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Fiscal Rules and Foreign Direct Investment in developing countries

HISGUIMA DASSIDI Crépin [1] [2] [3]

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Abstract

This study analyses the effect of fiscal rules on Foreign Direct Investment (FDI) in developing countries. Using a sample of 78 countries, we use the entropy balancing method to analyze the causal effect of rule adoption on FDI. Two hypotheses are tested in this study. The first one states that adopting fiscal rules increases FDI, and the second one is related to the ability of different types of rules to attract more investments. First, the robust results show that adopting fiscal rules increases FDI. The ratio of the public deficit to GDP, the rating of long-term sovereign debt in foreign currency, and the ratio of short-term external debt outstanding are the transmission channels through which fiscal rules affect FDI. The effect of the rules is amplified in the presence of a high level of business climate, economic performance, and better structuring of the agricultural and industrial sectors. On the other hand, this effect is attenuated in the presence of mineral rents and the economy's high real interest rate.

Keywords : Fiscal rules, Foreign Direct Investment, fiscal policy

JEL Classification : C33, E62, F21

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3. The paper was presented at the 11tth UECE Conference in Lisbon in 2023

1 Introduction

Budgetary drift and debt crises have revealed the importance of financial institutions in the execution of fiscal policy. In the 1990s, following the economic and financial crises, the issue of fiscal rules became one of the major concerns of international financial institutions (International Monetary Fund, etc.). Also, these fiscal rules are increasingly at the heart of the significant issues that preoccupy political decision-makers given their considerable contribution to macroeconomic stability (Fatás et Mihov, 2006 ; Badinger, 2009 ; Andrés et Doménech, 2006 ; Schaechter *et al.*, 2012). The numerous debt crises and other abuses of budgetary management by decision-makers have shown the need for budgetary discipline (Drazen, 2004 ; Kopits, 2001 ; Schaechter *et al.*, 2012). Without a binding measure on fiscal policy management, several economies risk facing a solid instability of the macroeconomic framework, which affects the process of poverty reduction and annihilates the efforts of progress and development obtained over several years(Barnes *et al.*, 2012). However, it is essential to clarify the debates on the nature of the budgetary discipline and on the means to implement fiscal rules (Wyplosz, 2012). The desire to impose budgetary discipline has led to the establishment of fiscal rules, which constitute numerical and procedural constraints in the execution of fiscal policy. A strict numerical limitation of budgetary aggregates manifests these rules. A fiscal rule thus has two fundamental characteristics : First, it is a concrete indicator of budgetary management. Second, it is binding on policymakers and political decisions. These two characteristics make them a crucial tool for budget management. Fiscal rules can also help constrain political budget cycles(Gootjes *et al.*, 2021).

According to the World Bank, Foreign Direct Investment (FDI) flows direct equity investment into the economy (host country). It is the sum of equity, profit reinvestment, and other capital. Direct investment is a category of cross-border investment associated with a resident of one economy having control or significant influence over managing an enterprise resident in another economy. Ownership of at least 10% of an enterprise's voting stock (or common stock) is the criterion for determining the existence of a direct investment relationship. These sources of external finance are important for the economic performance of countries as they contribute significantly to filling the financing gap in many developing countries (Iamsiraroj, 2016 ; Alfaro *et al.*, 2004 ; Azman-Saini *et al.*, 2010 ; Ayanwale, 2007). From 1990 to 2020, total FDI received increased from 203 billion to 1,000 billion in 2020, an increase of 80 percent. This increase in FDI has played an important role in financing development.

The link between FDI and fiscal rules is through the stability channel. The impact of fiscal rules concerns the effects on the main macroeconomic aggregates such as debt, inflation, budget deficit, and revenue. The impact of rules forces policymakers to consider two essential and complementary notions : the procedure for applying the rules and the numerical constraint that the rules impose on the macroeconomic aggregates. The effect of fiscal rules on Foreign Direct Investment (FDI) is manifested through the credibility that the rules give to fiscal policy management. Macroeconomic stability plays an essential role in attracting FDI ; it sends a signal to investors about the possibility of investing in a favorable environment. This effect also depends on the capacity of the rules to make the economic environment more competitive in order to attract more FDI. A good management of the budgetary framework increases FDI(Simões *et al.*, 2015 ; Ajayi, 2006). Also, the fiscal rules allow for a good allocation of resources to make the economic environment more attractive to investors. An attractive economic environment sends a positive signal to foreign investors and influences the decision of investors to invest (the macroeconomic

stability channel). Although fiscal rules help to improve fiscal performance, it is important to note that rules vary from region to region, and their success depends on their ability to force governments to strictly supervise the execution of fiscal decisions.

This article is linked to two streams of literature : The first stream demonstrates the importance of fiscal rules (Debrun et Kumar, 2007 ; Debrun, 2007 ; Debrun *et al.*, 2008 ; Debrun *et al.*, 2009 ; Rose, 2006 ; Combes *et al.*, 2021 ; Beetsma *et al.*, 2018 ; Schuknecht, 2004) and Foreign Direct Investment (FDI) (Hrechyshkina et Samakhavets, 2018 ; Hrechyshkina et Samakhavets, 2018 ; Alfaro *et al.*, 2004 ; Lee et Chang, 2009 ; Ajayi, 2006). The second stream questions the link between fiscal policy and FDI (Simões *et al.*, 2014 ; Simões *et al.*, 2015 ; Göndör et Nistor, 2012 ; Rădulescu et Druica, 2014 ; Schoeman, 2000). In the first stream, understanding the importance of fiscal rules is important for knowing the contribution of fiscal policy and, more particularly, that of macroeconomic stability and the credibility of fiscal policy. It also shows the importance of FDI in the economic performance of countries. In the second stream, (Mitsi et Kottaridi, 2022 ; Simões *et al.*, 2015 ; Ajayi, 2006 ; Rădulescu et Druica, 2014 ; Schoeman, 2000) highlight the link between budgetary institutions and foreign investment. Increasing macroeconomic stability and fiscal policy credibility help promote the entry of FDI and fill the financing gap in the economy. literature shows that fiscal discipline and fiscal stimulus help to attract more FDI in the long run.

Even if several studies analyze the link between fiscal policy and FDI, very few works have focused on the effect of fiscal rules on FDI in developing countries ; hence the interest in distinguishing ourselves from existing works by analyzing the effect of fiscal rules on FDI in developing countries. This analysis, therefore, essentially answers the following question : How does adopting fiscal rules affect FDI in developing countries ?

In this study, we make four main contributions to the existing literature on fiscal institutions and FDI :

First, we contribute to the existing literature by studying the effects of fiscal rules on FDI in developing countries. This study is oriented towards developing countries because of the high level of developing countries that receive FDI. Also, developing countries are particularly vulnerable because of their constant exposure to macroeconomic volatility. The governments of these countries adopt restrictive fiscal rules to mitigate the effects of exogenous macroeconomic shocks on the economy and attract more foreign investment.

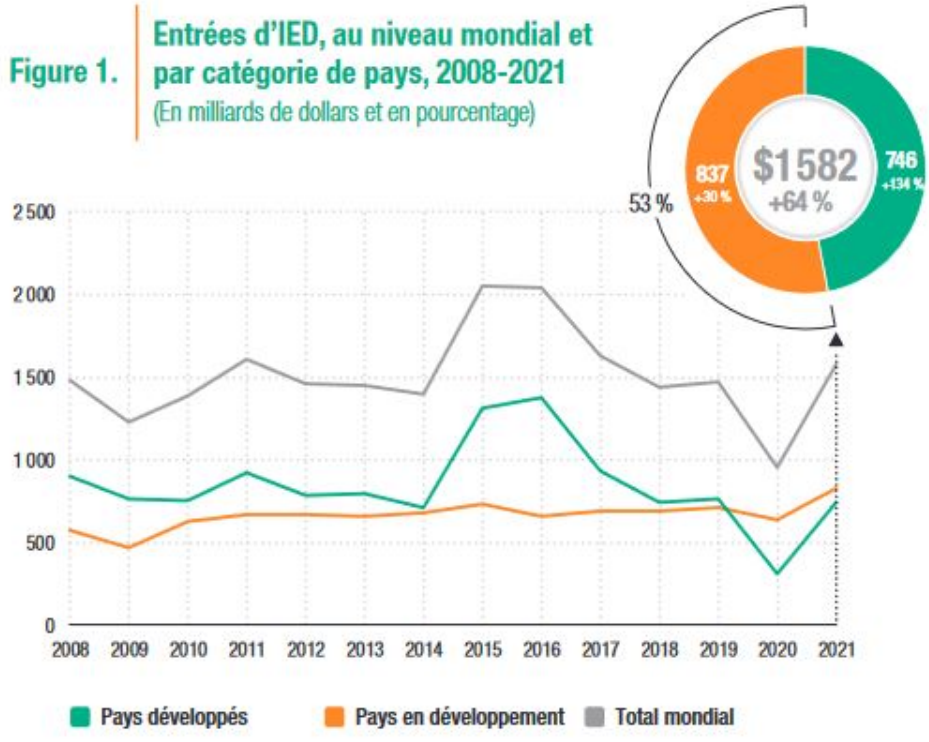
Secondly, on the empirical side, we enrich the existing literature by using the entropy balancing method of Hainmueller (2012). Other methods, such as the Propensity Score Matching (PSM) of Rosenbaum et Rubin (1983) are used in robustness. The entropy balancing method is an innovative method that combines a reweighting mechanism with a regression analysis. This method is performed in two steps : First, we calculate weights that are assigned to the control units (countries that have not adopted fiscal rules). In the second step, we use the weights obtained in the first step in a regression analysis with the treatment variable as an explanatory variable. Subsequently, we match the countries that have adopted the fiscal rule and the countries that have not adopted a fiscal rule on the basis of observable characteristics. This

is a more reliable method than the usual ones.

This study makes a new contribution insofar as it allows the analysis of the capacity of different types of fiscal rules to attract foreign investment. This analysis also differs from other work in providing empirical evidence on the channels through which fiscal rules affect FDI. We find evidence that the ratio of government deficit to GDP, the rating of long-term foreign currency debt, and the ratio of short-term external debt outstanding are transmission channels through which fiscal rules affect FDI. The study finds that the adoption of rules increases FDI in developing countries. Second, apart from expenditure rules, income rules, deficit rules, and debt rules increase FDI. In a further reflection, we contribute to this study through the analysis of heterogeneity that allows for specificities between developing countries.

Finally, this study makes a new contribution in terms of economic policy implications. This is one of the major contributions of the study, as it will make it possible to propose concrete economic policies likely to better attract Foreign Direct Investment (FDI).

The rest of the study is structured as follows : Section 2 reviews the theoretical and empirical literature related to the theme of the study. Section 3 presents the stylized facts on fiscal rules and FDI in developing countries. Section 4 focuses on the theoretical identification of transmission channels. In Section 5, we present the data. Sections 6, 7, and 8 present the identification strategy and the study's main results. Sections 9 and 10 analyze the heterogeneity and validation of the transmission channels. The last section concludes the study.



Source : CNUCED, base de données sur l'IED et les entreprises multinationales (https://unctad.org/fdistatistics).

2 Literature review

Fiscal policy is one of the last degrees of freedom for governments. However, this freedom is increasingly constrained by adopting fiscal rules, whose primary role is to discipline policymakers in exercising fiscal policy. Fiscal rules are budgetary institutions that provide a better framework for the conduct of fiscal policy. They function as devices that constrain the executors of fiscal policy and reduce the asymmetry of information between the electorate and the decision-makers. These rules prevent the decision-makers from drifting in the execution of the budget. They strengthen fiscal policy by reinforcing its credibility (Combes *et al.*, 2021). They also play an essential role in reducing financial risks. However, the implementation of these fiscal rules must be done independently in order to achieve the objectives of these rules (Debrun *et al.*, 2009 ; Beetsma *et al.*, 2018). authors show that rules specifically designed to prevent conflicts with the stabilization function of fiscal policy are indeed associated with less pro-cyclical policies. Sawadogo (2020) analyses the link between fiscal rules and financial market access in developing countries and shows that adopting fiscal rules lends credibility to fiscal policy management and gives a positive signal to investors about the ability of borrowers to repay loans. Thus, it demonstrates that adopting fiscal rules improves developing countries' access to the financial market by reducing borrowing costs. Debrun (2007) highlights the role of budgetary institutions in strengthening budgetary discipline. His study shows that rules are more effective when the cost of circumventing them is high because this discourages decision-makers from violating them. It also reveals that full budget transparency and strong democratic accountability are sufficient to establish the credibility of rules.

The work of Schuknecht (2004) shows the advantages (solving the problem of deficit bias and time inconsistency, reducing transaction costs on the financial market) and the limits (the complexity of the rules, limiting the ambitions of public decision-makers) of the fiscal rules and proposes the necessary reforms of these rules so that they are in line with economic realities. Several studies show the importance of fiscal policy in attracting FDI (Simões *et al.*, 2014 ; Schoeman, 2000). Schoeman (2000) analyses the link between fiscal policy and FDI and shows that this link involves an adjustment of fiscal policy which allows the government to contribute to creating a favorable environment capable of attracting more foreign investment. Fiscal rules have a strong link with FDI because, by giving fiscal policy more credibility and stability, they also affect the decision of foreign investors and lead to a better attractiveness of FDI. Indeed, the decision to invest in a country is not only conditioned by the size of the market and political and legal stability but also by the stability of the macroeconomic framework and, more globally, by the fiscal policy's credibility.

Poor management of the macroeconomic framework discourages foreign investors. It sends a negative signal on the capacity to make a return on its investments, as no investor wishes to invest sustainably in a country where the macroeconomic environment is characterized by strong instability(Simões *et al.*, 2014). Macroeconomic stability is one of the factors that influence the decision of foreign investors to invest (Ranjan et Agrawal, 2011 ; Shah, 2014 ; Aizenman, 2003). According to UNCTAD [4] global foreign direct investment (FDI) flows amounted to $,580 billion, an increase of 64% compared to the exceptionally low level of 2020 (linked to the Covid crisis19) before rising again in 2021. This increase in FDI in 2021 is due

4. https ://unctad.org/webflyer/world-investment-report-2022, in 2021

to record profits of multinationals in 2021 [5].

Recent work on fiscal rules and foreign direct investment shows that expenditure rules have a negative effect on foreign direct investment because they refer to budgetary indiscipline. In the framework of our study, we will carry out the same estimations to see if this effect is confirmed.

According to Eurostat [6], foreign direct investment (FDI) is the category of international investment that reflects the objective of obtaining a lasting interest by an investor from one economy in a resident enterprise in another economy. Sustained interest implies that there is a long-term relationship between the investor and the enterprise and that the investor has a significant influence on the way the enterprise is managed. Such an interest is formally deemed to exist where a direct investor holds 10% or more of the voting rights on the board of directors (for an incorporated company) or the equivalent (for an unincorporated company). These types of financing help fill the domestic financing gaps in many developing countries (Hrechyshkina et Samakhavets, 2018 ; Alfaro *et al.*, 2004 ; Lee et Chang, 2009 ; Ajayi, 2006). Tang *et al.* (2014) identifies GDP, real exchange rate, financial development, and macroeconomic uncertainty as the main determinants of Foreign Direct Investment (FDI).

Good management of fiscal policy increases FDI (Simões *et al.*, 2015 ; Ajayi, 2006). Several studies (Rădulescu et Druica, 2014 ; Schoeman, 2000 ; Simões *et al.*, 2015) analyze the link between fiscal policy and foreign direct investment (FDI) and show the contribution of fiscal policy to the attractiveness of FDI. Indeed, a stable fiscal policy sends a positive signal to foreign investors and attracts more foreign investment. On the other hand, a poorly conducted fiscal policy reduces investment. Indeed, a significant increase in expenditure reduces investment because this increase reduces the budgetary margins of maneuver. The expansionary effects of budgetary adjustments explain this. Similarly, the work of Rădulescu et Druica (2014) demonstrates the link between fiscal policy and FDI and shows that economic stimulus programs can be an incentive for foreign investment. The study shows that high-interest rates and high inflation attract less FDI in Romania. On the other hand, indirect taxes seem to play a less important role as they are only relevant in the long term. The study suggests that fiscal stimulus, infrastructure, and political and legal stability attract more FDI than direct taxes. Göndör et Nistor (2012) highlight the link between fiscal policy and FDI in emerging Europe and show that tax competition between governments for FDI is not necessarily a competition of corporate tax rates but of the business environment, which is mainly determined by fiscal policy. The study shows that fiscal policies are decisive in attracting FDI. Fiscal policy, therefore, plays an essential role in attracting FDI by managing the main macroeconomic aggregates. The worse a country's macroeconomic framework, the less attractive it is to FDI, as investors are not encouraged to invest in countries with an unstable macroeconomic framework. Simões *et al.* (2014) highlight the relationship between FDI and fiscal policy and show that fiscal policy is an increasingly important tool in countries' competition to attract FDI. They identify the geographical and cultural proximity between FDI home and host countries and the market size of (FDI) host countries as the main factors that attract FDI. The link between fiscal policy and FDI is also explained by the fact that a well-managed fiscal policy framework in a country influences decision-making when countries or investors compete to invest (FDI) in a host country. The economic literature discusses the link between

5. World Investment Report 2022 International tax reforms and sustainable investment

6. https ://ec.europa.eu/eurostat/web/economic-globalisation/globalisation-in-business-statistics/foreign-direct-investments

fiscal policy and FDI in developing countries. analyses the impact of fiscal policy on FDI and shows a formal link between FDI flows and fiscal policy variables such as the deficit/GDP ratio, representing fiscal discipline, and the tax burden on foreign investors. This linkage involves adjusting fiscal policy that allows the government to help create an investor-friendly environment. Other works(Škare *et al.*, 2020 ; Mahmood et Khalid, 2013) reveal the existence of a long-run relationship between FDI and fiscal policy through a vector error correction model (VECM) to test the existence of a causal relationship.

3 Stylized facts

Figure 1 : Average evolution of the FDI of the countries having adopted the fiscal rules and the countries having not adopted (% of the GDP)

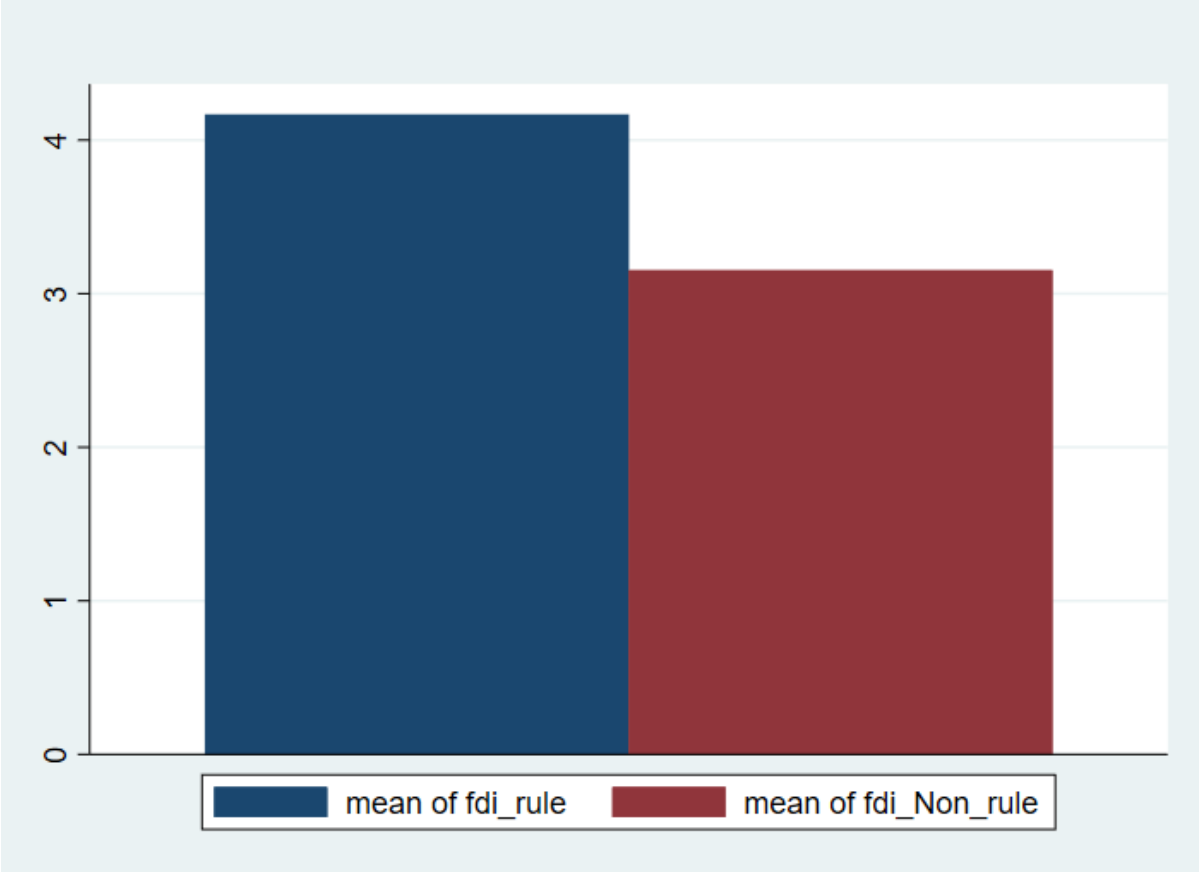


Figure 2 : Evolution of FDI between 1990-2020 (% of the GDP)

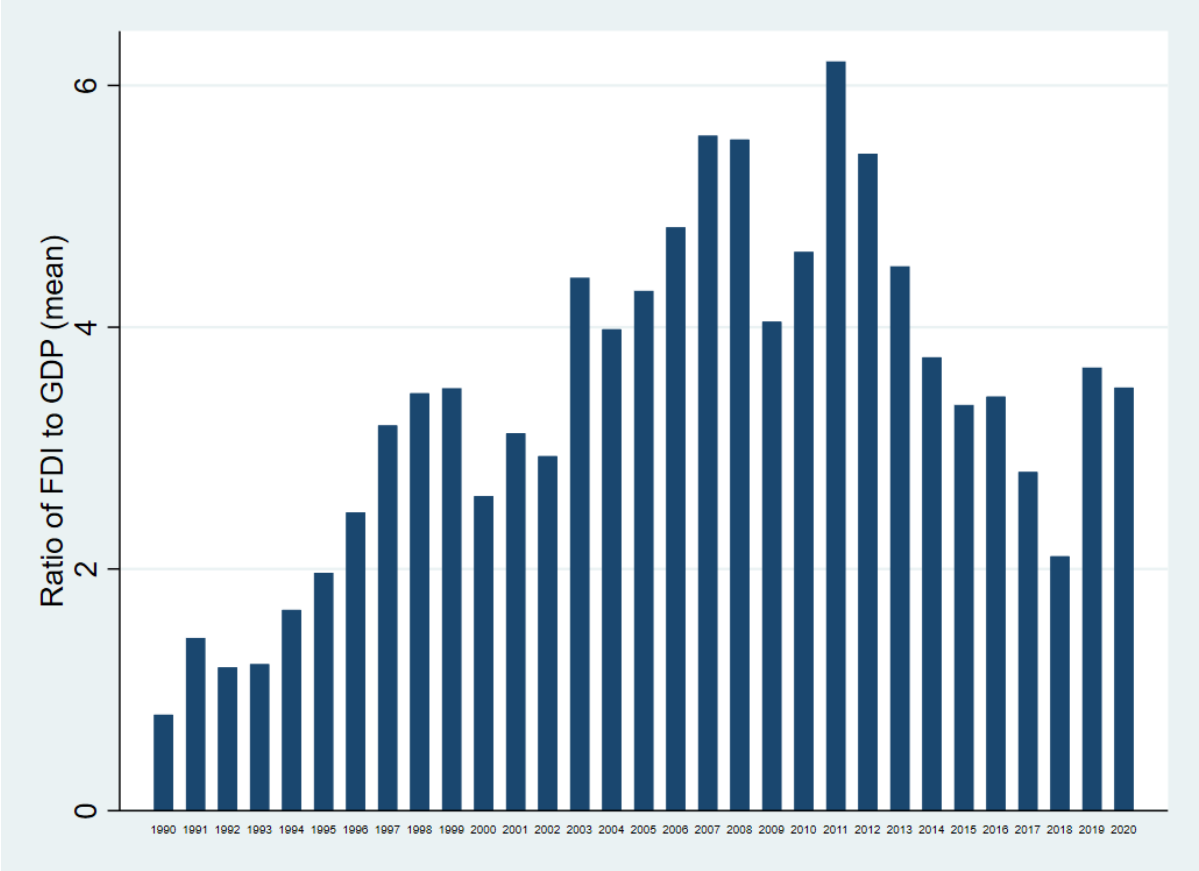
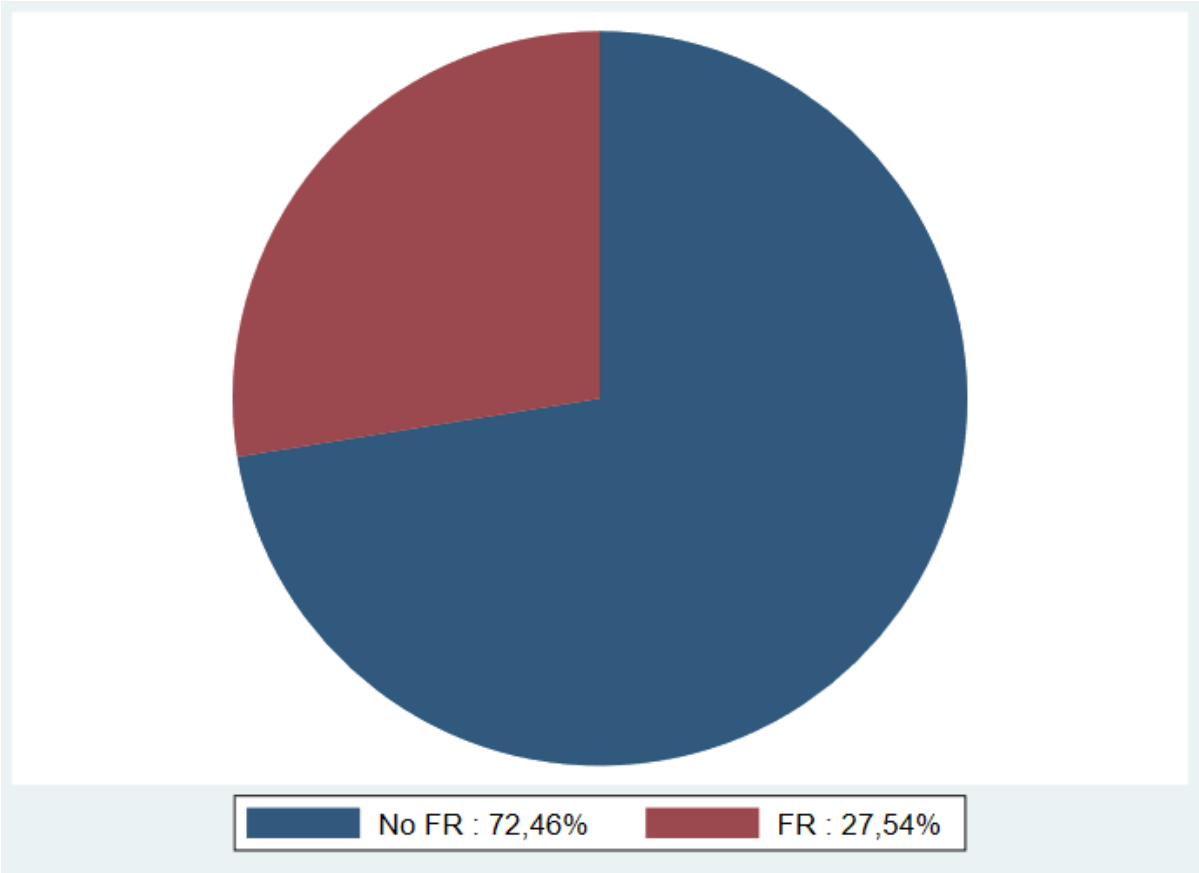


Figure 3 : Distribution diagram of the countries having adopted the fiscal rules and those having not adopted



This section presents the stylized facts about foreign direct investment (FDI) and fiscal rules (FR) in developing countries. Several economic studies highlight the important contribution of fiscal rules to FDI dynamics. The work of (Simões *et al.*, 2015 ; Ajayi, 2006 ; Rădulescu et Druica, 2014 ; Schoeman, 2000 ; Simões *et al.*, 2015) reveal the existence of a positive and significant effect of budgetary institutions on FDI. Figure 1 shows us the FDI/GDP ratio level as a function of the adoption or non-adoption of fiscal rules over the period 1990-2020. On average, the ratio of FDI to gross domestic product increased by 77% over the study period. However, this increase was greater in countries that adopted at least one fiscal rule (around 4.2% of GDP) than in countries that did not adopt a fiscal rule (with 3.2% of GDP on average) (see Figure 1). A link can therefore be established between adopting fiscal rules (FR) and increasing Foreign Direct Investment (FDI). This link has been highlighted in Schoeman (2000), which show that the existence of fiscal rules helps guarantee macroeconomic stability and creates a favorable environment for attracting more FDI. The stability of macroeconomic aggregates conferred by the rules also influences the decision-making of investors (FDI) to come to a country.

Several factors, such as the size of the country, geographical proximity, macroeconomic stability, political stability, and fiscal stability, determine the entry of FDI into a country. We note that there has been

a substantial increase (77% in FDI in developing countries since 1990. However, this progression of FDI has been slowed down by the recent crises (Coronavirus, etc.) that the world has experienced. As a result, the FDI ratio will decrease between 2019 and 2020 (see Figure 2). Following the numerous economic crises and other budgetary abuses, international financial institutions have massively advised the adoption of fiscal rules for developing countries in order to resist exogenous shocks and allow for a better allocation of resources and a stable macroeconomic framework. Thus, many countries have adopted one or more fiscal rules to guard against exogenous shocks and, more specifically, to discipline their fiscal policy. However, nowadays, fewer developing countries have adopted fiscal rules than have not. This is also the case for the countries in this study's sample (see Figure 3). In sum, it can be seen that both FDI and the adoption of fiscal rules have increased in developing countries over the period 1990-2020.

4 Theoretical identification of transmission channels

Based on the existing literature, we theoretically identify the channels through which fiscal rules could affect Foreign Direct Investment (FDI) in developing countries. Indeed, through their mechanism, several factors are the channels through which the effect of adopting fiscal institutions on FDI is transmitted.

The adoption of fiscal rules aims at increasing a better allocation of resources and contributes to stabilizing the macroeconomic framework. Adopting rules increases efficiency in financing growth policies, strengthens resilience to exogenous shocks, and reduces income disparities. This better allocation of resources through fiscal rules helps to use resources efficiently in sectors such as infrastructure, agriculture, and services. A better organization of the infrastructure, agriculture, and services sectors through a better allocation of expenditure is likely to attract massive Foreign Direct Investment (FDI)(Kumar, 2006 ; Awunyo-Vitor et Sackey, 2018) and a better allocation of expenditure is likely to attract massive Foreign Direct Investment (FDI). Fiscal institutions increase the stability of macroeconomic aggregates by reducing inflation, and this economic stability attracts FDI. Inflation is thus one of the theoretical determinants through which fiscal rules affect FDI. Secondly, adopting fiscal rules contributes to reducing the level of debt by making it more sustainable. This debt sustainability sends a positive signal to investors (FDI) about the country's macroeconomic stability and influences the decision to invest. In the same vein, the adoption of rules reduces the budget deficit by making the fiscal policy more credible, and this credibility conferred by the rules favors FDI. Finally, the rules increase the economic performance of the countries (Afonso et Jalles, 2013 ; Castro, 2011 ; Servén, 2007), and this performance positively affects the investors who wish to make their investments bear fruit and invest in places with high added value for the business.

It appears, therefore, that fiscal rules through the different transmission channels (pro-cyclicality, inflation, debt, budget deficit, and economic performance) affect Foreign Direct Investment (FDI).

5 Data

5.1 Source of data

Most of the data for this study comes from the World Development Indicators (WDI) database. Fiscal rules data are from the International Monetary Fund (IMF) Fiscal Rules Dataset. The institutional data comes from the International Country Risk Guide (ICRG) database.

5.2 Description of the database

We use the ratio of Foreign Direct Investment inflows (FDI) to GDP as a dependent variable. Our variable of interest is a binary variable that indicates 1 if the country has adopted a fiscal rule and 0 otherwise. Then we control for a series of variables : inflation, monetary union membership, fiscal balance, capital openness, inflation targeting, and institutional variables(Checks and corruption). The period (1990-2020) is chosen according to the availability of FDI data.

Inflation is the measure of the general price level. It directly impacts the purchasing power of poor households. It is a variable that captures economic stability. The higher it is, the more unstable the economic situation. Excessively high inflation is a brake on the attractiveness of FDI. The works of Sayek (2009) suggest that FDI is used as a hedging tool, mitigating the effects of inflation taxes even if there are no formal hedging mechanisms

Membership of a monetary union is a binary variable that indicates 1 if the country belongs to a monetary union and 0 otherwise. The work of Kilic *et al.* (2014) shows that membership of a monetary union increases FDI by reducing exchange rate volatility, inflation volatility, and distance and by supporting economic growth.

Checks and balances : is an institutional variable. It is a determinant of fiscal rules. The work of Perotti et Kontopoulos (2002) shows that a system of political checks and balances (other than budgetary constraints) can be considered an implicit contract between governments and voters, reducing the need for fiscal rules. This variable is expected to affect FDI positively.

Capital opening : This variable captures the financial openness of the country. An opening of the capital allows the mobilization of more resources. The work of Bergman et Hutchison (2015) highlights that financial openness is associated with less cyclicality in fiscal policy.

Inflation targeting : It allows for greater economic stability through inflation discipline. Several studies(Mason et Vracheva, 2017 ; Tapsoba, 2012) demonstrate that targeting allows for the attraction of more FDI. In this study, we expect inflation targeting to positively affect FDI

Institution : This is the index that captures the fight against corruption in the political system. Corruption hurts the attractiveness of foreign investment. In this study, we expect the fight against corruption to positively affect FDI.

Fiscal balance : This variable captures the amount of money that a government receives from tax revenue and the proceeds of assets sold, minus any government spending. When the balance is negative, the government has a fiscal deficit. When the balance is positive, the government has a fiscal surplus [7].

7. EUROSTAT

5.3 The measurement of fiscal rules

Fiscal rules are tools for managing fiscal policy. They aim to combat deficit bias, fight against the pro-cyclicality of fiscal policy, generate credibility to be able to borrow more cheaply on international markets, and also a means of combating the fiscal externalities resulting from excessive deficits. The economic literature distinguishes several types of fiscal rules, namely procedural rules and numerical rules

A. Procedural rules

Procedural rules are the rules of the budgetary procedure. Whatever the institutional structure of the country, two main procedures can be distinguished in the sense of decision-making :

1- Collegial procedure : a procedure that authorizes the representation of several groups in decision-making, with several structures participating in budgetary decision-making. This allows a better representation of social groups but could lead to the tragedy of the commons.

2- Hierarchical procedure : predominant role of one agent in elaborating the budget. In the budget vote : limited room for maneuvering the parliament, the right to amend the budget is limited, and in the execution of the budget, the procedure for the government to reduce the expenditure is voted by the parliament. The most effective way to reduce the tragedy of the commons is to adopt hierarchical top-down budgeting procedures.

B. Numerical rules : These are numerical goals. They manifest themselves through ceilings, floors, etc., which consist of constraining budget aggregates. They are permanent constraints on fiscal policy and are expressed as a synthetic indicator of budgetary performance.

However, fiscal rules are not without their critics : Firstly, they encourage the pro-cyclicality of fiscal policy : in periods of expansion, it is easier to respect the rule than in periods of economic slowdown. The target is the structural balance, which does not depend on the economic situation. Budgetary rules sometimes penalize public investment : when you impose budgetary constraints on the government, they will sacrifice investment because it is easier to sacrifice investment than to reduce current expenditure. Fiscal rules could have positive endogenous effects because the countries that adopt them are generally virtuous countries in terms of fiscal policy management. The second criticism is that these rules sometimes weaken investment spending. For example, debt or deficit will be limited or even prohibited when the debt is generated by investment spending. In addition to fiscal rules, independent budgetary committees should be set up to monitor the execution of the budget and make an independent forecast. Several economic studies suggest that the control of the significant budgetary aggregates should be entrusted to these independent budgetary committees(Debrun *et al.*, 2009 ; Beetsma *et al.*, 2017 ; Beetsma *et al.*, 2018). In this study, fiscal rules are measured by a binary variable that takes the value 1 if the country has adopted a fiscal rule and 0 otherwise.

5.4 The measurement of Foreign Direct Investments (FDI)

Foreign Direct Investment (FDI) is the net inflow of investment to acquire a lasting management stake (10 percent or more of the voting shares) in an enterprise operating in an economy other than the investors. According to the OECD, FDI is a type of transnational investment made by a resident of one economy ("the direct investor") to establish a lasting interest in an enterprise ("the direct investment enterprise") that is resident in an economy other than that of the direct investor. The investor is motivated to establish

a lasting strategic relationship with the enterprise to exercise significant influence over its management. A "lasting interest" is established when the direct investor holds at least 10% of the voting rights of the direct investment company. Schoeman (2000) highlights the link between FDI and fiscal rules and shows that RFs contribute to attracting FDI. The Foreign Direct Investment (FDI) data are taken from the World Development Indicators database [8]. The FDI data in this study represent the ratio of inward FDI to GDP. Several economic works(Blanco *et al.*, 2013 ; Jenkins, 2006 ; Ang, 2009 ; Decreuse et Maarek, 2015) use the ratio of FDI to GDP.

Several institutions (UNCTAD, IMF, etc.) publish FDI data online. More generally, the UNCTAD and IMF data show a similar trend for all countries, although there are differences in magnitude, particularly concerning FDI stocks in developing countries. A few observations are worth noting : First, regarding FDI flows, the differences between the two data sources are more relevant in the case of developing countries. For example, in 2000, UNCTAD data peaked at USD 264 billion, while IMF data started a downward trend. Second, regarding FDI stocks, the differences between the two databases are larger, especially for developing countries. This is explained by the fact that for developing countries, there is the problem of a lack of data related to the quality of data in these countries. The main reason is the IMF data's lack of information on many developing countries. Overall, the UNCTAD data is more informative than the IMF data. However, in this study, we favor using the ratio of FDI to GDP because the ratio better captures the effect of fiscal rules on FDI. After all, ratios tell us the exact order and value between units, which allows for a wide range of descriptive and inferential statistics. They also offer a multitude of possibilities for statistical analysis. For all these reasons, we prefer the ratio of inward FDI to GDP.

6 Identification strategy

In this study, the causal effect is analyzed through the entropy balancing method (Hainmueller, 2012 ; Hainmueller et Xu, 2013). The model developed in this study is based on the work of Badinger et Reuter (2017), which identifies inflation targeting and the checks variable as determinants of fiscal rules. We use these variables as controls in the study. A large amount of literature shows that inflation targeting increases discipline in the management of fiscal policy ; it increases inflation and has a positive impact on foreign direct investment. For this reason, we also add the variable capturing inflation targeting among the control variables. Second, we rely on the work on fiscal rules by Shawadogo2020can ; Kirsanova2007optimal, which uses inflation, the balanced budget variable, and capital openness as controls. We also use these three variables as controls in our model. Several economic works (Bova *et al.*, 2014 ; Gali et Monacelli, 2008 ; Dixit et Lambertini, 2003 ; Ferrero, 2009 ; Kirsanova *et al.*, 2007 ; Erceg et Lindé, 2013 provide information on the importance of monetary unions in the adoption of fiscal rules. Thus, we introduce the variable that captures the membership of a monetary union among the controls. Finally, we add the institutional variable that captures corruption among the controls. We use the propensity score matching (PSM) method of Rosenbaum et Rubin (1983), the IPW method, the GMM estimator, and the Mahalanobis distance balancing method to test the robustness of our results

8. https ://datatopics.worldbank.org/world-development-indicators/

6.1 Entropy balancing

Referring to the recent literature on impact assessment, we use the entropy balancing method of Hainmueller (2012), which was later implemented in the work of Neuenkirch et Neumeier (2016). It is a method that is carried out in two steps : In the first step, we calculate weights that are assigned to the control units (countries that have not adopted budget rules). In the second step, we use the weights obtained in the first step in a regression analysis with the treatment variable (countries having adopted the fiscal rule) as the explanatory variable. Subsequently, we match countries that have adopted the fiscal rule with countries that have not adopted a fiscal rule on the basis of observable characteristics. This study aims to analyze the link between adopting fiscal rules and FDI. In other words, to see whether the adoption of fiscal rules improves Foreign Direct Investment (FDI) in developing countries. The FDI used in this analysis is the ratio of FDI to GDP. The treatment variable indicates 1 if at least one fiscal rule is adopted and 0 otherwise. More precisely, countries that have adopted fiscal rules constitute the treatment group. Our empirical study's main challenge is determining a causal relationship between fiscal rules and FDI. However, it must be said that the reasons countries adopt fiscal rules (economic stability, limiting fiscal drift, fiscal profligacy, political risk, lack of liquidity, desire to attract more investment, etc.) could be associated with macroeconomic factors and the political situation of a country. This could, of course, trigger an endogeneity problem. However, to remedy this situation, we use the matching method. This matching method is more reliable and sufficiently robust than simple linear regression methods. The average treatment effect on the treated (ATT) is given by the relationship :

$$ATT = E[(Yi1Yi0)|FR = 1] = E[(Yi1|FR = 1)] - E[(Yi0|FR = 1)] \quad (1)$$

In equation (1), FR is a binary variable that represents the adoption of fiscal rules (FR) in country i, Yi1 is a variable that captures foreign direct investment (FDI) when country i has not adopted FR (Non-FR). Yi0|FR=1 denotes the value of FDI that would have been observed if a country that has not adopted RF (Non-FR) had adopted RF. Yi1 |FR=1 denotes the FDI observed for the same Non- FR country. Eq. (1) above tells us that comparing the observed FDI in Non- FR countries with the observed FDI in the same countries if they had adopted the fiscal rules (FR) would give us an unbiased estimate of ATT. However, the main difficulty with this equation is that the second term on the right-hand side is unobservable. To circumvent this difficulty, we randomly select countries that have not adopted FR(Non-FR). Using this random selection, we can compare the sample average of the Non-AR countries with that of the AR countries.

In equation(1), we replace E[Yi0 FR=1, Xi] with the term E[Yi0 FR=0, Xi] and we obtain this equation :

$$ATT = E[(Yi1Yi0)|FR = 1] = E[Yi1FR = 1, Xi] - E[Yi0FR = 0, Xi] \quad (2)$$

The entropy balancing method has several advantages : Its efficiency and reliability are compared to classical matching methods (e.g. PSM) through its non-parametric character. With this method, there is very little chance of having a problem of misspecification of the functional form of the model, which could bias our results. Secondly, as the treatment variable is orthogonal to the covariates due to the reweighting mechanism, it avoids the multicollinearity problems that could eventually arise.

Finally, the entropy balancing method allows combining a reweighting mechanism with a regression analysis (Neuenkirch et Neumeier, 2016). This method makes it possible to control for country and time-fixed effects in the regression analysis. The inclusion of country-fixed effects allows for potential unobserved heterogeneity between countries with and without fiscal rules. To account for country-specific temporal and structural specificities, we also use fixed effects to capture the invariant factors that explain differences in FDI attractiveness.

7 Results interpretation

In this section, we present the main results of our analysis.

7.1 Entropy balancing : Results

TABLE 1 – Descriptive statistics

Variables	(1)	(2)	3=(2-1)		
Variables	FR	Non-FR	Difference	t value	p-value
lag Currency	0.248	0.044	-0.203	-11.6248	0.0000
lag Inflation	4.833	48.638	43.804	5.3755	0.0000
lag Fiscal balance	-2.374	-2.205	0.169	0.6860	0.4928
lag Checks and balances	3.112	2.537	-0.575	-8.0823	0.0000
lag Financial openness	0.311	-0.165	-0.476	-7.1641	0.0000
lag Hardit	0.299	0.071	-0.2280	-12.0851	0.0000
lag Institution	2.362	2.433	0.0714	1.7444	0.0813
Nomber of observations	562	1154			

TABLE 2 – Covariate balancing

	(1)	(2)	3=(2-1)		
Variables	FR	Non-FR	Difference	t value	p-value
lag Currency	0.2473	0.2503	0.000	-0.142	0.887
lag Inflation	5.123	5.469	0.000	-1.330	0.184
lag Fiscal balance	-2.401	-2.392	0,000	-0.031	0.975
lag Checks and balances	3.148	3.142	3,4	0.058	0.954
lag Financial openness	0.3314	0.3216	22,502	0.142	0.887
lag Hardit	0.2865	0.2839	0,096	0.116	0.908
lag Institution	2.373	2.373	-0,002	0.133	0.998
Nomber of observations	562	1154			

Table 3 – Entropy balancing : Baseline model

Dependant variable : FDI	1	2	3	4	5	6	7
VARIABLES	Baseline	Adding Time	Adding Country	Adding Time/Country	Adding Controls	Adding Controls/Time	Adding Controls/Time/Country/FE
rule	1.376***	0.692*	1.307***	1.491**	1.369***	0.717*	1.598**
	(0.404)	(0.373)	(0.472)	(0.663)	(0.388)	(0.370)	(0.689)
lCurrency					-1.006**	-0.407	0.354
					(0.401)	(0.413)	(1.902)
linflation					0.007	0.012	-0.027
					(0.022)	(0.024)	(0.020)
lFiscal balance					0.038**	0.005	0.003
					(0.018)	(0.025)	(0.020)
lChecks and balances					0.113	0.077	0.164**
					(0.092)	(0.092)	(0.081)
lfinancial openness					0.791***	0.756***	-0.033
					(0.223)	(0.216)	(0.236)
lhardit					-0.763	-1.025**	0.767**
					(0.471)	(0.502)	(0.311)
lInstitution					0.249*	0.636***	0.478***
					(0.146)	(0.146)	(0.175)
Constant	2.712***	1.128	0.069	-0.136	2.035***	-0.585	-0.888
	(0.156)	(0.725)	(1.526)	(1.820)	(0.663)	(1.012)	(1.999)
Observations	1,714	1,714	1,714	1,714	1,714	1,714	1,714
R-squared	0.010	0.049	0.337	0.363	0.056	0.088	0.367
Country FE	No	No	Yes	Yes	No	No	Yes
Years	No	Yes	No	Yes	No	Yes	Yes

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

The results of the table (1) show us that there is a difference in average between the group of countries that have adopted the fiscal rule and those that have not adopted the fiscal rule. Column (1) represents the average of the group of countries that have adopted the fiscal rule, and column (2) for those that have not adopted a fiscal rule. Column (3) shows the difference between columns 2 and 1. The fourth and fifth columns show the results of the t-test statistic and the p-value. Overall, we find that countries belonging to a monetary union are more likely to adopt a fiscal rule, and their number is higher compared to countries belonging to a monetary union and not having adopted fiscal rules. Similarly, financial openness, inflation targeting, and the Checks and balance index[9] are higher in countries that have adopted a fiscal rule compared to those observed in countries that have not adopted a fiscal rule. However, we notice through the table (1) that the level of inflation and corruption is lower in countries that have adopted a budget rule than in those that have not adopted fiscal rules. With these descriptive statistics, it is still useful to choose a reliable control group before estimating the treatment's effect (matching approach). If this is not the case, it could be that the effect of the treatment estimated through the fiscal rules on Foreign Direct Investments (FDI) is biased. This is how in the table (2), we construct a control group and perform a comparison between the means of all the corresponding covariates in the treatment group and the control group created earlier. The results of the table (2) show us that the differences in means between these two groups are statistically insignificant.

Based on the control group in table (4), we estimate the effect of fiscal rules on FDI. For this, we use weighted least squares regressions. The results are presented in the table (18). In column (1), we run a simple regression without adding country and time-fixed effects. In columns (2) and (3), we add the time and country effects, respectively. In column (4), we simultaneously add the time and country effects to our basic equation (1). In column (5), we only add the control variables. Finally, in column (6), in addition to the explanatory variables, we add time-fixed effects, and in column (7), we simultaneously add country and time-fixed effects. Results (1)-(7) show that the adoption of fiscal rules increases Foreign Direct Investments (FDI). Indeed, the adoption of the rules gives more credibility to the fiscal policy, and this credibility in the management of the budgetary framework encourages more investors to invest in the country (Andrés et Doménech, 2006 ; Sacchi et Salotti, 2015 ; Fatás et Mihov, 2006). These results could also be justified by the fact that the adoption of fiscal rules sends a positive signal to investors on the economic stability of the country because the rules, through their binding nature, confer macroeconomic stability and make the economic environment more attractive to investors. It is also necessary to add the fact that the adoption of the rules allows a better allocation of resources in the economic sectors, and this contributes to making the various sectors (infrastructures, health, etc.) more attractive and favorable to investments (FDI)(Schick, 2003 ; Primus, 2016 ; Sutherland *et al.*, 2005). Finally, adopting the rules makes it possible to reduce the cost of borrowing for states and private investors because the markets, being reassured of the credibility of the budgetary framework, reduce the cost of borrowing(Thornton et Vasilakis, 2018). This allows states to easily mobilize resources to make the economic environment more attractive to foreign investment. One of the major problems developing countries encounters is the lack of image (credibility and economic stability) in the eyes of investors, which often leads to an increase in the cost of borrowing on the financial markets and with other financial partners. With the adoption of

9. It measures whether the powers are endowed with the constitutional titles allowing them to invade the domain of a competing body and are also allowed to defend themselves against the encroachments of their rivals

fiscal rules, the resulting economic stability makes it possible to reduce the cost of borrowing and thus enable developing countries to attract enough investors(Sawadogo, 2020 ; Thornton et Vasilakis, 2018) and mobilize resources to make the economic environment more attractive to foreign investors.

7.2 Entropy balancing : The effect of different types of fiscal rules

TABLE 4 – Robutness checks : Entropy balancing : Types of fiscal rules

	1	2	3	4	5
	FR	BBR	DR	ER	RR
VARIABLES	fdi	fdi	fdi	fdi	fdi
rule	1.598**				
	(0.689)				
lCurrency	0.354	0.858	-0.190	2.964	-0.319
	(1.902)	(1.946)	(2.208)	(2.561)	(2.201)
linflation	-0.027	-0.028	-0.052	0.021	-0.053
	(0.020)	(0.025)	(0.035)	(0.124)	(0.035)
lFiscal balance	0.003	-0.008	-0.004	-0.058	0.002
	(0.020)	(0.026)	(0.026)	(0.056)	(0.019)
lChecks and balances	0.164**	0.137*	0.202	0.195	-0.075
	(0.081)	(0.071)	(0.130)	(0.215)	(0.130)
lfinancial openness	-0.033	-0.173	-0.117	-0.702	0.274
	(0.236)	(0.237)	(0.341)	(0.532)	(0.431)
lhardit	0.767**	0.643**	0.860**	1.385**	-0.292
	(0.311)	(0.327)	(0.433)	(0.647)	(0.407)
lInstitution	0.478***	0.523***	0.723***	0.584	0.570***
	(0.175)	(0.183)	(0.221)	(0.374)	(0.216)
bbr		0.823*			
		(0.427)			
dr			1.412**		
			(0.677)		
er				-3.808	
				(2.457)	
rr					1.755***
					(0.492)
Constant	-0.888	-1.142	-1.018	-2.481	0.109
	(1.999)	(2.096)	(2.372)	(3.253)	(2.360)
Observations	1,714	1,714	1,714	1,714	1,713
R-squared	0.367	0.365	0.376	0.256	0.497
Country FE	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

In table (4), we present the effects of different fiscal rules on FDI. The objective is to identify the fiscal rules that can attract more Foreign Direct Investments (FDI). The results (4) show through column (2) that fiscal rules on the budget deficit increase FDI. We also find (column (3)) that debt ratio rules

also increase FDI. Their effects are positive and significant. In column (4), expenditure rules do not affect FDI. The procyclicality of fiscal rules could explain this. The works of (Combes *et al.*, 2017 ; Bova *et al.*, 2014) show the procyclicality of rules in developing countries. They find that fiscal rules mitigate the pro-cyclicality of fiscal policy. Recent work by Mitsi et Kottaridi (2022) also shows that spending rules negatively affect FDI. Column (5) of the table (4) shows that income rules also increase FDI. Among the four types of rules, apart from the rules on expenditure, the other types of rules positively and significantly affect FDI.

8 Robustnesses

8.1 Robustness : Additional control variables (Entropy balancing)

To test the robustness of our results, we proceed with additive robustness. It is a question of seeing if the addition of the new control variables will be able to influence the basic results of the study. For this, we add new control variables, namely the binary variable capturing the holding of presidential elections, political stability, the index of internal and external conflicts, the index of socio-economic well-being, and the quality of the public administration and democracy. By gradually adding the different variables, the results of the table (5) show that overall, the adoption of fiscal rules positively affects FDI, and the effect is significant. With the addition of the new control variables, the results remain convergent. These results (5) corroborate those obtained previously with the study's basic model and demonstrate our results' robustness.

8.2 Change in the estimation method : The propensity score matching (PSM) method

The study's objective is to analyze whether adopting at least one fiscal rule contributes to the increase of Foreign Direct Investments (FDI) in developing countries. To obtain a causal impact of fiscal rules, we compare the foreign direct investments of countries that have adopted at least one fiscal rule with those that have not adopted a fiscal rule. However, it should be noted that a potential selection bias could affect this comparison. Indeed, the treated and untreated groups are not identical, and their differences, in addition to being discussed, can act as confounding factors if they affect the dynamics of Foreign Direct Investments (FDI). A simple comparison of our control variables according to the treatment status of the individuals (Table 1) shows that this is the case in our sample. Developing countries adopt fiscal rules due to the lack of stability of the macroeconomic framework, the issues of the credibility of fiscal policy, the mobilization of resources on the financial market, the attractiveness of investments, etc. These factors could be associated with macroeconomic factors and political stability. Thus, the outcome of the treatment individuals and those of the control group may even differ in the absence of treatment. However, a problem of endogeneity could arise. To solve this problem, we use a matching approach.

1- Propensity score matching

We use a relevant method of analysis and evaluation of the effects of development policies which is the Propensity Score Matching (PSM) of (Rosenbaum et Rubin, 1983 ; Abadie et Imbens, 2016 ; Chapel, 2022 ;

TABLE 5 – Robutness checks : Entropy balancing : Additive controls

	1	2	3	4	5	6	7	8
Dependant variable	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi
rule	1.596**	1.478*	1.387**	1.483**	1.490**	1.641**	1.594**	1.588**
	(0.688)	(0.756)	(0.677)	(0.683)	(0.679)	(0.701)	(0.715)	(0.687)
lCurrency	0.368	0.560	1.067	0.864	-0.042	0.322	0.367	0.292
	(1.898)	(1.946)	(1.943)	(1.931)	(1.935)	(1.894)	(1.942)	(1.899)
linflation	-0.028	-0.025	-0.020	-0.026	-0.028	-0.026	-0.028	-0.026
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
lFiscal balance	0.003	0.001	-0.002	0.002	0.005	-0.001	0.004	0.002
	(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.022)	(0.021)	(0.020)
lChecks and balances	0.164**	0.151*	0.178**	0.156**	0.164**	0.168**	0.164**	0.146*
	(0.081)	(0.085)	(0.084)	(0.078)	(0.081)	(0.082)	(0.083)	(0.075)
lfinancial openness	-0.034	-0.033	-0.082	-0.021	-0.058	-0.030	-0.031	-0.047
	(0.235)	(0.236)	(0.229)	(0.235)	(0.230)	(0.234)	(0.231)	(0.236)
lhardit	0.768**	0.781**	0.997***	0.884***	0.735**	0.740**	0.773**	0.742**
	(0.312)	(0.311)	(0.319)	(0.319)	(0.309)	(0.310)	(0.317)	(0.310)
lInstitution	0.481***	0.478***	0.433**	0.463***	0.521***	0.492***	0.479***	0.432***
	(0.176)	(0.174)	(0.175)	(0.178)	(0.171)	(0.175)	(0.176)	(0.167)
lexelec	-0.086							
	(0.480)							
liconflicts		0.093						
		(0.101)						
lstability			0.419**					
			(0.172)					
leconflicts				0.210				
				(0.191)				
lbureaucracy					-0.556			
					(0.433)			
linvest$_q$*ual*						0.178		
						(0.150)		
lsocio							-0.012	
							(0.162)	
ldemocracy								0.249
								(0.158)
Constant	-0.901	-1.554	-3.489	-2.979	-0.222	-1.807	-0.830	-0.970
	(1.995)	(2.240)	(2.200)	(2.682)	(2.120)	(2.135)	(2.026)	(1.976)
Observations	1,714	1,714	1,714	1,714	1,714	1,714	1,714	1,714
R-squared	0.367	0.367	0.370	0.367	0.367	0.367	0.367	0.367
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*** p<0.01, ** p<0.05, * p<0.1

Rubin et Thomas, 1996). This method minimizes the selection bias by comparing each country that has adopted a fiscal rule with a counterfactual that has not adopted a fiscal rule deemed sufficiently similar in specific observable characteristics. Indeed, the PSM is a two-step method : first, using a probit model, we generate for each country a propensity score p(x), which estimates the probability that this country with its characteristic vector, adopts a fiscal rule.

$$p(X) = Pr(T = 1|X) = E(T|X) \tag{3}$$

Where, T= 0 ;1 is the binary variable that indicates whether the country has adopted a fiscal rule, and X is the vector of observed characteristics before treatment. We first define the variables used for the estimation with the descriptive statistics of these variables. Second, we assess the impact of adopting the fiscal rule by estimating a country's average treatment effect (ATT), which is expressed as :

$$ATT = E[(Yi1Yi0)|Ti = 1] = E[(Yi1|Ti = 1)]E[(Yi0|Ti = 1)] \tag{4}$$

Ti (treatment) is a binary variable that takes the value 1 if country i has adopted at least one fiscal rule and 0 otherwise. Yi1 captures foreign direct investment when the country adopts a fiscal rule, and Yi0 is the foreign direct investment observed if the country had not adopted a fiscal rule. The problem is that we cannot observe Yi1 and Yi0 simultaneously. We are therefore faced with a counterfactual problem. Several solutions can be envisaged. We favor the solution, which consists in comparing the average levels of increase in Foreign Direct Investments between the countries which have adopted a fiscal rule and the countries which have not adopted a fiscal rule to circumvent this difficulty. However, this approach assumes that treatment assignment is random. This hypothesis would be ad hoc because the choice to adopt a fiscal rule may be dictated by certain omitted variables (instability of the macroeconomic framework, budgetary drifts, vulnerability to external shocks, etc.), which could affect the dynamics of Foreign Direct Investments(IDE), which would lead to a potential auto-selection problem. Moreover, according to the conditional independence assumption (Smith et Todd, 2005 ; Rosenbaum, 1984 ; Rosenbaum et Rubin, 1983 ; Agterberg et Cheng, 2002), we can replace in equation 1 the term E[(Yi0|Ti1)] by the expression E[(Yi0|Ti0, Xi)]. This allows us to obtain equation 2.

$$ATT = E[(Yi1|Ti = 1, Xi)]E[(Yi0|Ti = 1, Xi)] \tag{5}$$

The second hypothesis concerns the existence of a common support (0 < p(X) <1). Indeed, this hypothesis assumes that for each treated country, there is at least one non-treated country that is similar to it and whose propensity score is close. Equation 2 can be rewritten as follows :

$$ATT = E[(Yi1|Ti = 1, p(Xi))]E[(Yi0|Ti = 1, p(Xi))] \tag{6}$$

Where p(Xi) = Pr(RBLi = 1|Xi) predicts the probability of adopting at least one fiscal rule, subject to set X. Additionally, we plot the density distribution of the propensity score over the two subsamples in the appendix to ensure that the support is large enough (see Figure 5). This figure tells us that each FDI-receiving country that has adopted a fiscal rule has at least one similar counterfactual (the country that has not adopted a fiscal rule), making a matching situation possible.

2- Choice of matching algorithms

In this part, we compare the treated countries to the untreated countries according to their propensity score through various matching methods. The ATT of these is the difference in access to FDI between the treated and untreated countries, matched on the basis of a similar propensity score. Inspired by the economic work of (Heckman *et al.*, 1998 ; Rubin et Thomas, 1996 ; Caliendo et Kopeinig, 2008), we test the robustness of our results using matching estimators commonly used in recent studies (Coulibaly *et al.*, 2022 ; Sawadogo, 2020 ; Vikram et Chindarkar, 2020 ; Bagnoli, 2019 ; Sawadogo et Wandaogo, 2021). To get more precise standard errors for the ATT, we proceed as Lechner (2002). First, we use nearest-neighbor matching and its extension. Indeed, it associates each treated country with a control country that has the closest propensity score. By extending this method, it is also possible to match each treated country with more than one control country. As a result, we match each treated country with the two and three nearest neighbors in terms of the propensity score. However, it should be noted that with this method, a treated country may be matched with one or more control countries having a very different propensity score leading to a mismatch and potentially biased results. In order to solve this potential problem, we proceed as Dehejia et Wahba (2002), using the radius gauge matching method to solve this bias. With this technique, each treated country is matched with all the control countries that are within a well-defined perimeter at the neighborhood threshold, called a caliber. In our case, we use three different calibers : low (r=0.005), medium (r=0.01), and high (r=0.05) caliber. Finally, we add two other algorithms : kernel-matching and local linear regression. Kernel-matching associates with each treated unit a counterfactual equal to the average of all the untreated units weighted by a weight inversely proportional to their distance from the considered unit treated unit. Local linear regression, on the other hand, is a generalized version of the Kernel estimator, but the difference is that it includes a linear term in the propensity score of a treated unit.

3- Interpretation and evaluation of matching quality

The goal of the matching technique is to achieve a balance between the treatment group and the comparison group on observable traits. In this part, we analyze the quality of the matching before proceeding to its interpretation. It is helpful to analyze the matching quality because this step helps avoid potential bias problems that could call the results into question. According to the economic literature, there is no consensus on the best test to use to judge the effectiveness of this test. Other works(Rosenbaum et Rubin, 1983 ; Simone et Bazilian, 2019) offer other methods to assess the quality of matching. Thus, the work of Rosenbaum et Rubin (1983) focuses instead on the standardized bias, which calculates the percentage of bias on each covariate. For a matching to be of good quality, the authors show that the bias must be significantly reduced compared to that before the matching for each covariate. The closer it is to 0, the more efficient our matching is. Also, the p-value associated with the standardized bias must be greater than the critical value of 10 % . We also note that this is the case in our study because all the values exceed this threshold. The work of Simone et Bazilian (2019) re-estimates the propensity score only for matched individuals and compares the Pseudo R2 obtained with that obtained before the matching process. Following the Gangl (2004) method, we perform a final test, the Rosenbaum lower bound sensitivity test(Rosenbaum, 2010), to assess the quality of the matching. This test analyzes whether unobservables

are likely to affect the probability of adopting a fiscal rule on Foreign Direct Investments (FDI). Our results are superior to those obtained by(Vikram et Chindarkar, 2020 ; Sawadogo et Wandaogo, 2021).

TABLE 6 – Robutness checks : Propensity Score Matching(PSM)

ATT : FR FDI	1	2	3	4	5	6	7	8
	1-Nearest Neighbour Matching	2-Nearest Neighbour Matching	3-Nearest Neighbour Matching	r=0.005	r=0.01	r=0.05	Kernel Matching	Local Linear Matching
ATT	1.3485***	1.3659***	1.2868***	1.1784***	1.2943***	1.2490***	1.2443***	1.2638***
	(0.4538)	(0.4350)	(0.4408)	(0.4252)	(0.4383)	(0.3652)	(0.4600)	(0.3904)
Observations	1714	1714	1714	1714	1714	1714	1714	1714
Treated	640	640	640	640	640	640	640	640
Untreated	1074	1074	1074	1074	1074	1074	1074	1074
Rosenbaum bound	1.55	1.4	1.3	1.1	1.1	1.15	1.1	1.1
Standardized bias (pvalue)	0.188	0.551	0.509	0.813	0.514	0.393	0.372	0.188
Pseudo R2	0.006	0.004	0.004	0.003	0.004	0.005	0.005	0.006

Notes : Bootstrapped standard errors based on 500 replications in parentheses. *** p <0.01, ** p <0.05, * p <0.1

In this part, we present the results of the ATT estimations. First, we use the N-nearest-Neighbors method, which matches each FR to non-FR N-nearest-Neighbors with the most comparable propensity scores possible. In this study, we retain N-nearest-Neighbors ranging from 1 to 3 nearest neighbors. Secondly, we use the radius method (Dehejia et Wahba, 2002), which associates the countries that have adopted the rules with those having not adopted the rules, located at a certain distance according to the propensity scores. To do this, we retain the small (R= 0.005), the medium (R=0.01), and the large (R=0.05) radius. Third, we use the Kernel method (Heckman *et al.*, 1998), which associates each country that has adopted the rule with a weighted average of all the countries that have not adopted it, the weights being inversely proportional to the difference between the propensity scores of the countries who have adopted the rule and those who have not adopted the rule. Finally, we use the local linear regression method (Heckman *et al.*, 1998), which associates the countries that have adopted the rule with the countries having not adopted the rule, like Kernel Matching, but uses a linear factor in the weighting function. The results show that there is a positive and significant link between the adoption of fiscal rules and Foreign Direct Investments (FDI). The estimated coefficients are positive and significant with an amplitude varying between 1.34 (N-nearest-Neighbors) and 1.24 (Local linear) percentage points (see table 6). These results suggest that the adoption of fiscal rules increases Foreign Direct Investments (FDI). Developing countries have a growing need in terms of infrastructure, and since a good part of FDI flows in the world is oriented towards infrastructure, good management of the fiscal policy (economic stability) conferred by the adoption of rules could send a positive signal to investors and lead to a strong attraction of FDI which generates new tax revenue intended for the reimbursement of the previous public debt. Indeed, the investments made in infrastructure positively affect well-being and increase economic growth.

8.3 Sensitivity analysis through robustness (Entropy balancing)

In this section, we test the robustness of our results. Thus, a model is said to be robust if it is valid under different circumstances. In column (1) of table(7), only countries with an inflation rate below 40% are considered. The results reveal that the effect of the rules is always positive and significant. In the second column, the years of the financial crisis of 2008 and 2009 are excluded from the sample. The results remain unchanged. In column (3) of the table (7), only the years after 1993 are considered. Indeed, the rules appeared around the 1990s, and their effects are visible in the medium and long term. Considering only the years after 1993, we want to know the effect of the rules after their adoption. The results show that rules always positively and significantly affect FDI. In column (4), only the least developed countries in the sample are considered. The results show that there is a positive and significant effect between the adoption of rules and FDI. In column (5), we exclude the years 2019 and 2020 ; in column (6), we consider only the years below 2020 to consider the Covid19 effect. The results show that in these two columns, the effect of the rules is always positive and significant. Finally, in column (7), only fragile countries are considered. The results show that the rules positively and significantly affect FDI.

8.4 Robustness : The GMM Estimator

In this part of the study, we use the Generalized Method of Moments (GMM).

TABLE 7 – Robustness : Entropy balancing (Alternative)

	1	2	3	4	5	6	7
Dependant variable	fdi	fdi	fdi	fdi	fdi	fdi	fdi
rule	1.631**	1.618**	1.481**	1.598**	1.598**	1.598**	15.821**
	(0.696)	(0.702)	(0.731)	(0.689)	(0.689)	(0.689)	(7.700)
lCurrency	0.258	0.621	0.776	0.354	0.354	0.354	-21.324*
	(1.911)	(2.190)	(1.949)	(1.902)	(1.902)	(1.902)	(11.052)
linflation	-0.040*	-0.035*	-0.035	-0.027	-0.027	-0.027	0.000
	(0.024)	(0.019)	(0.023)	(0.020)	(0.020)	(0.020)	(0.084)
lFiscal balance	0.002	-0.001	0.001	0.003	0.003	0.003	0.040
	(0.020)	(0.021)	(0.057)	(0.020)	(0.020)	(0.020)	(0.451)
lChecks and balances	0.161**	0.181**	0.154*	0.164**	0.164**	0.164**	1.371
	(0.081)	(0.087)	(0.085)	(0.081)	(0.081)	(0.081)	(1.462)
lfinancial openness	-0.038	-0.061	-0.211	-0.033	-0.033	-0.033	12.442**
	(0.242)	(0.259)	(0.271)	(0.236)	(0.236)	(0.236)	(5.442)
lhardit	0.727**	0.840***	0.759**	0.767**	0.767**	0.767**	
	(0.314)	(0.325)	(0.322)	(0.311)	(0.311)	(0.311)	
lInstitution	0.491***	0.484***	0.528***	0.478***	0.478***	0.478***	-1.512
	(0.174)	(0.182)	(0.195)	(0.175)	(0.175)	(0.175)	(3.496)
Constant	-0.805	-1.222	-1.315	-0.888	-0.888	-0.888	38.656**
	(2.013)	(2.279)	(2.038)	(1.999)	(1.999)	(1.999)	(17.705)
Observations	1,64	1,573	1,597	1,714	1,714	1,714	216
R-squared	0.367	0.389	0.362	0.367	0.367	0.367	0.609
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For the Generalized Method of Moments (GMM), the equation is as follows :

$$FDIit = \alpha i + \beta FDI_{i,t\,-1} + \gamma FRi, t + \sum_{k=0}^{n} \Delta Xi, t + \epsilon it \tag{7}$$

With FDI representing the dependent variable of the model. It represents the ratio of FDI. X is a vector representing the set of explanatory variables in the level used in the model. Epsilon is the error term.

We present in this part the results of the estimations with the GMM(8). The results in the first column represent the base model. It can be seen that there is a positive link between fiscal rules and FDI. This effect is significant at 1% (8). These results suggest that adopting fiscal rules increases FDI by 2.18 percentage points. The adoption of fiscal rules helps to attract more Foreign Direct Investments (FDI)(Andrés et Doménech, 2006 ; Sacchi et Salotti, 2015 ; Fatás et Mihov, 2006). The adoption of the rules avoids drifts in the management of macroeconomic aggregates (allows a better allocation of resources) and contributes to a discipline of the fiscal policy, thus giving a signal of stability to the investors(Schick, 2003 ; Primus, 2016 ; Sutherland *et al.*, 2005). In the rest of the columns of the table (8), we add, in turn a few control variables to the basic model, and we find that the link between the rules and the IDEs is always positive and significant(1%).

Table 8 – Robutness : GMM

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dependant variable	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi	fdi
L.fdi	0.471***	0.467***	0.459***	0.470***	0.441***	0.466***	0.456***	0.469***	0.470***	0.463***	0.470***	0.466***	0.471***	0.470***	0.470***
	(0.019)	(0.020)	(0.019)	(0.020)	(0.022)	(0.022)	(0.021)	(0.019)	(0.019)	(0.020)	(0.019)	(0.020)	(0.019)	(0.019)	(0.019)
rule	2.180***	2.167***	3.117***	2.210***	2.781***	2.792***	3.347***	2.450***	2.129***	2.210***	2.233***	2.135***	2.068***	2.180***	2.174***
	(0.778)	(0.784)	(0.802)	(0.782)	(0.867)	(0.970)	(0.908)	(0.792)	(0.782)	(0.776)	(0.792)	(0.819)	(0.778)	(0.779)	(0.778)
Currency	-21.084***	-21.335***	-20.873***	-20.937***	-3.305	-25.874***	-29.285***	-20.796***	-21.071***	-19.586***	-21.282***	-20.345***	-20.454***	-21.096***	-21.412***
	(5.072)	(5.093)	(5.046)	(5.173)	(4.833)	(6.811)	(5.373)	(5.075)	(5.075)	(5.105)	(5.100)	(5.151)	(5.091)	(5.075)	(5.107)
inflation	-0.001	-0.001	-0.001	-0.001	0.000	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fiscal balance	0.054*	0.069*	0.061*	0.054*	0.066*	0.058	0.027	0.045	0.050	0.025	0.051	0.055*	0.059*	0.054*	0.051
	(0.032)	(0.041)	(0.031)	(0.032)	(0.036)	(0.049)	(0.037)	(0.032)	(0.032)	(0.035)	(0.032)	(0.033)	(0.032)	(0.032)	(0.032)
Checks and balances	0.504***	0.489***	0.465***	0.502***	0.591***	0.467**	0.907***	0.483***	0.498***	0.509***	0.504***	0.556***	0.512***	0.503***	0.494***
	(0.175)	(0.176)	(0.175)	(0.175)	(0.188)	(0.208)	(0.247)	(0.176)	(0.176)	(0.175)	(0.175)	(0.184)	(0.175)	(0.175)	(0.176)
financial openness	0.137	0.166	0.397	0.129	0.582	-0.197	-0.269	0.121	0.127	0.190	0.117	0.229	0.218	0.136	0.117
	(0.313)	(0.315)	(0.316)	(0.316)	(0.355)	(0.380)	(0.344)	(0.313)	(0.315)	(0.313)	(0.316)	(0.324)	(0.319)	(0.313)	(0.314)
hardit	-3.756***	-3.717***	-2.342**	-3.734***	-1.837	-3.614***	-4.075***	-3.549***	-3.869***	-3.491***	-3.707***	-3.777***	-3.762***	-3.759***	-3.705***
	(1.046)	(1.053)	(1.088)	(1.056)	(1.179)	(1.275)	(1.182)	(1.052)	(1.055)	(1.050)	(1.052)	(1.074)	(1.045)	(1.046)	(1.048)
Institution	-0.059	0.026	-0.290	-0.059	0.141	-0.125	-0.127	-0.093	-0.010	0.000	-0.102	0.446	-0.022	-0.060	-0.088
	(0.371)	(0.376)	(0.370)	(0.371)	(0.409)	(0.475)	(0.423)	(0.371)	(0.379)	(0.371)	(0.390)	(0.564)	(0.372)	(0.371)	(0.372)
growth		0.034													
		(0.036)													
dpdcy			0.141***												
			(0.032)												
pop				-0.000											
				(0.000)											
credit					-0.007										
					(0.021)										
interest						-0.024									
						(0.017)									
gov3vote							0.290***								
							(0.061)								
stability								0.212*							
								(0.118)							
invest$_q$ual									0.082						
									(0.141)						
rents										0.082**					
										(0.037)					
law											0.132				
											(0.382)				
icrg												-5.961			
												(4.809)			
iconflicts													-0.227		
													(0.154)		
exelec														0.129	
														(0.379)	
econflicts															0.101
															(0.204)
Constant	2.928**	2.696**	-6.121**	2.989**	0.103	3.043**	3.043**	1.211	2.213	1.813	2.593*	4.529**	4.757***	2.917**	2.042
	(1.227)	(1.253)	(2.378)	(1.300)	(1.477)	(1.486)	(1.377)	(1.557)	(1.720)	(1.327)	(1.565)	(1.813)	(1.725)	(1.229)	(2.231)
Observations	1,688	1,676	1,688	1,688	1,396	1,285	1,42	1,688	1,688	1,688	1,688	1,581	1,688	1,688	1,688
Number of idcoun	74	74	74	74	74	63	73	74	74	74	74	70	74	74	74

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

8.5 Robustness : Changing the variable of interest

Still, intending to test the robustness of our results, we change the variable of interest by a binary proxy variable which indicates 1 if the country has adopted a flexible rule and 0 otherwise. Indeed, there are different types of flexible budget rules and binding rules. The results are significant and show that the adoption of these types of fiscal rules always increases FDI. The effect is positive and significant at 5% (9). Then we use another proxy variable that indicates 1 if the rules are enacted and written in an international treaty. The results show a positive and significant link between adopting rules and FDI (10). Finally, we use a last proxy variable which indicates 1 if the adopted rule is only governed by an international convention and 0 otherwise. The results highlight a positive and significant link between rules and FDI(11).

Table 9 – Robustness : Entropy balancing (Flexibility rule)

Dependant variable : FDI	1	2	3	4	5	6	7
VARIABLES	Baseline	Adding Time	Adding Country	Adding Time/Country	Adding Controls	Adding Controls/Time	Adding Controls/Time/Country/FE
Dependant variable : FDI	1	2	3	4	5	6	7
flexibility	1.907***	1.488***	1.220***	1.565**	2.199***	1.871***	1.781***
	(0.558)	(0.545)	(0.470)	(0.652)	(0.570)	(0.590)	(0.679)
lCurrency					-1.371***	-0.934***	0.273
					(0.356)	(0.359)	(1.894)
linflation					0.036	0.034	-0.025
					(0.026)	(0.028)	(0.020)
lFiscal balance					0.039**	0.007	0.004
					(0.018)	(0.024)	(0.020)
lChecks and balances					0.066	0.028	0.150*
					(0.081)	(0.080)	(0.077)
lfinancial openness					0.746***	0.720***	-0.075
					(0.211)	(0.205)	(0.232)
lhardit					-0.678	-0.820*	0.988***
					(0.465)	(0.493)	(0.349)
lInstitution					0.291**	0.583***	0.542***
					(0.142)	(0.140)	(0.176)
Constant	2.757***	1.122	0.069	-0.117	1.953***	-0.074	-1.015
	(0.126)	(0.700)	(1.526)	(1.814)	(0.654)	(0.899)	(1.975)
Observations	1,714	1,714	1,714	1,714	1,714	1,714	1,714
R-squared	0.017	0.056	0.337	0.364	0.068	0.098	0.368
Country FE	No	No	Yes	Yes	No	No	Yes
Years	No	Yes	No	Yes	No	Yes	Yes

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

Table 10 – Robustness : Entropy balancing (Legal basis rule)

Dependant variable : FDI	1	2	3	4	5	6	7
VARIABLES	Baseline	Adding Time	Adding Country	Adding Time/Country	Adding Controls	Adding Controls/Time	Adding Controls/Time/Country/FE
$legal_basis2$	1.635***	1.016**	1.236***	1.398**	1.678***	1.131***	1.485**
	(0.446)	(0.425)	(0.433)	(0.600)	(0.436)	(0.431)	(0.621)
lCurrency					-1.037***	-0.522	0.422
					(0.396)	(0.403)	(1.892)
linflation					0.020	0.019	-0.027
					(0.023)	(0.025)	(0.020)
lFiscal balance					0.040**	0.007	0.003
					(0.019)	(0.025)	(0.020)
lChecks and balances					0.091	0.060	0.162**
					(0.086)	(0.087)	(0.081)
lfinancial openness					0.790***	0.758***	-0.034
					(0.222)	(0.216)	(0.236)
lhardit					-0.771	-0.971*	0.731**
					(0.470)	(0.497)	(0.309)
lInstitution					0.252*	0.595***	0.480***
					(0.143)	(0.142)	(0.175)
Constant	2.686***	1.149	0.069	-0.175	1.992***	-0.349	-0.953
	(0.142)	(0.721)	(1.526)	(1.817)	(0.653)	(0.965)	(1.990)
Observations	1,714	1,714	1,714	1,714	1,714	1,714	1,714
R-squared	0.014	0.051	0.337	0.363	0.060	0.090	0.366
Country FE	No	No	Yes	Yes	No	No	Yes
Years	No	Yes	No	Yes	No	Yes	Yes

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

Table 11 – Robustness : Entropy balancing (Treaty rule)

Dependant variable : FDI	1	2	3	4	5	6	7
VARIABLES	Baseline	Adding Time	Adding Country	Adding Time/Country	Adding Controls	Adding Controls/Time	Adding Controls/Time/Country/FE
Treaty	0.001	-0.558	1.298**	1.259**	1.604**	0.653	1.312**
	(0.635)	(0.638)	(0.509)	(0.620)	(0.806)	(0.982)	(0.632)
lCurrency					-1.676***	-0.597	0.794
					(0.406)	(0.612)	(1.846)
linflation					0.019	0.020	-0.028
					(0.022)	(0.024)	(0.021)
lFiscal balance					0.039**	0.004	0.002
					(0.018)	(0.024)	(0.020)
lChecks and balances					0.096	0.072	0.097
					(0.098)	(0.097)	(0.076)
lfinancial openness					0.763***	0.743***	-0.063
					(0.220)	(0.214)	(0.235)
lhardit					-0.854*	-1.108**	0.819**
					(0.448)	(0.528)	(0.340)
lInstitution					0.341**	0.712***	0.530***
					(0.166)	(0.160)	(0.174)
Constant	3.400***	1.207	0.069	-0.439	2.431***	-0.623	-1.363
	(0.220)	(0.768)	(1.526)	(1.797)	(0.645)	(1.073)	(1.975)
Observations	1,714	1,714	1,714	1,714	1,714	1,714	1,714
R-squared	0.000	0.048	0.336	0.362	0.052	0.086	0.365
Country FE	No	No	Yes	Yes	No	No	Yes
Years	No	Yes	No	Yes	No	Yes	Yes

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

8.6 Change of estimation method : IPW and Mahalanobis distance matching method

TABLE 12 – Robustness : change in estimation method : IPW
ATT : Règles et investissement

	1	2	3	4	5
	IPW	IPW	IPW	IPW	IPW
ATET					
rule	1.3781***	1.1591***	1.4039***	1.6460***	1.4954***
	(0.4124)	(0.4236)	(0.4333)	(0.4338)	(0.3930)
rule	2.7097***	3.1152***	2.6839***	2.7107***	2.7789***
	(0.1639)	(0.1585)	(0.1883)	(0.1539)	(0.1643)
lCurrency	2.0959***	2.1682***	2.1084***	2.2125***	2.0982***
	(0.1259)	(0.1254)	(0.1355)	(0.1403)	(0.1292)
linflation	-0.0297***	-0.0275***	-0.0291***	-0.0246***	-0.0270***
	(0.0058)	(0.0060)	(0.0056)	(0.0059)	(0.0060)
lFiscal balance	-0.0085	-0.0059	-0.0091	-0.0077	-0.0093
	(0.0066)	(0.0058)	(0.0074)	(0.0076)	(0.0078)
lChecks and balances	0.1725***	0.1239***	0.1742***	0.1681***	0.1733***
	(0.0309)	(0.0289)	(0.0312)	(0.0290)	(0.0308)
lfinancial openness	0.2422***	0.2333***	0.2408***	0.2851***	0.2337***
	(0.0249)	(0.0269)	(0.0265)	(0.0309)	(0.0298)
lhardit	0.9446***	0.8298***	0.9376***	1.0646***	0.9096***
	(0.0980)	(0.0980)	(0.0920)	(0.1000)	(0.0979)
lInstitution	-0.0279	-0.0839*	-0.0364	-0.0355	-0.0368
	(0.0447)	(0.0472)	(0.0455)	(0.0665)	(0.0445)
democracy		0.1859***			
		(0.0353)			
lsocio			0.0140		
			(0.0223)		
icrg				-0.3720	
				(0.4502)	
$invest_qual$					0.0348
					(0.0246)
$_cons$	-1.1252***	-1.5831***	-1.1859***	-1.0931***	-1.4180***
	(0.1520)	(0.1708)	(0.1856)	(0.2119)	(0.2449)
N	1714	1642	1714	1535	1642

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

In this part, we test the robustness of our results by changing the estimation method. This is an alternative matching method, "the Mahalanobis distance matching." It is a method that compares each processed unit to the closest control unit in terms of distance (matching). Indeed, some economic works such as those of King et Nielsen (2019) show the limits of using propensity scores for matching. This work reveals that PSMs produce unreliable estimates varying greatly depending on the outcome model. For example, if one gradually removes units far from each other, the balance will eventually deteriorate with the propensity score, even if there are still units close. The study instead suggests using a potentially more robust method, the "Mahalanobis Distance Matching" method. However, recent works such as those of(Liu *et al.*, 2020 ; Ripollone *et al.*, 2018 ; Tremblay *et al.*, 2020 ; Freedberg *et al.*, 2020 ; Kane *et al.*, 2020) instead show that propensity score matching does not appear to induce increased covariate imbalance when extreme thickness values were not used, well beyond what would be recommended. Following this proposal, we use the "Mahalanobis Distance Matching" method to test the robustness of our results. We add the control variables, the index of democracy and socio-economic well-being, the quality of institutions, and the business climate in terms of investment profile to the basic model to see if it is still performing

under different circumstances. The results of the table (13) show us that the adoption of the rules always increases Foreign Direct Investments (FDI). This effect is also significant at the 1% level.

We test the robustness of our results by once again changing the estimation method. This time we use the inverse probability weight (IPW) estimator. It is true that the ATT estimator corrects for potential self-selection bias in policy adoption ; however, this estimator may have limitations, including a significant lack of data. The IPW estimator, on the other hand, uses propensity scores by giving more weight to observations that are similar to each other in their observable characteristics, thus allowing a good match, even in the presence of missing data. The results of the table (12) show us that the adoption of the rules increases Foreign Direct Investments (FDI). These results confirm those obtained in the basic model.

Finally, we replace the treatment variable with rule strength. It is an index constructed using several components, such as the procedure for adopting the rules, the character of the rules, the flexibility, the enforcement, and the nature of the rules. The results of column (1) of the table (14) show that the strength of fiscal rules increases Foreign Direct Investments. In columns (2,3,4,5,6, and 7), we add, in turn, the institutional variables (stability and election), macroeconomic (economic growth, normalized capital openness, and the primary balance), and a binary variable that indicates 1 if the country is emerging and 0 otherwise. The results of the table (14) show that there is always a positive and significant link between the strength of fiscal rules and FDI.

TABLE 13 – Robustness : change in estimation method (Mahalanobis distance matching)

ATT : Règles et FDI

	1	2	3	4	5
ATT	0.7117**	1.3238***	0.9443**	1.1717***	1.1763***
	(0.3098)	(0.4816)	(0.4507)	(0.4154)	(0.3742)
N	1589	1642	1702	1714	1713

TABLE 14 – Robustness : change in estimation method (Mahalanobis distance matching) with use of the strength of fiscal rules

ATT : FR FDI

	1	2	3	4	5	6	7
ATT(rule2)	1.0989*	1.5793***	1.1808**	1.2687**	1.5807***	1.1702**	1.3486**
	(0.6306)	(0.5315)	(0.5190)	(0.5114)	(0.5021)	(0.5743)	(0.5281)
N	1714	1451	1702	1713	1713	1714	1714

9 Heterogeneity

TABLE 15 – Exploring the heterogeneity

VARIABLES	1 fdi	2 fdi	3 fdi	4 fdi	5 fdi	6 fdi	7 fdi
rule	1.242*	1.479**	2.935***	1.865***	1.575**	1.482**	1.482**
	(0.665)	(0.664)	(0.885)	(0.701)	(0.666)	(0.664)	(0.664)
FR$_i nvest_q ual$	3.221**						
	(1.557)						
FR$_g rowth$		3.529***					
		(0.646)					
FR$_i nterest$			-3.586***				
			(1.127)				
FR$_o il$				-0.310***			
				(0.075)			
FR$_g as$					-1.226***		
					(0.321)		
FR$_a grigdp$						2.458***	
						(0.911)	
FR$_i nd$							2.458***
							(0.911)
Constant	-0.190	-0.149	0.559	0.049	-0.285	-0.140	-0.140
	(1.804)	(1.820)	(1.834)	(1.848)	(1.809)	(1.818)	(1.818)
Observations	1,714	1,714	1,714	1,714	1,714	1,714	1,714
R-squared	0.369	0.364	0.377	0.366	0.365	0.364	0.364
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Years	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes : ***p<0.001, **p<0.01, *p<0.05. Standard errors in parentheses.

We analyze heterogeneity by considering several factors : investment profile which captures factors affecting investment risk that is not covered by other components of political, economic, and financial risk ; economic performance, rents from the exploitation of oil and gas, the added value of the agricultural and industrial sector in the wealth produced. The results show that fiscal rules increase FDI. The effect of these rules is amplified in the presence of a high level of the business climate in the investment profiles of the countries, economic performance, and better structuring of the agricultural and industrial sectors. Next, we cross-reference the treatment variable with the rents from the exploitation of gas and oil and the real interest rate of the economy. The results show that the effect of fiscal rules is attenuated in the presence of a high level of rents from the exploitation of gas and oil, thus concurring with the work of (Kolstad et Søreide, 2009 ; Robbins, 2000 ; citeterum2019corruption) that highlight the negative effect of corruption and mismanagement in the exploitation of natural resources. The effect of the rules is also attenuated in the presence of a high level of the economy's real interest rate. This result is in line with the work of (Feldstein, 1986 ; Jacobs *et al.*, 2020 ;Engen et Hubbard, 2004), which shows that fiscal rules affect the real interest rate of the economy.

10 Validation of transmission channels

TABLE 16 – Validation of transmission channels

	1	2	3	4	5	6
VARIABLES	ccbalance	fdi	sovrate	fdi	stdebtall	fdi
rule	-1.388**		0.286*		-2.363***	
	(0.647)		(0.157)		(0.789)	
ccbalance		-0.179**				
		(0.075)				
sovrate				0.139*		
				(0.082)		
stdebtall						-0.044*
						(0.025)
Constant	-0.939	2.661	6.681***	-4.271**	13.260***	3.361*
	(2.528)	(1.667)	(0.836)	(1.832)	(1.648)	(1.954)
Observations	2,221	2,218	1,507	1,503	2,064	2,034
R-squared	0.334	0.358	0.845	0.299	0.523	0.290
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Three transmission channels are tested in this part : the ratio of public deficit to GDP, the rating of long-term sovereign debt in foreign currency, and the ratio of outstanding short-term external debt.

Regarding the public deficit, the results show that adopting fiscal rules reduces the public deficit. These

results corroborate with the work of(Luechinger et Schaltegger, 2013 ; Milesi-Ferretti, 1997 ;Kennedy *et al.*, 2001). The increase in the deficit also reduces foreign direct investment (Gale et Orszag, 2003). The results also reveal that fiscal rules increase sovereign debt ratings. These results are also confirmed by the work of(Sawadogo, 2020). An increase in sovereign debt rating signals macroeconomic stability to investors and increases foreign investment(Shah, 2017). Finally, for the third channel, the results show that fiscal rules decrease the debt ratio. This result is confirmed by the work of(Wyplosz, 2012). An increase in the debt ratio also decreases foreign direct investment because it sends a negative signal to foreign investors about the country's economic stability. All of these results show that the ratio of public deficit to GDP, the rating of long-term sovereign debt in foreign currency, and the ratio of outstanding short-term external debt are factors by which fiscal rules affect Foreign Direct Investments (FDI).

11 Conclusion

This study highlights the link between fiscal rules and Foreign Direct Investments (FDI) in developing countries from 1990-2020. We make three contributions : First, we identify how fiscal institutions affect FDI in developing countries. Secondly, this study shows through the entropy method, accompanied by PSM, that there is a causal effect between fiscal rules and FDI. Finally, we deepen the reflection by analyzing the effects according to the differences between the countries through heterogeneity analysis. Two hypotheses are at the heart of this study : The first hypothesis states that adopting fiscal rules increases FDI, and the second relates to the decomposition of fiscal rules. We used the entropy balancing method of Hainmueller (2012) the causal effect between fiscal rules and Foreign Direct Investments (FDI). The (Rosenbaum et Rubin, 1983) propensity score matching (PSM) method, along with other usual robustness models, are used to analyze the causal effect between fiscal rules and Foreign Direct Investments (FDI). The results show that the adoption of fiscal rules increases FDI. These results could be justified by three arguments. First, adopting the rules leads to discipline in managing macroeconomic aggregates(Sacchi et Salotti, 2015 ; Andrés et Doménech, 2006), and this discipline is conferred by the rules attract more FDI in the country because investors invest in places where they can make their investments profitable. Then the second reason lies in the fact that the adoption of the rules refers to good management of the fiscal policy(Fatás et Mihov, 2006 ; Kopits, 2001 ; Sacchi et Salotti, 2015 ; Andrés et Doménech, 2006 ; Badinger, 2009) since the rules are binding. This good management of fiscal policy sends a signal to investors about economic stability, and this stability influences the decision to invest more in a country. Finally, the adoption of fiscal rules leads to a better allocation of resources(Schick, 2003 ; Sutherland *et al.*, 2005 ; Primus, 2016) and this better allocation of resources implicitly leads to an improvement in the economic environment by making it more attractive to investment (FDI). Adopting the rules also leads to the countries' economic stability, allowing them to borrow at reduced costs (Sawadogo *et al.*, 2020 ; Sawadogo, 2020). Except for expenditure rules, the other rules (income, deficit, and debt) rules positively influence Foreign Direct Investments (FDI). The analysis of transmission channels shows us that the ratio of public deficit to GDP, the rating of long-term sovereign debt in foreign currency, and the ratio of outstanding short-term external debt are channels through which Fiscal rules affect Foreign Direct Investments (FDI) in developing countries. An in-depth analysis led us to perform a heterogeneity analysis. The results show that the effect of the rules is amplified in the presence of a high level of the business climate in the investment profiles of the countries, of the

economic performance, and of a better structuring of the agricultural and industrial sectors. On the other hand, this effect is attenuated in the presence of mining rents (oil and gas) and a high level of the real interest rate of the economy.

By referring to the results of this study, we can propose some recommendations for economic policy. First, it helps developing countries that are struggling to mobilize external resources for development because of the image deficit, the lack of credibility of fiscal policy, etc., to adopt binding fiscal rules likely to restore their image and increase the credibility of budget management. For this, we must create institutional conditions capable of sufficiently increasing the cost of circumvention of fiscal rules by leaders. Good management of macroeconomic aggregates must be based on an obligation of results. Reforms must be undertaken in the direction of a better allocation of public resources in order to make the agricultural sector, that of infrastructure and industry, and then the mining sector more attractive in the eyes of investors because a good part of the Foreign Direct Investments in Africa is in these sectors.

Then, developing countries should improve the quality of institutions and maintain the country on a trajectory of political stability to avoid any situation that discourages investors who wish to invest. These countries must capitalize on the natural resource deposits they possess in order to attract sufficient foreign investment in the mining sector and thus create more jobs. For this, an attractive business climate is needed, and a reform of the mining code in order to reassure investors and security and guarantee the credibility of the judicial system (in the event of a dispute).

In terms of the implications of economic policies, it is necessary to limit as much as possible the interference of politics or political actors in implementing fiscal rules because this distorts and prevents the construction of the reform. For this, the rules should be implemented by sufficiently independent entities, thus far from political interference. The decision to invest is also guided by the possibility for investors to repatriate the capital invested. This is why countries should implement an innovative framework capable of reassuring investors about the freedom of movement of capital. The business ecosystem must be sufficiently efficient through attractive reforms capable of influencing the decision of investors to invest.

Finally, in addition to adopting fiscal rules, it is essential to have excellent economic performance and better structuring of the infrastructure, agriculture, and industry sectors to attract enough FDI. This structuring involves reforms that increase the competitiveness of countries in terms of the business climate, increase economic stability, improve property rights, and increase competition between economic actors. All these reforms must be crowned by a quality judicial sector that can reassure foreign investors and thus influence their decision to invest in a country.

To better deepen the reflection on the effects of fiscal rules on FDI, it is helpful to explore the possibilities of a study on the severity of the rules in developing countries. Also, it is desirable to extend the reflection on the neighborhood effects of fiscal rules.

Références

Abadie, A. et Imbens, G. W. (2016). Matching on the estimated propensity score. *Econometrica*, 84(2):781–807. 19

Afonso, A. et Jalles, J. T. (2013). Do fiscal rules matter for growth ? *Applied Economics Letters*, 20(1):34–40. 10

Agterberg, F. P. et Cheng, Q. (2002). Conditional independence test for weights-of-evidence modeling. *Natural Resources Research*, 11(4):249–255. 21

Aizenman, J. (2003). Volatility, employment and the patterns of fdi in emerging markets. *Journal of Development Economics*, 72(2):585–601. 5

Ajayi, S. I. (2006). Fdi and economic development in africa. *A Paper presented at the ADB/AERC International [online]*. 2, 3, 6, 9

Alfaro, L., Chanda, A., Kalemli-Ozcan, S. et Sayek, S. (2004). Fdi and economic growth : the role of local financial markets. *Journal of international economics*, 64(1):89–112. 2, 3, 6

Andrés, J. et Doménech, R. (2006). Automatic stabilizers, fiscal rules and macroeconomic stability. *European Economic Review*, 50(6):1487–1506. 2, 17, 27, 37

Ang, J. B. (2009). Financial development and the fdi-growth nexus : the malaysian experience. *Applied Economics*, 41(13):1595–1601. 13

Awunyo-Vitor, D. et Sackey, R. A. (2018). Agricultural sector foreign direct investment and economic growth in ghana. *Journal of Innovation and Entrepreneurship*, 7(1):1–15. 10

Ayanwale, A. B. (2007). Fdi and economic growth : Evidence from nigeria. 2

Azman-Saini, W., Baharumshah, A. Z. et Law, S. H. (2010). Foreign direct investment, economic freedom and economic growth : International evidence. *Economic Modelling*, 27(5):1079–1089. 2

Badinger, H. (2009). Fiscal rules, discretionary fiscal policy and macroeconomic stability : an empirical assessment for oecd countries. *Applied Economics*, 41(7):829–847. 2, 37

Badinger, H. et Reuter, W. H. (2017). The case for fiscal rules. *Economic Modelling*, 60:334–343. 13, 46

Bagnoli, L. (2019). Does health insurance improve health for all ? heterogeneous effects on children in ghana. *World development*, 124:104636. 22

Barnes, S., Davidsson, D. et Łukasz Rawdanowicz (2012). Les nouvelles règles budgétaires européennes. (972). 2

Beetsma, M. R. M., Debrun, M. X., Fang, X., Kim, Y., Lledo, V. D., Mbaye, S. et Zhang, X. (2018). Independent fiscal councils : Recent trends and performance. 3, 5, 12

Beetsma, M. R. M., Debrun, M. X. et Sloof, R. (2017). *The political economy of fiscal transparency and independent fiscal councils*. International Monetary Fund. 12

Bergman, U. M. et Hutchison, M. (2015). Economic stabilization in the post-crisis world : Are fiscal rules the answer ? *Journal of International Money and Finance*, 52:82–101. 11

Blanco, L., Gonzalez, F. et Ruiz, I. (2013). The impact of fdi on co2 emissions in latin america. *Oxford Development Studies*, 41(1):104–121. 13

Bova, M. E., Carcenac, N. et Guerguil, M. M. (2014). *Fiscal rules and the procyclicality of fiscal policy in the developing world*. International Monetary Fund. 13, 19

Caliendo, M. et Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of economic surveys*, 22(1):31–72. 22

Castro, V. (2011). The impact of the european union fiscal rules on economic growth. *Journal of Macroeconomics*, 33(2):313–326. 10

Chapel, C. (2022). Impact of official development assistance projects for renewable energy on electrification in sub-saharan africa. *World Development*, 152:105784. 19

Combes, J.-L., Minea, A. et Sawadogo, P. N. (2021). Does the composition of government spending matter for government bond spreads ? *Economic Modelling*, 96:409–420. 3, 5

Combes, J.-L., Minea, A. et Sow, M. (2017). Is fiscal policy always counter-(pro-) cyclical ? the role of public debt and fiscal rules. *Economic Modelling*, 65:138–146. 19

Coulibaly, Y., Minea, A. et Villieu, P. (2022). How do natural resource–backed loans affect the public debt sustainability in developing countries ? Rapport technique, Orleans Economics Laboratory/Laboratoire d'Economie d'Orleans (LEO …. 22

Debrun, X. (2007). Tying hands is not commitment : can fiscal rules and institutions really enhance fiscal discipline ? Rapport technique, Bruegel working paper. 3, 5

Debrun, X., Hauner, D. et Kumar, M. S. (2009). Independent fiscal agencies. *Journal of Economic Surveys*, 23(1):44–81. 3, 5, 12

Debrun, X. et Kumar, M. (2007). Fiscal rules, fiscal councils and all that : commitment devices, signaling tools or smokescreens ? *Fiscal Councils and All That : Commitment Devices, Signaling Tools or Smokescreens*. 3

Debrun, X., Moulin, L., Turrini, A., Ayuso-i Casals, J. et Kumar, M. S. (2008). Tied to the mast ? national fiscal rules in the european union. *Economic Policy*, 23(54):298–362. 3

Decreuse, B. et Maarek, P. (2015). Fdi and the labor share in developing countries : A theory and some evidence. *Annals of Economics and Statistics/Annales d'Économie et de Statistique*, (119/120):289–319. 13

Dehejia, R. H. et Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and statistics*, 84(1):151–161. 22, 25

Dixit, A. et Lambertini, L. (2003). Symbiosis of monetary and fiscal policies in a monetary union. *Journal of International Economics*, 60(2):235–247. 13

Drazen, A. (2004). Fiscal rules from a political economy perspective. *In Rules-based fiscal policy in emerging markets*, pages 15–29. Springer. 2

Engen, E. M. et Hubbard, R. G. (2004). Federal government debt and interest rates. *NBER macroeconomics annual*, 19:83–138. 36

Erceg, C. J. et Lindé, J. (2013). Fiscal consolidation in a currency union : Spending cuts vs. tax hikes. *Journal of Economic Dynamics and Control*, 37(2):422–445. 13

Fatás, A. et Mihov, I. (2006). The macroeconomic effects of fiscal rules in the us states. *Journal of public economics*, 90(1-2):101–117. 2, 17, 27, 37

Feldstein, M. S. (1986). Budget deficits, tax rules, and real interest rates. 36

Ferrero, A. (2009). Fiscal and monetary rules for a currency union. *Journal of international Economics*, 77(1):1–10. 13

Freedberg, D. E., Conigliaro, J., Wang, T. C., Tracey, K. J., Callahan, M. V., Abrams, J. A., Sobieszczyk, M. E., Markowitz, D. D., Gupta, A., O'Donnell, M. R. *et al.* (2020). Famotidine use is associated with improved clinical outcomes in hospitalized covid-19 patients : a propensity score matched retrospective cohort study. *Gastroenterology*, 159(3):1129–1131. 33

Gale, W. G. et Orszag, P. R. (2003). Economic effects of sustained budget deficits. *National Tax Journal*, 56(3):463–485. 37

Gali, J. et Monacelli, T. (2008). Optimal monetary and fiscal policy in a currency union. *Journal of international economics*, 76(1):116–132. 13

Gangl, M. (2004). Rbounds : Stata module to perform rosenbaum sensitivity analysis for average treatment effects on the treated. 22

Göndör, M. et Nistor, P. (2012). Fiscal policy and foreign direct investment : evidence from some emerging eu economies. *Procedia-Social and Behavioral Sciences*, 58:1256–1266. 3, 6

Gootjes, B., de Haan, J. et Jong-A-Pin, R. (2021). Do fiscal rules constrain political budget cycles ? *Public Choice*, 188:1–30. 2

Hainmueller, J. (2012). Entropy balancing for causal effects : A multivariate reweighting method to produce balanced samples in observational studies. *Political analysis*, 20(1):25–46. 3, 13, 14, 37

Hainmueller, J. et Xu, Y. (2013). Ebalance : A stata package for entropy balancing. *Journal of Statistical Software*, 54(7). 13

Heckman, J. J., Ichimura, H. et Todd, P. (1998). Matching as an econometric evaluation estimator. *The review of economic studies*, 65(2):261–294. 22, 25

Hrechyshkina, O. et Samakhavets, M. (2018). Importance of foreign direct investment in financing for innovative development of the republic of belarus. 3, 6

Iamsiraroj, S. (2016). The foreign direct investment–economic growth nexus. *International Review of Economics & Finance*, 42:116–133. 2

Jacobs, J., Ogawa, K., Sterken, E. et Tokutsu, I. (2020). Public debt, economic growth and the real interest rate : A panel var approach to eu and oecd countries. *Applied Economics*, 52(12):1377–1394. 36

Jahan, S. (2012). Inflation targeting : Holding the line. *Finance & Development*, 4:72–73. 46

Jenkins, R. (2006). Globalization, fdi and employment in viet nam. *Transnational corporations*, 15(1):115. 13

Kane, L. T., Fang, T., Galetta, M. S., Goyal, D. K., Nicholson, K. J., Kepler, C. K., Vaccaro, A. R. et Schroeder, G. D. (2020). Propensity score matching : a statistical method. *Clinical Spine Surgery*, 33(3):120–122. 33

Kennedy, S., Robbins, J. et Delorme, F. (2001). The role of fiscal rules in determining fiscal performance. *In Fiscal Rules Conference*, page 237. 37

Kilic, C., Bayar, Y. et Arica, F. (2014). Effects of currency unions on foreign direct investment inflows : the european economic and monetary union case. *International Journal of Economics and Financial Issues*, 4(1):8–15. 11

King, G. et Nielsen, R. (2019). Why propensity scores should not be used for matching. *Political Analysis*, 27(4):435–454. 33

Kirsanova, T., Satchi, M., Vines, D. et Wren-Lewis, S. (2007). Optimal fiscal policy rules in a monetary union. *Journal of Money, credit and Banking*, 39(7):1759–1784. 13

Kolstad, I. et Søreide, T. (2009). Corruption in natural resource management : Implications for policy makers. *Resources Policy*, 34(4):214–226. 36

Kopits, G. (2001). Fiscal rules : useful policy framework or unnecessary ornament ? *Available at SSRN 2094462*. 2, 37

Kumar, N. (2006). Infrastructure availability, foreign direct investment inflows and their export-orientation : A cross-country exploration. *The Indian Economic Journal*, 54(1):125–144. 10

Lechner, M. (2002). Program heterogeneity and propensity score matching : An application to the evaluation of active labor market policies. *Review of Economics and Statistics*, 84(2):205–220. 22

Lee, C.-C. et Chang, C.-P. (2009). Fdi, financial development, and economic growth : international evidence. *Journal of applied economics*, 12(2):249–271. 3, 6

Liu, S. T., Lin, H.-M., Baine, I., Wajnberg, A., Gumprecht, J. P., Rahman, F., Rodriguez, D., Tandon, P., Bassily-Marcus, A., Bander, J. *et al.* (2020). Convalescent plasma treatment of severe covid-19 : a propensity score–matched control study. *Nature medicine*, 26(11):1708–1713. 33

Luechinger, S. et Schaltegger, C. A. (2013). Fiscal rules, budget deficits and budget projections. *International Tax and Public Finance*, 20:785–807. 37

Mahmood, H. et Khalid, S. (2013). Fiscal policy for growth and employment generation in pakistan. *Academic Research International*, 4(6):372. 7

Mason, R. L. et Vracheva, V. (2017). The impact of inflation targeting on attracting foreign direct investment. *Journal of Applied Business and Economics*, 19(4):79–94. 11

Milesi-Ferretti, G. M. (1997). Fiscal rules and the budget process. *Giornale degli economisti e annali di economia*, pages 5–40. 37

Mitsi, D. et Kottaridi, C. (2022). Fiscal and non-fiscal institutional context effects and foreign direct investment : empirical evidence in developing countries. *SPOUDAI-Journal of Economics and Business*, 72(1-2):11–33. 3, 19

Neuenkirch, M. et Neumeier, F. (2016). The impact of us sanctions on poverty. *Journal of Development Economics*, 121:110–119. 14, 15

Perotti, R. et Kontopoulos, Y. (2002). Fragmented fiscal policy. *Journal of public economics*, 86(2):191–222. 11

Primus, K. (2016). *Fiscal Rules for Resource Windfall Allocation : The Case of Trinidad and Tobago*. International Monetary Fund. 17, 27, 37

Răduleşcu, M. et Druica, E. (2014). The impact of fiscal policy on foreign direct investments. empiric evidence from romania. *Economic research-Ekonomska istraživanja*, 27(1):86–106. 3, 6, 9

Ranjan, V. et Agrawal, G. (2011). Fdi inflow determinants in bric countries : A panel data analysis. *International business research*, 4(4):255. 5

Ripollone, J. E., Huybrechts, K. F., Rothman, K. J., Ferguson, R. E. et Franklin, J. M. (2018). Implications of the propensity score matching paradox in pharmacoepidemiology. *American journal of epidemiology*, 187(9): 1951–1961. 33

Robbins, P. (2000). The rotten institution : corruption in natural resource management. *Political geography*, 19(4):423–443. 36

Roger, M. S. (2009). Inflation targeting at 20-achievements and challenges. 46

Rose, A. K. (2007). A stable international monetary system emerges : Inflation targeting is bretton woods, reversed. *Journal of International Money and Finance*, 26(5):663–681. 46

Rose, S. (2006). Do fiscal rules dampen the political business cycle ? *Public choice*, 128(3):407–431. 3

Rosenbaum, P. R. (1984). Testing the conditional independence and monotonicity assumptions of item response theory. *Psychometrika*, 49(3):425–435. 21

Rosenbaum, P. R. (2010). Evidence factors in observational studies. *Biometrika*, 97(2):333–345. 22

Rosenbaum, P. R. et Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1):41–55. 3, 13, 19, 21, 22, 37

Rubin, D. B. et Thomas, N. (1996). Matching using estimated propensity scores : relating theory to practice. *Biometrics*, pages 249–264. 21, 22

Sacchi, A. et Salotti, S. (2015). The impact of national fiscal rules on the stabilisation function of fiscal policy. *European Journal of Political Economy*, 37:1–20. 17, 27, 37

Sawadogo, F. et Wandaogo, A.-A. (2021). Does mobile money services adoption foster intra-african goods trade ? *Economics Letters*, 199:109681. 22, 23

Sawadogo, P. N. (2020). Can fiscal rules improve financial market access for developing countries ? *Journal of Macroeconomics*, 65:103214. 5, 18, 22, 37

Sawadogo, P. N. *et al.* (2020). Fiscal rules and international financial market access [règles budgétaires et accès aux marchés financiers internationaux]. Rapport technique. 37

Sayek, S. (2009). Foreign direct investment and inflation. *Southern Economic Journal*, 76(2):419–443. 11

Schaechter, M. A., Kinda, M. T., Budina, M. N. et Weber, A. (2012). *Fiscal Rules in Response to the Crisis : Toward the" Next-Generation" Rules : A New Dataset*. International Monetary Fund. 2

Schick, A. (2003). The role of fiscal rules in budgeting. *OECD Journal on Budgeting*, 3(3):7–34. 17, 27, 37

Schoeman, NJ, R. Z. C. . D. W. T. (2000). Foreign direct investment flows and fiscal discipline in south africa. *South African Journal of Economic and Management Sciences*, 3(2):235–244. 3, 5, 6, 9, 13

Schuknecht, L. (2004). Eu fiscal rules : issues and lessons from political economy. *Available at SSRN 631661*. 3, 5

Servén, L. (2007). *Fiscal rules, public investment, and growth*, volume 4382. World Bank Publications. 10

Shah, M. H. (2014). The significance of infrastructure for fdi inflow in developing countries. *Journal of Life Economics*, 1(2):1–16. 5

Shah, M. H. (2017). The effect of macroeconomic stability on inward fdi in african developing countries. *Shah, MH,(2016). The effect of macroeconomic stability on inward FDI in African developing countries. International Journal of Business Studies Review*, 1(1):1–11. 37

Simões, A. J., Ventura, J. et Coelho, L. A. (2015). The impact of fiscal policy on foreign direct investment. *Journal of Taxation of Investments*, 32(3). 2, 3, 6, 9

Simões, A. J., Ventura, J., Coelho, L. A. *et al.* (2014). Foreign direct investment and fiscal policy-a literature survey. *CEFAGE-UE Working Papers*, (2014_11). 3, 5, 6

Simone, T. et Bazilian, M. (2019). The role of international institutions in fostering sub-saharan africa's electrification. *The Electricity Journal*, 32(2):13–20. 22

Škare, M., Franc-Dąbrowska, J. et Cvek, D. (2020). Cointegration analysis and vecm of fdi, employment, export and gdp in croatia (2002 ? 2017) with particular reference to the global crisis and poor macroeconomic governance. *Equilibrium. Quarterly Journal of Economics and Economic Policy*, 15(4):761–783. 7

Smith, J. A. et Todd, P. E. (2005). Does matching overcome lalonde's critique of nonexperimental estimators ? *Journal of econometrics*, 125(1-2):305–353. 21

Sutherland, D., Price, R. et Joumard, I. (2005). Fiscal rules for sub-central governments : Design and impact. 17, 27, 37

Tang, C. F., Yip, C. Y. et Ozturk, I. (2014). The determinants of foreign direct investment in malaysia : A case for electrical and electronic industry. *Economic Modelling*, 43:287–292. 6

Tapsoba, R. (2012). Does inflation targeting matter for attracting foreign direct investment into developing countries ? 11, 46

Thornton, J. et Vasilakis, C. (2018). Fiscal rules and government borrowing costs : International evidence. *Economic Inquiry*, 56(1):446–459. 17, 18

Tremblay, D., Van Gerwen, M., Alsen, M., Thibaud, S., Kessler, A., Venugopal, S., Makki, I., Qin, Q., Dharmapuri, S., Jun, T. *et al.* (2020). Impact of anticoagulation prior to covid-19 infection : a propensity score–matched cohort study. *Blood*, 136(1):144. 33

Vikram, K. et Chindarkar, N. (2020). Bridging the gaps in cognitive achievement in india : The crucial role of the integrated child development services in early childhood. *World Development*, 127:104697. 22, 23

Wyplosz, C. (2012). Fiscal rules : Theoretical issues and historical experiences. *In Fiscal policy after the financial crisis*, pages 495–525. University of Chicago Press. 2, 37

Descriptive statistics

TABLE 17 – Descriptive statistics

Apart from the FDI and FR the rest of the variables are laggy in the basic model					
Variables	Observations	Moyenne	SD	Min	Max
FDI	2366	3.4379	6.5531	-40.0866	109.0253
rule	2418	.2754	.4468	0	1
Currency	2418	.1025	.3034	0	1
Inflation	2261	34.7068	262.3203	-16.1173	7481.664
Fiscal balance	2166	-2.4394	6.4945	-151.309	43.304
Checks and balances	2284	2.6917	1.5923	1	18
financial openness	2300	-.0222	1.4597	-1.9270	2.3106
hardit	2418	.1410	.3481	0	1
Institution	2114	2.4141	.9072	0	5

Table 18 – Description

Variables	Description	Source
Fiscal balance	Fiscal balance, % of GDP. It's the amount of money that a government receives from tax revenue and the proceeds of assets sold, minus any government spending. When the balance is negative, the government has a fiscal deficit. When the balance is positive, the government has a fiscal surplus.	WDI
Checks and balances	It is an index that makes it possible to capture the counter-power or the political counter-weight in a country	Badinger et Reuter (2017)
Currency	is a binary variable that indicates 1 if the country belongs to a monetary union and 0 otherwise	WDI
FDI	Foreign direct investment is the net inflow of investment to acquire a lasting management interest (10 % or more of the voting shares) in an enterprise operating in an economy other than that of the investor.	WDI
Inflation	measures the ratio of the general price level	WDI
Fiscal rules	is a binary variable that indicates 1 if the country has adopted at least one fiscal rule and 0 otherwise	FMI
Hardit	is an index that captures 1 if the country has adopted inflation targeting and O otherwise	Roger (2009) ; Rose (2007) ; Tapsoba (2012) ; Jahan (2012)
Institution	It is an index that captures the fight against corruption in the political system	ICRG
financial openness	is an index that captures the financial openness of a country	Chinn-Ito index (2002;2006;2008)