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**CAPITAL ACCOUNT LIBERALIZATION AND INEQUALITY.  
THE ROLE OF SKILL LEVELS AND FINANCIAL DEPTH**

**Abstract.** Capital account liberalizations affect income inequality differently, depending on cross-country heterogeneities as well as on whether reforms are targeted at inflows or outflows. I provide evidence for this claim by following a difference-in-differences approach using a disaggregated index of capital account openness. While liberalizations with respect to FDI outflows reduce inequality in low income countries, FDI inflows aggravate disparities. The latter effect is decreasing in countries' average skill level. Moreover, lifting restrictions on financial credit inflows reduces inequality in both high and low-income countries and credit market depth reinforces this effect in the former group.

**Keywords.** Inequality, Capital account liberalization, Foreign direct investment, Credit

## 1. INTRODUCTION

The fall of the Bretton Woods system in the early 1970s, has led to a progressive repeal of capital controls. Since then, global financial flows have increased tremendously starting from less than 5 percent of global GDP in the 1980s and reaching 20 percent by 2007 (Arora *et al.* 2013). While liberalizations were partly motivated by the prospect of boosting growth through widened access to credit and profitable investment opportunities, it remains unclear whether the benefits have been shared equally among all members of society (Das and Mohapatra 2013). In fact, during the same time period, global income inequality embarked on its steadily rising path. This correlation has raised the question of whether capital account liberalizations are to blame for reversing the declining trend in inequality that had lasted for eight decades. The aim of this paper is to shed light on this controversy.

Specifically, I argue that the effect of liberalization policies on inequality varies by asset type and depends on whether they are aimed at inflows or outflows.



Furthermore, I highlight the importance of pre-existing cross-country heterogeneities in shaping the distributional impact of eliminating capital controls. I am interested in studying two asset types in particular with the goal of answering the following two research questions:

- How does the average skill level in a country affect the way in which foreign direct investment (FDI) shapes inequality?
- How does financial depth influence the extent to which credit inflow liberalizations translate into changes in inequality?

To motivate my empirical analysis exploring the first question, I extend a model on FDI inflows by Larrain (2015) by incorporating cross-country skill differentials as well as the possibility of FDI outflows. Assuming that advanced capital and skilled labor are complements, I hypothesize that FDI inflows increase inequality in developing countries, whereas outflows should reduce income discrepancies. Furthermore, both effects should decrease in the labor force's average skill level. The exact opposite effects are predicted to hold in high income countries.

To answer the second question I draw on a theoretical framework by Bumann and Lensink (2016) which demonstrates that facilitating foreign credit to enter a country only reduces inequality if financial depth is sufficiently high. However, I point out that the predictive power of this model fades in the presence of domestic financial risk.

To test these hypotheses, I make use of a newly published panel dataset by Fernández *et al.* (2015), which provides indices of capital account openness disaggregated by asset types. Following a modified difference-in-differences approach suggested by Larrain (2015), I compare changes in inequality for reforming countries pre- and post-liberalization with changes in nonreforming countries. Including various controls and estimating the relationship by fixed effects as well as Arellano-Bond GMM, the econometric analysis supports most of the predictions relating to low income countries: While FDI inflow liberalizations lead to a short term increase of the Gini index of 1.6-4 percent, FDI outflows reduce inequality by around 4 percent in the first year after liberalization. In the case of inflows, higher average skill levels succeed at mitigating the adverse distributional affects. Furthermore, financial credit liberalizations cause persistent reductions in the Gini coefficient but financial depth seems to increase rather than decrease inequality. For the sample of high income countries, the effects of liberalization are less clear-cut.



Overall, the analysis provides new evidence on the role of cross-country heterogeneities in shaping distributional responses after capital account openings. Most importantly, it highlights that reform-minded developing countries with low educational standards need to complement liberalizations with pre-emptive inequality decreasing measures.

The remainder of this paper is structured as follows: section 2 provides a short overview of the related literature. Section 3 presents the theoretical underpinnings for my analysis, laying the foundations for section 4 which describes the data, empirical methodology, results and policy implications. Finally, section 5 concludes.

## 2. REVIEW OF RELATED LITERATURE

This paper closely links to the existing literature which has attempted to identify the channels connecting capital account openness and inequality. Atkinson and Morelli (2011) suggest that opening up countries to global financial flows allows economic disturbances to be spread more easily. In particular, sudden stops of inflows can trigger recessions which tend to disproportionately affect the less wealthy. An alternative channel is highlighted by Jayadev (2007) who finds a negative correlation between the labor share in income and the degree of openness. He justifies his results by pointing at the possibility for firm owners to relocate production abroad, which presents a credible threat to workers who are more likely to tolerate lower wages as openness increases. Some studies have attempted to identify the effect of liberalizations with respect to specific asset types. Using FDI stocks as a percentage of GDP, Figini and Görg (2006) find that inward direct investment increases inequality in non-OECD countries but decreases disparities in OECD countries. Jaumotte *et al.* (2013) extend this analysis and add that outward flows also have an inequality decreasing effect on developed countries. Both studies use *de facto* measures of openness which have been criticized by Furceri and Loungani (2015) for suffering from endogeneity problems and for not reflecting purely policy-induced liberalizations. To remedy this issue, several researchers have adopted *de jure* measures of openness. The most widely used is the KAOPEN index developed by Chinn and Ito (2007) which relies on information published in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Two studies using this index are particularly relevant for my paper as they pay close



attention to the role of heterogeneities regarding financial depth and skill levels. The first is a paper by Bumann and Lensink (2016) which highlights that liberalizations are only successful at reducing inequality if financial depth is high, i.e. if the private credit to GDP ratio exceeds 25 percent. The second study, published by Larrain (2015), shows that liberalizations increase wage inequality most in industries in which capital is highly complementary to skilled labor. Both studies, by relying on the KAOPEN index, are neither able to identify liberalizations with respect to their respective assets of interest – financial credit and FDI – nor are they able to distinguish between effects on sending and receiving countries. Using the disaggregated Fernández *et al.* (2015) index allows me to overcome these shortcomings. Its granularity and wide coverage of countries enables me to contribute to the existing empirical research in the following ways: firstly, I can extend the analysis by Bumann and Lensink (2016) by distinguishing between financial and commercial credit liberalizations. Secondly, I can differentiate between the effects of FDI inflows and outflows while circumventing the endogeneity problems of de facto measures. Thirdly, I am able to expand the sample of Larrain (2015) who only studies the effect of FDI on inequality in European countries by including other developed as well as developing countries. Moreover, instead of looking at the role of cross-industry skill differentials within one country only, my analysis will focus on crosscountry differences in educational attainment. Through these extensions I am hoping to provide more complete guidelines of how to implement liberalizations in the most welfare enhancing way.

### 3. TWO ANALYTICAL FRAMEWORKS

#### *3.1 FDI liberalization in the presence of skill heterogeneities*

According to Larrain (2015), facilitating FDI inflows increases the demand for skilled labor leading to adverse distributional consequences. However, this view may be overly one-sided and the aim of this section is to extend Larrain's model in three dimensions. Firstly, instead of accounting only for distributional effects within receiving countries, consequences for sending countries will be explored. Secondly, allowing for pre-existing differences in average skill levels can help to derive more



nuanced policy implications in the context of between-country heterogeneities. Thirdly, by considering the possibility that incoming technology may require below-average skill levels, I can demonstrate that capital account openings possibly reduce inequality.

Assume that a country's production technology is described by  $y = f(l^s, l^u, k^s, k^u)$ , where  $l^s$  represents skilled labour and  $l^u$  unskilled labor. Furthermore, capital or machinery that needs to be operated by highly skilled workers is denoted by  $k^s$  ('skilled capital' from now on) whereas  $k^u$  stands for capital that requires no specific skills ('unskilled capital'). Denote the elasticity of substitution between the two types of capital and labor by  $\sigma_{i,j}$  where  $i \in \{k^s, k^u\}$  and  $j \in \{l^s, l^u\}$ . Following the 'capital-skill complementarity hypothesis' by Larrain (2015), one can state that skilled capital is more complementary to skilled than to unskilled labor and vice versa, i.e.  $\sigma_{k^s, l^u} > \sigma_{k^s, l^s}$  and  $\sigma_{k^u, l^s} > \sigma_{k^u, l^u}$  holds. Hence, it is assumed that unskilled workers have a comparative advantage in operating less advanced technology which, for example, could be due to their ability to tolerate repetitive tasks better than highly skilled workers. Labor markets are assumed to be perfectly competitive so that  $\frac{\partial f}{\partial l^u} = w_u$  and  $\frac{\partial f}{\partial l^s} = w_s$  with  $w_s > w_u$ . Furthermore, both types of labor are assumed to be supplied inelastically. Income inequality is measured as the ratio of skilled to unskilled wages  $\left(\frac{w_s}{w_u}\right)$  and capital and capital-skill complementarity implies that

$$\frac{\partial\left(\frac{w_s}{w_u}\right)}{\partial k^s} > 0 \text{ and } \frac{\partial\left(\frac{w_s}{w_u}\right)}{\partial k^u} < 0$$

In other words, a larger stock of skilled capital increases relative demand for skilled labor. Since workers get paid their marginal product,  $w_s$  increases in equilibrium and income inequality intensifies. The reverse effect occurs in response to increases in unskilled capital, i.e. unskilled wages rise and inequality falls.

In order to describe the effect of capital account liberalizations, I assume that each country imposes restrictions on direct investment flows. Let  $\theta^{in}$  and  $\theta^{out}$  measure the degree of legal restrictions on FDI inflows and outflows, respectively, where higher values of represent capital account openings with respect to FDI. Policymakers' choice of  $\theta$  is taken as exogenously given since distributional considerations are often absent when decisions on capital account liberalizations are made (Jayadev 2007). When a country opens up for inflows, both types of capital can enter more easily and as outflows are liberalized, both technologies can exit more freely, i.e.



$$k^h = k(\theta^{in}, \theta^{out}) \text{ with } \frac{\partial k^h}{\partial \theta^{in}} \geq 0 \text{ and } \frac{\partial k^h}{\partial \theta^{out}} \leq 0 \text{ where } h \in \{s, u\}.$$

Following Larrain (2015), the impact of capital account liberalization on inequality can be decomposed into a “complementarity effect” and a “capital effect”:

$$\frac{\partial \left( \frac{w_s}{w_u} \right)}{\partial \theta^g} = \underbrace{\frac{\partial \left( \frac{w_s}{w_u} \right)}{\partial k^h}}_{\text{Complementarity effect}} * \underbrace{\frac{\partial k^h}{\partial \theta^g}}_{\text{Capital effect}} \quad (1)$$

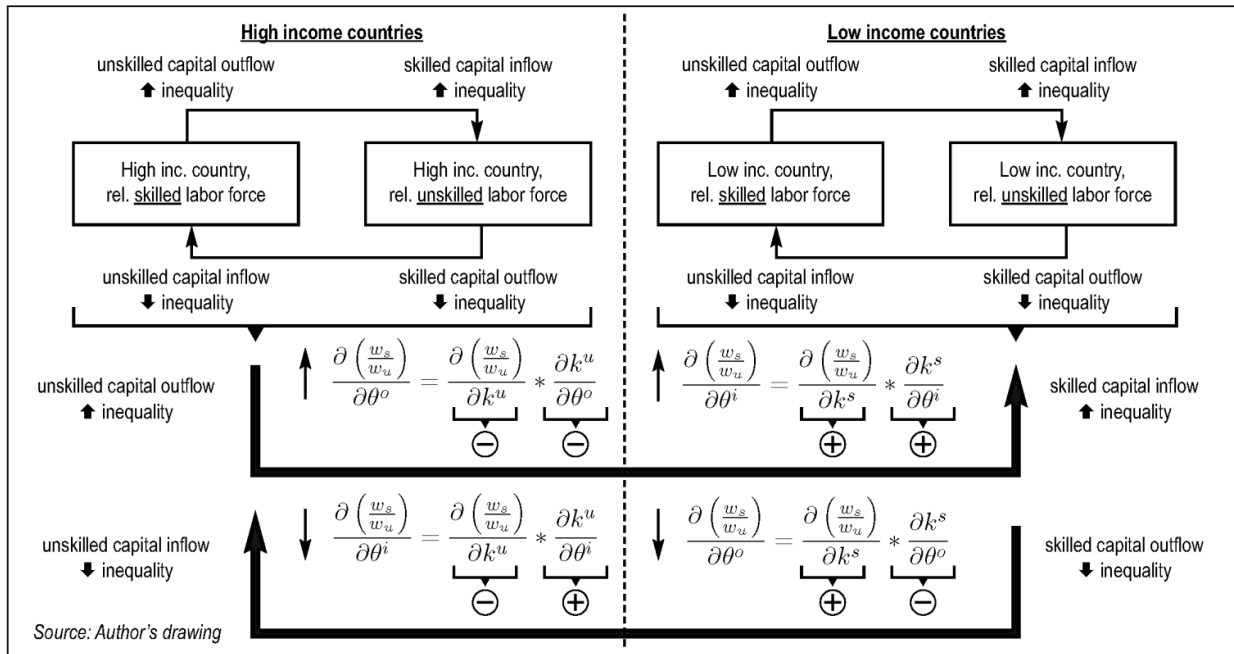
where  $g \in \{in, out\}$  and  $h \in \{s, u\}$ . The capital effect refers to the extent of capital deepening whereas the complementarity effect describes increases in the relative demand of skilled labor in response to capital deepening. Hence, one can distinguish between four different cases and their effects on inequality:

- 1) If the economy opens up for *inflows* (positive capital effect) and predominantly skilled capital enters (positive complementarity effect), inequality *increases* (i.e.,  $\frac{\partial \left( \frac{w_s}{w_u} \right)}{\partial \theta^g} > 0$ ).
- 2) If the economy opens up for *inflows* (positive capital effect) but predominantly unskilled capital enters (negative complementarity effect), inequality *decreases*.
- 3) If the economy opens up for *outflows* (negative capital effect) and predominantly skilled capital exits (positive complementarity effect), inequality *decreases*.
- 4) If the economy opens up for *outflows* (negative capital effect) but predominantly unskilled capital exits (negative complementarity effect), inequality *increases*.

These predicted effects on inequality are intuitive. The latter case, for example, describes a situation in which low skilled production is outsourced to a foreign country. As a result, unskilled domestic workers are left without a job which decreases their already low incomes even further and thus increases inequality. The type of capital that flows into and out of a country after liberalization depends on the relative skill levels of sending and receiving countries. Figure 1 illustrates this idea.



FIGURE 1 • FDI FLOWS AND THEIR EFFECT ON INEQUALITY BY INCOME GROUP AND SKILL LEVEL



For the sake of cohesion with the analysis conducted in the empirical section, a distinction is made between high and low income countries. The average skill level in high income countries is assumed to exceed the average skill level in the group of low income countries. As a result of this comparative advantage in operating technologically advanced capital, high income countries tend to experience FDI outflows of capital that requires low skills (symbolized by the upper one of the two thick arrows). In that case, inequality would increase in response to liberalization. On the other hand, ‘unskilled capital outflows’ from high income countries may present ‘skilled capital inflows’ for low income countries which increase inequality<sup>1</sup>. The opposite holds for FDI flows from poor to rich countries which are predicted to reduce inequality for countries in both groups (lower thick arrow). Besides between-income group FDI flows, liberalizations will also enhance flows across countries of the same income group, a claim which finds its empirical underpinnings in a study by UNCTAD (2015). Again, countries with higher educational standards will outsource unskilled production and will receive inflows that require below

<sup>1</sup> This assumption holds true if either the skill level in the most unskilled rich country exceeds the skill level in the most skilled poor country (unlikely) or if rich countries whose average skill level exceeds the one in poor countries, contribute equally to inflows into poor countries.



average skill levels. However, the latter presents relatively ‘skilled capital outflows’ for sending countries with an unskilled labor force. As a consequence, only for the most skilled high income country (on the far left) are all FDI inflows inequality decreasing and outflows inequality increasing. Similarly, only for the least skilled low income country (on the far right) should outflows unambiguously reduce inequality and inflows increase inequality. To summarize, two testable implications emerge:

**PROPOSITION 1:** Liberalizations with respect to FDI inflows (outflows) reduce (increase) inequality in *high income* countries on average and the effect is *increasing* in the labor force’s average skill level.

**PROPOSITION 2:** Liberalizations with respect to FDI inflows (outflows) increase (reduce) inequality in *low income* countries on average but the effect is *decreasing* in the labor force’s average skill level.

These hypotheses are tested empirically in section 4.

### 3.2 Credit inflows and financial depth

To motivate the second part of the empirical analysis, this section briefly presents a model by Bumann and Lensink (2016) describing the relation between credit market liberalization and inequality. The framework incorporates a banking sector, heterogeneous private agents and varying levels of financial depth.

Agents are assumed to live for one period and to receive an endowment of labor income ( $w$ ) at the beginning of their lives. Thereafter, they face three alternatives: Firstly, they could deposit an amount  $d$  of their income at a domestic bank receiving a fraction  $r_d$  in interest payments. Secondly, they have the option of investing  $w$  in new capital ( $k$ ) of which they can resell  $\phi k$  to the production sector at a price  $q$  (normalized to unity). Varying values of  $\phi$ , where  $\phi \sim U[0, 1]$ , reflect differences in agents’ investment talent. Thirdly, there is the possibility of obtaining a bank loan at a rate  $r_l$  and to invest  $w$  together with the funds borrowed. Due to information asymmetries, agents can only borrow up to a fraction  $v$  of their endowment  $w$ , i.e.  $0 \leq l \leq vw$ , where  $v \geq 0$  represents the level of credit market depth. Furthermore, it is assumed that  $r_l > r_d$  so that agents only borrow for investment purposes. During their lifetime agents choose the amount of deposits and loans to maximize their consumption according to:

$$\max_{d,l}(\phi k + r_d d - r_l l) \quad (2)$$





subject to the budget constraint  $w + l = d + k$  and the borrowing constraint  $0 \leq l \leq \nu w$ . Solving the above yields two threshold values  $T_1 = r_l$  and  $T_2 = r_d$  which together with the investment ability parameter ( $\phi$ ) determine which of the three possible actions agents will undertake. If  $\phi < T_2$ , agents prefer to become savers and deposit their entire labor income at the bank. If  $T_2 < \phi < T_1$ , agents invest all of their endowment in new capital but refrain from borrowing additional funds since the cost of doing so would exceed the return on investments. Lastly, if  $\phi > T_1$ , agents borrow as much as they can, i.e.  $l = \nu w$  and invest these funds together with their labor income, i.e.  $k = (1 + \nu)w$ . Hence, given the uniform distribution of investment ability ( $\phi$ ), a proportion  $T_2$  of the population are savers,  $T_1 - T_2$  become 'pure' investors without borrowing and  $1 - T_1$  borrow and invest. Consequently, aggregate demand for loans is determined only by the 'borrowing savers group' and amounts to  $L = \nu w(1 - T_1)$ . Similarly, the aggregate demand for deposits is determined by the 'savers group' and therefore equals  $D = wT_1$ . In order to determine equilibrium interest rates, Bumann and Lensink (2016) also incorporate a banking sector into their model. Banks' balance sheet is characterized by

$$L + R = D + F \quad (3)$$

where assets consist of domestic loans ( $L$ ) as well as required reserves ( $R$ ) and liabilities are the sum of domestic deposits ( $D$ ) and deposits by foreigners ( $F$ ). The government determines the fraction of domestic deposits ( $1 - h$ ) with  $0 < h < 1$ , that banks need to keep in reserves, i.e.

$$R = (1 - h)D. \quad (4)$$

In addition, it sets the fraction  $a$  ( $0 < a < 1$ ) of domestic lending that can be financed out of foreign deposits, i.e.

$$F = aL \quad (5)$$

where a low  $a$  reflects tight capital controls. The interest rate on foreign deposit is assumed to be lower than the one on domestic deposits so that banks prefer



financing loans through the former types of funds but are constrained by (5). With non-remunerated reserves, the banks' zero profit condition can be stated as

$$r_l L = r_d D + r_f F \quad (6)$$

Assuming that  $r_f = 0$ , swapping (3), (4) and (5) into (6) yields the relationship

$$r_d = b r_l \quad \text{with} \quad b = \frac{h}{(1-a)} r_d, \quad 0 < b < 1 \quad (7)$$

Capital account liberalization, by raising  $a$ , increases  $b$  and thus reduces the gap between the cost of borrowing and the benefit of saving. Combining (3), (4) and (7) with the two threshold values from the agent's problem and the demands for loans and domestic deposits finally yields the equilibrium conditions

$$T_1 = \frac{v}{(v + b^2)} \quad \text{and} \quad T_2 = \frac{bv}{(v + b^2)} \quad (8)$$

The impact of financial liberalization can then be described by

$$\frac{\partial T_1}{\partial b} = \frac{-2bv}{(v + b^2)^2} < 0 \quad \text{and} \quad \frac{\partial T_2}{\partial b} = \frac{v(v - b^2)}{(v + b^2)^2} \quad (9)$$

Hence, allowing banks to use a larger fraction of foreign deposits for domestic loans reduces the cost of borrowing which will motivate agents in the 'non-borrowing investors' group to start borrowing. As a result, more agents move from the middle to the right side of the income distribution. However, since  $\frac{\partial^2 T_1}{\partial b \partial v} < 0$ , this inequality increasing effect declines with the level of credit market depth. Additionally, from the equation on the right, it becomes clear that only if depth is relatively high, such that  $v > b^2$ , would liberalization increase  $r_d$  and benefit savers at the bottom of the income distribution. The above observations can be summarized as follows:

**PROPOSITION 3:** The distributional impact of liberalizing credit inflows is ambiguous but it is more likely to reduce inequality if financial depth is high.

Besides the the model's simplistic assumption that wage income is distributed equally across the population and that heterogeneous investment skills are the main



source of inequality, another point of criticism must be raised. By assuming that interest rates on foreign deposits are below the level that domestic depositors demand, the model by Bumann and Lensink (2016) neglects an important real-world feature. Especially in war-torn or disaster-affected poor countries, creditors demand high risk-premiums. As a result, accepting foreign deposits might be less attractive for banks so that credit liberalizations only lead to moderate increases in the supply of loans. Hence,  $r_l$  falls by less and  $r_d$  does not increase as much as in less risky countries. Assuming that the level of investment risk correlates negatively with GDP, one can state:

**PROPOSITION 4:** In the presence of deep financial markets, credit inflow liberalizations are more likely to decrease inequality in high income (low risk) countries than in low income (high risk) countries.

The following section tests the empirical validity of the four propositions derived above.

## 4. EMPIRICAL ANALYSIS AND RESULTS

### 4.1 Data

I construct a data set using several sources. To measure the intensity of capital controls with respect to FDI, financial and commercial credit I use indices developed by Fernández *et al.* (2015). These are available on an annual basis for 100 countries from 1995 to 2013. Their construction is based on information contained in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and the measure ranges from 0 (no restrictions) to 1 (high restrictions). Inequality is measured by the annual before-tax Gini index and is taken from the Standardized World Income Inequality Database (SWIID). Values range from 18 to 71 over the sample period. Merging these two measures provides a baseline data set containing 92 low, middle and high income countries. A first inspection of time trends since 1995 suggests that inequality has increased on average in high income countries, which have also seen large-scale capital liberalizations. On the other hand, in low and lower middle income countries, inequality has fallen slightly, while controls on outflows have been increased. To examine the effect of skill heterogeneities, I obtain annual data on the mean years of schooling from Barro and



Lee (2013) as well as on lower secondary school completion rates and on the share of agricultural income in GDP from the World Development Indicators (WDI) database. Furthermore, credit market depth is proxied by two measures: The first is an index of credit market freedom contained in the Economic Freedom of the World (EFW) database. This indicator assigns annual scores to countries ranging from 0 (very low depth) to 10 (very high depth). As a second measure of depth I use the ratio of private credit by banks to GDP available from the WDI database. In addition, following previous research, my analysis controls for various other country-specific time varying factors. Similar to Furceri and Loungani (2015), I incorporate information on the occurrence of a banking crisis published in the Global Financial Development Database and data on the trade to GDP ratio from the WDI. Following Jayadev (2007), I obtain unemployment rates (WDI) as well as an index reflecting the degree of centralization of collective bargaining (EFW).

#### *4.2 Difference-in-differences estimation with staggered treatment dates*

Using a modified difference-in-differences approach I compare changes in income inequality among reforming countries before and after liberalizations with changes in control group countries in the pre- and post-reform periods. Unlike in classical difference-in-differences studies, capital account reforms are staggered over time. Consequently, defining a common post- and pre-treatment period is difficult. To remedy this issue, I define a post-opening dummy, which equals one in the period after the liberalization, and zero otherwise. Liberalizations are identified whenever, for a given country in a given year, the annual change in the Fernández index falls more than one standard deviation below the average change in all countries. Hence, the composition of the control group varies year-by-year. This approach has been previously adopted by Furceri and Loungani (2015) and Larrain (2015) using the Chinn and Ito index for overall capital account liberalizations. To extend their analysis, I construct separate post-reform dummies distinguishing between three asset types. For the sample period between 1995-2013 I identify 27 instances of capital account openings with respect to FDI inflows, 28 with respect to FDI outflows, 29 occasions of financial credit inflow liberalizations and 38 inflow liberalizations for commercial credit. Hence, I consider four different treatments. Since the theoretical model presented in section 3.2 makes no predictions on the



effect of credit outflows, I leave this analysis to future research. Two criteria need to be met for identification:

(i) There are no unobserved heterogeneities affecting treatment and control group countries differently at the time of liberalization. This includes the requirement that global shocks influence both groups equally and that none of the two adopts additional reforms influencing inequality.

(ii) Treatments are imposed randomly and do not correlate with pre-existing levels of inequality.

While (ii) is likely to hold, assumption (i) may be violated. However, the prerequisite of common global shocks is more likely to be fulfilled, the less heterogeneous countries are. Therefore, I conduct my analysis separately for high income and low income countries. The concern that countries may have undertaken simultaneous liberalizations with respect to various asset types is not unwarranted. However, dummies indicating FDI and credit reforms only show low correlations with incidences of overall capital reforms. Yet, one should keep in mind that in a specific year inequality in some control group countries may still be influenced by recently adopted reforms, which would bias the true difference-in-differences estimate. Nevertheless, the limitations of this approach are counterbalanced by its advantages: opening dates can be defined with precision and the sample size is large since control groups are not restricted to countries that have never implemented reforms.

To identify the effect of lifting capital restrictions on inequality, I estimate the following relationship for each of the four reforms separately:

$$\ln(\text{Inequality})_{c,t} = \beta_1 D_{c,t} + \beta_2 X_{c,t} + \alpha_c + \alpha_t + \varepsilon_{c,t} \quad (10)$$

where *Inequality* is measured by the Gini coefficient,  $D_{c,t}$  is the dummy variable that equals one only in the first period after liberalization and  $X_{c,t}$  represents a vector of time-varying country controls. The latter are described in section 4.1 and consist of factors that are thought to influence inequality, while also affecting the probability of financial reforms. Hence, they serve to mitigate endogeneities that could bias the coefficient of interest ( $\beta_1$ ). Furthermore, I include country fixed effects ( $\alpha_c$ ) and time fixed effects ( $\alpha_t$ ) to capture the effect of global shocks.



### 4.3 Estimation results I: FDI liberalization

Table 1 presents the results from estimating (10) with respect to FDI liberalizations. Since the effect on inequality for high income countries is insignificant for any specification or subsample, only estimates for low income countries are reported. In the fixed effects estimation in column (2), I cluster standard errors at the country level to control for within-country correlations across time. The resulting estimates are significant at the 10% level and provide evidence that eliminating legal barriers to direct investment inflows has a significant inequality increasing effect in poor countries. Following Furceri and Loungani (2015), I augment (10) by including lagged inequality as an independent variable. Since this regressor is inevitably correlated with the idiosyncratic error, standard fixed effects estimation is inconsistent. Therefore, I revert to Arellano-Bond GMM estimation which confirms the positive relationship between inequality and FDI inflows for poor countries. As column (3) shows, this result is also robust to including further lags of the post-liberalization dummy. Immediately after opening up for inflows, the Gini coefficient increases by 2.6 percent. However, these adverse distributional effects are not permanent as the coefficients on the dummies with lags of higher order indicate. In order to examine the role of skill levels, I interact lower secondary school completion rates with the post-liberalization dummy. Column (4) reports the results from GMM estimation: Implementing inflow liberalizations when secondary completion is high, leads to slightly lower increases in inequality. While OLS and FE estimations yield the same conclusion, using alternative measures of skills such as average years of schooling or the share of agriculture in GDP, leads to insignificance.

Conducting the same sequence of analytical steps for FDI outflows, I find that this type of reform leads to a 4-5 percent decrease in inequality immediately after implementation. However, as column (7) documents, the effect becomes insignificant in the following two periods. Furthermore, including the same interaction term as above, I fail to provide evidence for the hypothesis that pre-existing skill levels influence the effect of outflows on inequality.

To extend my analysis further, I substitute the liberalization dummy for a ‘capital control dummy’ which equals one if the annual change in the Fernandez index falls below the average change in all countries by more than one standard deviation. However, capital control tightening has no significant effect on income



dispersion – a finding that is in line with Furceri and Loungani (2015). Moreover, as an alternative measure of inequality, I use the labor share in GDP provided by the OECD which is only available for high income countries. Again, no significant effect of FDI liberalizations emerges for the sub-sample of developed countries.

All in all, I fail to find evidence for proposition 1 relating to high income countries. However, the analysis finds evidence in favor of proposition 2: In low income countries, FDI outflow liberalizations reduce inequality, while inflow liberalizations increase disparities. In addition, the latter effect is decreasing in the labor force’s average skill level if measured by the secondary school completion rate.

TABLE 1 • THE EFFECT OF FDI LIBERALIZATION ON INEQUALITY [LN(GINI)] IN LOW INCOME COUNTRIES

VARIABLES	Low income countries, FDI inflow				Low income countries, FDI outflow			
	(1) OLS	(2) FE	(3) A.-Bond GMM	(4) A.-Bond GMM	(5) OLS	(6) FE	(7) A.-Bond GMM	(8) A.-Bond GMM
L.ln(Gini)			0.900*** (0.0173)	0.874*** (0.0409)			0.649*** (0.0630)	0.767*** (0.0727)
L.FDI lib.	0.0401** (0.0172)	0.0374* (0.0195)	0.0262*** (0.00530)	0.0157*** (0.00428)	-0.0437* (0.0231)	-0.0471* (0.0244)	-0.0432** (0.0204)	-0.00894 (0.00549)
L2.FDI lib.			0.00728** (0.00369)				-0.0269 (0.0259)	
L3.FDI lib.			-0.00231 (0.00231)				-0.0307 (0.0231)	
L.FDI lib.* School completion				-0.000163** (7.18e-05)				6.73e-05 (6.98e-05)
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Country FE	NO	YES	YES	YES	NO	YES	YES	YES
Year FE	NO	YES	NO	NO	NO	YES	NO	NO

*Note:* The dependent variable is ln(Gini). ‘L.FDI lib.’ presents the post-liberalization dummy, L2. and L3. denote higher order lags. Controls include lower secondary school completion rate, collective bargaining index, a banking crisis dummy, international private debt to GDP ratio, private credit to GDP ratio, unemployment rate and trade to GDP ratio. For (1), (2), (5) and (6) clustered standard errors in parentheses, for (3), (4), (7) and (8) robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

#### 4.4 Estimation results II: Credit inflow liberalization

Table 2 reports estimates for the effect of credit inflow liberalizations on inequality. A distinction is made between financial credit and commercial credit, the latter of which is associated with international trade transactions and the provision of international services. While in the case of high income countries, OLS and FE



estimation show no significant impact of financial credit inflows, including lagged inequality provides a more informative insight. The GMM estimate in column (2) indicates that this type of liberalization reduces the Gini index by 2.4 percent and the effect only abates in the third year after the reform has been introduced. Furthermore, interacting the post-liberalization dummy with the EFW index of credit market depth, reveals that inequality decreases even further if reforms are implemented in economies with deep financial markets. This result continues to hold even if depth is measured by the ratio of private credit to GDP. Opening up for commercial credit inflows, on the other hand, has no significant effect for high income countries and is therefore omitted. For low income countries, allowing financial credit to enter more freely, is associated with a more than 4 percent decrease in inequality and the result is robust across specifications. Even though the effect loses its strength in the second period, it remains significant. Contrary to what one would expect, higher depth widens the income distribution in liberalizing poor countries (column 4). However, this effect is small in magnitude. Commercial credit liberalizations show no significant impact under OLS and FE estimation but under GMM the effect on inequality is positive and significant at the 10 percent level. This contrast to the effect of financial credit might be due to commercial credit being more targeted towards already wealthy business owners. Financial depth seems to reinforce the adverse distributional consequences.

To summarize my findings, proposition 3 stating that credit liberalizations have stronger beneficial effects if depth is high can be partly confirmed for high income countries. In addition, the analysis supports proposition 4 which implied that the role of depth is less straightforward in low income countries due to pronounced financial risk for foreign depositors. The prominence of corruption in low income countries might provide an additional explanation for why, despite high depth, funds are not channeled towards the poor.





**TABLE 2. THE EFFECT OF FINANCIAL AND COMMERCIAL CREDIT LIBERALIZATION ON INEQUALITY [LN(GINI)]  
BY COUNTRY INCOME LEVELS**

VARIABLES	High income countries		Low income countries			
	Financial credit inflow		Financial credit inflow		Commercial credit inflow	
	(1) FE	(2) A.-Bond GMM	(3) FE	(4) A.-Bond GMM	(5) FE	(6) A.-Bond GMM
L.ln(Gini)		0.518*** (0.0419)		0.881*** (0.0179)		0.851*** (0.0507)
L.credit inflow lib.	0.00133 (0.00744)	-0.0240** (0.00968)	-0.0438*** (0.00985)	-0.0412*** (0.00446)	0.0530 (0.0313)	0.0155* (0.00917)
L2.credit inflow		-0.0243** (0.0106)		-0.0184*** (0.00496)		0.0173 (0.0151)
L3.credit inflow lib.		-0.0185* (0.0101)		-0.0150* (0.00877)		-0.00273 (0.00676)
L.credit inflow lib.* credit m. depth		-0.00277** (0.00130)		0.00211** (0.000874)		0.00366*** (0.000574)
Controls	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	YES	NO

*Note:* The dependent variable is ln(Gini). 'L.credit inflow lib.' presents the post-liberalization dummy, L2. and L3. denote higher order lags. Controls include an index of credit market depth, a collective bargaining index, a banking crisis dummy, international private debt to GDP ratio, unemployment rate and trade to GDP ratio. For (1), (3) and (5) clustered standard errors in parentheses, for (2), (4) and (6) robust standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

#### 4.5 Discussion and policy implications

The empirical results presented above largely support the theoretical predictions for low income countries. On the other hand, in high income countries, lifting legal restrictions on FDI and commercial credit flows seems to have no impact on inequality. This insignificance has several explanations: Firstly, in many developed countries, highly effective social welfare nets are in place. These are capable of safeguarding people from poverty after job losses, for example resulting from FDI outflows. Secondly, disaggregated capital control indices are only available starting in 1995. However, the bulk of liberalizations in developed countries took place in the 1980s and early 1990s, so that lack of variation in my sample might be responsible for insignificant estimates. Thirdly, the Fernández index is a de jure measure and legal decisions may not immediately translate into higher capital flows which could curb movements in inequality.



Overall, policy implications are not straightforward to derive. One reason is that liberalizing only with respect to one asset type may not be feasible in practice due to legal difficulties in drawing a clear line between direct investment and credit inflows. Furthermore, recommending developing countries to outsource high skill production to decrease inequality may be counterproductive as it might impede economic progress. Similarly, advising low income countries against FDI inflow liberalizations would be short-sighted as it would deprive them of reaping the long term benefits of improved resource allocation and growth (Ostry *et al.* 2011). Instead, what this paper implies is that financial integration needs to be complemented with pre-emptive inequality decreasing measures, especially in inflow liberalizing developing countries with low skill levels. These measures can take the form of short-term cash transfers but should also encompass investments in education. Training low-skilled workers to operate advanced technologies is likely to be the most sustainable path towards converging income levels. Another point that merits consideration is the fact that nations do not act in a vacuum but their policy actions impose externalities on others. Specifically, countries with high skill levels should be aware that their direct investment outflows might have adverse distributional repercussions for receiving countries and should contribute to offsetting this effect. Finally, the observation that in poor countries larger availability of credit does not reduce inequality even if financial depth is high, emphasizes the importance of eliminating corruption and making credit markets more inclusive.

## 5. CONCLUSION

In this paper, I have demonstrated that capital account liberalizations affect inequality differently depending on cross-country heterogeneities as well as on whether reforms are tailored towards inflows or outflows of specific assets. In particular, I extend the theoretical framework of FDI flows involving capital skill complementarity by Larrain (2015) and describe a model of credit and financial depth by Bumann and Lensink (2016). These allow me to derive predictions for the distributional impact of lifting capital account restrictions. Using a novel disaggregated index of openness by Fernández *et al.* (2015) and following a difference-in-differences approach, I assess the empirical validity of my hypotheses.



I am able to show that FDI inflow liberalizations increase inequality in low income countries but the effect is partly offset if the average skill level is high. The theoretical model explains this finding: Highly skilled poor countries receive capital inflows from other poor unskilled countries, which need to be paired with below-average skilled labor. The resulting increased demand for relatively unskilled labor reduces wage spreads. Consequently, adverse distributional effects of technologically advanced inflows from rich countries can be partly offset. Furthermore, I find evidence that FDI outflows reduce inequality in poor countries, as they tend to outsource tasks requiring high skills to high income countries. However, skill differential have no significant impact. In addition, I show that lifting restrictions on financial credit inflows reduces inequality in both high and low income countries but credit market depth only reinforces this effect in the former group.

All in all, the paper highlights that unhindered capital flows have mostly desirable distributional consequences. However, it also emphasizes that FDI inflow liberalizations in poor countries with low skill levels need to be accompanied by short-term inequality reducing measures. Future research should consider other asset types as well as additional cross-country heterogeneities such as differences in the magnitude of business cycles fluctuations.

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