53	7.82	1.42	81.89	85.36	70.30	84.29	8.68	10.63	0.42
Canada	4.09	2.23	1.96	84.69	8.05	2.05	81.36	62.86	87.76	90.00	9.77	16.27	0.73
Denmark	3.45	1.26	1.93	86.55	8.62	0.86	84.93	80.36	94.91	90.36	14.31	16.20	0.52
Finland	3.50	0.88	1.71	98.91	7.24	1.24	84.79	75.36	95.17	90.36	1.62	12.29	0.90
France	3.59	0.92	1.61	63.86	7.60	1.19	82.11	57.50	69.35	73.57	2.96	16.93	0.81
Germany	3.27	0.98	1.58	77.24	8.18	1.16	84.24	87.14	78.58	90.00	9.73	15.90	0.95
Greece	7.53	2.94	2.55	54.41	6.55	-0.04	77.61	55.36	42.01	50.71	0.39	4.62	0.49
Hungary	7.24	3.94	4.82	74.72	6.78	1.94	74.90	72.86	50.04	68.21	11.55	5.48	0.72
Ireland	4.79	0.80	2.15	88.89	7.45	3.09	82.36	90.36	75.20	90.00	7.91	4.37	0.14
Italy	4.43	1.90	2.07	63.39	7.55	-0.04	82.54	72.86	47.11	57.50	0.44	14.36	1.00
Japan	1.21	1.17	0.01	82.98	9.00	0.75	90.57	57.86	72.49	75.00	7.25	13.02	0.96
Netherlands	3.48	1.05	2.03	84.95	7.83	1.12	84.08	90.00	88.50	90.00	5.28	11.99	0.91
New Zealand	5.22	2.17	2.43	94.53	6.59	2.65	85.34	81.07	94.50	92.14	11.59	19.60	0.14
Norway	3.64	1.66	1.88	94.47	9.34	1.61	80.06	57.86	87.22	90.00	12.95	7.45	0.74
Poland	5.94	3.45	2.62	71.57	7.42	3.62	77.79	59.64	43.34	57.50	9.35	7.29	0.37
Portugal	5.37	1.63	2.21	79.34	6.94	0.10	81.86	70.00	63.08	70.00	0.83	10.59	0.64
Spain	4.35	1.91	2.49	44.94	7.21	1.30	81.17	74.29	66.69	70.00	6.76	19.09	0.97
Sweden	3.49	1.34	1.33	92.49	7.80	1.98	84.34	85.71	92.52	90.36	10.60	10.31	0.75
Switzerland	2.14	0.84	0.57	95.29	9.07	1.82	86.25	73.93	88.44	90.00	7.03	10.95	0.61
United Kingdom	3.93	1.53	2.21	60.61	7.73	1.75	80.39	84.29	82.60	89.29	3.22	8.93	0.72
United States	3.66	3.51	2.30	59.65	6.70	1.83	81.81	72.86	74.21	87.86	5.09	26.86	1.00

Table 2
Summary statistics of control variables, contd.

Country	Panel B. Emerging countries												
	IntRst	*NetIntMrgn*	*Infltn*	*PolStb*	*FinRsk*	*GDPgrowth*	*MoneFrdm*	*InvstFrdm*	*GovIntgrt*	*PropRight*	*EqIndx*	*Zscore*	*FmEff*
Argentina	12.50	4.47	10.84	41.95	6.74	2.97	70.11	49.29	29.32	27.86	19.28	5.62	0.08
Brazil	13.86	6.33	6.53	42.39	7.24	3.32	75.91	50.00	37.71	50.00	18.66	15.96	0.56
Chile	8.56	4.22	3.15	66.06	7.74	4.27	81.76	76.07	72.09	89.29	13.06	7.25	0.15
China	5.84	2.84	2.45	29.57	9.37	9.87	78.43	28.21	34.36	24.29	16.32	15.97	0.94
Egypt, Arab Rep.	12.47	2.24	8.62	21.90	8.01	4.12	69.81	51.79	31.40	42.14	28.32	16.14	0.40
Hong Kong SAR, C	5.64	2.06	1.61	84.85	8.47	6.57	85.69	90.00	81.24	90.00	9.85	14.62	0.55
India	11.18	3.21	7.05	13.36	8.52	5.37	70.84	40.36	30.54	50.00	21.55	16.03	0.80
Israel	7.03	2.36	2.07	12.25	7.93	4.04	82.58	78.21	64.24	70.36	6.04	26.84	0.41
Korea, Rep.	6.19	2.70	2.90	58.13	6.31	4.85	81.06	70.00			16.97	8.88	1.00
Malaysia	5.71	2.73	2.29	53.23	8.49	1.89	80.53	37.14	48.52	51.07	11.22	14.69	0.31
Mexico	8.05	6.45	4.44	28.80	7.95	5.48	76.95	55.71	33.91	50.00	15.17	20.94	0.28
Peru	21.37	6.47	2.63	19.25	8.12	5.10	84.53	65.71	37.29	37.14	26.43	15.40	0.07
Qatar	6.32	.	4.50	86.04	7.65	4.27	76.89	41.79	65.96	56.79	9.55	28.02	0.27
Russian Federation	9.40	5.10	10.99	17.09	8.69	5.61	61.79	33.93	23.72	29.29	21.85	8.40	0.41
Singapore	5.37	1.77	2.11	90.61	9.01	3.19	87.39	83.21	92.56	90.00	9.76	21.36	0.56
South Africa	8.92	3.81	6.78	42.92	7.64	4.14	76.99	54.64	46.54	50.00	14.78	15.99	0.28
Turkey	13.06	5.48	15.22	19.34	6.46	4.32	61.19	57.86	38.50	51.43	19.51	8.10	1.00

Table 3
Descriptive statistics of dependent, independent and control variables

	Standard deviation	Maximum	Mean	Median	Minimum	Skewness	Kurtosis
HRRtn	7.85	30.35	8.19	6.41	-5.67	1.01	0.72
CERP	2.26	16.40	6.41	6.01	4.78	2.76	9.52
DivYld	0.87	5.05	3.00	3.10	1.43	0.13	-0.26
CRRsk	4.12	16.50	4.96	4.21	1.00	0.91	0.16
CBI	18.79	90.91	64.92	66.38	29.50	-0.26	-1.41
IntRst	3.93	21.37	6.46	5.37	1.21	1.82	4.25
NetIntMrgn	1.62	6.47	2.66	2.17	0.80	1.05	0.30
Infltn	3.14	15.22	3.54	2.30	0.01	2.17	4.77
PolStb	26.88	98.91	63.20	68.81	12.25	-0.56	-0.98
FinRsk	0.82	9.37	7.76	7.77	6.31	0.15	-0.64
GDPgrowth	2.05	9.87	2.88	2.35	-0.04	1.10	1.99
MoneFrdm	6.23	90.57	80.01	81.79	61.19	-1.45	2.45
InvstFrdm	16.60	90.36	66.53	71.43	28.21	-0.51	-0.55
GovIntgrt	22.74	95.17	64.07	69.35	23.72	-0.24	-1.39
PropRight	21.51	92.14	69.92	73.57	24.29	-0.58	-0.97
EqIndx	6.77	28.32	11.24	10.22	0.39	0.54	0.13
Zscore	6.01	28.02	13.98	14.65	4.37	0.49	-0.05
FmEff	0.29	1.00	0.59	0.58	0.07	-0.16	-1.18

Table 4
Pearson's pairwise correlation coefficient between the dependent, independent and control variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
HRRtn (1)	1																	
CERP (2)	0.5640*	1																
DivYld (3)	-0.0007	0.0888*	1															
CRRsk (4)	0.5195*	0.7788*	0.0934*	1														
CBI (5)	-0.2136*	-0.1377*	-0.0165	-0.2214*	1													
IntRst (6)	0.4221*	0.6256*	0.2062*	0.7242*	-0.1669*	1												
NetIntMrgn (7)	0.4965*	0.5363*	-0.0067	0.6093*	-0.1628*	0.6619*	1											
Infltn (8)	0.3189*	0.5608*	0.0592	0.5044*	-0.0958*	0.5175*	0.3989*	1										
PolStb (9)	-0.2652*	-0.5194*	-0.0898*	-0.6855*	0.1654*	-0.6135*	-0.5745*	-0.4170*	1									
FinRsk (10)	-0.0806	-0.1669*	-0.1044*	-0.2459*	-0.1445*	-0.1488*	-0.1412*	-0.2117*	0.0405	1								
GDPgrowth (11)	0.1399*	0.1666*	-0.1347*	0.1961*	-0.2739*	0.2178*	0.3000*	0.1528*	-0.2901*	0.2303*	1							
MoneFrdm (12)	-0.2798*	-0.5664*	-0.0519	-0.5722*	0.0572	-0.4260*	-0.4421*	-0.6466*	0.5185*	0.1102*	-0.1616*	1						
InvstFrdm (13)	-0.1780*	-0.4275*	-0.0131	-0.4976*	0.3215*	-0.3658*	-0.4242*	-0.3355*	0.4940*	-0.1775*	-0.2842*	0.4371*	1					
GovIntgrt (14)	-0.3452*	-0.6295*	-0.0814	-0.8115*	0.0695	-0.6153*	-0.6363*	-0.4572*	0.8031*	0.0848*	-0.2805*	0.6022*	0.6680*	1				
PropRight (15)	-0.2875*	-0.6374*	-0.1280*	-0.7693*	0.1374*	-0.5968*	-0.5817*	-0.4135*	0.7579*	0.0092	-0.3190*	0.5519*	0.7535*	0.9203*	1			
EqIndx (16)	0.1436*	0.0943*	-0.2365*	0.1181*	-0.0958*	0.1178*	0.1698*	-0.0332	-0.1334*	0.0267	0.0919*	-0.0693	-0.1170*	-0.0957*	-0.1090*	1		
Zscore (17)	-0.0832	-0.1680*	0.0709	-0.1784*	-0.3149*	-0.0276	0.0557	-0.1376*	-0.0871*	0.1149*	0.1273*	0.1582*	-0.0483	0.1243*	0.0435	0.0613	1	
FmEff (18)	-0.1659*	-0.2202*	-0.0531	-0.2857*	0.0316	-0.3376*	-0.2994*	-0.0628	0.0877*	-0.0031	-0.1230*	0.0923*	0.0743	0.1939*	0.1860*	-0.1751*	-0.003	1

Table 5

The effects of central bank transparency on cost of capital (*CoC*) measures

$$CoC_{it} = a + \beta\, CBI + \beta\, Controls + Country\ and\ Year\ effects + \varepsilon_{it}$$

	Model (1) ***HRRtn***	**Model (2)** ***CERP***	**Model (3)** ***DivYld***	**Model (4)** ***CRRsk***
CBI	-0.093*** (-4.32)	-0.013*** (-2.98)	-1.192*** (-2.92)	-3.880*** (-7.04)
IntRst	0.003** (2.40)	0.001*** (4.45)	0.073*** (3.40)	0.276*** (9.37)
NetIntMrgn	0.020*** (7.14)	0.002*** (2.75)	-0.180*** (-3.46)	0.142** (2.00)
Infltn	0.004*** (3.00)	0.001*** (4.78)	-0.010 (-0.37)	0.128*** (3.43)
PolStb	0.001** (2.44)	0.000** (2.53)	-0.006 (-1.25)	-0.005 (-0.84)
FinRsk	0.010** (2.30)	0.000 (0.27)	-0.264*** (-3.12)	-0.214* (-1.84)
GDPgrowth	-0.002 (-1.59)	-0.000 (-1.21)	-0.042** (-1.97)	-0.088*** (-2.95)
MoneFrdm	0.000 (0.67)	-0.000*** (-2.88)	-0.013 (-1.03)	-0.031* (-1.80)
InvstFrdm	0.001*** (2.93)	0.000 (1.64)	0.017*** (2.79)	0.013 (1.57)
GovIntgrt	-0.001*** (-2.81)	-0.000 (-0.79)	0.017* (1.94)	-0.067*** (-5.72)
PropRight	0.001 (1.64)	-0.000*** (-3.69)	-0.033*** (-3.61)	-0.032*** (-2.64)
EqIndx	0.000** (2.35)	0.000 (0.67)	-0.011*** (-6.19)	0.000 (0.14)
Zscore	-0.001* (-1.68)	-0.000* (-1.86)	-0.002 (-0.18)	-0.071*** (-4.40)
FmEff	0.021* (1.80)	0.001 (0.34)	-0.101 (-0.48)	-0.875*** (-2.97)
Constant	-0.136* (-1.78)	0.104*** (6.61)	7.797*** (5.51)	16.554*** (8.48)
Adj. R-Square	0.318	0.575	0.227	0.823
Number of observations	438	438	414	423
Country_effects	Yes	Yes	Yes	Yes
Year_effects	Yes	Yes	Yes	Yes

Note: for tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 6

Difference-in-differences

$$Cost\ of\ Capital = \alpha + \beta_1 policy + \beta_2\ year\ dummy_t + \beta_3 policy \times after\ fiscal\ crisis + \beta_4 controls + \varepsilon_{it}$$

	HRRtn	*CERP*	*DivYld*	*CRRsk*	*HRRtn*	*CERP*	*DivYld*	*CRRsk*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Eurozone	-0.0199** (-2.170)	-0.0049*** (-3.062)	-0.2824* (-1.722)	-2.1059*** (-7.885)	-0.0231*** (-2.856)	-0.0049*** (-3.385)	-0.2621* (-1.678)	-2.0155*** (-8.309)
Post2007	0.0233** (2.187)	0.0027 (1.396)	0.0050 (0.030)	-0.6333*** (-2.621)				
Post2007*Eurozone	-0.0124 (-1.088)	-0.0061*** (-2.772)	-0.0299 (-0.136)	1.3697*** (4.212)				
Post2010					0.0242** (2.479)	0.0069*** (2.837)	-0.0284 (-0.144)	-0.3531 (-1.488)
Post2010*Eurozone					-0.0138 (-1.196)	-0.0086*** (-3.107)	-0.2575 (-1.074)	2.7426*** (5.857)
Constant	-0.2384*** (-2.812)	0.1114*** (5.771)	6.1542*** (3.799)	21.6285*** (7.908)	-0.2276*** (-2.904)	0.1010*** (5.722)	6.6017*** (4.367)	18.9794*** (7.559)
Control variables included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.1096	0.1253	0.0190	0.1576	0.1094	0.1287	0.0056	0.1725
Number of observations	511	511	485	511	511	511	485	511

Notes:

This table reports the difference-in-difference results of the relationship between central bank transparency and cost of capital using indicator variables of the Eurozone for treatment and control groups. For example, Post2007 is equal to 1 after 2007 and zero otherwise. Eurozone is equal to one if countries are in the Eurozone and zero otherwise. Post2007*Eurozone is the difference between the country in the Eurozone and non-Eurozone before and after 2007.

For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 7
Placebo test

	HRRtn	***CERP***	***DivYld***	***CRRsk***
	(1)	**(2)**	**(3)**	**(4)**
CBI	-0.014 (-0.812)	-0.001 (-0.305)	0.098 (0.308)	-1.018** (-2.051)
IntRst	0.004** (2.485)	0.001*** (3.308)	0.097*** (3.247)	0.287*** (6.082)
NetIntMrgn	0.020*** (5.417)	0.002** (2.485)	-0.172*** (-3.181)	-0.029 (-0.291)
Infltn	0.007*** (3.683)	0.002*** (4.333)	0.034 (1.135)	0.077 (0.842)
PolStb	0.000* (1.781)	0.000* (1.737)	-0.005 (-1.230)	-0.009 (-1.097)
FinRsk	0.018*** (4.237)	0.001 (1.585)	-0.234*** (-2.756)	-0.426** (-2.299)
GDPgrowth	-0.002* (-1.677)	-0.001 (-1.519)	-0.032 (-1.335)	-0.063 (-1.297)
MoneFrdm	-0.000 (-0.312)	-0.000* (-1.904)	-0.006 (-0.412)	-0.046 (-1.325)
InvstFrdm	0.001*** (2.904)	0.000 (1.167)	0.010 (1.554)	0.002 (0.190)
GovIntgrt	-0.001 (-1.619)	0.000 (0.076)	0.016** (2.031)	-0.067*** (-4.503)
PropRight	0.001 (1.603)	-0.000** (-2.184)	-0.021** (-2.132)	-0.032* (-1.934)
EqIndx	0.000*** (2.922)	0.000* (1.802)	-0.007*** (-3.280)	0.004 (1.210)
Zscore	-0.000 (-0.942)	-0.000 (-1.630)	0.004 (0.458)	-0.053*** (-3.179)
FmEff	0.012 (1.120)	-0.001 (-0.318)	0.297 (1.264)	-0.999*** (-2.698)
Constant	-0.224*** (-2.995)	0.079*** (4.926)	5.024*** (3.594)	18.918*** (5.532)
Adj. R-Square	0.3665	0.6286	0.2078	0.7699
Number of observations	435	435	412	435

Notes:
This table reports summary statistics of the regression estimates for the baseline model with the full set of control variables when we randomly assigned independent variables to each country based on the sample distribution over the period. For each replication, we recorded the estimated coefficient and associated P value.
For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 8
Hierarchical cluster analysis

	Cluster 1				Cluster 2			
	HRRtn	*CERP*	*DivYld*	*CRRsk*	*HRRtn*	*CERP*	*DivYld*	*CRRsk*
CBI	-0.0222 (-0.432)	0.0163** (2.386)	-0.9679 (-0.537)	2.4540 (1.470)	-0.1624 (-0.945)	-0.0266 (-0.738)	2.5671 (0.329)	1.7601 (0.419)
IntRst	-0.0015 (-1.137)	0.0005* (1.721)	-0.0258 (-0.513)	0.3973*** (2.837)	-0.0009 (-0.631)	0.0017** (2.299)	-0.0626 (-1.156)	0.2090*** (2.825)
NetIntMrgn	0.0054** (2.266)	0.0000 (0.058)	-0.0384 (-0.488)	-0.0436 (-0.363)	0.0007 (0.292)	0.0025 (1.383)	0.0970 (0.959)	-0.0201 (-0.168)
Infltn	-0.0018 (-1.305)	-0.0004* (-1.692)	-0.0109 (-0.200)	-0.0932 (-1.209)	0.0009 (0.517)	0.0011 (1.569)	-0.0581 (-0.955)	0.0389 (0.765)
PolStb	0.0003 (1.397)	0.0001 (1.527)	-0.0086 (-0.964)	-0.0238** (-2.355)	0.0025** (2.310)	0.0001 (0.645)	0.0167 (0.715)	-0.0645*** (-3.227)
FinRsk	-0.0023 (-0.757)	0.0022** (2.338)	-0.1192 (-0.684)	-0.3518 (-1.066)	0.0059 (0.457)	0.0059 (0.919)	-0.4092 (-0.971)	-0.3567 (-0.954)
GDPgrowth	0.0017** (2.592)	0.0000 (0.159)	0.0356 (0.756)	-0.1125** (-2.189)	-0.0051** (-2.497)	0.0008 (1.217)	-0.0481 (-0.802)	-0.0847* (-1.750)
MoneFrdm	0.0017*** (3.098)	0.0002 (1.566)	-0.0064 (-0.248)	-0.0354 (-1.240)	0.0011 (1.176)	-0.0000 (-0.093)	-0.0532 (-1.402)	-0.0429 (-1.510)
InvstFrdm	0.0002 (0.832)	0.0000 (0.905)	0.0052 (0.574)	0.0046 (0.493)	0.0015 (1.206)	0.0001 (0.694)	0.0012 (0.050)	0.0429** (2.566)
GovIntgrt	-0.0005** (-1.998)	0.0001 (1.008)	-0.0171 (-0.986)	0.0336 (1.618)	-0.0050*** (-3.579)	0.0006 (1.143)	0.0370 (0.685)	-0.1067** (-2.165)
PropRight	-0.0006* (-1.845)	0.0001 (0.331)	-0.0101 (-0.613)	-0.0622*** (-3.175)	-0.0014 (-1.508)	-0.0004 (-0.914)	0.0447 (0.865)	-0.0199 (-0.582)
EqIndx	0.0002* (1.786)	-0.0000 (-0.039)	-0.0089* (-1.954)	0.0030 (0.653)	0.0002 (1.336)	0.0001 (1.019)	-0.0111** (-2.441)	-0.0008 (-0.149)
Zscore	0.0008* (1.742)	-0.0002 (-1.485)	0.0169 (1.425)	0.0056 (0.387)	0.0026** (2.133)	-0.0004 (-1.227)	0.0464 (1.288)	-0.0116 (-0.352)
FmEff	0.0082 (1.216)	0.0022 (1.194)	0.4814 (0.999)	-0.0645 (-0.176)	0.0096 (0.283)	-0.0098 (-0.897)	0.8823 (0.706)	-1.0970 (-1.097)
Constant	-0.0635 (-0.923)	-0.0031 (-0.098)	7.4836** (2.085)	9.2781* (1.778)	0.1271 (0.493)	0.0164 (0.180)	3.2714 (0.380)	18.0426*** (2.701)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.8826	0.6846	0.5698	0.8420	0.8826	0.8198	0.5557	0.9162
Number of observations	303	354	344	303	135	135	121	135

Cluster 1: Spain, Switzerland, New Zealand, Germany, Norway, Finland, Netherlands, Belgium, Singapore, Italy, Ireland, Canada, Sweden, Hong Kong, United States, Australia, Chile, Austria, Poland, Hungary, United Kingdom, Portugal, Japan, Israel, Demark, France.
Cluster 2: Egypt, Argentina, Turkey, Malaysia, Peru, Brazil, Mexico, Russian Federation, South Africa, Greece, China, India.
For tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 9
Cross-sectional analysis of economic development regions

	Developed countries				Developing countries			
	HRRtn	***CERP***	***DivYld***	***CRRsk***	***HRRtn***	***CERP***	***DivYld***	***CRRsk***
CBI	-0.0227 (-1.428)	0.0153** (2.253)	-1.3563 (-0.756)	2.6232 (1.636)	-0.1689 (-0.848)	-0.0364 (-1.324)	-0.4334 (-0.059)	3.8039** (2.338)
IntRst	0.0008 (1.411)	0.0002 (0.594)	-0.0605 (-1.035)	0.5940*** (9.594)	0.0004 (0.217)	0.0019*** (2.795)	0.0239 (0.427)	0.0167 (0.514)
NetIntMrgn	0.0021* (1.681)	-0.0002 (-0.330)	-0.0296 (-0.393)	-0.0441 (-0.388)	0.0016 (0.693)	0.0024 (1.524)	0.0807 (0.890)	0.0819 (0.659)
Infltn	0.0000 (0.018)	-0.0001 (-0.498)	-0.0328 (-0.535)	0.0462 (0.556)	0.0008 (0.498)	0.0008 (1.310)	-0.0727 (-1.221)	0.0848** (2.471)
PolStb	0.0004** (2.547)	0.0001 (1.156)	-0.0075 (-0.798)	-0.0198* (-1.953)	0.0018** (2.256)	0.0002 (1.120)	0.0153 (0.710)	-0.0287** (-2.090)
FinRsk	-0.0010 (-0.400)	0.0019* (1.948)	-0.0811 (-0.448)	-0.0748 (-0.234)	0.0132 (1.159)	0.0062 (1.212)	-0.3245 (-0.886)	-0.1035 (-0.391)
GDPgrowth	0.0020*** (3.473)	-0.0000 (-0.024)	0.0201 (0.424)	0.0107 (0.231)	-0.0050** (-2.291)	0.0005 (0.879)	-0.0720 (-1.221)	-0.0615 (-1.594)
MoneFrdm	0.0012** (2.381)	0.0002 (1.553)	-0.0036 (-0.133)	-0.0257 (-0.886)	0.0017* (1.725)	0.0000 (0.027)	-0.0378 (-1.108)	-0.0728*** (-3.584)
InvstFrdm	-0.0001 (-0.904)	0.0000 (0.938)	-0.0049 (-0.543)	0.0037 (0.363)	0.0014 (1.368)	0.0001 (0.699)	0.0313 (1.594)	0.0141 (1.030)
GovIntgrt	-0.0007*** (-2.653)	0.0001 (1.193)	-0.0148 (-0.815)	0.0280 (1.348)	-0.0039*** (-2.881)	0.0002 (0.438)	0.0215 (0.509)	-0.0221 (-1.016)
PropRight	-0.0006* (-1.801)	0.0001 (0.356)	-0.0079 (-0.490)	-0.0614*** (-3.162)	-0.0016 (-1.642)	-0.0004 (-0.887)	0.0511 (0.969)	0.0076 (0.275)
EqIndx	0.0001* (1.835)	-0.0000 (-0.568)	-0.0076 (-1.588)	0.0048 (0.896)	0.0001 (1.078)	0.0001 (1.380)	-0.0112** (-2.502)	-0.0034 (-0.915)
Zscore	0.0004** (2.257)	-0.0002 (-1.223)	0.0245* (1.864)	-0.0058 (-0.403)	0.0022** (2.288)	-0.0003* (-1.672)	0.0035 (0.113)	0.0537*** (3.920)
FmEff	0.0159*** (3.240)	0.0020 (0.978)	0.4863 (0.956)	0.1528 (0.421)	0.0253 (0.753)	-0.0091 (-1.028)	1.2336 (1.092)	-0.5300 (-0.759)
Constant	-0.0256 (-0.458)	-0.0019 (-0.055)	7.5182** (1.987)	4.2741 (0.860)	0.1849 (0.748)	0.0937 (1.268)	5.9664 (0.809)	20.6945*** (5.260)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R	0.9393	0.6618	0.5809	0.8799	0.8566	0.8468	0.5497	0.9646
Number of observations	273	273	269	273	165	165	145	165

Note: for tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 10
Fixed effect and double clustering regressions

	Fixed effect results				Double clustering results			
	HRRtn	***CERP***	***DivYld***	***CRRsk***	***HRRtn***	***CERP***	***DivYld***	***CRRsk***
CBI	-0.0194 (-0.340)	-0.0021 (-0.131)	1.5884 (0.773)	-0.3541 (-0.188)	-0.0933*** (-4.334)	-0.0132*** (-3.664)	-1.1918*** (-3.091)	-3.8799*** (-7.108)
IntRst	-0.0008 (-0.959)	0.0013*** (5.346)	-0.0355 (-1.116)	0.2946*** (10.099)	0.0028** (2.067)	0.0011*** (3.536)	0.0731** (2.502)	0.2756*** (6.535)
NetIntMrgn	0.0027 (1.236)	0.0014** (2.282)	0.0302 (0.419)	0.0087 (0.121)	0.0199*** (5.591)	0.0016** (2.317)	-0.1797*** (-3.297)	0.1419 (1.643)
Infltn	0.0004 (0.457)	0.0005* (1.940)	-0.0162 (-0.526)	0.0007 (0.023)	0.0044** (2.050)	0.0014*** (3.495)	-0.0100 (-0.311)	0.1282 (1.583)
PolStb	0.0001 (0.522)	0.0002*** (3.004)	-0.0062 (-0.787)	-0.0284*** (-3.575)	0.0006*** (2.611)	0.0001* (1.959)	-0.0056 (-1.338)	-0.0052 (-0.770)
FinRsk	0.0084* (1.771)	0.0038*** (2.863)	-0.2823* (-1.818)	-0.5751*** (-3.700)	0.0105** (2.171)	0.0003 (0.270)	-0.2636*** (-3.100)	-0.2139 (-1.591)
GDPgrowth	0.0008 (1.073)	-0.0002 (-0.987)	-0.0407* (-1.724)	-0.0535** (-2.293)	-0.0019 (-1.293)	-0.0003 (-0.938)	-0.0422* (-1.829)	-0.0878** (-2.243)
MoneFrdm	0.0009** (2.117)	-0.0003*** (-2.716)	-0.0204 (-1.387)	-0.0202 (-1.452)	0.0005 (0.454)	-0.0004* (-1.822)	-0.0130 (-0.940)	-0.0312 (-0.926)
InvstFrdm	0.0002 (0.601)	0.0001 (0.776)	0.0083 (0.883)	0.0234*** (2.600)	0.0010*** (3.253)	0.0001* (1.807)	0.0169*** (2.999)	0.0131* (1.695)
GovIntgrt	-0.0015*** (-2.736)	0.0002 (1.117)	0.0016 (0.091)	-0.0050 (-0.280)	-0.0013** (-2.178)	-0.0001 (-0.535)	0.0167** (2.022)	-0.0669*** (-5.424)
PropRight	-0.0011** (-2.271)	-0.0001 (-0.984)	-0.0089 (-0.557)	-0.0172 (-1.100)	0.0008 (1.164)	-0.0004** (-1.977)	-0.0325*** (-3.583)	-0.0319** (-2.239)
EqIndx	0.0002*** (4.220)	0.0000 (0.475)	-0.0115*** (-6.821)	-0.0024 (-1.445)	0.0002** (2.183)	0.0000 (0.525)	-0.0110*** (-5.320)	0.0004 (0.134)
Zscore	0.0009* (1.913)	-0.0001 (-1.059)	0.0134 (0.809)	0.0177 (1.107)	-0.0011* (-1.894)	-0.0002** (-2.547)	-0.0020 (-0.190)	-0.0709*** (-4.637)
FmEff	0.0420*** (3.567)	-0.0031 (-0.939)	0.9266** (2.359)	-1.2486*** (-3.219)	0.0207* (1.802)	0.0008 (0.285)	-0.1014 (-0.439)	-0.8746** (-2.543)
Constant	0.0576 (0.611)	0.0317 (1.199)	5.9112* (1.872)	11.5306*** (3.715)	-0.1362* (-1.795)	0.1036*** (5.851)	7.7971*** (4.683)	16.5540*** (6.045)
Adjusted R	0.0719	0.1908	0.0547	0.6611	0.3400	0.5886	0.2532	0.8357
N	438	438	414	438	438	438	414	438

Note: for tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 11
Newey-West standard error

	Model (1) ***HRRtn***	**Model (2)** ***CERP***	**Model (3)** ***DivYld***	**Model (4)** ***CRRsk***
CBI	-0.093*** (-2.87)	-0.013** (-2.36)	-1.192*** (-2.85)	-3.880*** (-4.24)
IntRst	0.003 (1.58)	0.001** (2.56)	0.073*** (2.65)	0.276*** (4.95)
NetIntMrgn	0.020*** (4.54)	0.002* (1.81)	-0.180*** (-2.75)	0.142 (1.30)
Infltn	0.004 (1.64)	0.001*** (2.93)	-0.010 (-0.28)	0.128 (1.51)
PolStb	0.001* (1.75)	0.000 (1.33)	-0.006 (-1.22)	-0.005 (-0.53)
FinRsk	0.010 (1.50)	0.000 (0.20)	-0.264** (-2.54)	-0.214 (-1.09)
GDPgrowth	-0.002 (-1.10)	-0.000 (-0.96)	-0.042 (-1.54)	-0.088** (-2.10)
MoneFrdm	0.000 (0.33)	-0.000 (-1.31)	-0.013 (-0.75)	-0.031 (-0.79)
InvstFrdm	0.001** (2.28)	0.000 (1.40)	0.017** (2.50)	0.013 (1.18)
GovIntrgt	-0.001 (-1.41)	-0.000 (-0.37)	0.017 (1.64)	-0.067*** (-3.58)
PropRight	0.001 (0.73)	-0.000 (-1.26)	-0.033*** (-2.83)	-0.032 (-1.39)
EqIndx	0.000** (2.36)	0.000 (0.52)	-0.011*** (-5.65)	0.000 (0.15)
Zscore	-0.001 (-1.28)	-0.000** (-1.98)	-0.002 (-0.16)	-0.071*** (-3.36)
FmEff	0.021 (1.13)	0.001 (0.19)	-0.101 (-0.36)	-0.875* (-1.70)
Constant	-0.136 (-1.27)	0.104*** (4.20)	7.797*** (4.06)	16.554*** (4.52)
Number of observations	438	438	414	438
Country_effects	Yes	Yes	Yes	Yes
Year_effects	Yes	Yes	Yes	Yes

Note: for tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Table 12
Variance inflator factor (VIF) of other control variables

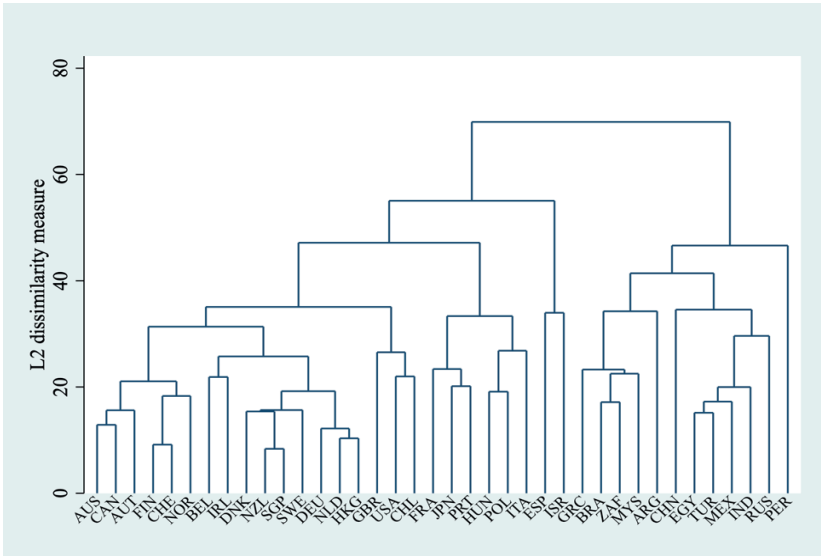
Variables	VIF	1/VIF
PropRight	11.08	0.9025
GovIntgrt	10.80	0.9262
CRRsk	8.01	0.1249
PolStb	3.88	0.2580
CERP	3.34	0.2990
InvstFrdm	3.06	0.3267
IntRst	2.94	0.3404
NetIntMrgn	2.74	0.3646
Infltn	2.24	0.4467
MoneFrdm	2.23	0.4481
CBI	1.62	0.6190
FinRsk	1.57	0.6370
Zscore	1.54	0.6493
GDPgrowth	1.44	0.6954
FmEff	1.40	0.7167
DivYld	1.35	0.7430
EqIndx	1.25	0.7980
Mean VIF	3.56	

Table 13
Fisher-type unit-root test (based on augmented Dickey-Fuller tests)

Variables	P	Z	L*	pm	P-value	
					I (0)	I (1)
HRRtn	202.89	-8.53	-8.53	9.99	0.000***	0.000***
CERP	149.24	-5.39	-5.32	5.47	0.000***	0.000***
DivYld	164.75	-7.70	-7.55	8.59	0.000***	0.000***
CRRsk	141.75	-4.55	-4.44	4.88	0.000***	0.000***
CBI	108.14	-3.59	-3.47	2.41	0.013***	0.000***
IntRst	152.53	-5.68	-5.84	6.71	0.000***	0.000***
NetIntMrgn	242.38	-9.19	-10.03	13.16	0.000***	0.000***
Infltn	220.26	-8.42	-8.86	11.08	0.000***	0.000***
PolStb	177.26	-7.03	-6.90	7.68	0.000***	0.000***
FinRsk	226.54	-8.46	-9.01	11.58	0.000***	0.000***
GDPgrowth	196.02	-8.15	-8.03	9.17	0.000***	0.000***
MoneFrdm	222.29	-8.83	-9.03	11.24	0.000***	0.000***
InvstFrdm	174.66	-5.67	-6.02	7.48	0.000***	0.000***
GovIntgrt	210.93	-8.18	-8.60	10.64	0.000***	0.000***
PropRight	180.57	-7.41	-7.25	8.21	0.000***	0.000***
EqIndx	206.32	-8.29	-8.41	10.27	0.000***	0.000***
Zscore	163.74	-6.11	-6.13	7.11	0.000***	0.000***
FmEff	189.36	-7.77	-7.60	8.64	0.000***	0.000***

Note: for tractable interpretation, all the coefficients are reported as elasticity and the statistical significance is reported against 10% (*), 5% (**) and 1% (***) significance levels respectively.

Figure 1
Dendrogram for cluster analysis



Wpływ niezależności banku centralnego na koszt kapitału: analiza porównawcza

Streszczenie

Polityka banku centralnego w zasadniczy sposób wpływa na rynki finansowe, oddziałując na stopy procentowe, rentowność obligacji i wyniki giełdowe. Zdolność banków centralnych do prowadzenia działalności niepodlegającej politycznej presji jest kluczowym elementem ich efektywności – podnosi wiarygodność i stabilizuje oczekiwania podmiotów gospodarczych. Polityka pieniężna i aktywność banku centralnego również na innych polach determinują stabilność finansową oraz ogólną sytuację gospodarczą w danym kraju. Eijfinger i de Haan (1996) wskazują na to, że na niezależność banku centralnego oddziałują czynniki ekonomiczne i polityczne o szerokim zakresie, np. mechanizmy wyboru publicznego w danym kraju, faktyczna inflacja oraz niespójność polityki pieniężnej w czasie. Z kolei koszt kapitału jest ważną zmienną przy podejmowaniu decyzji inwestycyjnych w skali mikro przez przedsiębiorstwa. Polityka banku centralnego, wpływając na krajowe warunki finansowe i ekonomiczne, wpływa również pośrednio na decyzje inwestycyjne o charakterze transgranicznym. Frank i in. (2020) dowodzą, że kraje z niezależnym i transparentnym bankiem centralnym wykazują wyraźną tendencję do przyciągania kapitału zagranicznego.

Niezależność banku centralnego umożliwia podejmowanie decyzji bez wpływu i ingerencji politycznej instytucji rządowych. Na koszt kapitału oddziałują zarówno warunki ekonomiczne i finansowe, jak i polityka banku centralnego. Do tej pory nie opublikowano jednak znaczących prac, które podejmowałyby problem relacji między stopniem niezależności banku centralnego a kosztem kapitału na rynkach finansowych. Dlatego też w artykule badamy właśnie ten problem. W analizie wykorzystano dane panelowe zebrane w 23 rozwiniętych i 17 rozwijających się krajach. Miała ona na celu znalezienie różnic między kosztem kapitału w badanych krajach, związanych ze zróżnicowanym stopniem niezależności banku centralnego. Podstawowe pytanie badawcze brzmi zatem: „jaki jest wpływ niezależności banku centralnego na koszt kapitału?". Wyniki badania pozwalają na sformułowanie następującego wniosku: wzrost niezależności banku centralnego przekłada się na niższy koszt kapitału. Pogłębione analizy pokazują również, że niezależność banku centralnego ma większy wpływ na redukcję kosztu kapitału w krajach rozwijających się niż w krajach rozwiniętych.

Hipoteza badawcza postawiona w artykule brzmi następująco: „w kraju, w którym respektowany jest wyższy stopień niezależności banku centralnego, notuje się niższy koszt kapitału niż w kraju, w którym niezależność banku centralnego jest ograniczana". Z dostępnej literatury wynika, że istnieje wyraźny lub ukryty związek między niezależnością banku centralnego a rynkami finansowymi i kosztem kapitału, co uzasadnia przyjęcie wyżej postawionej hipotezy badawczej.

Niezależność banku centralnego wpływa na koszt za pośrednictwem prowadzonej polityki pieniężnej. Inflacja, stopy procentowe oraz kursy walutowe są kluczowymi komponentami polityki pieniężnej, które wpływają na stopy zwrotów osiągane przez inwestorów oraz premię za ryzyko w przypadku inwestycji portfelowych. Studia empiryczne weryfikujące relację między niezależnością banku centralnego a inflacją wskazują na to, że inflacja jest istotnie wyższa w krajach z niskim poziomem niezależności banku centralnego (Klomp, de Haan 2009). Alesina i Summers (1993)

wykazali, że polityka pieniężna prowadzona przez niezależny bank centralny stwarza możliwość obniżenia inflacji i redukcji jej zmienności. Borio i Lowe (2002) twierdzą, że polityka niskiej inflacji zmniejsza obawy inwestorów i instytucji finansowych dotyczące możliwości wystąpienia kryzysów gospodarczych, co zwiększa wolumen udzielonych i zaciągniętych pożyczek, a w rezultacie korzystnie wpływa na ceny aktywów. Papadamou, Sidiropoulos i Spyromitros (2017) dowodzą, że wyższa niezależność banków centralnych stabilizuje rynki finansowe i ogranicza zmienność kursów akcji na giełdach.

Pomiar wpływu niezależności banku centralnego (*CBI*) na koszt kapitału odbywa się z wykorzystaniem czterech zmiennych objaśniających, którymi są: historyczna stopa zwrotu (*HRRtn*), premia za ryzyko krajowe (*CERP*), stopa dywidendy (*DivYld*) i ocena ryzyka kredytowego państwa (*CRRsk*). Nasze wyniki sugerują, że wyższy poziom *CBI* zmniejsza *HRRtn*, co obniża koszt kapitału. Znaleźliśmy także istotne dowody na to, że wyższy poziom *CBI* zmniejsza *CERP* i w ten sposób ogranicza koszt kapitału. Ponadto rezultaty badania dostarczają dowodu na to, że wyższy poziom *CBI* zmniejsza *DivYld*, co w konsekwencji obniża również koszt kapitału. Dodatkowo nasze badania dostarczają istotnych dowodów, że wyższy poziom *CBI* obniża ocenę systemowego ryzyka kredytowego państwa, co także zmniejsza koszt kapitału. W celu weryfikacji hipotezy badawczej wykorzystaliśmy metodę różnicy w różnicach, test placebo, grupowanie hierarchiczne i estymator Neweya-Westa.

Słowa kluczowe: niezależność banku centralnego, polityka pieniężna, koszt kapitału, portfel inwestycji zagranicznych