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FINANCIALIZATION AND INCOME INEQUALITY

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ABSTRACT

This study aims to explore the nonlinear impact of financial integration on income inequality during the period of 1996-2019. To this end, we apply data-driven panel fixed effect threshold procedure of Hansen (1999) for the set of advanced economies (AE) and emerging market and developing economies (EMDE) including MENA countries. Our 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 AE, albeit this positive relation diminishes in more financially integrated episodes. In EMDE, inequality decreases with IFI in less financially integrated episodes while increasing in more financially integrated observations. We also decompose IFI into capital inflows and capital outflows. 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. The empirical findings suggest that the inequality-increasing effect of IFI is much lower in financially more developed episodes in EMDE. These results 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 Classification: F41, F62, I30, O15

1. Introduction

Income inequality (inequality) has been growing within the countries. For instance, it has been 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 (IMF, 2020). Inequality is often associated with higher social costs, lower growth, poorer health, and higher instability (Stiglitz, 2013; Nolan and Valenzuela, 2019; Ostry et al., 2019). 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 (Jaumatte 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; Coady and Diziol, 2018), 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, 2003). Furthermore, we also take into account not only capital inflows (liability flows) but also 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 structuralist view including Nurkse (1953), Myrdal (1957), and Lewis (1977), on the other hand, suggests that capital controls tend to reduce inequality by impeding the

movement of domestic savings to foreign countries. The theoretical model results by Matsuyama (2004) 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. Cabral et al. (2016) reports that the effect of financial globalization on inequality often operates by either foreign direct investment (FDI) or equity flows. Asteriou et al. (2014) finds that FDI flows, capital account openness, and stock market capitalization are the main driving forces of inequality.

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 Lee et al. (2019) indicate that the effect of trade globalization on inequality is almost negligible, especially for the sample of advanced economies (Dorn et al., 2018). The cointegration-based results by Shin and Lee (2019) suggest that neither financial globalization nor financial development affects inequality. Bergh and Nilsson (2010) finds that both trade globalization and economic freedom are positively associated with inequality. Daisaka et al. (2014) states that financial imperfections amplify inequality by decreasing the capital rental rate, which provides benefits for borrowers while causing difficulties for lenders.

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), Law et al. (2014), 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. Law et al. (2014) finds that financial development reduces inequality only after a certain threshold level of institutional quality is achieved. 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 an estimated threshold level.

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 effects threshold procedure of Hansen (1999).

Our panel fixed effects 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 much lower in financially more integrated advanced economies. In emerging markets and developing economies, we find that inequality decreases with international financial integration in less financially integrated observations while increasing in more financially integrated episodes. 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 (Pi and Zhang, 2018; 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 on the drivers of inequality.

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 Clarke et al. (2006) and Beck et al. (2007). The more recent studies, including Jaumotte et al. (2013), Thornton and Di Tommaso (2020), and Hailemariam et al. (2021), 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 relationship between financial development and inequality may be conditional on institutional quality and governance (Rajan and Zingales, 2003). Law et al. (2014) finds that financial development reduces inequality only after a certain threshold level of institutional quality is achieved. 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 threshold level. According to De Hann and Strum (2017), banking development raises income inequality irrespective of the quality of political institutions. 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 (AE) and EMDE. 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. 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), financial openness and IFI may lead to higher growth, increase the incomes of the poor, and decrease income inequality, especially in EMDE. 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 (Furceri et al., 2020; 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.

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, Roine et al. (2009) shows that economic growth is pro-rich and thus causes an increase in top-income inequality. This appears to be the case, 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 on 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. In this context, we employ panel fixed effects threshold estimation procedure by Hansen (1999).

3. The Data

This paper investigates the relationship between financial globalization and income inequality in 24 advanced economies[1] (AE) and 52 emerging market and developing economies[2] (EMDE) during the 1996-2019 period. Our measure of income inequality is the GINI index of pre-tax income inequality, and the data are from Standardized World Income Inequality Database (Solt, 2020). 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

[1] 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.

[2] 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.

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 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 obtained 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	46.64	18287.5	2.806	0.446	0.586	326.38
SD	5.64	18807.5	0.586	0.243	0.406	552.93
CV	0.12	1.03	0.209	0.545	0.406	1.69
	Advanced Economies					
Mean	47.82	41487.5	3.202	0.721	0.855	712.66
SD	3.35	14407.3	0.368	0.131	0.095	840.71
CV	0.07	0.35	0.115	0.182	0.111	1.18
	Emerging Market and Developing Economies					
Mean	46.07	7133.7	2.615	0.314	0.457	140.66
SD	6.39	6381.6	0.575	0.160	0.168	83.71
CV	0.14	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 47 for advanced (AE) and emerging market and developing (EMDE) economies, albeit the standard deviation and coefficient of variation are slightly 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 a much higher level 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 and less volatile 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

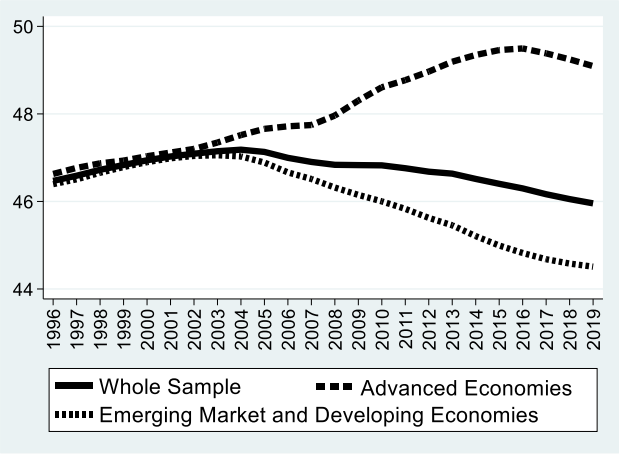

Figure 1 shows the trajectory of income inequality over time. Until the 2000s, income inequality is almost the same in advanced (AE) and emerging market and developing economies (EMDE). However, post-2000, a divergent trend is observed: income inequality increases in AE, while it declines in EMDE for the rest of the period.

Figure 2: Evolution of International Financial Integration and Main Components

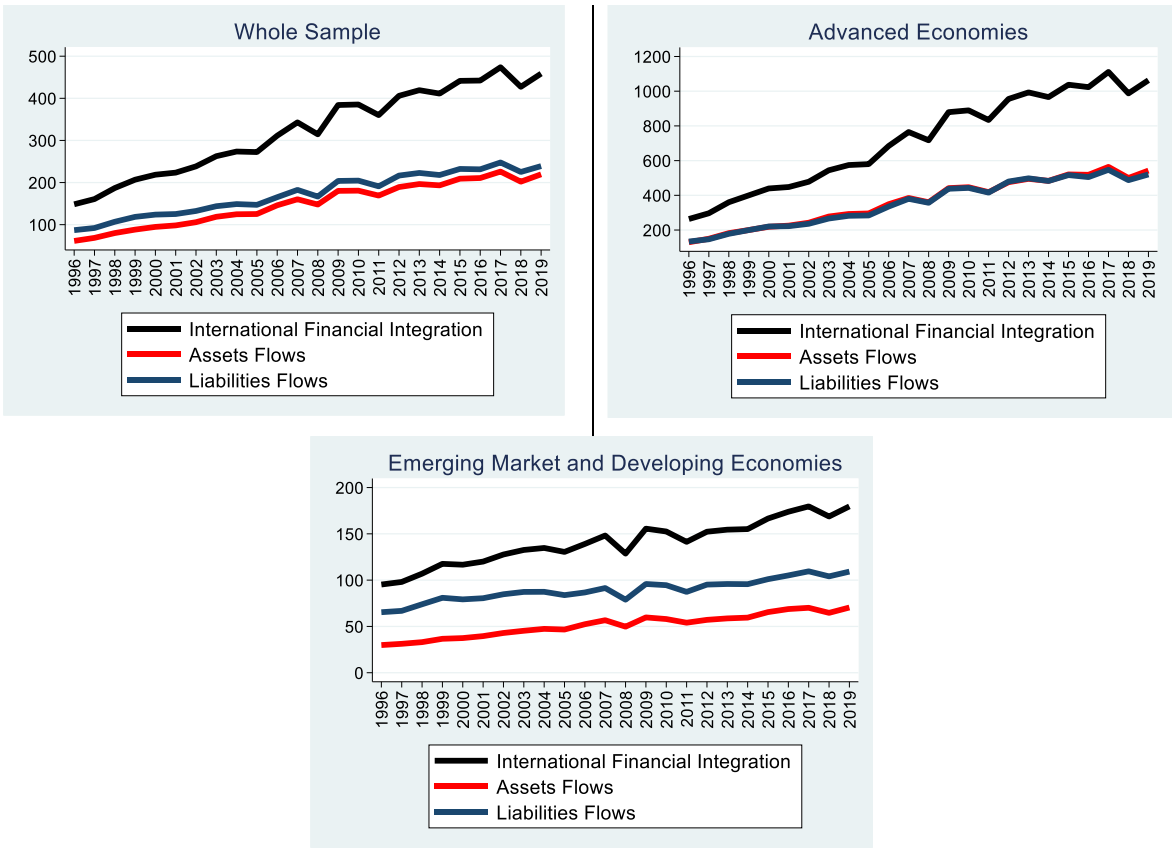

Figure 2 represents the evolution of international financial integration and its main components, including asset and liability flows, all measured as a percentage of GDP. International financial integration appears to increase in both advanced and emerging market and developing economies, albeit at a much higher rate in advanced countries. Additionally, liability flows are much higher than asset flows in emerging market 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

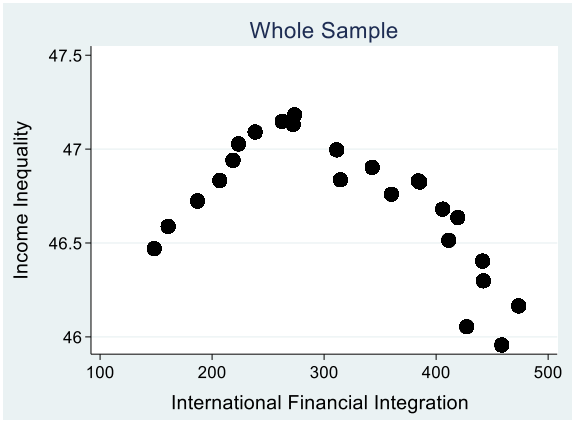

Figure 3 shows the scatter plot of income inequality and international financial integration for the whole sample. Accordingly, there is an inverted-U shaped relationship between income

inequality and international financial integration in the whole sample. This pattern suggests that income inequality first increases and then decreases with international financial integration.

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 pre-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 standardized value of 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 index is between zero and one, with higher values representing better institutional quality and governance. Following Lane and Milesi-Ferretti (2003), *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 which suggest that the threshold is exogenous 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 effects 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 methodology begins by eliminating fixed effects through de-meaning the country-specific effects. The de-meaned data is then sorted in ascending order according to the threshold variable. After trimming the smallest and largest 5% of the observations, a threshold search is conducted by considering each observation as a potential candidate. For each candidate, panel least squares method is applied to the de-meaned sample, with the threshold being the one that minimizes the sum of squared residuals. Yu and Phillips (2018) shows 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 effects threshold estimation results.

According to the results in Table 2, IFI provides data-driven estimated threshold[3] for the effect of IFI on inequality. Endogenously estimated threshold level of IFI is around 580 in the whole sample, 695 in advanced economies and 87 in emerging market and developing economies. As compared to the main descriptive statistics provided by Table 1, IFI threshold level is almost the same with the mean in advanced economies, albeit slightly lower than the mean in emerging market and developing economies. The effect of IFI on inequality for the whole sample is around 0.54 in the low regime, including less financially integrated

Table 2: IFI as Threshold

	(1.1) Whole Sample	(1.2) AE	(1.3) EMDE
Threshold IFI	580.52*	694.92**	86.70*
F_B[.]	56.87 [0.08]	55.97 [0.04]	42.20 [0.09]
$y_{i,t-1}$	0.347	2.206***	1.451***
	(0.329)	(0.679)	(0.370)
HC_{it}	-3.251***	1.077**	-6.181***
	(0.390)	(0.469)	(0.489)
FD_{it}	-2.769***	1.478	-7.444***
	(0.934)	(0.993)	(1.259)
GOV_{it}	-0.162	-3.404***	0.171
	(0.318)	(0.480)	(0.360)
IFI_{it} ($IFI_{it} \leq \lambda$)	0.540***	0.378***	-0.827***
	(0.059)	(0.045)	(0.276)
IFI_{it} ($IFI_{it} > \lambda$)	0.151***	0.076***	0.656***
	(0.014)	(0.011)	(0.117)
Constant	52.14***	22.56***	47.67***
	(2.913)	(6.426)	(3.348)
R-squared	0.121	0.385	0.248
# of Observations	1748	552	1196
# of Countries	76	24	52
F-test [p-value]	38.16[0.00]	54.55[0.00]	62.70[0.00]

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

observations, while it is estimated as 0.15 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 advanced economies. However, IFI tends to diminish inequality in less financially integrated emerging market and developing economies while promoting inequality in more financially

[3] 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.

integrated observations. The result for less financially integrated emerging market and developing 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. On the other hand, in more financially integrated emerging market and developing economies, financial integration tends to increase inequality due to the benefits of financial integration, including access to foreign investment and financial services may be concentrated among wealthier individuals, vulnerability to global financial market fluctuations may disproportionately affect poorer segment of the population and income polarization where the rich benefit more from global financial opportunities.

Income inequality tends to increase with higher real income per capita. This finding contrasts with a 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 (2016) 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 2016, p. 134). However, this does not necessarily downplay the crucial importance of growth-enhancing policies for improvements in social welfare. The effect of human capital on inequality is striking. Accordingly, human capital tends to increase inequality in advanced economies while lowering inequality in emerging market and developing economies. This finding may imply that the benefits of human capital disproportionately favor those who are already better off, thereby widening the income gap between the rich and the poor in advanced economies. In emerging market and developing economies, on the other hand, increasing access to education may provide more people with the opportunity to improve their economic situation, lifting a larger portion of the population out of poverty and reducing the income gap. An increase in financial development lowers income inequality in emerging market and developing economies and the whole sample. This empirical finding is 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. 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.

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 effects threshold estimation results.

Table 3: Assets and Liabilities as Thresholds

VARIABLES	(2.1) Whole Sample	(2.2) AE	(2.3) EMDE	(3.1) Whole Sample	(3.2) AE	(3.3) EMDE
Threshold: Assets	138.13	331.71*	35.48			
F_B[.]	42.85 [0.25]	51.06 [0.08]	12.70 [0.88]			
Threshold: Liabilities				294.55**	313.64*	63.69*
F_B[.]				82.44 [0.02]	42.46 [0.09]	37.96 [0.09]
$y_{i,t-1}$	0.873**	1.635**	1.820***	0.347	2.164***	1.564***
	(0.339)	(0.689)	(0.380)	(0.325)	(0.687)	(0.364)
HC_{it}	-3.209***	1.373***	-5.997***	-3.153***	1.279***	-6.031***
	(0.393)	(0.470)	(0.511)	(0.384)	(0.474)	(0.481)
FD_{it}	-1.610*	1.781*	-4.391***	-2.893***	1.634	-6.938***
	(0.918)	(0.998)	(1.296)	(0.920)	(1.015)	(1.225)
GOV_{it}	-0.401	-3.558***	0.0282	-0.210	-3.161***	0.0368
	(0.319)	(0.484)	(0.373)	(0.314)	(0.492)	(0.355)
$Assets_{it}$ ($Assets_{it} \leq \lambda$)	-0.860***	0.715***	2.830***			
	(0.176)	(0.0941)	(0.688)			
$Assets_{it}$ ($Assets_{it} > \lambda$)	0.225***	0.154***	0.687***			
$Liabilities_{it}$ ($Liabilities_{it} \leq \lambda$)				1.160***	0.688***	-0.552
				(0.104)	(0.097)	(0.387)
$Liabilities_{it}$ ($Liabilities_{it} > \lambda$)				0.300***	0.136***	1.120***
				(0.027)	(0.022)	(0.191)
Constant	46.97***	28.06***	42.20***	51.70***	22.05***	45.81***
	(3.010)	(6.562)	(3.450)	(2.882)	(6.495)	(3.280)
R-squared	0.112	0.373	0.204	0.139	0.366	0.266
# of Countries	76	24	52	76	24	52
# of Observations	1748	552	1196	1748	552	1196
F-test [p-value]	34.88[0.00]	51.85[0.00]	48.59[0.00]	44.66[0.00]	50.18[0.00]	68.64[0.00]

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 330. The effect of assets on inequality is positively significant both in the low and high regimes, albeit the magnitude of the estimated coefficient is substantially much lower in the high regime including observations with more capital outflows. 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 290 in the whole sample, 310 in advanced economies, and 60 in emerging market and developing economies. Accordingly, liability flows are positively associated with inequality in both regimes, albeit the inequality-increasing effect is less severe in the high regime including observations with more capital inflows. This pattern is almost the same in advanced economies. However, liability flows tend to enhance inequality in the high regime of emerging market and developing economies sample. These results may imply that both asset and liability flows are associated with increasing inequality, but the severity of this effect diminishes in economies with higher levels of these flows, particularly in advanced economies. However, in emerging market and developing economies, liability flows, especially in the high regime, tend to exacerbate inequality, most potentially due to weaker financial systems as briefly presented in Table 1.

4.2 Financialization and Inequality: Financial Development as Threshold

We now investigate 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 effects threshold estimation results of eq. (4) are presented in Table 4.

Table 4: Financial development as Threshold

VARIABLES	(4.1) Whole Sample	(4.2) AE	(4.3) EMDE
FD Threshold	0.15***	0.61	0.15*
F_B[.]	142.91 [0.00]	25.14 [0.34]	73.90 [0.07]
$y_{i,t-1}$	0.532*	0.565	1.640***
	(0.321)	(0.757)	(0.364)
HC_{it}	-2.512***	1.708***	-5.374***
	(0.382)	(0.477)	(0.491)
FD_{it}	-0.555	3.123***	-4.630***
	(0.894)	(0.986)	(1.251)
GOV_{it}	-0.134	-3.433***	0.319
	(0.310)	(0.494)	(0.356)
IFI_{it} ($FD_{it} \leq \lambda$)	2.360***	0.0317***	2.230***
	(0.190)	(0.0118)	(0.206)
IFI_{it} ($FD_{it} > \lambda$)	0.121***	0.127***	0.520***
	(0.014)	(0.018)	(0.118)
Constant	47.50***	38.06***	42.26***
	(2.862)	(7.304)	(3.288)
R-squared	0.163	0.351	0.268
# of Countries	76	24	52
# of Observations	1748	552	1196
F-test [p-value]	54.15[0.00]	47.09[0.00]	69.29[0.00]

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 as 0.15 which is slightly 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 with our earlier findings.

5. Concluding Notes

Financial globalization has increased substantially during the recent two decades in advanced and emerging market 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 market and developing economies during the 1996-2019 sample period.

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 promote income inequality in advanced and emerging market and developing economies. However, the inequality-increasing effect of financial integration is less severe in more financially integrated advanced economies. International financial integration appears to lower (increase) inequality in emerging market and developing economies with less (more) financial integration. We also decompose the 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 a data-driven estimated threshold for 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 periods.

In this study, we reveal that the impact of international financial integration on income inequality varies according to which country group set we are dealing with. That is, our findings illustrate 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 is not surprising since the stage and the development level of financial integration, and so the relation with income inequality might vary in those country sets. Hence, this reveals the

significance of application of the well-established policy instruments by policymakers by taking into account their countries' financial integration level and processes so that they can optimize the social benefits of financial markets. We also explain the importance of the direction of international financial integrations. Hence, policymakers should regulate the capital flows in order to achieve healthier financial market together with minimizing the adverse effect of it on different income level groups.

As the next step, it would be interesting to carry out a similar analysis by developing a different index measuring social inequality as an alternative to the GINI index since GINI index considers only the income level of households and ignores the social side of the story such as leisure time, social rights and so on. It could also be informative to carry out the analysis for the sub-component of financial markets since the market structures of the foreign direct investment and the portfolio investment of AE and EMDE groups, and even the countries within those groups may have different dynamics, and thus the way of impact on inequality might give different results.

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