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Abstract

This study aims to explore the nonlinear impact of financial integration on income inequality in advanced (AE) and emerging market and developing economies (EMDE). Our panel fixed effect threshold estimation results suggest that international financial integration (IFI) provides a data-driven estimated threshold for the effect of IFI on income inequality. IFI is positively associated with inequality in EMDE, albeit this positive relation diminishes in more financially integrated episodes. In AE, inequality decreases with IFI in less financially integrated episodes. Our empirical findings reveal that the relationship between IFI and inequality is driven by both capital inflows and outflows in AE while it is determined by capital inflows in EMDE. Finally, we investigate whether the impact of IFI on inequality changes with the level of financial development. Our results also suggest that the inequality-increasing effect of IFI is much lower in financially more developed episodes in EMDE. All these findings imply that policies fostering financial development and equitable financial access are crucially important to mitigate the adverse effects of IFI on inequality, especially in EMDE.

Keywords: Income Inequality, International Financial Integration, Financial Development, Panel Threshold Model, Advanced Economies, Emerging Markets and Developing Economies
JEL Classifications: F41, F62, I30, O15

ملخص

تهدف هذه الدراسة إلى استكشاف التأثير غير الخطي للتكامل المالي على عدم المساواة في الدخل في الاقتصادات المتقدمة والأسواق الناشئة والاقتصادات النامية. تشير نتائج تقدير عتبة التأثير الثابت التي توصلت إليها لجنتنا إلى أن التكامل المالي الدولي يوفر عتبة تقديرية تعتمد على البيانات لتأثير المؤسسات المالية الدولية على عدم المساواة في الدخل. ترتبط المؤسسات المالية الدولية بشكل إيجابي بعدم المساواة في الأسواق الناشئة والاقتصادات النامية ، على الرغم من أن هذه العلاقة الإيجابية تتضاءل في الحلقات الأكثر تكاملاً مالياً. في الاقتصادات المتقدمة، يتناقص عدم المساواة مع المؤسسات المالية الدولية في الحلقات الأقل تكاملاً مالياً. تكشف النتائج التجريبية التي توصلنا إليها أن العلاقة بين المؤسسات المالية الدولية وعدم المساواة مدفوعة بكل من تدفقات رأس المال الداخلة والخارجة في الاقتصادات المتقدمة بينما يتم تحديدها من خلال تدفقات رأس المال الداخلة في الأسواق الناشئة والاقتصادات النامية .وأخيرا، فإننا نتحقق مما إذا كان تأثير المؤسسات المالية الدولية على عدم المساواة يتغير مع مستوى التنمية المالية. تشير نتائجنا أيضًا إلى أن تأثير المؤسسات المالية الدولية على زيادة عدم المساواة أقل بكثير في الحلقات الأكثر تطورًا ماليًا في الأسواق الناشئة والاقتصادات النامية. تشير كل هذه النتائج إلى أن السياسات التي تعزز التنمية المالية والوصول المالي العادل لها أهمية حاسمة للتخفيف من الآثار السلبية للمؤسسات المالية الدولية على عدم المساواة، وخاصة في الأسواق الناشئة والاقتصادات النامية

1. Introduction

Income inequality (inequality) has been growing within the countries. For instance, it has increased by almost 50 percent in advanced economies and remains very high in most of the emerging market and developing economies (EMDE) since the early 1990s (Everaert and Genberg 2020). Inequality is often associated with higher social costs, lower growth, poorer health, and higher instability (Nolan and Valenzuela 2019; Ostry et al. 2019). Duong (2025) reports that excessive inequality driven by biased policies may harm economic welfare and social trust. Consequently, concerns about inequality are not only among the top policy issues but also provide a crucially important research agenda.

The empirical literature suggests that trade openness and financial globalization (Jaumotte et al. 2013; Furceri and Ostry 2019), the level and composition of capital flows (Jaumotte et al. 2013; Eichengreen et al. 2021), innovation and technology (Aghion et al. 2019), institutional conditions and governance (Eichengreen et al. 2021), access to education and human capital (Gregorio and Lee 2002; Jaumotte et al. 2013), financial development (Demirguc-Kunt and Levine 2009; Thornton and Di Tommaso 2020) and real GDP (Hailemariam et al. 2021; Cerra et al. 2021) are important determinants of inequality. Considering the remarks by Guichard (2017) suggesting gross capital inflows (as a percent of world GDP) increased from 60% in the second half of the 1990s to 180% in 2007, the investigation of the financialization-inequality nexus becomes a much more important issue.

Financialization refers to "increasing role of financial motives, financial markets, financial actors, and financial institutions in an economy" according to Epstein (2005, p.3). Financialization is often associated with macroeconomic instability and financial crisis, both of which have adverse effects on the poor and thus contribute to inequality (Stiglitz 2012). In this study, we consider both the domestic and international aspects of financialization. The domestic financialization is represented by financial development (Svirydzenka 2016). For the international aspect of financialization we consider *de facto* international financial integration (Lane and Milesi-Ferretti 2018). Furthermore, we also take into account the main components of international financial integration including capital inflows (liability flows) and capital outflows (asset flows) which are often ignored by the literature.

The conventional theory maintains that the movement of capital from rich to poor countries promotes growth in poor economies. Accordingly, financial globalization leads to a decline in inequality. The theoretical model results by Matsuyama (2004), however, suggest that financial globalization tends to increase inequality by binding borrowing constraints on poor countries, leading to richer economies becoming richer and poorer economies becoming poorer. Jaumotte et al. (2013) points out that financial globalization increases while trade globalization dampens inequality. Dorn et al. (2018) reports that the positive relationship between globalization and inequality often appears to be the case for emerging market and developing economies (EMDE). The findings by Dorn et al. (2018) indicate that the effect of trade globalization on inequality is almost negligible, especially for the sample of advanced economies. The

cointegration-based results by Shin and Lee (2019) suggest that neither financial globalization nor financial development affects inequality.

The literature often does not consider a postulation that the relationships between inequality and its main determinants, including financial globalization proxied by international financial integration and financial development, may not be linear. The recent exemptions include Kim and Lin (2011), Cihak and Sahay (2020), and Madni and Anwar (2021). Cihak and Sahay (2020) tackles the nonlinearity issue by considering a quadratic functional form for financial depth. Kim and Lin (2011) maintains that financial development itself provides a threshold such that the benefits of it on income distribution occur only after the country reaches a certain threshold level. Madni and Anwar (2021) reports that GDP growth increases inequality if institutional quality is lower than a certain level of threshold.

The literature, however, has yet to comprehensively investigate whether international financial integration provides an endogenous threshold for the effect of international financial integration on income inequality. This may also be the case for the main components of international financial integration including capital inflows (liability flows) and outflows (asset flows). Even, the effect of international financial integration on inequality may change with the level of financial development. This paper aims to investigate all these crucially important issues by employing a data-driven panel fixed effect threshold procedure of Hansen (1999).

Our panel fixed effect threshold estimation results suggest that international financial integration provides a data-driven estimated threshold for the effect of international financial integration on income inequality. Accordingly, the inequality-increasing effect of international financial integration is lower in financially more integrated emerging market and developing economies. In advanced economies, we find that inequality decreases with international financial integration in less financially integrated observations. This appears to be driven by the joint effects of both capital inflows (liability flows) and outflows (asset flows) in advanced economies, albeit it is determined by capital inflows in emerging markets and developing economies. We also find that financial development provides an endogenously estimated threshold for the effect of international financial integration on income inequality in emerging markets and developing economies. Our results suggest that inequality increasing effect of international financial integration is much lower in economies with more financially developed.

The plan for the rest of this paper is as follows. The following section presents a brief review of the related literature. Section 3 introduces the data and provides some key stylized facts. Section 4 presents our estimation results. In this section, we first maintain that the impact of international financial integration on inequality may vary with the level of international financial integration. We then proceed with the alternative case that financial development provides an endogenous threshold for the impact of international financial integration on inequality. Finally, Section 5 presents an evaluation of our main findings and provides some policy suggestions.

2. A brief review of the literature

There is now a large and growing number of studies empirically investigating the causes of inequality. The literature often considers financial development (Demirguc-Kunt and Levine 2009; Thornton and Di Tommaso 2020), real GDP (Hailemariam et al. 2021; Cerra et al. 2021), capital inflows and international financial integration (Furceri and Ostry 2019; Eichengreen et al. 2021), trade openness (Furceri and Ostry 2019), education and human capital (Jaumotte et al. 2013), technology (Aghion et al. 2019), institutional structure and governance (Eichengreen et al. 2021) as the main determinants of income inequality. Cerra et al. (2021) provides a recent survey of the related literature.

Financial development may increase the availability and use of financial services by broader segments of the population and thus may lead to narrowing inequality. In contrast to such an extensive margin impact, financial development may also operate on the intensive margin by enhancing the use of financial services by the richer segments of the population (Demirguc-Kunt and Levine 2009). According to the extensive margin explanation, higher financial development appears to decrease inequality, although the intensive margin argument suggests otherwise. Extensive margin explanation is consistent with the theoretical contributions by Galor and Moav (2004), stressing the positive impact of financial development on human capital accumulation leading to a decrease in inequality along with the earlier empirical contributions by Beck et al. (2007). The more recent studies, including Jaumotte et al. (2013), Thornton and Di Tommaso (2020), Hailemariam et al. (2021) and Gomado (2024), report similar findings. Cihak and Sahay (2020), on the other hand, finds that there is an inverted-U relationship between inequality and financial depth such that financial deepening is associated with lower inequality, but only up to a point, after which inequality rises. The results by Brei et al. (2023), however, suggest the existence of a U-shaped relationship between financial development and inequality.

The relationship between financial development and inequality may be conditional on institutional quality and governance (Rajan and Zingales 2003). Kim and Lin (2011) maintains that financial development itself provides a threshold such that the benefits of it on income distribution occur only after the country reaches a certain level of threshold. According to De Hann and Strum (2017), banking development raises income inequality irrespective of the quality of political institutions. Gravina and Lanzafame (2021) find that financial development increases income inequality in emerging market economies. The results by Roine and Waldenström (2015) provide support for the argument that stronger democracy is associated with lower top-income shares and, thus, lower inequality.

Capital flows have often been found among the main determinants of real income cycles and growth in EMDE, as suggested by the seminal contribution of Calvo et al. (1996) and recent studies, including Erdem and Özmen (2015) and Eichengreen et al. (2021). The recent two decades have witnessed a dramatic increase in capital flows and international financial integration (IFI), *de facto* financial openness, both in advanced and emerging market and

developing economies. Guichard (2017) reports that gross capital inflows (as a % of world GDP) increased from 60% in the second half of the 1990s to 180% in 2007. Liu et al. (2023) finds that income inequality rises with capital inflows and falls with capital outflows, primarily driven by changes in the labor income share of entrepreneurs. IFI, or *de facto* financial openness, is measured as the sum of international assets and liabilities over GDP (Lane and Milesi-Feretti 2018). The literature often maintains capital inflows as one of the basic determinants of inequality. According to Beck et al. (2007) and Gravina and Lanzafame (2021), financial openness and IFI may lead to higher growth, increase the incomes of the poor, and decrease income inequality, especially in EMDE. The study by Lang and Tavares (2024) finds that globalization yields positive but diminishing returns with benefits declining and distributional costs increasing over time. The more recent literature, however, often provides mixed results on the inequality impact of capital inflows. Jaumotte et al. (2013), Furceri and Ostry (2019), Erauskin and Turnovsky (2019), and Eichengreen et al. (2021) all find that inequality increases with financial globalization both in AE and EMDE. Higher *de facto* financial openness (IFI) is associated with an increase in income inequality also in developing countries (Li and Su 2021). This appears to be the case, particularly for less democratic countries (Kim et al. 2021). According to Jaumotte et al. (2020), financial globalization appears to benefit mainly the richest 20 percent of the population. In the same vein, higher *de jure* financial openness (Chinn and Ito 2008) leads to higher inequality by raising the share of the richest income deciles (Eichengreen et al. 2021). The distributional effects of capital account liberalization may be conditional on the level of financial development. Furceri and Loungani (2018), for instance, finds that the inequality-increasing impact of higher *de jure* financial openness tends to be significantly smaller in countries with stronger levels of financial development. A more recent study by You et al. (2024) suggests that macroprudential policies and capital controls may reduce income inequality.

Economic growth may be expected to be inclusive to bring higher welfare to the whole population and consequently to decrease income inequality. This is consistent with an interpretation that "a rising tide lifts all the boats" (Stiglitz 2015). The recent studies, however, often report the reverse. Hailemariam et al. (2021), for instance, finds that an increase in real GDP per capita leads to an increase in income inequality. Similarly, economic growth is pro-rich and causes an increase in top-income inequality, especially for the episodes of above-average growth (Roine and Waldenström 2015). According to Madni and Anwar (2021), GDP growth increases inequality if institutional quality measured by country risk of the International Country Risk Guide (ICRG) is lower than an estimated threshold level.

Better education allowing also poorer segments of the population to be engaged in higher-skill activities and consequently leads to an expectation that higher human capital may decrease inequality. Consistent with such an interpretation, Jaumotte et al. (2013) finds that inequality decreases with higher human capital (hc) proxied by years of schooling (Feenstra et al. 2015). According to Gregorio and Lee (2002), education plays a significant role in making income distribution more even. In the same vein, Hailemariam et al. (2021) reports that educational

attainment significantly reduces top-income inequality. The evidence reported by Eichengreen et al. (2021) suggests that higher educational attainment is associated with less inequality.

This paper aims to contribute to the literature by investigating the relationship between international financial integration and income inequality in advanced (AE) and emerging market and developing economies (EMDE). To examine the association between these variables, we consider the effects of real income per capita, human capital, financial development, and institutional quality and governance. In contrast to the bulk of the literature, we maintain that the effect of international financial integration on inequality may not be linear. In this vein, we suggest that the sensitivity of inequality to international financial integration may change depending on the level and composition of international financial integration. Furthermore, consistent with the intensive/extensive margin explanations, we maintain that the relationship between international financial integration and inequality may vary with the level of financial development. Based on all these arguments, we consider the potential thresholding effects of international financial integration and its main components, along with financial development, to explain the association between international financial integration and inequality.

3. The data

This paper investigates the relationship between financial globalization and income inequality in 24 advanced[4] (AE) and 52 emerging market and developing economies[5] (EMDE) during the 1996-2019 period. Our measure of income inequality is the GINI index of post-tax income inequality, and the data are from Standardized World Income Inequality Database (Solt 2020). GINI index varies between 0 and 100 with higher values represent greater income inequality. Cerra et al., (2021) provides a discussion on alternative measures of inequality. We consider international financial integration (IFI) as a measure of *de facto* financial globalization. The data for IFI are from External Wealth of Nations database provided by Lane and Milesi-Ferretti (2018). IFI is measured as the sum of gross stocks of financial assets (purchases/sales of foreign financial assets by domestic residents) and liabilities (purchases/sales of domestic financial assets by foreign residents).

To examine the relationship between financial globalization represented by IFI and income inequality, we consider the effects of real income per capita, human capital, financial development, and institutional quality and governance. The data for real income per capita are taken from World Development Indicators, World Bank. Human capital is measured as the years of schooling and returns to education, and the data are taken from Penn World Table

[4] AE sample includes Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom and United States.

[5] EMDE sample contains Argentina, Bangladesh, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Croatia, Czechia, Dominican R., Ecuador, Egypt, El Salvador, Estonia, Fiji, Honduras, Hungary, India, Indonesia, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Latvia, Lithuania, Malaysia, Mexico, Moldova, Morocco, Niger, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Romania, Russia, Slovak R., Slovenia, South Africa, South Korea, Sri Lanka, Sudan, Thailand, Turkey, Uganda, Ukraine, Uruguay and Venezuela.

database (Feenstra et al. 2015). Human capital data change between 1.00 and 4.35 with higher values representing more educated labor. The data for financial development are from financial development index database by Svirydzenka (2016). Financial development is measured as the depth, access, and efficiency of financial markets and institutions. Financial development data vary between zero and one, with higher values representing better financial development. World Bank, Worldwide Governance Indicators database provides information for voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption. In a similar vein to Kose et al. (2009), we consider the standardized version of the simple average of these six components to represent governance. Thus, our governance variable varies between zero and one, with higher values representing better governance.

Table 1. Main descriptive statistics

	GINI	Real Income per capita	HC	FD	GOV	IFI
	Whole Sample					
Mean	37.08	17893.5	2.803	0.445	0.375	323.76
SD	8.45	18598.6	0.589	0.244	0.889	554.19
CV	0.23	1.04	0.210	0.550	2.372	1.71
	Advanced Economies					
Mean	30.60	41206.4	3.210	0.728	1.392	720.47
SD	4.19	14582.4	0.372	0.129	0.361	853.29
CV	0.14	0.35	0.116	0.177	0.259	1.18
	Emerging Market and Developing Economies					
Mean	40.07	7133.7	2.615	0.314	0.457	140.66
SD	8.25	6381.6	0.575	0.160	0.168	83.71
CV	0.21	0.89	0.220	0.509	0.367	0.595

Note: SD and CV are, respectively, the standard deviation and coefficient of variation computed as the standard deviation over the mean.

Table 1 presents the main descriptive statistics for our variables. The mean of income inequality (GINI) is around 31 for advanced (AE) and 40 for emerging market and developing (EMDE) economies, albeit the standard deviation and coefficient of variation are much higher for the EMDE sample. As compared to AE, the mean and standard deviation of real income per capita are substantially lower in EMDE. The mean of human capital (HC) is lower in EMDE than in AE, albeit the standard deviation and coefficient of variation are slightly higher for EMDE. Financial development (FD) tends to be much higher in AE than EMDE, whilst the standard deviation is almost the same in both country groupings. The institutional quality and governance (GOV) level is much higher in AE. As compared to AE, international financial integration (IFI) is substantially at a much lower level and less volatile in EMDE.

Figure 1. Evolution of income inequality

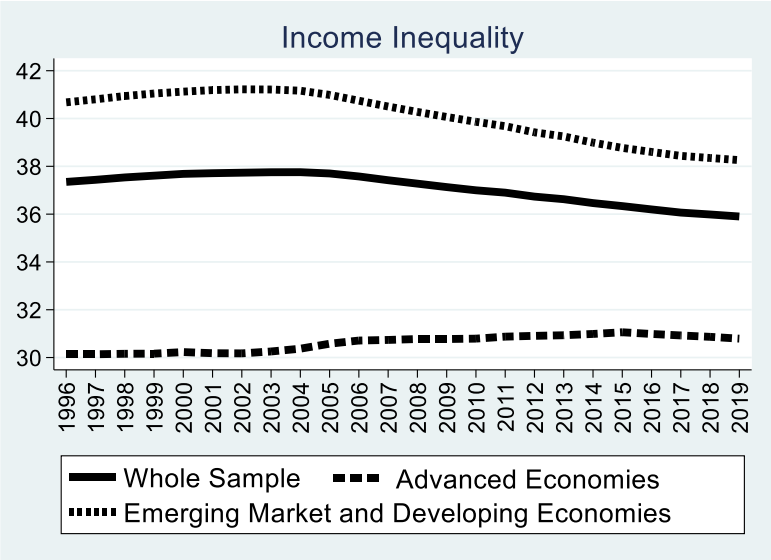
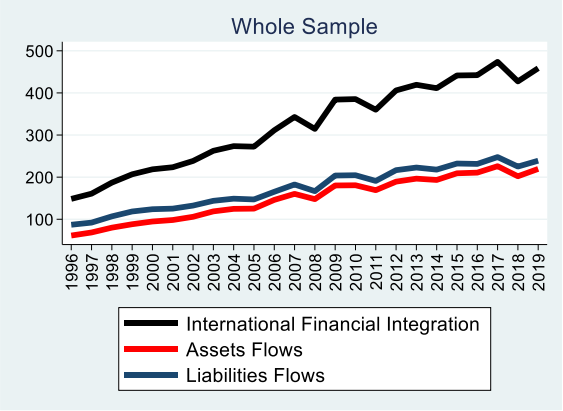
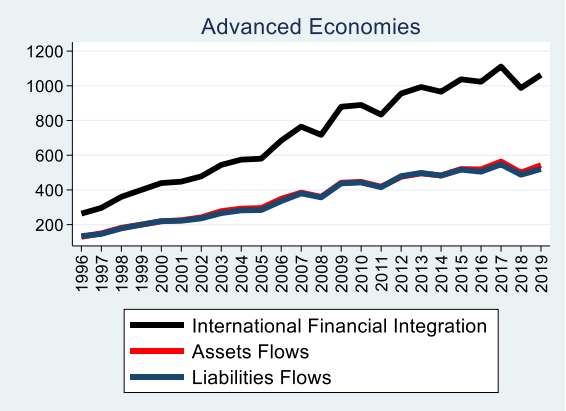


Figure 1 shows the trajectory of post-tax income inequality over time. In EMDE, post-tax income inequality increases slightly until the mid-2000s, after which it tends to decline. In contrast, income inequality appears to rise after the mid-2000s in AE.

Figure 2. Evolution of international financial integration and main components





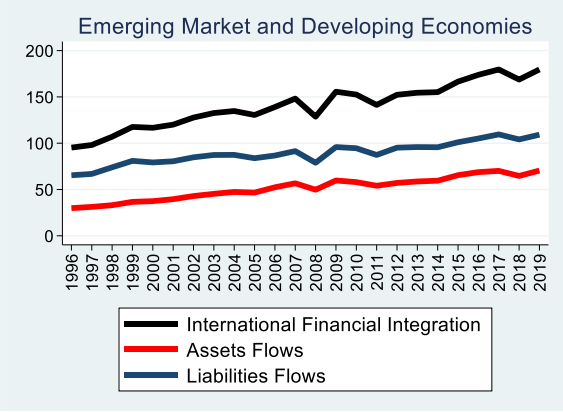


Figure 2 represents the evolution of international financial integration (IFI) and its main components, including asset and liability flows, all measured as a percentage of GDP. International financial integration appears to increase both in advanced and emerging markets and developing economies, albeit at a much higher rate in advanced countries. Additionally, liability flows are much higher than asset flows in emerging markets and developing economies, whereas there is no substantial difference between them in the sample of advanced economies.

Figure 3. Income inequality and international financial integration

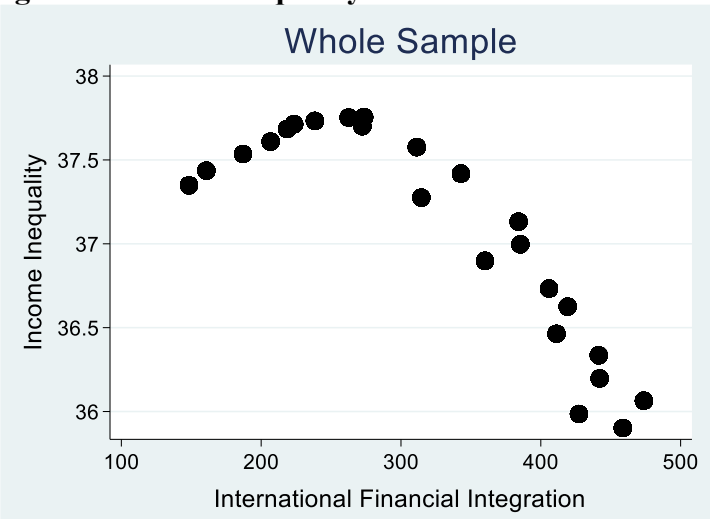


Figure 3 shows the scatter plot of income inequality and international financial integration for the whole sample. Accordingly, there is an inverted-U shaped relationship between income inequality and international financial integration in the whole sample. This pattern suggests that income inequality first increases and then decreases with international financial integration. The nonlinearity embedded in this figure clearly points to threshold-dependent relationship between income inequality and international financial integration. In line with this observation, we use international financial integration as the thresholding variable and apply the panel fixed effect threshold method to examine how its influence on income inequality changes across different integration levels.

4. Financialization and inequality: empirical methodology

To investigate the relationship between income inequality and international financial integration, we first consider the following equation:

$$GINI_{it} = \alpha_i + \alpha_1 y_{i,t-1} + \alpha_2 HC_{it} + \alpha_3 FD_{it} + \alpha_4 GOV_{it} + \alpha_5 IFI_{it}(IFI_{it} \leq \lambda) + \alpha_6 IFI_{it}(IFI_{it} > \lambda) + u_{it} \quad (1)$$

In equation (1), the subscripts i and t denote, respectively, country and time. GINI is the natural logarithm of GINI index of post-tax income inequality from Standardized World Income Inequality Database (Solt 2020). y is the natural logarithm of real GDP per capita in constant

local currency units. Kuznets (1955) maintains that income is both the cause and consequence of income inequality. Therefore, considering the potential endogeneity of real GDP, we prefer to use lagged real income in (1). HC is human capital index proxied by years of schooling and returns to education (Feenstra et al. 2015). FD is the domestic financial development index by Svirydzenka (2016), which considers both the size and liquidity of financial institutions and markets. FD lies between zero and one, with higher values denoting better financial development. Governance (GOV) is the average of six main components: voice and accountability, rule of law, political stability and no violence, government effectiveness, control of corruption, and regulatory quality (Kaufmann et al. 2010). The higher values represent better institutional quality and governance. Following Lane and Milesi-Ferretti (2018), *de facto* international financial integration (IFI) is measured as the sum of gross international liabilities and assets over GDP. The IFI data are from External Wealth of Nations database (Lane and Milesi-Ferretti 2018).

The nonlinearity and/or threshold issues are often tackled either by utilizing some interaction specifications or *ad hoc* sample-splitting methods by the bulk of the literature. As an alternative to these procedures, the potential thresholding effect of international financial integration (IFI) for the sensitivity of inequality to IFI may better be investigated by using endogenously estimated methods. The literature often does not consider the postulation that the effect of financial globalization on inequality may change depending on the level and the direction (non-resident driven liability flows and resident-driven asset flows) of IFI. In this context, we consider the level of international financial integration and its main components including capital inflows (non-resident driven liability inflows) and outflows (resident-driven asset flows) scaled by GDP in current US dollars, separately, to explain the nonlinear impact on inequality. To the best of our knowledge, this is the first study that investigates whether IFI and its main components provide data-driven estimated thresholds for the effect of IFI on inequality. We examine this important issue for a balanced panel of 24 advanced and 52 emerging market and developing economies by utilizing panel fixed effect threshold method of Hansen (1999).

In (1), λ is the data-driven estimated threshold. The value of the threshold divides the whole sample into the low and high regimes. For instance, if IFI $\leq \lambda$, the estimated parameter, α_5, shows the effect of international financial integration on inequality in the low regime, including less financially integrated observations. Otherwise, the estimated parameter, α_6, represents the impact of international financial integration on inequality in the high regime, including more financially integrated episodes. The low and high regimes are differentiated with different slope coefficients. If the estimated parameters α_5 and α_6 statistically equal to each other, then we suggest that there is no significant IFI threshold.

When testing the null hypothesis of no significant threshold, the parameter λ remains unidentified. To address this issue, Hansen (1999) proposes a bootstrap method to determine the asymptotic p-values of the F-test under the null hypothesis of no threshold effect. The panel threshold method begins by eliminating fixed effects through de-meaning the country-specific

effects. The de-meaned data is then sorted in ascending order based on the threshold variable. After trimming the smallest and largest 5% of the observations, a grid search is conducted by considering each observation as a potential threshold candidate. For each candidate, panel least squares method is applied to the de-meaned sample, with the threshold selected as the one that minimizes the sum of squared residuals. Yu and Phillips (2018) show that "both the threshold point and the threshold effect parameters are identified without the need for instrumentation" (p.50). Consequently, our estimations may be interpreted as valid even under the potential endogeneity of the thresholding variables.

4.1. Financialization and inequality: IFI and its main components as thresholds

We first start with the investigation of whether international financial integration (IFI) provides data-driven estimated threshold for the effect of IFI on inequality. In this vein, we estimate eq. (1). Table 2 presents the panel fixed effect threshold estimation results.

According to the results in Table 2, IFI provides data-driven estimated threshold[6] for the effect of IFI on inequality. Endogenously estimated threshold level of IFI is around 580 in the whole sample, 400 in advanced economies and 200 in emerging market and developing economies. As compared to the main descriptive statistics provided by Table 1, IFI threshold level is much lower than the mean in advanced economies, albeit much higher than the mean in emerging market and developing economies. The effect of IFI on inequality for the whole sample is around 0.41 in the low regime, including less financially integrated observations, while it is estimated as 0.09 in the high regime containing more financially integrated episodes. This may imply that the inequality-increasing effect of IFI is substantially much lower in economies with more financially integrated. This pattern is almost the same in emerging markets and developing economies. However, IFI tends to diminish inequality in less financially integrated advanced economies. The result for less financially integrated advanced economies may imply that an increase in financial integration can lead to improved access to finance for a broader segment of the population which reduces inequality.

Income inequality tends to increase with higher real income per capita in advanced and emerging markets and developing economies. This finding contrasts with the view that economic growth is inclusive and thus brings higher welfare to all sections of the economy, leading to a decrease in income inequality. Stiglitz (2015) interprets such situation as "a rising tide lifts all the boats". According to our results, "the rising tide appears to lift the large yachts, and many of the smaller boats are left dashed on the rocks" (Stiglitz 2015, p. 134). However, this does not necessarily downplay the crucial importance of growth-enhancing policies for improvements in social welfare. There is a negative and significant relationship between human capital and inequality. Accordingly, human capital tends to lower inequality. This finding may imply that increasing access to education may provide more people with the opportunity to

[6] Our preliminary results (not reported to save the space but available on request) suggested not to reject the null hypothesis that two thresholds (three regimes) are insignificant for all the specifications considered in this paper. The trimming parameter for the Hansen procedure is set to be 0.05 at both ends of the threshold variable but our results are found to be robust for different plausible values.

improve their economic situation, lifting a larger portion of the population out of poverty and reducing the income gap. The effect of financial development on inequality is striking. An increase in financial development lowers income inequality in emerging markets and developing economies and the whole sample while increases in advanced economies. The empirical finding for emerging market and developing economies consistent with the extensive margin explanation indicating the availability and the use of financial services by broader segments of the population leading to diminishing inequality. The result for advanced economies, on the other hand, is consistent with the intensive margin explanations suggesting financial development enhances the use of financial services by the richer segments of the population. Better governance also tends to lower inequality in advanced economies. This may be related to an argument that better governance provides an environment where wealth and income are more evenly distributed leading to lower levels of inequality. However, improvements in governance may disproportionately benefit higher-income groups, leading to increased income inequality in emerging markets and developing economies as well as in the whole sample.

Table 2. IFI as threshold

	(1.1) Whole Sample	(1.2) AE	(1.3) EMDE
Threshold IFI	580.52***	412.19**	218.08*
$F_B[.]$	43.42 [0.00]	55.62 [0.03]	38.72[0.09]
$y_{i,t-1}$	-0.053	1.106**	1.140***
	(0.305)	(0.508)	(0.358)
HC_{it}	-4.461***	-0.591*	-7.060***
	(0.362)	(0.348)	(0.475)
FD_{it}	-3.337***	2.285***	-9.101***
	(0.865)	(0.721)	(1.226)
GOV_{it}	0.617**	-0.932***	0.600*
	(0.295)	(0.360)	(0.350)
IFI_{it} ($IFI_{it} \leq \lambda$)	0.408***	-0.257***	1.764***
	(0.054)	(0.038)	(0.180)
IFI_{it} ($IFI_{it} > \lambda$)	0.091***	0.002	1.138***
	(0.013)	(0.008)	(0.118)
Constant	50.646***	20.19***	46.48***
	(2.699)	(4.820)	(3.221)
R-squared	0.208	0.152	0.353
# of Observations	1748	552	1196
# of Countries	76	24	52
F-test [p-value]	72.92[0.00]	15.63[0.00]	103.42[0.00]

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

We also disaggregate international financial integration as assets (i.e., capital outflows) and liabilities (i.e., capital inflows) flows to better explain the driving mechanism of international financial integration on inequality. In this vein, we estimate the following equations:

$$\mathrm{GINI}_{it} = \alpha_i + \alpha_1 y_{i,t-1} + \alpha_2 \mathrm{HC}_{it} + \alpha_3 \mathrm{FD}_{it} + \alpha_4 \mathrm{GOV}_{it} + \alpha_5 \mathrm{Assets}_{it}(\mathrm{Assets}_{it} \leq \lambda) + \alpha_6 \mathrm{Assets}_{it}(\mathrm{Assets}_{it} > \lambda) + u_{it} \quad (2)$$

$$\mathrm{GINI}_{it} = \alpha_i + \alpha_1 y_{i,t-1} + \alpha_2 \mathrm{HC}_{it} + \alpha_3 \mathrm{FD}_{it} + \alpha_4 \mathrm{GOV}_{it} + \alpha_5 \mathrm{Liabilities}_{it}(\mathrm{Liabilities}_{it} \leq \lambda) + \alpha_6 \mathrm{Liabilities}_{it}(\mathrm{Liabilities}_{it} > \lambda) + u_{it} \quad (3)$$

In equations (2) and (3), λ represents, respectively, the threshold values of assets and liabilities. Table 3 presents the panel fixed effect threshold estimation results.

Table 3. Assets and liabilities as thresholds

	(2.1) Whole Sample	(2.2) AE	(2.3) EMDE	(3.1) Whole Sample	(3.2) AE	(3.3) EMDE
Threshold: Assets	141.91	181.09*	60.59			
F_B[.]	31.34[0.46]	51.16[0.07]	18.83[0.67]			
Threshold: Liabilities				61.04**	199.15**	61.04*
F_B[.]				63.56[0.04]	64.83[0.01]	36.83[0.07]
$y_{i,t-1}$	0.368	0.979*	1.187***	-0.148	1.445***	1.054***
	(0.314)	(0.510)	(0.367)	(0.303)	(0.503)	(0.355)
HC_{it}	-4.417***	-0.487	-6.982***	-4.410***	-0.764**	-6.853***
	(0.363)	(0.348)	(0.495)	(0.358)	(0.347)	(0.468)
FD_{it}	-2.366***	2.091***	-6.628***	-2.874***	2.056***	-8.036***
	(0.849)	(0.726)	(1.245)	(0.845)	(0.717)	(1.191)
GOV_{it}	0.417	-0.986***	0.657*	0.375	-0.326	0.418
	(0.295)	(0.360)	(0.361)	(0.293)	(0.363)	(0.346)
$Assets_{it}$ ($Assets_{it} \leq \lambda$)	-0.736***	-0.595***	-0.693			
	(0.164)	(0.089)	(0.518)			
$Assets_{it}$ ($Assets_{it} > \lambda$)	0.125***	0.005	0.727***			
	(0.027)	(0.017)	(0.272)			
$Liabilities_{it}$ ($Liabilities_{it} \leq \lambda$)				-1.841***	-0.594***	-0.485
				(0.255)	(0.078)	(0.395)
$Liabilities_{it}$ ($Liabilities_{it} > \lambda$)				0.143***	-0.005	1.243***
				(0.025)	(0.016)	(0.185)
Constant	46.46***	21.47***	47.14***	52.22***	16.38***	47.91***
	(2.790)	(4.852)	(3.314)	(2.691)	(4.752)	(3.193)
R-squared	0.203	0.151	0.317	0.219	0.167	0.364
# of Countries	76	24	52	76	24	52
# of Observations	1748	552	1196	1748	552	1196
F-test [p-value]	70.64[0.00]	15.47[0.00]	88.13[0.00]	77.69[0.00]	17.45[0.00]	108.70[0.00]

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

According to the results in Table 3, asset flows provide a data-driven estimated threshold for the effect of assets (capital outflows) on inequality in advanced economies. The endogenously estimated threshold level of assets is around 180. The effect of assets on inequality is negatively significant in the low regime. Liability flows (capital inflows) also provide data-driven estimated thresholds for the effect of liability flows on inequality. The endogenously estimated threshold level of liability flows is around 60 in the whole sample and emerging market and developing economies and 200 in advanced economies. Liability flows tend to lower income inequality in the low regime while they appear to increase it in the high regime for the whole sample. The results by eq. (3.2) indicate that liability flows are negatively related to income inequality in the low regime albeit they are positively associated with income inequality in the high regime of eq. (3.3). These empirical findings imply that an increase in liability flows lower inequality in advanced economies with less capital inflows. Liability flows, on the other hand, lead to an increase in income inequality in emerging markets and developing economies with more capital inflows. These findings may be related to the argument that low levels of financial development, briefly summarized in Table 1, can hinder the equitable allocation of capital inflows in emerging market and developing economies, thereby disproportionately supporting the economic activities of wealthier segments of the population.

4.2. Financialization and inequality: financial development as threshold

We are now investigating whether the distributional effect of international financial integration may change with the level of financial development. According to the extensive margin explanation, financial development may lower inequality by increasing the availability and use of financial services by broader segments of the population. The literature including Jaumotte et al. (2013), Thornton and Di Tommaso (2020) and Hailemariam et al. (2021) provides an empirical support to this argument. Under the extensive margin argument, the effect of international financial integration on inequality may not be the same in economies with low and high levels of financial development. Even, financial development may provide a data-driven estimated threshold to explain the relationship between international financial integration and inequality. To this end, we estimate the following equation:

$$GINI_{it} = \alpha_i + \alpha_1 y_{i,t-1} + \alpha_2 HC_{it} + \alpha_3 FD_{it} + \alpha_4 GOV_{it} + \alpha_5 IFI_{it}(FD_{it} \leq \lambda) + \alpha_6 IFI_{it}(FD_{it} > \lambda) + u_{it} \quad (4)$$

In eq. (4), λ is the financial development (FD) threshold that divides the whole sample as the low and high regimes. The low regime includes observations with less financial development while the high regime contains more financially developed episodes. Panel fixed effect threshold estimation results of eq. (4) are presented in Table 4.

Table 4. Financial development as threshold

	(4.1) Whole Sample	(4.2) AE	(4.3) EMDE
FD Threshold	0.15***	0.91	0.15*
F_B[.]	166.76[0.00]	8.52[0.82]	72.60[0.06]
$y_{i,t-1}$	0.128***	1.037*	1.132***
	(0.029)	(0.530)	(0.352)
HC_{it}	-3.766***	-0.374	-6.262***
	(0.351)	(0.363)	(0.475)
FD_{it}	-1.394*	2.262***	-6.307***
	(0.820)	(0.772)	(1.211)
GOV_{it}	0.680**	-0.839**	0.830**
	(0.284)	(0.374)	(0.345)
IFI_{it} ($FD_{it} \leq \lambda$)	2.294***	0.010	2.320***
	(0.175)	(0.008)	(0.199)
IFI_{it} ($FD_{it} > \lambda$)	0.065***	0.114***	0.682***
	(0.013)	(0.037)	(0.114)
Constant	46.159***	19.70***	44.64***
	(2.626)	(5.029)	(3.185)
R-squared	0.261	0.081	0.372
# of Countries	76	24	52
# of Observations	1748	552	1196
F-test [p-value]	97.91[0.00]	7.70[0.00]	112.29[0.00]

*Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1*

Accordingly, financial development provides a data-driven estimated threshold for the effect of international financial integration on inequality in the whole sample. The threshold level of financial development is estimated at 0.15 which is much lower than the mean as reported by Table 1. This threshold level is almost the same in the sample of emerging market and developing economies. Apparently, financial development does not constitute a data-driven estimated threshold in advanced economies. This may not be surprising because financial development is already at a higher level as briefly presented in Table 1. International financial

integration tends to be positively associated with inequality in both regimes, albeit it is substantially much lower in the high regime including more financially developed observations. This empirical result is consistent with the findings by Furceri and Loungani (2018) stating that inequality increasing effect of *de jure* financial openness appears to be smaller in economies with better financial development. The rest of the estimated parameters are almost the same as our earlier findings.

5. Concluding notes

Financial globalization has increased substantially during the recent two decades in advanced and emerging markets and developing economies. This has rekindled the debate on the distributional effect of financial globalization. The literature provides mixed evidence on this important issue. This paper investigates the effect of *de facto* financial globalization proxied with international financial integration on income inequality in advanced and emerging markets and developing economies.

Our panel fixed effect threshold estimation results suggest that the relationship between international financial integration and inequality may change with the level of international financial integration. Accordingly, international financial integration tends to lower income inequality in advanced economies with less financially integrated. However, international financial integration promotes inequality in both regimes, albeit the inequality-increasing effect of financial integration is less severe in more financially integrated emerging market and developing economies. We also decompose international financial integration into capital inflows (liabilities) and capital outflows (assets) to investigate the driving mechanism of international financial integration on income inequality. Our empirical results reveal that the effect of financial integration on inequality is driven by the joint effects of capital inflows and outflows in advanced economies, although it is mainly determined by capital inflows in emerging market and developing economies. Finally, we allow financial development as thresholding variable to explain the effect of international financial integration on inequality. The findings illustrate that financial development does not constitute a data-driven estimated threshold in advanced economies since financial development is already at a higher level. In emerging market and developing economies, on the other hand, we find empirical evidence supporting a data-driven estimated threshold of financial development. Accordingly, the positive relationship between international financial integration and inequality diminishes in better financially developed episodes.

In this study, we reveal that the effects of international financial integration on income inequality in advanced economies are different than those in emerging markets and developing economies. This finding may not be surprising since the stage and the development level of financial integration and so the relation with income inequality may vary in these economies. Hence, this highlights the importance of applying well-established policy instruments while considering each country's level and process of financial integration, enabling policymakers to

optimize the social benefits of financial markets. Hence, policymakers should regulate capital flows to foster healthier financial markets while minimizing their adverse effects on inequality.

In advanced economies, where both capital inflows and outflows drive the inequality effects of financial integration, strengthening financial market regulations and enhancing transparency in cross-border financial activities are essential. In emerging market and developing economies, capital flow management policies, enhanced financial inclusion and well-sequenced financial liberalization are key to mitigating the inequality-enhancing effects of capital inflows. Strengthening financial development in these countries also reduces the adverse impact of financial integration on income distribution. These differentiated strategies underscore the need for tailored financial integration policies aligned with each country group's structural characteristics and level of financial development.

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