Can fiscal rules curb income inequality? Evidence from developing countries

Jean-Louis Combes, Alexandru Minea, Cezara Vinturis, Pegdéwendé Nestor Sawadogo

CENTRE D'ÉTUDES
ET DE RECHERCHES
SUR LE DEVELOPPEMENT
INTERNATIONAL

SÉRIE ÉTUDES ET DOCUMENTS

Can fiscal rules curb income inequality? Evidence from developing countries

Jean-Louis Combes
Alexandru Minea
Pegdéwendé Nestor Sawadogo
Cezara Vinturis

Études et Documents n° 25
December 2019

[First version: March 2019 ; This version: revised December 2019]

To cite this document:

Combes J.-L., Minea A., Sawadogo P. N., Vinturis C. (2019) "Can fiscal rules curb income inequality? Evidence from developing countries", *Études et Documents,* n° 25, CERDI.

CERDI
POLE TERTIAIRE
26 AVENUE LÉON BLUM
F- 63000 CLERMONT FERRAND
TEL. + 33 4 73 17 74 00
FAX + 33 4 73 17 74 28
http://cerdi.uca.fr/

The authors

Jean-Louis Combes
Université Clermont Auvergne, CNRS, CERDI, F-63000 Clermont-Ferrand, France.
Email address: j-louis.combes@uca.fr

Alexandru Minea
Université Clermont Auvergne, CNRS, CERDI, F-63000 Clermont-Ferrand, France, and Department of Economics, Carleton University, Canada.
Email address: alexandru.minea@uca.fr

Pegdéwendé Nestor Sawadogo
Université Clermont Auvergne, CNRS, CERDI, F-63000 Clermont-Ferrand, France.
Email address: pegdewende_nestor.sawadogo@etu.uca.fr

Cezara Vinturis
Université Clermont Auvergne, CNRS, CERDI, F-63000 Clermont-Ferrand, France, and West University of Timisoara, Romania.
Email address: cezara.vinturis@etu.uca.fr

Corresponding author: Alexandru Minea

Études et Documents are available online at: https://cerdi.uca.fr/etudes-et-documents/

Director of Publication: Grégoire Rota-Graziosi
Editor: Catherine Araujo-Bonjean
Publisher: Mariannick Cornec
ISSN: 2114 - 7957

Disclaimer:

Abstract

Despite a large literature linking fiscal policy and income inequality (IQ), the relationship between fiscal rules (FR) and IQ is severely underexplored. In a large panel of developing countries, propensity score matching estimations reveal that countries that adopted FR experience a significant decrease in their IQ with respect to countries that did not. Economically meaningful, this favorable effect is robust to a wide set of alternative measurement, methodology, and modeling specifications. Moreover, we unveil significant differences among FR: balanced budget and debt rules robustly decrease IQ, contrary to expenditure rules that increase it. Finally, the effect of FR on IQ is subject to heterogeneity related to structural factors. Given the current global IQ trends, our results showing that the FR are not neutral for IQ may provide insightful evidence for governments of countries aiming at adopting FR.

Keywords

Fiscal rules, Income inequality, Developing countries, Impact analysis.

JEL Codes

H61, H62, D63, 023.

I. Introduction

Income inequality (IQ) trends are periodically scrutinized by economists (see e.g. Anand and Segal, 2008; Piketty, 2014; Alvaredo et al., 2017), probably due to the large consequences of IQ—see e.g. Wilkinson and Pickett (2009) *The Spirit Level: Why More Equal Societies Almost Always Do Better?*, Stiglitz (2012) *The Price of Inequality: How Today's Divided Society Endangers Our Future*, or Atkinson (2015) *Inequality: What Can Be Done?*. From a macroeconomic perspective, the literature devoted to IQ focuses on mainly three issues.

A first strand of literature, capitalizing on the pioneering work of Kuznets (1955), looks at the determinants of IQ; prominent determinants include international factors, such as globalization or trade (e.g. Dollar and Kraay, 2004; Goldberg and Pavcnik, 2007; Dreher and Gaston, 2008; Ezcurra and Rodriguez-Pose, 2013; Kanbur, 2015), financial factors (e.g. Claessens and Perotti, 2007; Demirguc-Kunt and Levine, 2009; Kim and Lin, 2011), technological change (e.g. Galor and Moav, 2000; Acemoglu, 2002; Jovanovic, 2009), institutions (e.g. Chong and Gradstein, 2007; Acemoglu et al., 2015; Lin and Fu, 2016), inflation (e.g. Romer and Romer, 1999; Bulir, 2001; Albanesi, 2007); or natural resources (e.g. Gylfason and Zoega, 2002; Fum and Hodler, 2010; Parcero and Papyrakis, 2016).

Second, IQ is regularly pointed out as a major source of various macroeconomic imbalances; for example, IQ is found to reduce economic growth[1] (e.g. Alesina and Rodrik, 1994; Persson and Tabellini, 1994; Ostry et al., 2014; Berg et al., 2018; and possibly contribute to the secular stagnation, see Auclert and Rognlie, 2018) or the quality of the institutions (Alesina and Perotti, 1996), to increase inflation (Beetsma and van der Ploeg, 1996) and poverty (Ravallion, 1997), and to contribute to underdevelopment (Easterly, 2007) and even crises, including the recent Great Recession (Rajan, 2010; Reich, 2010).

Third, given these detrimental effects, a wide variety of policies were imagined to bring down IQ. Such policies may be related with e.g. trade (UNCTAD, 2019), FDI (Figini and Gorg, 2011), human capital (Goldin and Katz, 2009), finance (Brei et al., 2018), technology (UNESCAP, 2018, chapter 4), or the labor market (Berg, 2015).

Belonging to the latter strand of literature, this paper asks the following question: can fiscal rules (FR) curb income inequality (IQ)?[2] Such a question is legitimate since FR affect

[1] However, some early 2000s studies reported that IQ may sometimes increase growth (e.g. Forbes, 2000).

[2] Nowadays, FR—defined as permanent constraints on fiscal policy, expressed in terms of a summary indicator of fiscal performance (Kopits and Symansky, 1998)—became a popular tool for conducting fiscal policy (in more than 90 countries according to the 2015 IMF Fiscal Rules Dataset), despite a certain lack of consensus regarding their macroeconomic performances, with mostly pros—FR may e.g. improve fiscal discipline (Debrun et al., 2008), make fiscal policy more countercyclical (Combes et al., 2017), or reduce inflation (Combes et al., 2018); and some cons—FR may make public investment more procyclical (Dessus et al., 2016).

various dimensions of the fiscal policy, which received by far the greatest attention among all policies aiming at reducing IQ both from international institutions (e.g. OECD, 2015, chapters 3 and 7; or IMF, 2017) and academia—for recent surveys, see e.g. Bastagli et al. (2012), Heshmati and Kim (2014), Clements et al. (2015), or Anderson et al. (2017). In light of this literature, the potential effect of FR on IQ can transit through at least three channels.

First, and most importantly, by affecting the fiscal balance (e.g. Debrun et al., 2008; Tapsoba, 2012; Combes et al., 2018), FR most likely influence both government spending and revenues. While more recently e.g. Joumard et al. (2012), Martinez-Vazquez et al. (2012), or Higgins and Lustig (2016) discuss the effect of taxes on IQ, the meta-analysis of Anderson et al. (2017) performed on 84 studies reports mitigated findings for the government spending-IQ link: while total government spending present a moderate positive relationship with IQ, some types of government spending, including social or consumption spending, present a moderate negative relationship with IQ.

Second, following the Great Recession many countries enacted FR together with fiscal consolidation programs, in accordance with previous evidence supporting a key role of FR for fiscal consolidations (e.g. Guichard et al., 2007). In turn, recent studies suggest that fiscal consolidations may be associated with higher IQ particularly when based on spending cuts (e.g. Ball et al., 2013; Woo et al., 2013; Agnello and Sousa, 2014), while the opposite may arise for tax-based fiscal consolidations (Ciminelli et al., 2019).

Third, by affecting in particular fiscal policy cyclicality (e.g. Debrun et. al. 2008; Bova et al., 2014; Combes et al., 2017; Guerguil et. al., 2017) and government borrowing costs (e.g. Badinger and Reuter, 2017; Thornton and Vasilakis, 2018), FR are likely to influence fiscal policy equally in the medium-run, for example in terms of public debt dynamics and fiscal policy credibility. In turn, credibility may affect IQ for example through capital flows (Jaumotte et al., 2013), while there seems to be a positive link between public debt and IQ, particularly in OECD (e.g. Azzimonti et al., 2014; Arawatari and Ono, 2017).

To explore the relationship between FR and IQ, we draw upon the propensity scores-matching (PSM) method that properly overcomes the selection bias related with the adoption of FR.[3] We aim at estimating potential differences in IQ between countries that adopted FR and that did not adopt FR but present a comparable probability of adopting FR conditional on a set of covariates, i.e. comparable propensity scores (Rosenbaum and Rubin, 1983).

[3] Initially employed in macroeconomics to analyze inflation targeting adoption (e.g. Lin and Ye, 2007; Minea and Tapsoba, 2014), PSM is equally used to estimate the effect of FR (e.g. Tapsoba, 2012; Guerguil et al., 2017).

Our analysis conducted on wide panel of 84 developing countries over the period 1990-2015 reveals the following. First, countries that adopted FR experience a significant decrease in their IQ with respect to comparable countries that did not adopt FR. All the more that IQ is most likely not the primary goal that motivates the adoption of FR, this favorable effect is economically meaningful as it ranges between 18% and 30% of the standard deviation of our measure of IQ. The strength of our finding is confirmed by a rich robustness analysis that includes an alternative IQ measure, additional control variables, the entropy balancing method as an alternative to the PSM method, or different samples—and in particular the inclusion of developed countries.

Second, since not all FR are alike, we explore possible heterogeneities in their effect on IQ. On the one hand, we find that contrary to the favorable effect of balanced budget rules (BBR) and debt rules (DR) on IQ, the presence of expenditure rules (ER) strongly *increases* IQ; a possible explanation is related to the fact that ER may constrain government expenditure (e.g. Tapsoba, 2012; Dahan and Strawczinski, 2013), including spending that may contribute to reduce IQ. On the other hand, when combining these rules two by two, we reveal complementarities in the favorable effect of BBR and DR on IQ, as well as a neutralization of the *unfavorable* effect of ER on IQ in the presence of BBR or DR.

Third, switching to the control function regression method, we explore possible heterogeneities driven by various economic and structural factors in the relationship between FR and IQ. On the one hand, considering FR altogether, we reveal that the favorable effect of FR alone on IQ can be amplified in a context of deteriorated fiscal space (for example, a higher public debt); when combined with FR, higher trade further supports the favorable effect of FR on IQ; better political stability reduces IQ when combined with FR; and that education (economic growth or mineral rents) reduces (*increase*) IQ when combined with FR. On the other hand, combining various FR and various economic and structural variables reveals additional heterogeneities. Compared with findings for all FR, the interactive effect may become significant or—on the contrary—turn into not significant; the interactive effect of some variables may differ across the various types of FR; and some variables may weaken the unfavorable effect of ER on IQ illustrated in the benchmark estimations.

Consequently, in light of our analysis, the adoption of FR mostly reduces IQ. However, not only the magnitude of this effect may vary with the precise type of FR, but some FR—and in particular ER—are found to significantly *increase* IQ. In addition, the effect of various types of FR on IQ may be subject to important heterogeneities, related to a wide set of fiscal, monetary, international, political, or structural factors. Given the

importance of IQ in developing countries and its upward trend in many advanced countries (see e.g. IMF, 2017), our results showing not only that FR are not neutral for IQ, but also identifying cases in which various FR may curb or on the contrary increase IQ, may provide insightful evidence for governments aiming at adopting FR.

The paper is organized as follows. Section 2 presents the data and the methodology, section 3 reports our main results, section 4 assesses their robustness, section 5 investigates the impact of various types of FR on IQ, section 6 explores heterogeneities in the effect of FR on IQ related with various economic and structural factors, and section 7 concludes.

II. Data and methodology

2.1. Data

We explore the effect of FR on IQ using a yearly panel of 84 developing countries over the period 1990-2015, selected mainly on two grounds. On the one hand, in the developing world the presence of trustworthy fiscal data begins in the 1990s. On the other hand, to ensure the comparability between the groups of FR and non-FR countries, i.e. for the control group to be a good counterfactual for the treatment group, we exclude from the group of non-FR countries those with a real per capita GDP lower than that of the poorest FR country, and a smaller population than that of the smallest FR country.

Our main variables are IQ and FR. Following previous studies (e.g. Afesorgbor and Mahadevan, 2016), we measure IQ by the Gini index of the disposable net income extracted from the Standardized World Income Inequality Database (SWIID) developed by Solt (2016), which provides comparable data across countries. We capture FR by a dummy variable equal to 1 if for a given country in a given year a fiscal rule is at work and to 0 otherwise, using the IMF Fiscal Rules Dataset. Appendix A in the Online Supplementary Material presents the list of countries and the year of FR adoption.

2.2. Methodology

The presentation of the methodology is standard, and follows the existing work (e.g. Lin and Ye, 2007; Tapsoba, 2012). The average treatment effect of the treated (ATT) equals the average difference between IQ in countries that adopted FR ($FR=1$), namely IQ^1, and the IQ they would have had in the absence of FR, namely IQ^0

$$ATT = E\left[\left(IQ_i^1 - IQ_i^0\right)\middle|FR_i = 1\right] = E\left[IQ_i^1\middle|FR_i = 1\right] - E\left[IQ_i^0\middle|FR_i = 1\right]. \quad (1)$$

Unfortunately, the latter term is not observable, and a solution would be to simply compare the average IQ in countries that adopted FR and countries that did not. However, this would lead to biased results, given that the adoption of FR (i.e. the treatment) is most likely not random but correlated with a set of observable variables that may equally affect IQ (i.e. the "self-section" problem, see e.g. Heckman et al., 1998, and Dehejia and Wahba, 2002). Instead, under the conditional independence assumption (namely, conditional to a set of observed variables X, IQ^1 and IQ^0 are independent of the FR adoption), we can replace the last term of (1) by the IQ in countries that did not adopt FR but present comparable values of the variables X

$$ATT = E\left[IQ_i^1 \middle| FR_i = 1, X_i\right] - E\left[IQ_i^0 \middle| FR_i = 0, X_i\right]. \quad (2)$$

Although the last term of (2) is observable, matching countries on a large set of variables could raise practical issues. Therefore, we follow Rosenbaum and Rubin (1983), and concentrate the information from set X into the variable $p_{X_i} = \Pr\left[FR_i = 1 \middle| X_i\right]$, which provides, conditional on the set X, the probability of adopting FR. Assuming, for each country that adopted FR, the existence of comparable countries that did not adopt FR (i.e. the common support assumption), the ATT finally rewrites as

$$ATT = E\left[IQ_i^1 \middle| FR_i = 1, p_{X_i}\right] - E\left[IQ_i^0 \middle| FR_i = 0, p_{X_i}\right]. \quad (3)$$

When estimating (3), we follow the existing literature (e.g. Lin and Ye 2007; Minea & Tapsoba, 2014), and draw upon a large variety of propensity scores-matching methods.

III. Results

3.1. The estimation of the propensity scores

We estimate the propensity scores using a probit model with the FR dummy as the dependent variable. To account for macroeconomic and political factors related to the adoption of FR, we draw upon the existing literature on FR (e.g. Debrun and Kumar, 2007; Tapsoba, 2012; Combes et al., 2017; or Eyraud et al., 2018), and use a wide range of control variables (see Appendix A for the description and sources of variables, and for descriptive statistics).

First, since FR are most likely to be introduced in countries with good macroeconomic performances (e.g. IMF, 2009; Tapsoba, 2012), higher economic growth (measured by the real GDP per capita growth) is expected to increase the probability of FR adoption. Although the same may hold for external debt (in ratio of GDP), FR may equally be adopted to stabilize a large indebtedness, making uncertain the overall effect of debt on the likelihood of FR

adoption. Second, given their higher demand for social spending, countries with higher population dependency ratio will have a lower likelihood of FR adoption, facing more difficulties to introduce fiscal discipline (Calderón and Schmidt-Hebbel, 2008). Third, as emphasized by e.g. Kose et al. (2009), a larger capital openness (that we measure using the Chinn and Ito, 2008, index) fosters a more efficient allocation of capital, which may stimulate economic growth and constitute a prerequisite for the adoption of FR. Fourth, since the adoption of inflation targeting often went along with the establishment of FR and other fiscal reforms (e.g. fiscal responsibility laws, fiscal transparency, fiscal accountability) to ensure fiscal discipline (e.g. Minea and Tapsoba, 2014; Combes et al., 2018), we expect a positive link with FR adoption. At the same time, a higher inflation—measured as log(1+inflation)—may signal a poor quality of monetary institutions, and is expected to negatively affect the likelihood of FR. Fifth, following e.g. Tapsoba (2012), we account for political factors. On the one hand, a high political risk usually signals poor institutions (including fiscal institutions that should guarantee the respect of FR), and should negatively affect the probability of FR adoption. On the other hand, since the government fractionalization may raise public spending pressures (e.g. Perotti and Kontopoulos, 2002), voters may support the establishment of strengthened fiscal frameworks to offset them, thereby increasing the need for FR.

Table 1 reports the probit estimates of the PS. As shown by column [1], coefficients of most variables are significant and confirm our expectations. Among the significant effects, GDP per capita growth, the presence of an inflation targeting regime, and government fractionalization increase the probability of FR adoption, with opposite effects for the dependency ratio, inflation, and political risks.

Table 1: The estimation of propensity scores

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
L.Real gdppc growth	0.00815*	0.00811*	0.00816*	0.00880*	0.00917*	0.0115**	0.00874*	0.00817*
	(0.00478)	(0.00480)	(0.00480)	(0.00489)	(0.00493)	(0.00561)	(0.00481)	(0.00478)
L.Debt	0.00154	0.00154	0.00154	0.00216*	0.00226*	0.00388***	0.00192	0.00155
	(0.00116)	(0.00116)	(0.00116)	(0.00118)	(0.00118)	(0.00119)	(0.00118)	(0.00116)
L.Dependency ratio	-0.00619**	-0.00619**	-0.00619**	-0.00667**	-0.00654**	-0.00685**	-0.00669***	-0.00626**
	(0.00259)	(0.00259)	(0.00259)	(0.00268)	(0.00270)	(0.00283)	(0.00259)	(0.00259)
L.Capital openness	0.0971***	0.0968***	0.0971***	0.0748**	0.0755**	0.0921***	0.0865***	0.0967***
	(0.0292)	(0.0292)	(0.0292)	(0.0296)	(0.0296)	(0.0310)	(0.0290)	(0.0292)
L.Inflation	-5.574***	-5.551***	-5.580***	-5.389***	-5.417***	-5.588***	-5.938***	-5.603***
	(0.914)	(0.947)	(0.943)	(0.915)	(0.922)	(1.062)	(0.926)	(0.917)
IT_conservative	0.636***	0.635***	0.636***	0.629***	0.635***	0.641***	0.567***	
	(0.116)	(0.116)	(0.116)	(0.118)	(0.118)	(0.122)	(0.116)	
L.Political risk	-0.0164***	-0.0163***	-0.0164***	-0.0159***	-0.0159***	-0.0212***	-0.0133**	-0.0164***
	(0.00568)	(0.00569)	(0.00569)	(0.00572)	(0.00572)	(0.00600)	(0.00578)	(0.00568)
L.Gov fractionalization	0.430***	0.430***	0.430***	0.422***	0.426***	0.452***	0.452***	0.432***
	(0.152)	(0.152)	(0.152)	(0.155)	(0.155)	(0.159)	(0.153)	(0.152)
Fix regime		0.0564						
		(0.302)						
Floating regime			0.0147					
			(0.309)					
CBI_regular				-0.0982				
				(0.234)				
CBI_irregular					0.137			
					(0.124)			
Debt default						-0.658***		
						(0.162)		
Resource-Rich							0.368***	
							(0.0893)	
IT_default								0.625***
								(0.115)
Observations/Pseudo-R2	1234/0.141	1234/0.141	1234/0.141	1189/0.134	1189/0.135	1151/0.170	1234/0.152	1234/0.141

Note: standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.2. The results of matching on propensity scores

Using estimated PS, we match countries that adopted FR with comparable countries that did not, drawing upon four popular matching methods. First, the nearest-neighbor matches each FR country with the non-FR countries with the closest PS (we retain up to $n = 3$ neighbors). Second, the radius matches each FR with all non-FR countries with PS within a radius (we retain a small $R = 0.005$, a medium $R = 0.01$, and a large $R = 0.05$ radius). Third, the local linear regression (Heckman et al., 1998) matches covariates-adjusted outcomes of each FR country with the corresponding ones of non-FR countries. Fourth, Kernel matches each FR country with a weighted-average of all non-FR countries (weights are inversely proportional to the gap between the PS of the FR and non-FR countries). Since the matching estimator has no analytical variance, we compute bootstrapped standard errors (Dehejia and Wahba, 2002).

Before discussing the main results, we report that statistical tests support the quality of our estimations. First, following Sianesi (2004), the pseudo-R2 test analyzes the common support assumption by estimating the PS on matched and non-matched observations to contrast their fit before and after matching. Pseudo-R2 reported in Table 2 are fairly close to zero (i.e. always below 0.01), suggesting that the matching provided balanced scores. Consequently, our estimations are robust with regard to the common support hypothesis.

Second, we explore the conditional independence assumption in two ways. Regarding unobservables, the lower bound of the Rosenbaum (2002) sensitivity test, conducted at the usual 5% significance level under the assumption of an underestimated ATT, is around 1.4 (see Table 2), comparable with existing studies (e.g. around 1.2 in Guerguil et al., 2017). Regarding observables (see Rosenbaum, 2002), the p-values of the equality test of the mean difference (standardized bias) between the characteristics of countries that adopted and did not adopt FR supports the absence of statistical differences after matching (see Table 2). Thus, estimations are equally robust with respect to the conditional independence assumption.

Given these diagnostic tests, using estimated PS from column [1] of Table 1, our benchmark results are reported on line [1] of Table 2. Irrespective of the matching method, the estimated ATT is negative and statistically significant: with respect to comparable countries that did not adopt FR, countries that adopted FR experience a significant IQ reduction. In absolute value, the estimated decrease in IQ ranges between 0.0135 (radius $r = 0.01$) and 0.0217 (neighbor $n = 2$), depending on the retained specification. Since they represent between 18% and 30% of the standard deviation of our IQ variable (equal to 0.073, see Appendix A), these numbers are economically meaningful, all the more that IQ is most likely not the primary goal that motivates the adoption of FR.

Table 2: Matching results

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
				Dependent variable: Gini Index				
[1] ATT: Differences in Inequality	-0.0195**	-0.0217***	-0.0211***	-0.0135**	-0.0144**	-0.0174***	-0.0171***	-0.0175***
	(0.00916)	(0.00778)	(0.00731)	(0.00681)	(0.00615)	(0.00534)	(0.00540)	(0.00570)
Number of observations, of which:	1192	1192	1192	1192	1192	1192	1192	1192
- treated observations	291	291	291	291	291	291	291	291
- control observations	901	901	901	901	901	901	901	901
				Quality of the matching				
Pseudo-R2	0.004	0.005	0.005	0.003	0.002	0.002	0.004	0.002
Rosenbaum bounds sensitivity test	1.8	1.5	1.5	1.1	1.4	1.5	1.3	1.5
Standardized bias (p-value)	0.88	0.79	0.80	0.96	0.86	0.98	0.88	0.98

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

IV. Robustness

This section investigates the robustness of the favorable effect of FR adoption on IQ.

4.1. An alternative measure of inequality

Our main IQ measure is the Gini index based on the net income from Solt (2016). We consider an alternative IQ measure, from the United Nation University World Institute for Development Economics Research (UNU-WIDER). Given data availability and for consistency with our main measure, we focus on IQ based on equivalized household disposable (post-tax, post-transfer) income. The results of the matching using PS from column [1] in Table 1 are reported in Table 3. Our usual tests support the quality of the matching. Moreover, all ATTs are negative and significant, suggesting that the decrease in IQ following the adoption of FR does not change with the IQ measure. Finally, the estimated decrease in IQ varies in absolute value between 0.0236 and 0.0458 (namely, between 25% and 48% of the standard deviation), a magnitude somewhat higher compared with our benchmark findings.

4.2. Additional controls

We augment the benchmark probit model (column [1] in Table 1) with several additional variables, namely: the exchange rate regime (we distinguish corner, i.e. fixed and floating regimes); the central bank independence (the regular and irregular change in central banks' governor turnover); debt default experiences; natural resources endowment (signaling resource-rich countries); and the presence of a default (instead of a conservative) inflation targeting regime (Appendix A provides definitions, sources, and descriptive statistics).

According to columns [2]-[8] in Table 1, most additional variables do not have a significant effect, confirming the robustness of our benchmark model. Whenever significant, their effect is consistent with what one may expect; in particular, countries with a history of debt default are less likely to adopt FR, which requires fiscal institutions inconsistent with default, while being a resource-rich country may generate additional fiscal revenues that relax the government's budget constraint and may support its capacity to respect the FR.

Based on PS computed using Table 1, lines [1]-[7] in Table 4 report the ATT. Corroborating our benchmark results, the ATTs are significant and negative irrespective of the considered specification. In addition, the size of the effect is equally consistent with our benchmark findings, ranging (in absolute value) between 0.0140 (neighbor $n=1$, line [5]) and 0.0257 (neighbor $n=1$, line [7]). Overall, accounting for additional control variables confirms the significant reduction of IQ in countries that adopted FR.

Table 3: Matching results: Robustness—Inequality measured using the UNU-WIDER database

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
Dependent variable: Gini Index								
[1] ATT: Differences in Inequality	-0.0427***	-0.0362**	-0.0305**	-0.0458***	-0.0378***	-0.0236**	-0.0250**	-0.0244**
	(0.0162)	(0.0145)	(0.0141)	(0.0161)	(0.0143)	(0.0115)	(0.0121)	(0.0116)
Observations/treated observations	447/125							
Quality of the matching								
Pseudo-R2	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.01
Rosenbaum bounds sensitivity test	1.7	1.6	1.4	2	1.8	1.4	1.5	1.5
Standardized bias (p-value)	0.46	0.46	0.45	0.97	0.90	0.84	0.46	0.84

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

Table 4: Matching results: Robustness—Additional controls

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
ATT: Differences in Inequality				r=0.005	r=0.01	r=0.05		
Robustness checks								
[1] Adding Fix exchange regime	-0.0206**	-0.0156**	-0.0173**	-0.0186***	-0.0165***	-0.0171***	-0.0167***	-0.0170***
	(0.00853)	(0.00791)	(0.00718)	(0.00691)	(0.00591)	(0.00511)	(0.00549)	(0.00538)
[2] Adding Floating exchange regime	-0.0197**	-0.0164**	-0.0188***	-0.0179***	-0.0165***	-0.0158***	-0.0158***	-0.0156***
	(0.00870)	(0.00767)	(0.00713)	(0.00643)	(0.00611)	(0.00566)	(0.00536)	(0.00549)
[3] Adding CBI regular turnover	-0.0163*	-0.0185**	-0.0162**	-0.0190***	-0.0179***	-0.0183***	-0.0186***	-0.0185***
	(0.00922)	(0.00815)	(0.00766)	(0.00678)	(0.00618)	(0.00551)	(0.00548)	(0.00577)
[4] Adding CBI irregular turnover	-0.0169*	-0.0162**	-0.0167**	-0.0184***	-0.0165***	-0.0172***	-0.0179***	-0.0170***
	(0.00874)	(0.00752)	(0.00726)	(0.00679)	(0.00621)	(0.00558)	(0.00548)	(0.00558)
[5] Adding Debt default dummy	-0.0140*	-0.0146*	-0.0143**	-0.0180***	-0.0166***	-0.0172***	-0.0176***	-0.0173***
	(0.00848)	(0.00750)	(0.00721)	(0.00656)	(0.00627)	(0.00554)	(0.00505)	(0.00539)
[6] Adding Resource-Rich country dummy	-0.0249***	-0.0192**	-0.0221***	-0.0245***	-0.0223***	-0.0248***	-0.0254***	-0.0247***
	(0.00963)	(0.00888)	(0.00780)	(0.00737)	(0.00670)	(0.00625)	(0.00622)	(0.00615)
[7] Using IT Default date	-0.0257***	-0.0220***	-0.0186***	-0.0161**	-0.0169***	-0.0171***	-0.0169***	-0.0171***
	(0.00848)	(0.00757)	(0.00714)	(0.00646)	(0.00628)	(0.00534)	(0.00563)	(0.00529)

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

4.3. An alternative estimation method

To check if our main results based on PSM still hold when using an alternative technique, we draw upon the entropy balancing method of Hainmueller (2012)—see Neuenkirch and Neumeier (2016) and Balima et al. (2018) for a presentation of the method. Table 5a shows that a simple comparison of main control variables' averages in countries that adopted FR (column [1]) and that did not adopt FR (column [2]) reveals statistically-significant differences for almost all variables (column [4]). To neutralize the potential influence of such differences on the treatment effect, we compute a synthetic control group by applying weights to non-FR observations such as the average of variables in this group (column [5]) is not statistically different from their average in the FR group (column [2]), as in column [7].

Table 5a: Building the synthetic control group

	[1]	[2]	[3]=[1]-[2]	[4]	[5]	[6]=[5]-[2]	[7]
Variables	Non-FR	FR	difference	p_value	W_Non-FR	difference	p_value
L.real gdppc growth	-7.427	2.319	-9.746	0.000	2.963	0.644	0.738
L.debt	60.867	53.697	7.17	0.034	56.32	2.623	0.873
L.dependency ratio	70.262	66.65	3.611	0.001	66.69	0.04	0.882
L.capital openness	-.248	.05	-.297	0.000	.151	0.101	0.928
L.inflation	.166	.047	.118	0.000	.0510	0.004	0.347
IT_conservative	.058	.226	-.168	0.000	.266	0.04	0.889
L.political risk	60.769	62.652	-1.883	0.001	62.439	-0.213	0.898
L.gov fractionalization	.195	.263	-.069	0.000	.273	0.01	0.955
Observations	807	285			285		

Table 5b: Robustness—Entropy balancing estimations

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Baseline	Country-FE	Time-FE	CFE & TFE	Main	MC	MC	MC
	(Only FR)	(CFE)	(TFE)	(CTFE)	Controls (MC)	and CFE	and TFE	and CTFE
FR	-0.0162***	-0.0116***	-0.0122***	-0.0069***	-0.0170***	-0.0097***	-0.0074*	-0.0069***
	(0.00420)	(0.00208)	(0.00442)	(0.00235)	(0.00385)	(0.00218)	(0.00399)	(0.00242)
Obs.	1142							

Note: Unreported constant included. Standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

Using these weights, Table 5b reports weighted least squares estimations. Column [1] shows that countries that adopted FR present significantly lower IQ with respect to comparable countries that did not adopt FR (and the magnitude of the estimated coefficient is close to our findings based on the PSM method). Next, we take advantage of the possibility of modeling the panel dimension with the entropy balancing method, and include country-fixed effects (CFE), time-fixed effects (TFE), and both CFE and TFE. According to columns [2]-[4], the decrease of IQ remains significant in the presence of fixed effects. Moreover, a significant effect is still at work when we add in column [5] the set of eight main control variables used in our PSM benchmark estimation. Finally, comparable results arise when

combining the main control variables with different fixed effects in columns [6]-[8]. Consequently, the use of an alternative method, i.e. entropy balancing, allowing controlling for unobservables through both country and time fixed effects confirms our previous conclusion based on the PSM of a favorable impact of FR on IQ.

4.4. Alternative samples

We now look at the robustness of our benchmark findings when changing the sample. First, we drop former Soviet Union countries due to their particular structural characteristics. Second, we abstract of post-Cold War years (1990-1995) during which many countries experienced particular dynamics of their economies. Third, we look if our results still hold when abstracting of fuel exporter countries. Fourth, we drop hyperinflation episodes, defined by annual inflation rates above 40%. Fifth, we ignore the recent financial crisis years (2008-2009). Sixth, we extend our sample to include the group of developed countries. As illustrated by ATTs reported on lines [1]-[6] in Table 6a, the effect of FR adoption on IQ is significant and in some cases of a higher magnitude compared with our benchmark findings. In addition, Table 6b shows that these results remain robust in the presence of additional control variables, since at least 6 out of 8 ATTs are significant (at least at the 10% significance level) in each set of estimated ATTs (i.e. except for two sets when dropping post-Cold War years), namely in 40 out of the 42 sets of estimated ATTs.[4] Altogether, these results support the robustness of our main findings.

[4] To save space, full results are reported in the Appendix B.

Table 6a: Matching results: Robustness—Alternative samples

Treatment Variable: FR ATT: Differences in Inequality	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
				Dependent variable: Gini Index				
[1] Dropping former Soviet Union countries	-0.0195**	-0.0173**	-0.0166**	-0.0166**	-0.0184***	-0.0227***	-0.0233***	-0.0228***
	(0.00877)	(0.00822)	(0.00734)	(0.00692)	(0.00680)	(0.00574)	(0.00580)	(0.00582)
[2] Dropping post-Cold War years	-0.0150*	-0.0148*	-0.0143*	-0.0138**	-0.0134**	-0.0100*	-0.0112**	-0.0101*
	(0.00856)	(0.00827)	(0.00764)	(0.00667)	(0.00624)	(0.00528)	(0.00560)	(0.00557)
[3] Dropping fuel exporters countries	-0.0252***	-0.0221***	-0.0267***	-0.0279***	-0.0247***	-0.0235***	-0.0242***	-0.0236***
	(0.00879)	(0.00770)	(0.00769)	(0.00692)	(0.00630)	(0.00559)	(0.00530)	(0.00563)
[4] Dropping hyperinflation countries	-0.0119	-0.0152*	-0.0173**	-0.0159**	-0.0162***	-0.0156***	-0.0157***	-0.0158***
	(0.00878)	(0.00788)	(0.00743)	(0.00640)	(0.00612)	(0.00567)	(0.00558)	(0.00529)
[5] Dropping financial crisis years	-0.0198**	-0.0182**	-0.0173**	-0.0188***	-0.0157**	-0.0176***	-0.0177***	-0.0179***
	(0.00996)	(0.00870)	(0.00796)	(0.00722)	(0.00694)	(0.00654)	(0.00606)	(0.00612)
[6] Including developed countries	-0.0392***	-0.0406***	-0.0434***	-0.0396***	-0.0382***	-0.0359***	-0.0354***	-0.0361***
	(0.0130)	(0.0126)	(0.0121)	(0.00734)	(0.00856)	(0.00963)	(0.0106)	(0.00980)

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

Table 6b: Matching results: Robustness—Alternative samples & Additional Controls

Treatment Variable: FR Number of significant ATT coefficients (out of 8)	Fix Exchange Regime	Floating Exchange Regime	CBI Regular Turnover	CBI Irregular Turnover	Debt Default Dummy	Resource Rich Countries	IT Default Dummy
[1] Dropping former Soviet Union countries	8	8	8	8	8	8	8
[2] Dropping post-Cold War years	2	1	6	6	7	8	7
[3] Dropping fuel exporters countries	8	8	8	8	8	8	8
[4] Dropping hyperinflation countries	7	8	8	7	7	8	6
[5] Dropping financial crisis years	6	8	8	7	8	8	7
[6] Including developed countries	8	8	8	8	8	8	8

Note: reported ATT coefficients are significant at least at the 10% significance level.

V. Heterogeneity: the type of fiscal rule

The previous section confirmed that the favorable effect of FR adoption on IQ is robust. We now investigate possible sources of heterogeneity in this effect, related to the type of fiscal rule (this section), and the economic and structural environment (the next section).

As previously emphasized, the effect of FR on IQ transits through the way they affect government spending and revenues, fiscal consolidations, and fiscal aggregates. However, these variables may be affected in different ways by different FR; for example, according to e.g. Tapsoba (2012) or Combes et al. (2018), fiscal aggregates may respond differently in the presence of balanced budget rules (BBR), debt rules (DR), or expenditure rules (ER). Therefore, we look in the following if the effect of FR on IQ differs among these FR.[5]

5.1. Balanced budget rules (BBR)

Usually defined in relation with the overall balance, the structural balance, or the balance "over the cycle", BBR are aimed to ensure a sound and sustainable public finance by setting a numerical ceiling or target on the government budget balance.[6] Using the dummy variable BBR equal to 1 if a country has a BBR and to 0 otherwise, based on PS from Table C1a in Appendix C we report the ATT in Table 7a. ATTs are significant irrespective of the matching method, and the favorable effect on IQ is estimated to be up to -0.0214 (neighbor $n = 2$).

We assess the robustness of these findings using the additional control variables from our benchmark analysis. All ATT in lines [2]-[8] in Table 7a are significant and, consistent with results on line [1], IQ decreases by up to 0.0294 (neighbor $n = 1$, line [8]). Consequently, the favorable effect of BBR on IQ is slightly stronger (in absolute value) compared with that of all FR taken together. A possible explanation is that BBR may not affect total government spending (e.g. Dahan & Strawczinski, 2013) but mainly public investment (e.g. Guerguil et al., 2017), possibly leaving more room for spending that may be used to reduce IQ.

5.2. Debt rules (DR)

By setting an explicit limit on the stock of public debt (for example, the 60% debt/GDP ceiling of the SGP), DR are designed to ensure the convergence to a debt target. Although DR should provide an easy-to-communicate anchor to debt sustainability, they do not ensure a clear short-run operational guidance for policymakers. While BBR and ER are more dominant

[5] The low number of countries that adopted revenue rules does not allow investigating their impact.

[6] Examples of BBRs include (see e.g. IMF, 2009) the well-known 3% deficit-to-GDP ratio rule embodied in the Stability and Growth Pact (SGP); limits on structural deficits in line with the "fiscal compact" for EU countries; or the "over-the-cycle" rule that targets the average budget balance over the cycle (e.g. the UK).

in advanced and emerging countries, DR are the prevailing national rules in low-income countries (Schaechter et al., 2012).[7] Based on estimated PS (see Table C1b in Appendix C), line [1] in Table 7b reports the ATT. Similar to BBR, all eight ATTs are significant, but the size of the decrease in IQ is higher compared with BBR (up to -0.0279, neighbor $n=1$).

These strong effects are confirmed when accounting for additional variables in lines [2]-[8] of Table 7b: all estimated ATT are significant, and the favorable effect of DR on IQ is reinforced, namely up to -0.0418 (neighbor $n=1$, line [5]). Consequently, the effect of DR on IQ is of a stronger magnitude than that of BBR or all FR together. This may be because even if DR place a limit on public finance, this limit is ultimately not that tight and may leave enough room for public spending that are favorable for reducing IQ, while still providing an anchor for reducing the probability of fiscal consolidations that may be detrimental for IQ.

5.3. Expenditure rules (ER)

ER are aimed to limit the total, primary, or current spending, by setting a ceiling on their growth rate or as a ratio of GDP. The most important feature of ER is that they can directly target the government size (Schaechter et al., 2012).[8] Using the dummy variable ER, equal to 1 for countries that have adopted ER and to 0 otherwise, we use PS (from Table C1c in Appendix C) to estimate the ATT of ER adoption on IQ in Table 7c. Contrary to results for all FR, BBR, and DR, the positive (and significant in 7 out of 8 cases) ATTs suggesting that ER adoption *increases* IQ. The magnitude of this effect is fairly strong, between 0.0359 (neighbor $n=0.1$) and 0.0413 (Kernel matching).

When accounting for additional variables, ATTs in Table 7c are significant in at least 5 out of 8 cases for each of the lines [2]-[8] (except on line [7]), and the detrimental effect of ER adoption on IQ may climb up to almost 0.06 (neighbor $n=1$, line [3]). This harmful impact may be related to the fact that, not only ER do not affect taxes (which may be increased under BBR or DR, with favorable effects on IQ in the presence of progressive taxes), but they directly constrain government spending (Tapsoba, 2012), whose reduction may directly affect spending designed to reduce IQ.

[7] To balance flexibility and sustainability, some countries (e.g. Mauritius) included formal escape clause provisions that allow for temporary deviations from their debt rule. Furthermore, to avoid missing the target, some countries (e.g. Slovakia) include automatic correction mechanisms that take effect when the debt-to-GDP ratio reaches a certain level below the target.

[8] Examples of ER include a nominal expenditure ceiling for the central government (e.g. Sweden), or public expenditure levels below 30% of GDP (e.g. Namibia).

Table 7a: Matching results—BBR dummy as the treatment variable

Treatment Variable: BBR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
Dependent variable: Gini Index								
[1] ATT: Differences in Inequality	-0.0183**	-0.0214***	-0.0205***	-0.0210***	-0.0196***	-0.0195***	-0.0201***	-0.0195***
	(0.00878)	(0.00763)	(0.00720)	(0.00588)	(0.00561)	(0.00536)	(0.00526)	(0.00507)
Observations/treated observations	1152/245							
Quality of the matching								
Pseudo-R2	0.006	0.006	0.005	0.001	0.001	0.001	0.006	0.001
Rosenbaum bounds sensitivity test	1.3	1.5	1.6	1.7	1.6	1.6	1.7	1.6
Standardized bias (p-value)	0.83	0.83	0.89	0.99	0.99	0.99	0.83	0.99
Robustness checks								
[2] Adding Fix exchange regime	-0.0189**	-0.0233***	-0.0240***	-0.0204***	-0.0202***	-0.0196***	-0.0201***	-0.0196***
	(0.00926)	(0.00821)	(0.00750)	(0.00652)	(0.00537)	(0.00501)	(0.00550)	(0.00512)
[3] Adding Floating exchange regime	-0.0156*	-0.0164**	-0.0202***	-0.0202***	-0.0204***	-0.0196***	-0.0201***	-0.0196***
	(0.00855)	(0.00753)	(0.00735)	(0.00606)	(0.00554)	(0.00548)	(0.00539)	(0.00511)
[4] Adding CBI regular turnover	-0.0200**	-0.0233***	-0.0224***	-0.0219***	-0.0217***	-0.0199***	-0.0212***	-0.0202***
	(0.00865)	(0.00775)	(0.00748)	(0.00579)	(0.00580)	(0.00517)	(0.00545)	(0.00569)
[5] Adding CBI irregular turnover	-0.0157*	-0.0163**	-0.0184**	-0.0198***	-0.0213***	-0.0210***	-0.0219***	-0.0211***
	(0.00952)	(0.00774)	(0.00725)	(0.00623)	(0.00592)	(0.00529)	(0.00526)	(0.00533)
[6] Adding Debt default dummy	-0.0247***	-0.0239***	-0.0207***	-0.0216***	-0.0217***	-0.0214***	-0.0212***	-0.0212***
	(0.00859)	(0.00761)	(0.00703)	(0.00650)	(0.00550)	(0.00529)	(0.00507)	(0.00532)
[7] Adding Resource-Rich country dummy	-0.0261***	-0.0220***	-0.0257***	-0.0285***	-0.0277***	-0.0249***	-0.0259***	-0.0253***
	(0.00895)	(0.00836)	(0.00835)	(0.00689)	(0.00642)	(0.00624)	(0.00680)	(0.00639)
[8] Using IT Default date	-0.0294***	-0.0277***	-0.0230***	-0.0186***	-0.0197***	-0.0194***	-0.0201***	-0.0195***
	(0.00828)	(0.00802)	(0.00705)	(0.00594)	(0.00552)	(0.00547)	(0.00530)	(0.00503)

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

Table 7b: Matching results—DR dummy as the treatment variable

Treatment Variable: DR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
Dependent variable: Gini Index								
[1] ATT: Differences in Inequality	-0.0279***	-0.0218**	-0.0237***	-0.0220***	-0.0267***	-0.0261***	-0.0261***	-0.0258***
	(0.00980)	(0.00904)	(0.00825)	(0.00695)	(0.00691)	(0.00621)	(0.00600)	(0.00582)
Observations/treated observations	1152/205							
Quality of the matching								
Pseudo-R2	0.008	0.003	0.003	0.001	0.002	0.002	0.008	0.002
Rosenbaum bounds sensitivity test	1.6	1.4	1.5	1.6	1.9	1.9	2	1.9
Standardized bias (p-value)	0.75	0.97	0.98	0.99	0.99	0.98	0.75	0.99
Robustness checks								
[2] Adding Fix exchange regime	-0.0180*	-0.0200**	-0.0240***	-0.0218***	-0.0249***	-0.0264***	-0.0271***	-0.0256***
	(0.0104)	(0.00901)	(0.00802)	(0.00731)	(0.00669)	(0.00595)	(0.00626)	(0.00629)
[3] Adding Floating exchange regime	-0.0188*	-0.0201**	-0.0193**	-0.0208***	-0.0268***	-0.0261***	-0.0271***	-0.0257***
	(0.00979)	(0.00871)	(0.00818)	(0.00742)	(0.00680)	(0.00644)	(0.00663)	(0.00588)
[4] Adding CBI regular turnover	-0.0192*	-0.0261***	-0.0253***	-0.0262***	-0.0236***	-0.0264***	-0.0271***	-0.0265***
	(0.0105)	(0.00944)	(0.00852)	(0.00726)	(0.00676)	(0.00612)	(0.00634)	(0.00667)
[5] Adding CBI irregular turnover	-0.0418***	-0.0300***	-0.0294***	-0.0276***	-0.0256***	-0.0280***	-0.0273***	-0.0270***
	(0.0105)	(0.00949)	(0.00855)	(0.00746)	(0.00745)	(0.00654)	(0.00657)	(0.00638)
[6] Adding Debt default dummy	-0.0271***	-0.0216**	-0.0221**	-0.0253***	-0.0245***	-0.0264***	-0.0264***	-0.0261***
	(0.00962)	(0.00875)	(0.00862)	(0.00710)	(0.00706)	(0.00620)	(0.00592)	(0.00594)
[7] Adding Resource-Rich country dummy	-0.0162*	-0.0191**	-0.0224***	-0.0241***	-0.0232***	-0.0253***	-0.0266***	-0.0251***
	(0.00943)	(0.00873)	(0.00847)	(0.00726)	(0.00660)	(0.00597)	(0.00656)	(0.00624)
[8] Using IT Default date	-0.0314***	-0.0232**	-0.0223***	-0.0209***	-0.0265***	-0.0261***	-0.0260***	-0.0258***
	(0.0103)	(0.00934)	(0.00829)	(0.00718)	(0.00617)	(0.00628)	(0.00607)	(0.00640)

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

Table 7c: Matching results—ER dummy as the treatment variable

Treatment Variable: ER	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
Dependent variable: Gini Index								
[1] ATT: Differences in Inequality	0.0362*	0.0362*	0.0359**	0.0241	0.0405**	0.0412***	0.0365**	0.0413**
	(0.0194)	(0.0197)	(0.0183)	(0.0268)	(0.0203)	(0.0154)	(0.0150)	(0.0169)
Observations/treated observations	619/53							
Quality of the matching								
Pseudo-R2	0.10	0.06	0.04	0.008	0.03	0.03	0.10	0.03
Rosenbaum bounds sensitivity test	1.8	1.5	1.5	1.1	1.4	1.5	1.3	1.5
Standardized bias (p-value)	0.07	0.28	0.59	0.99	0.90	0.79	0.07	0.81
Robustness checks								
[2] Adding Fix exchange regime	0.0507**	0.0446**	0.0426**	0.0193	0.0226	0.0437***	0.0388**	0.0436***
	(0.0211)	(0.0203)	(0.0185)	(0.0248)	(0.0216)	(0.0152)	(0.0160)	(0.0149)
[3] Adding Floating exchange regime	0.0597***	0.0418**	0.0430**	0.00268	0.0224	0.0435***	0.0385***	0.0438***
	(0.0212)	(0.0193)	(0.0173)	(0.0271)	(0.0225)	(0.0162)	(0.0146)	(0.0161)
[4] Adding CBI regular turnover	0.0409	0.0539***	0.0528***	0.00899	0.0253	0.0479***	0.0457***	0.0489***
	(0.0252)	(0.0208)	(0.0193)	(0.0303)	(0.0251)	(0.0177)	(0.0159)	(0.0170)
[5] Adding CBI irregular turnover	0.0491**	0.0436**	0.0412**	-0.0106	0.0125	0.0484***	0.0437***	0.0450**
	(0.0249)	(0.0214)	(0.0190)	(0.0282)	(0.0221)	(0.0171)	(0.0163)	(0.0178)
[6] Adding Debt default dummy	0.0430**	0.0474**	0.0447***	0.0347	0.0340	0.0446***	0.0439***	0.0445***
	(0.0214)	(0.0191)	(0.0161)	(0.0282)	(0.0231)	(0.0154)	(0.0154)	(0.0150)
[7] Adding Resource-Rich country dummy	0.0462*	0.0413*	0.0313	-0.0152	0.000196	0.0297	0.0342*	0.0278
	(0.0276)	(0.0234)	(0.0215)	(0.0264)	(0.0224)	(0.0197)	(0.0190)	(0.0189)
[8] Using IT Default date	0.0497**	0.0383*	0.0401**	0.0299	0.0393*	0.0410**	0.0364**	0.0419***
	(0.0239)	(0.0196)	(0.0174)	(0.0262)	(0.0210)	(0.0169)	(0.0146)	(0.0142)

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

5.4. Combined types of fiscal rules

The trend of the last decade is for countries to adopt multiple FR, and particularly combine BBR with DR or ER (Eyraud et al., 2018). We analyze such combined effects of our three FR on IQ using three combinations of two rules (considering all three rules together leads to too few—eleven—treated observations for robust statistical inference). In each case, the treatment variable is a dummy variable equal to 1 if both rules are adopted, and to 0 if not (i.e. if none or only one rule is adopted). Matching results in Table 8 show the following.

First, the joint presence of BBR and DR significantly reduces IQ (line [1]), confirming individual results for BBR and DR. The magnitude of this favorable effect is slightly stronger than that of BBR or DR alone (up to -0.0312), suggesting some complementarities between them for reducing IQ. Second, the joint effect of DR and ER is not significant (line [2]), which may reproduce the conflicting effects of DR alone (decrease) and ER alone (increase) on IQ. Third, the joint influence of BBR and ER is equally mostly not significant (line [3]), reflecting yet again the conflicting effects of BBR and ER alone.

Altogether, these results (which are robust in the presence of additional control variables in Tables C2a-b-c in Appendix C) show that combining different FR should be done with caution in terms of IQ. On the one hand, the detrimental effect of ER adoption on IQ can be neutralized by the presence of either BBR or DR; and the presence of both BBR and DR reduces IQ by more compared to their individual effect. However, on the other hand, the adoption of ER reduces the favorable effects of BBR or DR alone.

Table 8: Matching results—combined types of FR

	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
				Dependent variable: Gini index				
Treatment Variable: BBR*DR Dummy	-0.0231**	-0.0312***	-0.0295***	-0.0275***	-0.0260***	-0.0242***	-0.0226***	-0.0239***
[1] ATT: Differences in Inequality	(0.0108)	(0.00987)	(0.00898)	(0.00755)	(0.00823)	(0.00743)	(0.00706)	(0.00660)
Observations/treated observations				1152/173				
Treatment Variable: DR*ER Dummy	-0.0359	-0.0130	-0.00410	0.00159	-0.00368	-0.000283	0.00316	0.00121
[2] ATT: Differences in Inequality	(0.0279)	(0.0252)	(0.0226)	(0.0337)	(0.0291)	(0.0171)	(0.0154)	(0.0178)
Observations/treated observations				979/27				
Treatment Variable: BBR*ER Dummy	0.0530	0.0625*	0.0517	-0.0152	0.0168	0.0592*	0.0464	0.0576*
[3] ATT: Differences in Inequality	(0.0375)	(0.0357)	(0.0325)	(0.0397)	(0.0381)	(0.0346)	(0.0338)	(0.0344)
Observations/treated observations				934/26				

Note: standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

VI. Heterogeneity: different economic and structural environments

The previous section revealed that the effect of FR adoption on IQ varies with the type of FR. At the same time, to account for possible differences among the countries in our sample, we consider a large set of potential sources of heterogeneity related to fiscal, monetary, international, political, and other structural variables. We explore such heterogeneities using a control function regression approach (e.g. Tapsoba, 2012)

$$IQ_{it} = \alpha + \beta FR_{it} + \gamma PScore_{it} + \delta X_{it} + \phi FR_{it} X_{it} + \varepsilon_{it}, \quad (4)$$

with $PScore$ the estimated PS from the benchmark model, and X the vector of variables that may be a source of heterogeneity. A significant coefficient of interest ϕ signals the presence of heterogeneity in the treatment effect. We look at all FR together and then at each rule.

6.1. All fiscal rules

Column [1] in Table 9 shows that FR significantly decrease IQ on average by 0.0164, comparable with our benchmark results. From column [2] onwards we report only estimations in which the interactive effect between the considered variables and FR (i.e. the coefficient ϕ) is significant at least at the 10% significance level.

First, columns [2]-[4] show that all fiscal variables significantly reduce IQ when combined with FR, suggesting that the favorable effects of FR on IQ may be amplified when FR are in place in a deteriorated fiscal space. Second, regarding monetary variables, columns [5]-[6] reveal that the favorable effect of FR alone on IQ is enforced in the presence of floating exchange rates (while mitigated under fixed exchange rates), suggesting that floating exchange rates may better absorb various types of shocks that could lower the favorable effect of FR on IQ. Third, among international variables, higher trade combined with FR significantly reduces IQ (column [7]), as access to international markets for goods and services may foster the efficiency of spending designed to reduce IQ within FR-based fiscal policy frameworks. Fourth, all political environment variables, namely the degree of political stability, the absence of internal conflicts, and the absence of ethnic tensions, reduce IQ when combined with FR (columns [8]-[10]), possibly because better political conditions may support more stable fiscal institutions in which the compliance with FR can be combined with more judicious spending policies, including in terms of distributional goals.

Table 9: Heterogeneity in the treatment effect—all FR

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
FR	-0.0164***	-0.0194***	-0.00317	-0.0114**	-0.0191***	-0.0556***	0.00794
	(0.00469)	(0.00507)	(0.00660)	(0.00580)	(0.00486)	(0.0166)	(0.0121)
PSCORE		0.0340**	0.0285**	0.0167	0.0425***	0.0418***	0.0211
		(0.0134)	(0.0135)	(0.0136)	(0.0139)	(0.0140)	(0.0134)
Debt default		0.0163***					
		(0.00534)					
FR*Debt default		-0.0492***					
		(0.00995)					
Gross debt			0.0179***				
			(0.00498)				
FR*Gross debt			-0.0351***				
			(0.00952)				
Short term debt				0.0182***			
				(0.00490)			
FR*ST debt				-0.0180*			
				(0.00980)			
Floating regime					0.0414***		
					(0.00870)		
FR*Float. regime					-0.0409**		
					(0.0173)		
Fix regime						-0.0369***	
						(0.00864)	
FR*Fix regime						0.0366**	
						(0.0173)	
Trade							-0.0206***
							(0.00646)
FR*Trade							-0.0323**
							(0.0127)
Observations	1185	1146	1185	1185	1185	1185	1185

Table 9 (continued): Heterogeneity in the treatment effect—all FR

	[8]	[9]	[10]	[11]	[12]	[13]	[14]
FR	0.00176	-0.00770	-0.00837	-0.0495***	0.0381	-0.0235***	-0.0310***
	(0.00707)	(0.00693)	(0.00637)	(0.00778)	(0.0234)	(0.00512)	(0.00587)
PSCORE	0.0213	0.0190	0.0219	0.0252*	0.147***	0.0172	0.0252*
	(0.0139)	(0.0135)	(0.0134)	(0.0134)	(0.0273)	(0.0137)	(0.0133)
Political stability	0.00410						
	(0.00509)						
FR*Pol. stability	-0.0359***						
	(0.00923)						
Internal conflict		-0.00713					
		(0.00474)					
FR*Int. conflict		-0.0198**					
		(0.00918)					
Ethnic tensions			0.00408				
			(0.00477)				
FR*Eth. tensions			-0.0229**				
			(0.00942)				
GDP growth				-0.00175***			
				(0.000666)			
FR*GDP growth				0.00683***			
				(0.00134)			
Sec. education					-0.00716		
					(0.0125)		
FR*Sec. educ.					-0.00142***		
					(0.000425)		
Mineral rents						-0.0000119	
						(0.000694)	
FR*Min. rents						0.00274**	
						(0.00109)	
Saving glut							-0.0112**
							(0.00526)
FR*Saving glut							0.0291***
							(0.00975)
Observations	1185	1185	1185	1185	216	1185	1185

Notes: unreported constant included. Standard errors in parentheses. *p<0.10, **p<0.05, ***p<0.01.

Finally, our last set of variables captures other structural characteristics. Column [11] shows that higher economic growth mitigates the favorable effect of FR on IQ, to the point where above a certain growth rate FR increase IQ probably due to poor redistribution. Next, despite relatively few available observations, education is found to reduce IQ when combined with FR (column [12]), since a more educated population could sustain government policies incorporating public spending designed for combating IQ. Moreover, the interactive term between mineral rents and FR is positive (column [13]), suggesting that in our sample of developing countries important mineral rents may increase IQ when combined with FR, possibly echoing the famous "Dutch disease". Lastly, column [14] indicates that the favorable effect of FR on IQ was mitigated during the saving glut (2000-06), possibly due to a shortage of public spending aimed at reducing IQ.

6.2. Different types of fiscal rules

We now look at heterogeneities for each type of FR. To save space, Table 10 reports only the coefficient of the interactive term between each variable and each FR, namely significant (at least at the 10% level) & positive (+), significant & negative (–), or not significant (NS).

Table 10. Heterogeneity by type of fiscal rule

	[1] All FR	**[2] BBR**	**[3] DR**	**[4] ER**
Fiscal variables				
Debt default	–	–	NS	NS
Gross debt	–	–	NS	–
Short term debt	–	NS	–	–
Government size	NS	–	–	NS
Monetary variables				
Inflation rate	NS	NS	NS	NS
Broad money	NS	+	+	–
Floating regime	–	NS	+	+
Fix regime	+	NS	–	–
International variables				
Trade	–	NS	NS	–
FDI Inflows	NS	NS	NS	NS
Capital openness	NS	NS	NS	–
Political variables				
Political stability	–	–	NS	–
Internal conflict	–	NS	NS	–
Ethnic tensions	–	NS	–	NS
Other structural variables				
Growth rate of GDP	+	+	+	+
Secondary education	–	–	–	–
Mineral rents	+	+	–	+
Post crisis	NS	NS	NS	–
Saving glut	+	+	NS	+
Time	NS	NS	NS	+

Note: the interaction term between each variable and the corresponding type of fiscal rule can be +, –, or NS, namely significant (at least at the 10% level) & positive, significantly & negative, and not significant.

Table 10 shows that whenever significant the coefficient of the interaction term between FR and fiscal variables is negative, similar to FR altogether (column [1]). However, in addition to the fiscal stance, the type of FR is of crucial importance: except for short term debt, all other fiscal variables reduce IQ when combined with BBR; only when combined with larger short term debt and higher government size do DR significantly reduce IQ; and a larger government size contributes to the IQ reduction triggered by all FR, except ER. Next, a larger broad money ratio decreases the favorable (unfavorable) effect of BBR and DR (ER) on IQ; however, the interactive term between the exchange rate regimes and BBR is not significant, contrary to their significant impact when combined with DR and ER. Moreover, irrespective of the considered international variable, its interaction with BBR and DR does not significantly affect IQ; on the contrary, both trade and capital openness reduce the positive effect of ER on IQ, and may even turn it into negative for large enough values of these variables. Furthermore, whenever significant, the interactive coefficient between political variables and the various types of FR is negative; in particular, higher political stability and lower internal conflicts significantly reduce the unfavorable effect of ER on IQ, to the point where, for good enough political conditions, the overall effect of ER may turn into negative. Finally, the influence of the other structural variables mostly echoes the results obtained for all FR; in particular, when combined with various FR, higher economic growth rates and mineral rents, and the saving glut period are detrimental for IQ (except in some cases for DR), while the opposite holds for the secondary education. Nevertheless, although the harmful effect of ER on IQ increases with the time since the ER was adopted, during the post crisis period (from 2008 onwards) ER have been less detrimental for IQ.

Altogether, the type of FR is crucial when assessing the effect of different variables on IQ: compared with results for all FR, in some cases the interactive effect may become significant, or, on the contrary, turn into not significant. Moreover, important heterogeneities are at work across various FR for most of the considered variables. Finally, the damaging effect of ER on IQ is weakened when combined with some of the considered variables.

VII. Conclusion

This paper asked if fiscal rules can curb inequality. Estimations performed in a large sample of developing countries revealed that FR adoption significantly reduces IQ. This economically meaningful effect is robust across multiple alternative specifications. However, the type of FR matters, since only some budget balance and debt rules reduce IQ, while

expenditure rules *increase* it. Finally, important heterogeneities were unveiled in the significance, sign, and magnitude of the effect of FR on IQ, depending on various factors.

Consequently, our analysis contributes to the literature devoted to identifying policies that may reduce IQ. Even if FR may not be originally designed to fight IQ, the important side effect we unveiled suggests that they should not be treated as neutral in terms of IQ. Instead, we provide several insights that may contribute to the design and implementation of appropriate FR with the goal of curbing IQ. Through extending our analysis to include the effect of FR on economic growth, future research could explore the way various types of FR may deal with the famous equality-efficiency tradeoff suggested by Okun (1975).

References

- Acemoglu, D. (2002). Technical Change, Inequality, and the Labor Market. *Journal of Economic Literature* 40, 7-72
- Acemoglu, D., Naidu, S., Restrepo, P., Robinson, J. (2015). Democracy, Redistribution, and Inequality. *Handbook of Income Distribution* 2B, Chapter 21, 1885-1966.
- Afesorgbor, S., Mahadevan, R. (2016). The impact of economics sanctions on income inequality of target states. *World Development* 83, 1-11.
- Agnello, L., Sousa, R. (2014). How does fiscal consolidation impact on income inequality?. *Review of Income and Wealth* 60, 702-726.
- Albanesi (2007). Inflation and inequality. *Journal of Monetary Economics* 54, 1088-1114.
- Alesina, A., Perotti, R. (1996). Income distribution, political instability, and investment. *European Economic Review* 40, 1203-1228.
- Alesina, A., Rodrik, D. (1994). Distributive Politics and Economic Growth. *Quarterly Journal of Economics* 109, 465-490.
- Alvaredo, F., Chancel, L., Piketty, T., Saez, E., Zucman, G. (2017). Global Inequality Dynamics: New Findings from WID.world. *American Economic Review* 107, 404-409.
- Anderson, E., D'Orey, M., Duvendack, M., Esposito, L. (2017). Does Government Spending Affect Income Inequality? A Meta-Regression Analysis. *Journal of Economic Surveys* 31, 961-987.
- Anand, S., Segal, P. (2008). What Do We Know about Global Income Inequality?. *Journal of Economic Literature* 46, 57-94.
- Arawatari, R., Ono, T. (2017). Inequality and public debt: A positive analysis. *Review of International Economics* 25, 1155-1173.
- Atkinson, A. (2015). *Inequality: What Can Be Done?*. Harvard University Press.
- Auclert, A., Rognlie, M. (2018). Inequality and Aggregate Demand. NBER wp 24280.
- Azzimonti, M., De Francisco, E., Quadrini, V. (2014). Financial globalization, inequality, and the rising public debt. *American Economic Review* 104, 2267-2302.
- Badinger, H., Reuter, W. (2017). The case for fiscal rules. *Economic Modelling* 60, 334-343.
- Balima, W., Combes, J.-L., Minea, A. (2018). The "Dark Side" of Credit Default Swaps Initiation: A Close Look at Sovereign Debt Crises. *Macroeconomic Dynamics* online first DOI: https://doi.org/10.1017/S1365100518000627.
- Ball, L., Furceri, D., Leigh, M., Loungani, M. (2013). The distributional effects of fiscal consolidation, IMF wp 151.
- Bastagli, F., Coady, D., Gupta, M. (2012). Income inequality and fiscal policy. IMF Staff Discussion Note 12/08.
- Beetsma, R., Van Der Ploeg, F. (1996). Does Inequality Cause Inflation?: The Political Economy of Inflation, Taxation and Government Debt. *Public Choice* 87, 143-162.

- Berg, J. (2015). *Labour Markets, Institutions and Inequality*. Edward Elgar Publishing, Cheltenham UK, Northampton MA USA.
- Berg, A., Ostry, J., Tsangarides, C., Yakhshilikov, Y. (2018). Redistribution, inequality, and growth: new evidence. *Journal of Economic Growth* 23, 259-305.
- Bova, M., Carcenac, N., Guerguil, M. (2014). Fiscal rules and the procyclicality of fiscal policy in the developing world. IMF wp 122.
- Brei, M., Ferri, G., Gambacorta, L. (2018). Financial structure and income inequality. BIS wp 756.
- Bulir, A. (2001). Income Inequality: Does Inflation Matter?. *IMF Staff Papers* 48, 139-159.
- Calderón, C., Schmidt-Hebbel, K. (2008). The choice of fiscal regimes in the world. Central Bank of Chile wp 487.
- Chinn, M., Ito, H. (2008). A new measure of financial openness. *Journal of Comparative Policy Analysis: Research and Practice* 10, 309-322.
- Chong, A., Gradstein, M. (2007). Inequality and Institutions. *Review of Economics and Statistics* 89, 454-465.
- Ciminelli, G., Ernst, E., Merola, R., Giuliodori, M. (2019). The composition effect of tax-based consolidation on income inequality. *European Journal of Political Economy* 57, 107-124.
- Claessens, S., Perotti, E. (2007). Finance and inequality: Channels and evidence. *Journal of Comparative Economics* 35, 748-773.
- Clements, B., de Mooij, R., Gupta, S., Keen, M. (2015). *Inequality and fiscal policy*. International Monetary Fund, Washington D.C.
- Combes, J.-L., Debrun, X., Minea, A., Tapsoba, R. (2018). Inflation Targeting, Fiscal Rules and the Policy Mix: Cross-Effects and Interactions. *The Economic Journal* 128, 2755-2784.
- Combes, J.-L., Minea, A., Sow, M. (2017). Is fiscal policy always counter-(pro-) cyclical? The role of public debt and fiscal rules. *Economic Modelling* 65, 138-146.
- Dahan, M., Strawczynski, M. (2013). Fiscal Rules and the Composition of Government Expenditures in OECD Countries. *Journal of Policy Analysis and Management* 32, 484-504.
- Debrun, X., Kumar, S. (2007). The discipline-enhancing role of fiscal institutions: theory and empirical evidence, IMF wp 171.
- Debrun, X., Moulin, L., Turrini, A., Ayuso-i-Casals, J., Kumar, S. (2008). Tied to the Mast? National Fiscal Rules in the European Union. *Economic Policy*, April, 299-362.
- Dehejia, R., Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics* 84, 151-161.
- Demirguc-Kunt, A., Levine, R. (2009). Finance and Inequality: Theory and Evidence. *Annual Review of Financial Economics* 1, 287-318.
- Dessus, S., Diaz-Sanchez, J., Varoudakis, A. (2016). Fiscal Rules and the Pro-cyclicality of Public Investment in the West African Economic and Monetary Union. *Journal of International Development* 28, 887-901.
- Dollar, D., Kraay, A. (2004). Trade, growth, and poverty. *The Economic Journal* 114, F22-F49.
- Dreher, A., Gaston, N. (2008). Has Globalization Increased Inequality?. *Review of International Economics* 16, 516-536.
- Easterly, W. (2007). Inequality does cause underdevelopment: Insights from a new instrument. *Journal of Development Economics* 84, 755-776.
- Eyraud, L., Debrun, X., Hodge, A., Lledo, V., Patillo, C. (2018). Second Generation Fiscal Rules: Balancing Simplicity, Flexibility and Enforceability. IMF Staff Discussion Note 18/04.
- Ezcura, R., Rodriguez-Pose, A. (2013). Does Economic Globalization Affect Regional Inequality? A Cross-Country Analysis. *World Development* 52, 92-103.
- Figini, P., Gorg, H. (2011). Does Foreign Direct Investment Affect Income Inequality? An Empirical Investigation. *The World Economy* 34, 1455-1475.
- Forbes, K. (2000). A Reassessment of the Relationship between Inequality and Growth. *American Economic Review* 90, 869-887.
- Fum, R., Hodler, R. (2010). Natural resources and income inequality: The role of ethnic divisions. *Economics Letters* 107, 360-363.
- Galor, O., Moav, O. (2000). Ability-Biased Technological Transition, Wage Inequality, and Economic Growth. *The Quarterly Journal of Economics* 115, 469-497.

- Goldberg, P., Pavcnik, N. (2007). Distributional Effects of Globalization in Developing Countries. *Journal of Economic Literature* 45, 39-82.
- Goldin, C., Katz, L. (2009). *The Race Between Education and Technology*. Harvard University Press.
- Guerguil, M., Mandon, P., Tapsoba, R. (2017). Flexible fiscal rules and countercyclical fiscal policy. *Journal of Macroeconomics* 52, 189-220.
- Guichard, S., Kennedy, M., Wurzel, E., André, C. (2007). What Promotes Fiscal Consolidation: OECD Country Experiences. OECD Economics Department wp 553.
- Gylfason, T., Zoega, G. (2002). Inequality and Economic Growth: Do Natural Resources Matter?. CESifo wp 712.
- Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis* 20, 25-46.
- Heckman, J., Ichimura, H., Todd, P. (1998). Matching as an econometric evaluation estimator. *Review of Economic Studies* 65, 261-294.
- Heshmati, A., Kim, J. (2014). A survey of the role of fiscal policy in addressing income inequality, poverty reduction and inclusive growth. IZA DP 8119.
- Higgins, S., Lustig, N., (2016). Can a poverty-reducing and progressive tax and transfer system hurt the poor?. *Journal of Development Economics* 122, 63-75.
- IMF (2009). Fiscal Rules—Anchoring Expectations for Sustainable Public Finances. IMF Policy Paper, November 12, 2009.
- IMF (2017). Tackling Inequality. IMF Fiscal Monitor, October 2017.
- Jaumotte, F., Lall, S., Papageorgiu, C. (2013). Rising Income Inequality: Technology, or Trade and Financial Globalization?. *IMF Economic Review* 61, 271-309.
- Joumard, I., Pisu, M., Bloch, D. (2012).Tackling income inequality: The role of taxes and transfers. *OECD Journal: Economics Studies* online first http://dx.doi.org/10.1787/eco_studies-2012-5k95xd6l65lt
- Jovanovic, B. (2009). The Technology Cycle and Inequality. *Review of Economics Studies* 76, 707-729.
- Kanbur, R. (2015). Globalization and Inequality. *Handbook of Income Distribution*, Chapter 20, 1845-1881.
- Kim, D.-H., Lin, S.-C. (2011). Nonlinearity in the financial development-income inequality nexus. *Journal of Comparative Economic* 39, 310-325.
- Kopits, G., Symansky, S. (1998). Fiscal Policy Rules. IMF Occasional Paper 162.
- Kose, A., Prasad, S., Terrones, E. (2009). Does openness to international financial flows raise productivity growth?. *Journal of International Money and Finance* 28, 554-580.
- Kuznets, S. (1955). Economic growth and income inequality. *American Economic Review* 45, 1-28.
- Lin, F., Fu, D. (2016). Trade, Institution Quality and Income Inequality. *World Development* 77, 129-142.
- Lin, S., Ye, H. (2007). Does inflation targeting really make a difference? Evaluating the treatment effect of inflation targeting in seven industrial countries. *Journal of Monetary Economics* 54, 2521-2533.
- Martinez-Vazquez, J., Vulovic, V., Moreno-Dodson, B. (2012). The Impact of Tax and Expenditure Policies on Income Distribution: Evidence from a Large Panel of Countries. *Hacienda Publica Espanola* 200, 95-130.
- Minea, A., Tapsoba, R. (2014). Does inflation targeting improve fiscal discipline?. *Journal of International Money and Finance* 40, 185-203.
- Neuenkirch, M., Neumeier, F. (2016). The impact of US sanctions on poverty. *Journal of Development Economics* 121, 110-119.
- OECD (2015). *In It Together: Why Less Inequality Benefits All?*. OECD Publishing, Paris.
- Okun, A. (1975). *Equality and Efficiency*. The Brookings Institutions, Washington D.C.
- Ostry, J., Berg, A., Tsangarides, C. (2014). Redistribution, Inequality, and Growth. IMF Staff Discussion Note 14/02.
- Parcero, O., Papyrakis, E. (2016). Income inequality and the oil resource curse. *Resource and Energy Economics* 45, 159-177.
- Perotti, R., Kontopoulos, Y. (2002). Fragmented fiscal policy. *Journal of Public Economics* 86, 191-222.

- Persson, T., Tabellini, G. (1994). Is Inequality Harmful for Growth?. *American Economic Review* 84, 600-621.
- Piketty, T. (2014). *Capital in the Twenty-First Century*. Harvard University Press.
- Rajan (2010). *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton University Press, Princeton NJ.
- Ravallion, M. (1997). Can high-inequality developing countries escape absolute poverty?. *Economics Letters* 56, 51-57.
- Reich (2010). *Aftershock: The Next Economy and America's Future*. Random House, New York.
- Romer, C., Romer, D. (1999). Monetary Policy and the Well-Being of the Poor. *Federal Reserve Board of Kansas City Economic Review* 84, 21-49.
- Rosenbaum, P. (2002). *Observational studies*. Springer, New York.
- Rosenbaum, P., Rubin, B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika* 70, 41-55.
- Schaechter, A., Kinda, T., Budina, T., Weber, A. (2012). Fiscal Rules in Response to the Crisis—Toward the "Next-Generation" Rules. A New Dataset. IMF wp 187.
- Sianesi, B. (2004). An Evaluation of the Swedish System of Active Labor Market Program in the 1990s. *Review of Economics and Statistics* 86, 133-155.
- Solt, F. (2016). The standardized world income inequality database. *Social Science Quarterly* 97, 1267-1281.
- Stiglitz, J. (2012). *The Price of Inequality: How Today's Divided Society Endangers Our Future*. WW Norton & Company.
- Tapsoba, R. (2012). Do national numerical fiscal rules really shape fiscal behaviors in developing countries? A treatment effect evaluation. *Economic Modelling* 29,1356-1369.
- Thornton, J., Vasilakis, C. (2018). Fiscal rules and government borrowing costs: International evidence. *Economic Inquiry* 56, 446-459.
- UNCTAD (2019). *Trade Policies for Combating Inequality*. United Nations Publications, New York.
- UNESCAP (2018). Technology and Inequalities, Chapter 4, 62-77, in *Inequality in Asia the Pacific in the era of the 2030 Agenda for Sustainable Development*. United Nations Publications.
- Wilkinson, R., Pickett, K. (2009). *The Spirit Level: Why More Equal Societies Almost Always Do Better*. Allen Lane/Penguin Group UK; Bloomsbury Publishing.
- Woo, J., Bova, E., Kinda, T., Zhang, Y. (2013). Distributional consequences of fiscal consolidation and the role of fiscal policy: What do the data say?. IMF wp 195.

ONLINE SUPPLEMENTARY MATERIAL

APPENDIX A. DESCRIPTIVE STATISTICS

Table A1. The list of countries, and the starting dates of FR

a. List of Fiscal Rules (FR) and Non-FR countries

Non-FR	FR
Albania	Argentina
Algeria	Armenia
Belarus	Benin
Bolivia	Brazil
Cambodia	Bulgaria
China	Burkina Faso
Djibouti	Burundi
Dominican Republic	Cabo Verde
Egypt, Arab Rep.	Cameroon
El Salvador	Chile
Ethiopia	Colombia
Fiji	Costa Rica
Ghana	Cote d'Ivoire
Guatemala	Croatia
Guinea	Ecuador
Honduras	Equatorial Guinea
Jordan	Guinea-Bissau
Kazakhstan	Hungary
Kyrgyz Republic	India
Lao PDR	Indonesia
Lebanon	Iran, Islamic Rep.
Macedonia, FYR	Malaysia
Madagascar	Mali
Malawi	Mauritius
Mauritania	Mexico
Moldova	Mongolia
Morocco	Namibia
Nicaragua	Niger
Philippines	Pakistan
Qatar	Panama
Sierra Leone	Paraguay
South Africa	Peru
Tajikistan	Poland
Thailand	Romania
Tunisia	Russian Federation
Turkey	Rwanda
Ukraine	Senegal
Venezuela, RB	Sri Lanka
Vietnam	Tanzania
Yemen, Rep.	Togo
Zambia	Uganda
Zimbabwe	Uruguay

b. Year of adoption of Fiscal Rules

FR	Year
Argentina	2000
Armenia	2008
Benin	2000
Brazil	2000
Bulgaria	2003
Burkina Faso	2000
Burundi	2013
Cabo Verde	1998
Cameroon	2002
Chile	2001
Colombia	2000
Costa Rica	2001
Cote d'Ivoire	2000
Croatia	2009
Ecuador	2003
Equatorial Guinea	2002
Guinea-Bissau	2000
Hungary	2004
India	2004
Indonesia	1990
Iran, Islamic Rep.	2010
Malaysia	1990
Mali	2000
Mauritius	2008
Mexico	2006
Mongolia	2013
Namibia	2001
Niger	2000
Pakistan	2005
Panama	2002
Paraguay	2015
Peru	2000
Poland	1999
Romania	2007
Russian Federation	2007
Rwanda	2013
Senegal	2000
Sri Lanka	2003
Tanzania	2013
Togo	2000
Uganda	2013
Uruguay	2006

Table A2. Description of variables, and sources

Variables	Descriptions	Sources
Gini index (SWIID)	Estimate of Gini index of inequality in equivalized (square root scale) household disposable (post-tax, post-transfer) income, using Luxembourg Income Study data as the standard.	Standardized World Income Inequality Database (SWIID)
Gini UNU-WIDER	Estimate of Gini index of inequality based on disposable income.	World Income Inequality Database (WIID)
IT default date	Binary variable taking the value 1 if in a given year a country operates informally under IT, zero otherwise. When we use the default starting dates of IT, we refer to soft IT.	Roger and Stone (2005); Roger (2009)
IT conservative date	Binary variable taking the value 1 if in a given year a country operates formally under IT, zero otherwise. When we use the conservative starting dates of IT, we refer to full-fledged IT.	
CBI regular turnover	Central banks governor's regular turnover dummy. It is equal to 1 if the change of governor takes place at the end of the official mandate and 0 otherwise. This is proxy of central bank independence.	Dreher et al. (2008, 2010); Sturm and de Haan (2001)
CBI irregular turnover	Central banks governor's irregular turnover dummy. It is equal to 1 if the change of governor takes place in an irregular manner and 0 otherwise. This is proxy of central bank independence.	
Political risk	It is a composite measure of the quality of governance. It represents a simple average of ICRG political variables. Higher value indicates low political risk.	Authors' calculations based on ICRG data
Debt default	Dummy equal to 1 if a country did not pay its debt or restructured it with a lost for investors, and 0 if there was no payment default or debt restructuring.	Reinhart and Rogoff (2009)
Capital openness	It captures the degree of financial openness.	Chinn and Ito (2006)
Fix regime	Dummy equal 1 if ER_Fine is classified as fix regime and 0 if not	Authors' construction based on Ilzetzki et al. (2017)
Floating regime	Dummy equal 1 if ER_Fine is classified as floating regime and 0 if not	
Real GDP pc growth	Annual growth rate of real output per capita.	World Economic Outlook.
Resource-rich country	Dummy equal to 1 if a country is a resource-rich one and 0 if not	IMF Fiscal Monitor
Gross debt/GDP	General government gross debt, % of GDP (Government debt sustainability)	Kose et al. (2017)
External debt/GDP	Total external debt stocks, % of GDP (External public and private sector debt)	
Short term debt/Total debt	Short term external debt stocks, % of total (External and private sector debt)	
Government fractionalization	Index measuring the probability that two deputies picked at random among from the government parties will be of different parties.	World Bank DPI database
FDI inflows	Net inflows (new investment inflows less disinvestment) in a given economy from foreign investors, divided by GDP.	World Development Indicators (WDI)
Political stability	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimates give a country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.	
Trade	Sum of exports and imports of goods and services, % of GDP.	
Secondary education	Secondary duration refers to the number of grades (years) in secondary school.	
Mineral rents	The difference between the value of production for minerals at world prices and their total costs of production. Minerals included in the calculation are tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate.	
Government size	General government final consumption expenditure, % of GDP.	
Inflation	Annual percentage change of consumer price index	
Broad money/GDP	Sum of currency outside banks, demand deposits other than those of the central government, the time, savings, and foreign currency deposits of resident sectors other than the central government, bank and traveler's checks, and other securities such as certificates of deposit and commercial paper, % of GDP	
Dependency ratio	The ratio of dependent people younger than 15 or older than 64 to the working-age population (aged 15-64), in ratio of dependents	

	per 100 working-age people.	
GDP growth	Annual percentage growth rate of GDP	
Internal conflict	Political violence and its actual or potential impact on governance. The highest (lowest) score signals no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people (a country embroiled in an on-going civil war).	
Ethnic tensions	The degree of tension within a country attributable to racial, nationality, or language divisions. Higher values signal lower tensions.	
Post crisis	Dummy equal to 1 for the period from 2008 onwards.	Authors' construction
Saving glut	Dummy equal to 1 for the period 2000-2006.	
Time	It captures the time length since fiscal rule adoption	

Table A3. Descriptive statistics of variables

Variable	Obs	Mean	Std.Dev.	Min	Max
Gini index	1950	.408	.073	.203	.587
Real GDP pc growth	2112	-5.273	19.1	-98.193	110.785
External Debt/GDP	2022	57.888	44.035	.493	583.866
Dependency ratio	2184	69.073	19.708	16.453	119.139
Capital openness	2066	-.172	1.396	-1.904	2.374
Inflation	1953	15.615	53.813	-8.484	951.962
IT conservative date	2184	.097	.295	0	1
Political risk	1740	61.233	9.765	10.33	86.58
Government fractionalization	1788	.209	.268	0	.893
Fix regime	2184	.89	.313	0	1
Floating regime	2184	.099	.299	0	1
CBI regular turnover	1925	.041	.197	0	1
CBI irregular turnover	1924	.141	.348	0	1
Debt default	1625	.215	.411	0	1
Resource-rich country	2184	.286	.452	0	1
IT default date	2184	.101	.302	0	1
Gini index UNU-WIDER	591	.419	.096	.196	.771
Gross debt/GDP	1612	54.091	35.732	.089	260.964
Short term debt/Total Debt	2023	13.531	13.502	0	98.994
Government size	2068	14.368	5.949	2.047	88.983
Broad money/GDP	2060	62.78	563.598	4.894	18347.09
Trade	2112	75.124	39.884	13.753	531.737
FDI inflows	2101	3.566	6.08	-15.989	161.824
Political stability	1428	-.381	.781	-2.81	1.261
Internal conflict	1740	8.615	1.983	0	12
Ethnic tensions	1740	3.982	1.302	0	6
GDP growth	2146	4.096	6.569	-50.248	149.973
Secondary education	347	53.797	23.979	2.036	99.341
Mineral rents	2164	1.491	3.946	0	44.644
Post-crisis	2184	.308	.462	0	1
Saving glut	2184	.269	.444	0	1
Time	2184	1.855	4.162	0	26

Table B1. Matching results—Dropping former Soviet Union countries

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
FR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0195**	-0.0173**	-0.0166**	-0.0166**	-0.0184***	-0.0227***	-0.0233***	-0.0228***
Differences in Inequality	(0.00877)	(0.00822)	(0.00734)	(0.00692)	(0.00680)	(0.00574)	(0.00580)	(0.00582)
Number of observations, of which	1071	1071	1071	1071	1071	1071	1071	1071
- treated observations	284	284	284	284	284	284	284	284
- control observations	787	787	787	787	787	787	787	787
	Quality of the matching							
Pseudo R2	0.01	0.008	0.009	0.004	0.006	0.003	0.01	0.003
Rosenbaum bounds sensitivity tests	1.4	1.3	1.4	1.5	1.5	1.8	1.8	1.8
Standardized biases (p-value)	0.36	0.61	0.47	0.89	0.71	0.96	0.36	0.95
	Robustness checks							
[2] Adding Fix Exchange Regime	-0.0163*	-0.0178**	-0.0190**	-0.0166**	-0.0191***	-0.0221***	-0.0227***	-0.0223***
	(0.00842)	(0.00761)	(0.00745)	(0.00673)	(0.00642)	(0.00560)	(0.00555)	(0.00565)
[3] Adding Float Exchange Regime	-0.0195**	-0.0191**	-0.0173**	-0.0174***	-0.0196***	-0.0218***	-0.0225***	-0.0219***
	(0.00839)	(0.00784)	(0.00734)	(0.00676)	(0.00627)	(0.00561)	(0.00560)	(0.00569)
[4] Adding CBI regular turnover	-0.0261***	-0.0243***	-0.0232***	-0.0253***	-0.0220***	-0.0237***	-0.0248***	-0.0241***
	(0.00844)	(0.00790)	(0.00744)	(0.00722)	(0.00655)	(0.00618)	(0.00567)	(0.00556)
[5] Adding CBI irregular turnover	-0.0192**	-0.0246***	-0.0266***	-0.0242***	-0.0240***	-0.0230***	-0.0239***	-0.0233***
	(0.00871)	(0.00760)	(0.00723)	(0.00732)	(0.00696)	(0.00554)	(0.00559)	(0.00585)
[6] Adding Debt default dummy	-0.0251***	-0.0214***	-0.0202***	-0.0230***	-0.0229***	-0.0214***	-0.0217***	-0.0215***
	(0.00788)	(0.00824)	(0.00689)	(0.00647)	(0.00629)	(0.00543)	(0.00545)	(0.00538)
[7] Adding Resource-Rich country dummy	-0.0390***	-0.0305***	-0.0328***	-0.0341***	-0.0297***	-0.0314***	-0.0321***	-0.0313***
	(0.0100)	(0.00952)	(0.00872)	(0.00738)	(0.00721)	(0.00630)	(0.00684)	(0.00680)
[8] Using IT Default date	-0.0155*	-0.0203***	-0.0189**	-0.0156**	-0.0187***	-0.0227***	-0.0232***	-0.0227***
	(0.00820)	(0.00775)	(0.00738)	(0.00709)	(0.00652)	(0.00563)	(0.00554)	(0.00556)

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B2. Matching results—Dropping post-Cold War years

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
FR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0150*	-0.0148*	-0.0143*	-0.0138**	-0.0134**	-0.0100*	-0.0112**	-0.0101*
Differences in Inequality	(0.00856)	(0.00827)	(0.00764)	(0.00667)	(0.00624)	(0.00528)	(0.00560)	(0.00557)
Number of observations, of which	940	940	940	940	940	940	940	940
- treated observations	279	279	279	279	279	279	279	279
- control observations	661	661	661	661	661	661	661	661
Quality of the matching								
Pseudo R2	0.008	0.002	0.001	0.002	0.001	0.001	0.008	0.001
Rosenbaum bounds sensitivity tests	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.2
Standardized biases (p-value)	0.61	0.97	0.99	0.99	0.99	0.99	0.61	0.99
Robustness checks								
[2] Adding Fix Exchange Regime	-0.00585	-0.00529	-0.00589	-0.00746	-0.0102	-0.00947	-0.0104*	-0.00915*
	(0.00892)	(0.00822)	(0.00771)	(0.00706)	(0.00642)	(0.00581)	(0.00537)	(0.00556)
[3] Adding Float Exchange Regime	-0.0134	-0.00936	-0.00804	-0.0103	-0.00912	-0.00917	-0.00999*	-0.00882
	(0.00857)	(0.00821)	(0.00719)	(0.00707)	(0.00606)	(0.00577)	(0.00540)	(0.00564)
[4] Adding CBI regular turnover	-0.0115	-0.0135	-0.0151**	-0.0158**	-0.0134**	-0.0125**	-0.0138**	-0.0124**
	(0.00927)	(0.00829)	(0.00756)	(0.00736)	(0.00620)	(0.00552)	(0.00564)	(0.00589)
[5] Adding CBI irregular turnover	-0.00400	-0.00988	-0.0130*	-0.0127*	-0.0160**	-0.0118**	-0.0127**	-0.0117**
	(0.00911)	(0.00841)	(0.00771)	(0.00706)	(0.00683)	(0.00568)	(0.00586)	(0.00528)
[6] Adding Debt default dummy	-0.0116	-0.0152*	-0.0179**	-0.0151**	-0.0126**	-0.0129**	-0.0138***	-0.0131**
	(0.00865)	(0.00778)	(0.00776)	(0.00706)	(0.00611)	(0.00540)	(0.00513)	(0.00563)
[7] Adding Resource-Rich country dummy	-0.0198**	-0.0225**	-0.0216**	-0.0257***	-0.0230***	-0.0210***	-0.0190***	-0.0210***
	(0.0101)	(0.00908)	(0.00844)	(0.00808)	(0.00744)	(0.00702)	(0.00702)	(0.00673)
[8] Using IT Default date	-0.0143	-0.0152*	-0.0141*	-0.0145**	-0.0115*	-0.0100*	-0.0112*	-0.0101*
	(0.00882)	(0.00793)	(0.00732)	(0.00702)	(0.00625)	(0.00576)	(0.00586)	(0.00546)

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B3. Matching results—Dropping fuel exporters countries

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
FR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0252***	-0.0221***	-0.0267***	-0.0279***	-0.0247***	-0.0235***	-0.0242***	-0.0236***
Differences in Inequality	(0.00879)	(0.00770)	(0.00769)	(0.00692)	(0.00630)	(0.00559)	(0.00530)	(0.00563)
Number of observations, of which	1012	1012	1012	1012	1012	1012	1012	1012
- treated observations	263	263	263	263	263	263	263	263
- control observations	749	749	749	749	749	749	749	749
	Quality of the matching							
Pseudo R2	0.006	0.004	0.004	0.006	0.001	0.001	0.006	0.001
Rosenbaum bounds sensitivity tests	1.6	1.6	1.8	2	1.9	1.8	1.9	1.9
Standardized biases (p-value)	0.75	0.91	0.90	0.99	0.99	0.99	0.75	0.99
	Robustness checks							
[2] Adding Fix Exchange Regime	-0.0316***	-0.0253***	-0.0281***	-0.0283***	-0.0252***	-0.0234***	-0.0242***	-0.0236***
	(0.00844)	(0.00795)	(0.00806)	(0.00676)	(0.00629)	(0.00536)	(0.00560)	(0.00583)
[3] Adding Float Exchange Regime	-0.0333***	-0.0262***	-0.0274***	-0.0274***	-0.0252***	-0.0235***	-0.0241***	-0.0236***
	(0.00844)	(0.00856)	(0.00751)	(0.00718)	(0.00612)	(0.00562)	(0.00557)	(0.00551)
[4] Adding CBI regular turnover	-0.0339***	-0.0292***	-0.0260***	-0.0273***	-0.0263***	-0.0242***	-0.0251***	-0.0239***
	(0.00915)	(0.00803)	(0.00768)	(0.00702)	(0.00641)	(0.00569)	(0.00548)	(0.00555)
[5] Adding CBI irregular turnover	-0.0175*	-0.0201***	-0.0213***	-0.0244***	-0.0228***	-0.0244***	-0.0252***	-0.0244***
	(0.00921)	(0.00773)	(0.00752)	(0.00685)	(0.00646)	(0.00570)	(0.00579)	(0.00549)
[6] Adding Debt default dummy	-0.0258***	-0.0199***	-0.0228***	-0.0258***	-0.0238***	-0.0241***	-0.0242***	-0.0242***
	(0.00883)	(0.00754)	(0.00727)	(0.00659)	(0.00619)	(0.00541)	(0.00521)	(0.00556)
[7] Adding Resource-Rich country dummy	-0.0381***	-0.0383***	-0.0366***	-0.0362***	-0.0364***	-0.0359***	-0.0390***	-0.0362***
	(0.0103)	(0.00975)	(0.00863)	(0.00771)	(0.00714)	(0.00706)	(0.00714)	(0.00711)
[8] Using IT Default date	-0.0205**	-0.0218***	-0.0217***	-0.0241***	-0.0237***	-0.0233***	-0.0241***	-0.0235***
	(0.00898)	(0.00825)	(0.00754)	(0.00678)	(0.00651)	(0.00563)	(0.00568)	(0.00544)

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B4. Matching results—Dropping hyperinflation countries

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
FR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0119	-0.0152*	-0.0173**	-0.0159**	-0.0162***	-0.0156***	-0.0157***	-0.0158***
Differences in Inequality	(0.00878)	(0.00788)	(0.00743)	(0.00640)	(0.00612)	(0.00567)	(0.00558)	(0.00529)
Number of observations, of which	1093	1093	1093	1093	1093	1093	1093	1093
- treated observations	290	290	290	290	290	290	290	290
- control observations	803	803	803	803	803	803	803	803
	Quality of the matching							
Pseudo R2	0.007	0.004	0.005	0.003	0.004	0.003	0.007	0.004
Rosenbaum bounds sensitivity tests	1.2	1.3	1.4	1.4	1.4	1.4	1.5	1.4
Standardized biases (p-value)	0.68	0.87	0.85	0.96	0.90	0.92	0.68	0.92
	Robustness checks							
[2] Adding Fix Exchange Regime	-0.0116	-0.0153*	-0.0180**	-0.0178***	-0.0170***	-0.0156***	-0.0156***	-0.0159***
	(0.00838)	(0.00799)	(0.00733)	(0.00688)	(0.00594)	(0.00552)	(0.00517)	(0.00580)
[3] Adding Float Exchange Regime	-0.0197**	-0.0186**	-0.0168**	-0.0190***	-0.0166***	-0.0152***	-0.0153***	-0.0156***
	(0.00841)	(0.00774)	(0.00709)	(0.00683)	(0.00640)	(0.00542)	(0.00540)	(0.00532)
[4] Adding CBI regular turnover	-0.0209**	-0.0185**	-0.0188**	-0.0185***	-0.0170***	-0.0174***	-0.0176***	-0.0174***
	(0.00876)	(0.00821)	(0.00750)	(0.00697)	(0.00638)	(0.00550)	(0.00530)	(0.00546)
[5] Adding CBI irregular turnover	-0.0148	-0.0163**	-0.0173**	-0.0166**	-0.0169***	-0.0171***	-0.0177***	-0.0170***
	(0.00911)	(0.00811)	(0.00716)	(0.00669)	(0.00619)	(0.00557)	(0.00561)	(0.00589)
[6] Adding Debt default dummy	-0.0114	-0.0143*	-0.0171**	-0.0152**	-0.0172***	-0.0167***	-0.0172***	-0.0168***
	(0.00829)	(0.00754)	(0.00726)	(0.00652)	(0.00589)	(0.00543)	(0.00542)	(0.00534)
[7] Adding Resource-Rich country dummy	-0.0167*	-0.0186**	-0.0202**	-0.0244***	-0.0256***	-0.0242***	-0.0253***	-0.0245***
	(0.00920)	(0.00854)	(0.00815)	(0.00737)	(0.00651)	(0.00575)	(0.00645)	(0.00620)
[8] Using IT Default date	-0.0138	-0.0101	-0.0145**	-0.0141**	-0.0152**	-0.0156***	-0.0158***	-0.0158***
	(0.00893)	(0.00769)	(0.00725)	(0.00632)	(0.00624)	(0.00517)	(0.00528)	(0.00518)

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B5. Matching results—Dropping financial crisis years

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
FR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT) Differences in Inequality	-0.0198** (0.00996)	-0.0182** (0.00870)	-0.0173** (0.00796)	-0.0188*** (0.00722)	-0.0157** (0.00694)	-0.0176*** (0.00654)	-0.0177*** (0.00606)	-0.0179*** (0.00612)
Number of observations, of which	1029	1029	1029	1029	1029	1029	1029	1029
- treated observations	239	239	239	239	239	239	239	239
- control observations	790	790	790	790	790	790	790	790
	Quality of the matching							
Pseudo R2	0.01	0.007	0.007	0.004	0.004	0.002	0.001	0.002
Rosenbaum bounds sensitivity tests	1.3	1.3	1.3	1.5	1.4	1.5	1.5	1.5
Standardized biases (p-value)	0.48	0.76	0.78	0.92	0.92	0.98	0.48	0.99
	Robustness checks							
[2] Adding Fix Exchange Regime	-0.00928 (0.00971)	-0.0138 (0.00862)	-0.0153* (0.00818)	-0.0143* (0.00746)	-0.0151** (0.00688)	-0.0165*** (0.00617)	-0.0166*** (0.00580)	-0.0167*** (0.00619)
[3] Adding Float Exchange Regime	-0.0167* (0.00980)	-0.0164* (0.00866)	-0.0152* (0.00840)	-0.0152** (0.00697)	-0.0161** (0.00690)	-0.0156*** (0.00583)	-0.0165*** (0.00585)	-0.0159** (0.00616)
[4] Adding CBI regular turnover	-0.0199** (0.00947)	-0.0197** (0.00945)	-0.0213*** (0.00793)	-0.0203*** (0.00735)	-0.0199*** (0.00751)	-0.0188*** (0.00594)	-0.0195*** (0.00607)	-0.0187*** (0.00619)
[5] Adding CBI irregular turnover	-0.0180* (0.00972)	-0.0180** (0.00880)	-0.0121 (0.00846)	-0.0194** (0.00752)	-0.0185*** (0.00698)	-0.0176*** (0.00609)	-0.0187*** (0.00604)	-0.0177*** (0.00594)
[6] Adding Debt default dummy	-0.0272*** (0.00959)	-0.0232*** (0.00889)	-0.0197** (0.00827)	-0.0210*** (0.00769)	-0.0183*** (0.00665)	-0.0164*** (0.00601)	-0.0175*** (0.00578)	-0.0164*** (0.00593)
[7] Adding Resource-Rich country dummy	-0.0316*** (0.0107)	-0.0265*** (0.00958)	-0.0249*** (0.00860)	-0.0246*** (0.00809)	-0.0268*** (0.00765)	-0.0251*** (0.00726)	-0.0270*** (0.00686)	-0.0252*** (0.00699)
[8] Using IT Default date	-0.0219** (0.00972)	-0.0198** (0.00849)	-0.0173** (0.00830)	-0.00800 (0.00739)	-0.0138* (0.00726)	-0.0177*** (0.00602)	-0.0177*** (0.00627)	-0.0178*** (0.00628)

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B6. Matching results—Including developed countries

Treatment Variable: FR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
FR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0392***	-0.0406***	-0.0434***	-0.0396***	-0.0382***	-0.0359***	-0.0354***	-0.0361***
Differences in Inequality	(0.0130)	(0.0126)	(0.0121)	(0.00734)	(0.00856)	(0.00963)	(0.0106)	(0.00980)
Number of observations, of which	1493	1493	1493	1493	1493	1493	1493	1493
- treated observations	591	591	591	591	591	591	591	591
- control observations	902	902	902	902	902	902	902	902
	Quality of the matching							
Rosenbaum bounds sensitivity tests	2.1	2.5	2.9	2.3	2.4	2.6	2.7	2.7
Standardized biases (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pseudo R2	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.02
	Robustness checks							
[2] Adding Fix Exchange Regime	-0.0324**	-0.0392***	-0.0443***	-0.0352***	-0.0379***	-0.0371***	-0.0360***	-0.0375***
	(0.0136)	(0.0121)	(0.0119)	(0.00728)	(0.00814)	(0.00976)	(0.0105)	(0.00958)
[3] Adding Float Exchange Regime	-0.0421***	-0.0427***	-0.0425***	-0.0328***	-0.0393***	-0.0372***	-0.0363***	-0.0379***
	(0.0124)	(0.0122)	(0.0119)	(0.00759)	(0.00781)	(0.00990)	(0.0104)	(0.00990)
[4] Adding CBI regular turnover	-0.0302**	-0.0357***	-0.0386***	-0.0311***	-0.0358***	-0.0354***	-0.0354***	-0.0355***
	(0.0133)	(0.0120)	(0.0127)	(0.00727)	(0.00858)	(0.00987)	(0.0111)	(0.0105)
[5] Adding CBI irregular turnover	-0.0423***	-0.0418***	-0.0438***	-0.0382***	-0.0407***	-0.0353***	-0.0350***	-0.0353***
	(0.0141)	(0.0118)	(0.0123)	(0.00745)	(0.00783)	(0.00947)	(0.0105)	(0.00998)
[6] Adding Debt default dummy	-0.0292***	-0.0283***	-0.0259***	-0.0273***	-0.0269***	-0.0243***	-0.0219***	-0.0241***
	(0.00969)	(0.00897)	(0.00826)	(0.00709)	(0.00669)	(0.00665)	(0.00788)	(0.00708)
[7] Adding Resource-Rich country dummy	-0.0305***	-0.0332***	-0.0317***	-0.0303***	-0.0351***	-0.0310***	-0.0298***	-0.0312***
	(0.0110)	(0.0110)	(0.00984)	(0.00799)	(0.00840)	(0.00768)	(0.00823)	(0.00833)
[8] Using IT Default date	-0.0392***	-0.0402***	-0.0423***	-0.0409***	-0.0385***	-0.0367***	-0.0360***	-0.0367***
	(0.0134)	(0.0126)	(0.0124)	(0.00744)	(0.00835)	(0.00932)	(0.0104)	(0.00969)

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

APPENDIX C. HETEROGENEITY: DIFFERENT TYPES OF FISCAL RULES

Table C1a. Probit estimates of the propensity score—Budget Balance Rule

BBR	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
L.Real GDP growth	0.0109**	0.0106**	0.0107**	0.0113**	0.0118**	0.0144**	0.0115**	0.0109**
	(0.00534)	(0.00533)	(0.00533)	(0.00545)	(0.00551)	(0.00621)	(0.00535)	(0.00534)
L.Debt	0.00226*	0.00227*	0.00226*	0.00260**	0.00272**	0.00416***	0.00250**	0.00226*
	(0.00116)	(0.00117)	(0.00117)	(0.00119)	(0.00119)	(0.00119)	(0.00119)	(0.00116)
L.Dependency ratio	0.00257	0.00269	0.00268	0.00211	0.00225	0.0000458	0.00225	0.00253
	(0.00268)	(0.00267)	(0.00267)	(0.00277)	(0.00278)	(0.00289)	(0.00268)	(0.00268)
L.Capital openness	0.109***	0.107***	0.108***	0.0939***	0.0944***	0.122***	0.100***	0.108***
	(0.0295)	(0.0296)	(0.0296)	(0.0301)	(0.0301)	(0.0314)	(0.0291)	(0.0295)
L.Inflation	-5.656***	-5.523***	-5.549***	-5.541***	-5.575***	-5.594***	-5.997***	-5.671***
	(1.037)	(1.075)	(1.071)	(1.045)	(1.054)	(1.176)	(1.039)	(1.038)
IT_conservative	0.296**	0.292**	0.293**	0.312***	0.319***	0.231*	0.209*	
	(0.116)	(0.116)	(0.116)	(0.118)	(0.118)	(0.122)	(0.116)	
L.Political risk	-0.00603	-0.00555	-0.00560	-0.00644	-0.00643	-0.0132**	-0.00272	-0.00602
	(0.00593)	(0.00592)	(0.00593)	(0.00596)	(0.00596)	(0.00615)	(0.00609)	(0.00593)
L.Gov. fractionalization	0.134	0.135	0.135	0.151	0.153	0.208	0.147	0.136
	(0.160)	(0.160)	(0.160)	(0.162)	(0.162)	(0.165)	(0.160)	(0.160)
Fix regime		0.405						
		(0.355)						
Float regime			-0.351					
			(0.362)					
CBI regular				-0.106				
				(0.233)				
CBI irregular					0.163			
					(0.128)			
Default						-0.582***		
						(0.170)		
Resource-Rich							0.380***	
							(0.0918)	
IT_default								0.288**
								(0.115)
Constant	-0.336	-0.780	-0.371	-0.299	-0.341	0.233	-0.620	-0.332
	(0.482)	(0.606)	(0.483)	(0.488)	(0.489)	(0.501)	(0.496)	(0.482)
Observations	1194	1194	1194	1153	1153	1113	1194	1194
Pseudo R2	0.112	0.113	0.112	0.108	0.109	0.135	0.124	0.111

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C1b. Probit estimates of the propensity score—Debt Rule

DR	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
L.Real GDP growth	0.0131***	0.0127***	0.0128***	0.0137***	0.0143***	0.0189***	0.0131***	0.0131***
	(0.00466)	(0.00466)	(0.00466)	(0.00478)	(0.00478)	(0.00515)	(0.00465)	(0.00466)
L.Debt	0.00451***	0.00451***	0.00448***	0.00516***	0.00529***	0.00749***	0.00442***	0.00450***
	(0.00122)	(0.00123)	(0.00122)	(0.00125)	(0.00125)	(0.00137)	(0.00121)	(0.00122)
L.Dependency ratio	0.00205	0.00219	0.00219	0.00156	0.00173	0.00189	0.00219	0.00204
	(0.00281)	(0.00282)	(0.00282)	(0.00293)	(0.00294)	(0.00300)	(0.00280)	(0.00281)
L.Capital openness	-0.0613*	-0.0632**	-0.0627**	-0.0903***	-0.0897***	-0.103***	-0.0589*	-0.0613*
	(0.0319)	(0.0319)	(0.0319)	(0.0326)	(0.0327)	(0.0349)	(0.0319)	(0.0319)
L.Inflation	-7.085***	-6.907***	-6.945***	-6.697***	-6.769***	-7.109***	-7.057***	-7.088***
	(0.954)	(0.980)	(0.978)	(0.935)	(0.945)	(1.010)	(0.963)	(0.954)
IT_conservative	0.100	0.0969	0.0972	0.0740	0.0799	0.0637	0.117	
	(0.127)	(0.126)	(0.126)	(0.129)	(0.129)	(0.134)	(0.129)	
L.Political risk	-0.00709	-0.00647	-0.00649	-0.00513	-0.00510	-0.0109	-0.00813	-0.00708
	(0.00622)	(0.00623)	(0.00623)	(0.00626)	(0.00624)	(0.00679)	(0.00626)	(0.00622)
L.Gov. fractionalization	0.903***	0.907***	0.906***	0.877***	0.882***	0.938***	0.904***	0.904***
	(0.165)	(0.165)	(0.165)	(0.168)	(0.168)	(0.175)	(0.165)	(0.165)
Fix regime		0.638						
		(0.445)						
Float regime			-0.575					
			(0.453)					
CBI regular				-0.107				
				(0.252)				
CBI irregular					0.170			
					(0.136)			
Default						-0.835***		
						(0.187)		
Resource-Rich							-0.110	
							(0.101)	
IT_default								0.0982
								(0.126)
Constant	-0.575	-1.263*	-0.622	-0.708	-0.753	-0.449	-0.490	-0.574
	(0.527)	(0.684)	(0.530)	(0.534)	(0.534)	(0.573)	(0.533)	(0.527)
Observations	1194	1194	1194	1153	1153	1113	1194	1194
Pseudo R2	0.153	0.155	0.154	0.151	0.152	0.190	0.154	0.153

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C1c. Probit estimates of the propensity score—Expenditure Rule

ER	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
L.Real GDP growth	-0.0142*	-0.0145*	-0.0141	-0.0136	-0.0128	-0.0137	-0.0134	-0.0142*
	(0.00834)	(0.00874)	(0.00862)	(0.00865)	(0.00851)	(0.00871)	(0.00828)	(0.00837)
L.Debt	0.00277	0.00275	0.00278	0.00443	0.00435	0.00435	0.00673**	0.00279
	(0.00311)	(0.00310)	(0.00310)	(0.00298)	(0.00296)	(0.00320)	(0.00313)	(0.00312)
L.Dependency ratio	-0.0613***	-0.0615***	-0.0613***	-0.0588***	-0.0586***	-0.0628***	-0.0627***	-0.0618***
	(0.0104)	(0.0105)	(0.0105)	(0.0104)	(0.0103)	(0.0107)	(0.0103)	(0.0104)
L.Capital openness	0.471***	0.472***	0.470***	0.434***	0.435***	0.523***	0.433***	0.472***
	(0.103)	(0.104)	(0.104)	(0.101)	(0.102)	(0.110)	(0.0985)	(0.104)
L.Inflation	-3.759**	-3.654*	-3.780*	-3.607**	-3.478**	-4.228**	-4.387***	-3.852**
	(1.708)	(2.026)	(1.984)	(1.718)	(1.696)	(2.114)	(1.701)	(1.719)
IT_conservative	1.689***	1.690***	1.689***	1.716***	1.716***	1.656***	1.711***	
	(0.230)	(0.231)	(0.231)	(0.245)	(0.237)	(0.230)	(0.250)	
L.Political risk	-0.0653***	-0.0652***	-0.0653***	-0.0618***	-0.0625***	-0.0782***	-0.0573***	-0.0656***
	(0.0116)	(0.0117)	(0.0116)	(0.0114)	(0.0116)	(0.0130)	(0.0119)	(0.0117)
L.Gov. fractionalization	1.037***	1.042***	1.036***	0.970***	0.988***	1.182***	1.368***	1.042***
	(0.336)	(0.341)	(0.339)	(0.343)	(0.344)	(0.350)	(0.362)	(0.337)
Fix regime		0.0945						
		(0.639)						
Float regime			0.0209					
			(0.644)					
CBI regular				-0.410				
				(0.641)				
CBI irregular					0.134			
					(0.305)			
Default						-1.301*		
						(0.677)		
Resource-Rich							0.648***	
							(0.178)	
IT_default								1.686***
								(0.231)
Constant	5.081***	4.984***	5.081***	4.657***	4.643***	5.939***	4.090***	5.129***
	(1.068)	(1.252)	(1.067)	(1.045)	(1.030)	(1.169)	(1.077)	(1.065)
Observations	621	621	621	613	613	604	621	621
Pseudo R2	0.411	0.411	0.411	0.411	0.410	0.425	0.431	0.411

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C2a. Matching results with BBR*DR as the treatment variable

Treatment Variable: BBR*DR	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
BBR*DR Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0231**	-0.0312***	-0.0295***	-0.0275***	-0.0260***	-0.0242***	-0.0226***	-0.0239***
Differences in Inequality	(0.0108)	(0.00987)	(0.00898)	(0.00755)	(0.00823)	(0.00743)	(0.00706)	(0.00660)
Number of observations, of which	1152	1152	1152	1152	1152	1152	1152	1152
- treated observations	173	173	173	173	173	173	173	173
- control observations	979	979	979	979	979	979	979	979
	Quality of the matching							
Pseudo R2	0.01	0.01	0.01	0.004	0.006	0.004	0.01	0.004
Rosenbaum bounds sensitivity tests	1.3	1.9	1.8	1.8	1.7	1.8	1.7	1.6
Standardized biases (p-value)	0.56	0.34	0.73	0.98	0.95	0.97	0.56	0.97
	Robustness checks							
[2] Adding Fix Exchange Regime	-0.0244**	-0.0284***	-0.0279***	-0.0260***	-0.0263***	-0.0246***	-0.0225***	-0.0238***
	(0.0111)	(0.00986)	(0.00874)	(0.00785)	(0.00707)	(0.00686)	(0.00760)	(0.00738)
[3] Adding Float Exchange Regime	-0.0319***	-0.0316***	-0.0317***	-0.0276***	-0.0259***	-0.0241***	-0.0227***	-0.0239***
	(0.0109)	(0.00968)	(0.00921)	(0.00823)	(0.00702)	(0.00750)	(0.00742)	(0.00694)
[4] Adding CBI regular turnover	-0.0346***	-0.0282***	-0.0279***	-0.0246***	-0.0250***	-0.0249***	-0.0237***	-0.0249***
	(0.0105)	(0.00983)	(0.00932)	(0.00765)	(0.00721)	(0.00695)	(0.00743)	(0.00731)
[5] Adding CBI irregular turnover	-0.0196*	-0.0267***	-0.0248***	-0.0244***	-0.0245***	-0.0242***	-0.0236***	-0.0246***
	(0.0103)	(0.00995)	(0.00923)	(0.00780)	(0.00777)	(0.00733)	(0.00748)	(0.00693)
[6] Adding Debt default dummy	-0.0252**	-0.0230**	-0.0210**	-0.0236***	-0.0243***	-0.0225***	-0.0195***	-0.0215***
	(0.0102)	(0.00906)	(0.00893)	(0.00788)	(0.00750)	(0.00708)	(0.00691)	(0.00675)
[7] Adding Resource-Rich country dummy	-0.0198**	-0.0230**	-0.0264***	-0.0235***	-0.0215***	-0.0240***	-0.0224***	-0.0238***
	(0.00999)	(0.00946)	(0.00873)	(0.00802)	(0.00729)	(0.00711)	(0.00748)	(0.00742)
[8] Using IT Default date	-0.0240**	-0.0288***	-0.0298***	-0.0276***	-0.0261***	-0.0242***	-0.0226***	-0.0238***
	(0.0103)	(0.00930)	(0.00871)	(0.00798)	(0.00694)	(0.00760)	(0.00724)	(0.00711)

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C2b. Matching results with DR*ER as the treatment variable

Treatment Variable: DR*ER	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
DR*ER Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	-0.0359	-0.0130	-0.00410	0.00159	-0.00368	-0.000283	0.00316	0.00121
Differences in Inequality	(0.0279)	(0.0252)	(0.0226)	(0.0337)	(0.0291)	(0.0171)	(0.0154)	(0.0178)
Number of observations, of which	979	979	979	979	979	979	979	979
- treated observations	27	27	27	27	27	27	27	27
- control observations	952	952	952	952	952	952	952	952
	Quality of the matching							
Pseudo R2	0.06	0.04	0.04	0.04	0.05	0.02	0.06	0.02
Rosenbaum bounds sensitivity tests	1.3	1	1	1	1	1	1	1
Standardized biases (p-value)	0.75	0.91	0.92	0.95	0.84	0.97	0.75	0.98
	Robustness checks							
[2] Adding Fix Exchange Regime	0.0157	-0.000172	0.0107	0.0101	0.00125	0.00329	0.00667	0.00405
	(0.0299)	(0.0259)	(0.0224)	(0.0362)	(0.0287)	(0.0190)	(0.0174)	(0.0179)
[3] Adding Float Exchange Regime	0.0167	0.0105	0.00597	0.0231	0.0134	0.00522	0.00645	0.00373
	(0.0281)	(0.0253)	(0.0240)	(0.0328)	(0.0259)	(0.0186)	(0.0174)	(0.0191)
[4] Adding CBI regular turnover	-0.0244	0.00546	0.00919	0.00103	0.00649	-0.000846	0.00646	0.000381
	(0.0329)	(0.0304)	(0.0276)	(0.0539)	(0.0430)	(0.0248)	(0.0239)	(0.0249)
[5] Adding CBI irregular turnover	0.0263	0.00882	0.00473	0.0197	0.0231	0.0100	0.00960	0.00920
	(0.0338)	(0.0304)	(0.0287)	(0.0586)	(0.0446)	(0.0242)	(0.0230)	(0.0251)
[6] Adding Debt default dummy	0.00700	0.00975	0.00869	-0.00246	0.000167	-0.00374	-0.0102	-0.00525
	(0.0309)	(0.0281)	(0.0265)	(0.0356)	(0.0297)	(0.0222)	(0.0219)	(0.0217)
[7] Adding Resource-Rich country dummy	-0.0127	0.00203	0.00609	0.00117	0.000438	-0.000318	0.0115	0.00245
	(0.0290)	(0.0250)	(0.0237)	(0.0364)	(0.0274)	(0.0193)	(0.0186)	(0.0189)
[8] Using IT Default date	-0.0352	-0.0159	-0.00359	0.00580	-0.00669	-0.0000829	0.00316	0.00125
	(0.0295)	(0.0233)	(0.0227)	(0.0372)	(0.0294)	(0.0174)	(0.0159)	(0.0177)

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C2c. Matching results with BBR*ER as the treatment variable

Treatment Variable: BBR*ER	1-Nearest Neighbor Matching	2-Nearest Neighbor Matching	3-Nearest Neighbor Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
				r=0.005	r=0.01	r=0.05		
BBR*ER Dummy	**Dependent variable: Gini index**							
[1] Average Treatment on the Treated (ATT)	0.0530	0.0625*	0.0517	-0.0152	0.0168	0.0592*	0.0464	0.0576*
Differences in Inequality	(0.0375)	(0.0357)	(0.0325)	(0.0397)	(0.0381)	(0.0346)	(0.0338)	(0.0344)
Number of observations, of which	934	934	934	934	934	934	934	934
- treated observations	26	26	26	26	26	26	26	26
- control observations	934	934	934	934	934	934	934	934
	Quality of the matching							
Pseudo R2	0.23	0.16	0.07	0.04	0.03	0.06	0.23	0.07
Rosenbaum bounds sensitivity tests	1.5	1.6	1.3	1	1	1.3	1.3	1.3
Standardized biases (p-value)	0.03	0.15	0.72	0.98	0.99	0.81	0.03	0.78
	Robustness checks							
[2] Adding Fix Exchange Regime	0.0568	0.0625*	0.0515	-0.0150	0.0170	0.0593*	0.0449	0.0579*
	(0.0391)	(0.0369)	(0.0330)	(0.0391)	(0.0360)	(0.0319)	(0.0319)	(0.0323)
[3] Adding Float Exchange Regime	0.0568	0.0625*	0.0515	-0.0150	0.0170	0.0593*	0.0448	0.0579*
	(0.0399)	(0.0369)	(0.0351)	(0.0397)	(0.0367)	(0.0349)	(0.0326)	(0.0333)
[4] Adding CBI regular turnover	0.0512	0.0478	0.0447	-0.00356	0.00352	0.0595*	0.0465	0.0567
	(0.0381)	(0.0366)	(0.0338)	(0.0401)	(0.0365)	(0.0331)	(0.0326)	(0.0352)
[5] Adding CBI irregular turnover	0.0480	0.0561	0.0480	-0.0210	0.0142	0.0615**	0.0471	0.0594*
	(0.0366)	(0.0342)	(0.0320)	(0.0391)	(0.0346)	(0.0307)	(0.0294)	(0.0305)
[6] Adding Debt default dummy	0.0663	0.0647*	0.0642*	-0.00824	0.00579	0.0702*	0.0546	0.0705*
	(0.0418)	(0.0351)	(0.0367)	(0.0493)	(0.0435)	(0.0366)	(0.0370)	(0.0368)
[7] Adding Resource-Rich country dummy	0.0365	0.0198	0.00267	0.00511	0.0166	0.0107	0.0113	0.0131
	(0.0386)	(0.0337)	(0.0308)	(0.0436)	(0.0410)	(0.0290)	(0.0290)	(0.0302)
[8] Using IT Default date	0.0569	0.0625*	0.0503	-0.0152	0.0170	0.0515	0.0448	0.0575
	(0.0370)	(0.0361)	(0.0348)	(0.0379)	(0.0380)	(0.0331)	(0.0328)	(0.0355)

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

References for the Supplementary Material

- Chinn, M., Ito, H. (2006). What Matters for Financial Development? Capital Controls, Institutions, and Interactions. *Journal of Development Economics* 81, 163-192
- Dreher, A., Sturm, J.-E., De Haan, J. (2008). Does high inflation cause central bankers to lose their job? Evidence based on a new data set. *European Journal of Political Economy* 24, 778-787.
- Dreher, A., Sturm, J.-E., De Haan, J. (2010). When is a central bank governor replaced? Evidence based on a new dataset. *Journal of Macroeconomics* 32, 766-781
- Ilzetzki, E., Reinhart, C., Rogoff, K. (2017). Exchange Arrangements Entering the 21st Century: Which Anchor Will Hold?. NBER wp 2134.
- Kose, A., Kurlat, S., Ohnsorge, F., Sugawara, N. (2017). A Cross-Country Database of Fiscal Space. World Bank Policy Research wp 8157.
- Reinhart, C., Rogoff, K. (2009). *This Time is Different: Eight Centuries of Financial Folly*. Princeton University Press: New Jersey.
- Roger, S. (2009). Inflation targeting at 20: achievements and challenges. IMF wp 236.
- Roger, S., Stone, M. (2005). On Target: The International Experience with Achieving Inflation Targets, IMF wp 163.
- Sturm, J.-E., de Haan, J. (2001). Inflation in developing countries: Does Central Bank independence matter?. CESifo wp 511.