Financial Globalization vs. Income Inequality: The Surprising Role of Delegated Portfolio Flows in Taming the Top 1%

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Abstract

Although financial globalization related to foreign direct investment is known to enhance income inequality, we document a surprising finding that foreign *indirect* investment delegated through the global mutual fund industry can actually *reduce* the income of the top 1% as reported by the World Wealth and Income Database. To rationalize this observation, we construct a novel database of worldwide ownership of rich families for both private and publicly listed firms for the 2001–2013 period, which allows us to measure income inequality as the fraction of sales revenues accrued to rich families in each country-industry. We find that large inflows of delegated foreign portfolio flows induce local ultimate owners to rebalance their assets, which triggers a misallocation problem in that rich families tend to sell industries that can subsequently outperform their holding ones. By contrast, delegated domestic portfolio flows and a list of alternative mechanisms, including corporate governance, taxation, labor market conditions, technology shocks, education, financial development, and liquidity, fail to generate/explain the phenomenon. Our results have important normative implications in that we show financial globalization might have an intriguing impact on the issue of income inequality through their influence on the top 1%.

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Introduction

How value and wealth distribute within a society and transfer across borders are fundamental questions of the modern global economy. Recent developments in both directions, however, appear worrisome if not controversial. Vast evidence, for instance, shows that income inequality increases in recent decades in a list of major countries, though its economic grounds and social implications are still under heated debate (see, e.g., Piketty, 2014 and the debate it provokes, such as Acemoglu and Robinson, 2015; Blume and Durlauf, 2015; and Krusell and Smith, 2015).[1] Likewise, financial globalization rings alarms related to the potential propagation of economic shocks and even financial crisis, despite the benefits it can bring to a local economy.[2] The most subtle observation arises when the two important trends meet: globalization can join force with other economic mechanisms, such as industrialization (e.g., Kuznets, 1955) and certain properties of capitalism economy (e.g., Piketty, 2014), in affecting the distribution of income and wealth within an economy, yet its influence may not be desirable. Indeed, between the two major forms of financial globalization, foreign direct investment boosts income inequality, whereas portfolio investment appears to play an insignificant role (e.g., Milanovic, 2005; IMF, 2007; Jaumotte, Lall, and Papageorgiou, 2013).

A closer look at the literature, however, suggests that our current knowledge regarding the potential influence of financial globalization on income inequality my not be complete. For instance, financial globalization and income inequality are typically measured at the country level.[3] They may be subject to spurious correlation if some omitted country characteristics can affect both. Moreover, since foreign *direct* equity investments are known to boost high inequality, perhaps a special attention should be paid to foreign *indirect* equity investments—particularly those related to delegated portfolio management because of the more and more important role it plays in the global capital market—in order to fully capture the particular influence of financial globalization. The relationship between financial globalization and inequality, in this regard, needs perhaps a fresh scrutiny with better identification and measurement strategies.

This paper aims to fill this economic gap by assessing the relationship between delegated portfolio investment and income inequality. Indeed, as soon as we use the complete sample of global mutual funds and their portfolio investment to proxy for delegated portfolio flows, remarkably different observations

[1] The literature of income equality is growing fast for both U.S. (e.g., Piketty and Saez, 2003; Guvenen, Karahan, Ozkan, and Song, 2016; De Nardi, Fella, and Pardo, 2016) and international studies (e.g., Piketty, 2003; Moriguchi and Saez, 2008; Alvaredo, Atkinson, Piketty, and Saez, 2013). Benhabib and Bisin (2018) provides a recent survey on both income and wealth inequality.

[2] The beneficial roles include reduced cost of capital (Bekaert and Harvey, 2000), increased real investment (Henry, 2000), and spurred growth (Bekaert, Harvey, and Lundblad, 2005, 2009). Evidence on financial instability can be found in, among others, Jotikasthira, Lundblad, and Ramadorai (2012) and Hau and Lai (2017).

[3] Traditional portfolio investment measures constructed from balance of payments and international investment position data may lack information to analyze this question. See Lane and Milesi-Ferretti (2007) for more details on data construction.

arise. In particular, when we link large waves of delegated portfolio flows—in particular those triggered by fire sales and fire purchases (Coval and Stafford, 2007)—to the standard measures of inequality provided by the World Wealth and Income Database (e.g., the income share of top 1% in WWID), we find that the two are *negatively* related. Furthermore, when we differentiate flow shocks by their countries of origin, we find that the mitigating effect comes mainly from the capital flows of foreign funds. The economic magnitude is also large: a one-standard-deviation increase in foreign portfolio flow shocks is associated with about 16%-standard-deviation reduction in top 1% income. Since fire sales and fire purchases of a foreign fund arises when its (foreign) investors shift vast amount of capitals in and out of the fund, which are largely exogenous to the economic conditions of the investing country in the mutual fund literature, our results suggest that financial globalization in terms of delegated portfolio flows may help *reduce* inequality.[4]

But how could foreign portfolio investment help reduce income inequality? To answer this question, we need to revisit the economic sources of the income received by different groups of people. Inequality, as noticed by the *Economist* in commenting Piketty (2014), means a small group of rich families holding concentrated wealth and income.[5] If we further enquire how rich families reap their income, it turns out that companies, private or public, may play a pivotal role. Rich families own companies that can generate profits by selling products. Directly (e.g., through dividends) or indirectly (e.g., through price appreciation), such sales revenues provide the primitive source of income to rich families, which differ drastically from workers who draw income from salaries (e.g., Quadrini, 2000; Cagetti and De Nardi, 2006).[6] Income inequality observed at the macro level, in this regard, has a micro foundation rooted at the firm level as heterogeneity in cash flow rights in sharing companies' sales revenue.

To better understand inequality at this economic root, we construct a novel database that can help us measure heterogeneity in cash flow rights. In particular, we obtain the worldwide ownership of *both publicly listed and private* (non-listed) firms for the 2001─2013 period for which we merge, for the first time, information on the full spectrum of ownership structure with detailed accounting data for both public and private firms. For each country and industry, this database allows us to measure the fraction of

[4] The benefit of focusing on the global mutual fund dataset is threefold. First, it provides the geography of all portfolio flows delegated through the global mutual fund industry: we know both the country from which the capital is raised (the country of origin) and the country as the destination of investment (the country of destination). Second, even within a country, we know which companies and industries these portfolio flows go to, which will allow us to explore within-country variations. Finally, the mutual fund literature also provides an identification strategy of flow "shocks" unrelated to the destination of fund investment—i.e., large flows triggered by the fire sales and fire purchases of individual funds (Coval and Stafford, 2007). These features persuade us to focus on delegated portfolio investment to understand its influence on inequality, rather than sketching loosely the relationship between many financial globalization variables and the latter.

[5] "*Private wealth dwarfed national income and was concentrated in the hands of the rich families who sat atop a relatively rigid class structure.*" The Economist, 5th May, 2014.

[6] Both papers look at income heterogeneity based on the difference between workers and entrepreneurs. Cagetti and De Nardi (2006), for instance, show that a model incorporating both types of people can better explain the distribution of wealth as well as its relationship with financial constraints. Heterogeneity in labor skills (e.g., college vs. high school workers) may also lead to income inequality (see, Acemoglu and Autor, 2011 for a recent survey). This inequality, however, is less related to our finding.

companies' sales revenue accrued to rich families in each country and each industry. A higher fraction of companies' sales revenue reaped by the rich families implies a higher degree of inequality between the rich and the rest of the society.[7] Since this measure resorts the economic root of income inequality to companies' sales revenues, we refer to it as "Top Income from Sales" (denoted as *TopIncome_Sales*) and interpret it as "*cash flow rights inequality*" to highlight both its similarity to and its difference from the top income measures provided by WWID (denoted as *TopIncome_WWID*).

Our novel database and new measure of income inequality can shed new light on the potential influence of portfolio flows on inequality in several ways. First, it can help assess the robustness of our previous finding. Secondly, it allows us to measure inequality not only at the county level but also at country-industry level (we can also measure flow shocks at the two corresponding levels). This improvement is substantial, as we can use within-country cross-industry variations to further validate the influence. Empirically, delegated portfolio flow shocks and its foreign part can affect cash flow rights inequality both at the country level and at the country-industry level in a similar way that they affect the WWID income inequality. As for its economic magnitude, with country fixed effects (and we also control for time and industry fixed effects), a one-standard-deviation increase in foreign flow shocks is associated with a 6%-standard-deviation reduction in cash flow rights inequality. Although this within-country effect is smaller in magnitude than the case of WWID top 1% income, it better identifies the influence of delegated portfolio investment in that not only flow shocks are largely exogenous, but we also control for persistent country- and industry-characteristics that may spuriously correlate with income inequality.[8]

Perhaps even more importantly, the construction of this database also paves the way for us to pin down the economic ground that may link foreign portfolio flows to inequality. Indeed, once we consider income inequality from the perspective of companies' cash flow rights, there could be several new testable channels through which delegated portfolio flows may help *reduce* inequality. First of all, financial globalization is likely to induce rich families to rebalance their assets—i.e., a reallocation effect—for a few reasons. For instance, since the cost of capital of foreign fund investors are often lower than that of local investors (Bekaert and Harvey, 2000), the expected returns of local firms may change due to the process of financial globalization, which should incentivize rich families to rebalance their portfolio. Whether such a reallocation enhances or reduces cash flow rights inequality, however, depends on the optimality of such

[7] We use the Shapley-Shubik (1954) power index to identify direct owners, and then penetrate possible pyramid structures of firms to identify ultimate owners. We finally manually identify rich families from these ultimate owners, and compute their cash flow rights. In our main tests, we include cash flow rights of all family-owners that can reap more than 20% of sales revenue of any particular firm. This cash flow rights threshold mimics the voting right threshold typically used in the literature (e.g., La Porta, Lopez-de-Silanes, and Shleifer, 1999 for controlling rights and Masulis, Pham, and Zein, 2011 for family ownership). Our results are robust to this threshold.

[8] The reduction in magnitude is reasonable, as many important factors that affect income inequality, such as tax and transfer system (e.g., Alvaredo, Atkinson, Piketty, and Saez, 2013; Kaymak and Poschke, 2016), are absorbed by country fixed effects.

asset rebalance. Although rich families have more knowledge and experience in the domestic market, their advantages may not hold when financial globalization reshapes the local market—sticking to previous experience may sometimes lead to the opposite and unintended results. If rich families' asset reallocation is not optimal, it may potentially trigger a misallocation problem, which reduces their future cash flow rights and thus the degree of income and wealth inequality.[9]

Our empirical analysis provides supporting evidence for the misallocation channel in a two-stage test. In the first stage, we ask whether exogenous shocks in foreign delegated portfolio flows could affect the allocation efficiency of rich families, which is measured by the correlation between the changes in investment weights of companies owned by a particular family and the future return on assets (ROA) of these companies. A higher correlation indicates a more efficient allocation of assets in generating future cash flows. We find that large foreign portfolio inflows reduce such allocation efficiency. In the second stage, we link Top Income from Sales to flow-projected allocation efficiency, and find that a higher allocation efficiency is in general associated with more cash flow rights inequality. Economically speaking, rich families rebalance (e.g., sell) shares to foreign fund managers—but they sell assets with higher future ROAs, which reduces the portion of future income that they can reap from the sales revenue of companies. In terms of economic magnitude, a one-standard-deviation increase in foreign flow shocks transforms into 10.61%-standard-deviation reduction in inequality through misallocation, suggesting that this particular channel explains perhaps the majority influence of flow shocks on income inequality.

To further understand the economic ground of globalization-induced family misallocation, we zoom in and examine one of the most representative and important reallocation decisions of rich families upon the occurrence of large foreign delegated flows: exit, or giving up the controlling ownership from a particular industry. We find that ultimate owners tend to exit from their core assets (i.e., industries that can generate the highest among of sales within the ultimate owner's portfolio), suggesting that diversification might be an important reason driving families' exit decisions. By contrast, the exit decision is not driven by ROA, stock return, or the needs to upgrade from manufacturing industries to other industries. Interestingly, diversification does not seem to benefit rich families because the effect is achieved via the selling of more profitable industries.

We next examine a list of alternative channels. First of all, cash flow rights may be affected when foreign investors affect the corporate governance of local firms (e.g., Aggarwal, Erel, Ferreira, and Matos,

[9] Note that we focus on income inequality because of the wider data coverage in WWID. Misallocation and the reduction in cash flow rights in principle can also reduce wealth inequality, even though the two types of inequality may otherwise have little relationship (e.g., Benhabib, Bisin, and Luo, 2017; Benhabib and Bisin, 2018 provide an extensive survey on the possible factors that may influence wealth inequality). The misallocation effect can affect wealth inequality because it reduces the return on the remaining wealth for domestic rich families.

2011). Indeed, better corporate governance is often argued as a benign consequence of financial globalization. A better corporate governance may reduce the probability for large shareholders of a firm to transfer wealth from small investors. For instance, large shareholders may have incentives to tunnel assets from the latter, with tunneled assets essentially becoming their income. If such agency issues contribute to the income of rich families, then improved corporate governance can help reduce inequality.

Empirically, however, we find insignificant results for the governance channel in our country-industry level analysis. This insignificance is perhaps not surprising because, for the governance channel to work, portfolio flows should be strategic—i.e., fund managers should carefully manage these flows to exert its governance influence. Fire sale/purchase flows, on the contrary, are not strategic. The interesting finding in this regard is that normal flows—which include the endogenous actions of fund managers—still fail to support the governance channel, suggesting that governance may indeed not be the main mechanism in mitigating the issue of inequality.

We then consider a list of country characteristics known to play a role in distributing income and wealth. Tax and transfer system (e.g., Alvaredo, Atkinson, Piketty, and Saez, 2013; Kaymak and Poschke, 2016), for instance, can affect the incentives of workers to generate income. Labor market properties, such as participation and polarization, can affect the distribution of income (e.g., Autor and Dorn, 2013). Technology changes and education may also influence both return to capital and the distribution of income among different types of workers (e.g. Jaumotte, Lall, and Papageorgiou, 2013). Finally, financial development can lead to more investment and growth (Henry, 2000; Bekaert, Harvey, and Lundblad, 2005, 2009), which may affect inequality through the Kuznets (1955) channel. Although financial globalization may influence income inequality by affecting policies and conditions related to these characteristics, proxies for these channels are empirically very weakly related to foreign delegated portfolio flows, and are thus unlikely be the main mechanism to explain its observed relationship with income inequality.[10]

We finally conduct a list of additional analyses and robustness checks in order to shed more light on the relationship between foreign portfolio flows and inequality. First, consistent with the misallocation channel, we find that the influence of foreign portfolio flows applies mostly to domestic rich families, as opposed to foreign ones (who already enjoy more diversification than domestic families). Second, we also show that our results are robust using alternative definitions of the income inequality measure.

[10] In a model incorporating tax policies, transfer payments (e.g., Social Security and Medicare), and technology, Kaymak and Poschke (2016) show that a lower interest rate can mitigate income inequality. But their model does not resort to globalization and distinctive groups of people in an economy. Rather, in their model interest rates work through the savings and tax channels. In models with two types of works subject to different technological changes (e.g., Autor and Dorn, 2013), globalization can also increases inequality through labor market polarization. Tax policy is not the main driving force of our results, because taxes are largely country-specific and thus absorbed by country-fixed effects in our country-industry level analysis. We cannot completely rule out the labor market polarization effect in our test. However, since we focus on richest families in the economy, labor market polarization may not be economically important to this group of people.

We contribute to several strands of the literature. To the best of our knowledge, we are the first to analyze how delegated cross-border portfolio investment affects income inequality. In doing so, we contribute to the literature on inequality in general (e.g., among others, Kuznets, 1955; Piketty, 2003; Piketty and Saez, 2003; Moriguchi and Saez, 2008; Alvaredo, Atkinson, Piketty, and Saez, 2013; Piketty, 2014; Blume and Durlauf, 2015; Acemoglu and Robinson, 2015; Guvenen, Karahan, Ozkan, and Song, 2016; De Nardi, Fella, and Pardo, 2016), and the effect of globalization on income inequality in particular (e.g., Milanovic, 2005, 2015; IMF 2007; Jaumotte, Lall, and Papageorgiou, 2013). We contribute by extending analysis to the new variable of cash flow rights inequality, which also lays out a potential framework to understand the subtle impacts of financial globalization on inequality.

We also contribute to the literature on financial liberalization (e.g., Bekaert and Harvey, 2000; Henry, 2000; Karolyi and Stulz, 2003; Bekaert, Harvey, and Lundblad, 2005, 2009; Bae, Ozoguz, Tan, and Wirjanto, 2012; Jotikasthira, Lundblad, and Ramadorai, 2012; Bartram, Griffin, Lim, and Ng, 2015; Hau and Lai, 2017). Our analysis suggests that the impact of globalization is complex in spirit. For instance, FDI and delegated portfolio investment might have exactly the opposite influence on inequality, suggesting that direct and indirect foreign investments may sometimes exert different impacts on the receiving country.

To some extent, what we document in this paper portraits an economic trend to the opposite of—and thus complements—what Piketty (2014) has noticed in recent decades. Piketty (2014) argues that inequality increases in a list of countries in the last three decades when the rate of return on capital exceeds the rate of economic growth. Our finding is that, financial globalization can help reduce inequality. Using the terminology of Piketty (2014), financial globalization provides an economic force to revert the relationship between the rate of return on capital and the rate of economic growth. Our results therefore have important normative implications: a more interconnected global financial market may surprisingly help solve social issues related to inequality. Piketty's policy recommendations related to global capital tax, in this regard, needs to be treated with caution when cross-border delegated portfolio investment in involved.

Finally, we also contribute to the literature on the global the mutual fund industry (e.g., Wahal and Wang, 2011; Khorana and Servaes, 2004; Cremers, Ferreira, Matos, and Starks, 2016). We extend the literature by demonstrating that global mutual fund companies may play an important role in mitigating inequality society, a role that has never considered before in the literature.

The remainder of the paper is organized as follows. Section II presents our variables and summary statistics. Section III reports the baseline relationship between delegated portfolio flows and income inequality provided by WWID. Section IV examines the relationship between delegated portfolio flows and our new measure of income inequality from sales, as well as its driving force. Section V provides additional analysis and robustness checks. Section VI concludes.

II. Data Section and Definition of Main Variables

We first describe the data sources and the main variables.

A. Ownership Data

The ownership data are from the ORBIS database of Bureau van Dijk, which contains data on worldwide private and publicly listed firms over the period of 2001–2013. In our sample, there are 150,343 unique firms, out of which 48,461 are unique publicly listed firms from 134 countries, and 101,882 are unique private firms from 190 countries. These firms are held by 535,088 unique ultimate owners, among which 212,337 can be identified as single private individuals or families.[11] We provide a detailed description of the methodology that we use to identify family and other owners in Appendix A, based upon which we further refine the sample of firms. The final sample includes 8,760 unique private or publicly listed firms from 91 countries (41,865 firm-year observations).

We then construct several indexes of income inequality from sales. Our main measure (*TopIncome_Sales*) proxies for the top income from sales in a specific industry-country-year. It is computed as follows: $TopIncome\_Sales_{i,c,t} = \frac{\sum_u Sale_{u,i,c,t} \times I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{IndSale_{i,c,t}}$, where $Sale_{u,i,c,t}$ refers to the dollar value of sales revenue that ultimate owner u can reap from all firms in industry i in country c in year t, $IndSale_{i,c,t}$ refers to the total dollar value of the sales revenue in industry i in country c in year t, $I\{\cdot\}$ is an indicator function that equals one if $Sale_{u,i,c,t}/IndSale_{i,c,t}$ is larger than the cash flow rights threshold of 20% and zero otherwise. We also consider a version of it that just focuses on the top income from sales that are reaped by domestic families (*TopIncome_Sales_Dom*) and that by foreign owners (*TopIncome_Sales_For*). Overall, the measure top income from sales captures the cash flow rights inequality between rich families and the rest of the economy in a given industry of a country.

Since the existing literature typically measures income inequality at the country level, we also build a version of our measures at the country level to allow for a direct assessment of cash flow rights inequality at the country level. In particular, the top income from sales in a specific country-year is computed as follows: $TopIncome\_Sales_{c,t} = \frac{\sum_u UOSale_{u,c,t} \times \max_{u,c,t} I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{MktSale_{c,t}}$, where $UOSale_{u,c,t}$ refers to the total sales of ultimate owner u in country c in year t, $\max_{u,c,t} I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}$ refers the

[11] More generally, the 535,088 unique ultimate owners are distributed as follows: 212,337 single private individuals or families (the focus of this paper); 4,612 insurance companies; 9,223 banks; 180,648 industrial firms (all companies that are neither banks nor financial companies nor insurance companies); 58,566 mutual or pension funds, nominees, trusts or trustees; 40,117 financial companies; 3,275 foundations or research institutes; 2,465 employees, managers or directors; 1,058 private equity firms; 4,181 public authorities, states and governments; 884 venture capital firms; 30 hedge funds; and 17,692 with an unidentified type.

maximum value of $I\{\cdot\}$ across all industries for ultimate owner u in country c in year t, $MktSale_{c,t}$ refers to the total sales in country c in year t, and all other variables are defined the same as in *TopIncome_Sales* at industry level. In addition, we separately consider the top income from sales for domestic and foreign families.

B. Delegated Portfolio Flows

We use the global mutual fund industry to assess the importance of delegated portfolio investment. The data on mutual fund portfolio flows are from the Factset/Lionshares database. The Factset/Lionshares holdings data on international funds are sparse before 2001, so our sample is restricted to the 2001–2013 period. We match the database to the Morningstar mutual fund database. From Morningstar, we obtain additional information on monthly fund return and total net assets (TNA). We consolidate multiple share classes into portfolios by adding share class TNA together and by value weighting share class returns. More specifically, to compute returns, we obtain fund total returns net of fees. When a portfolio has multiple share classes, we compute its total return as the TNA-weighted return of all share classes of the portfolio, where TNA values are one-month lagged. All prices have been converted to U.S. Dollars.

In order to capture the exogenous shocks of delegated portfolio investment flows, we explore the fire sales and fire purchases of mutual funds following Coval and Stafford (2007). The industry-level flow shocks in a given quarter q are computed as: $Flow\_Shock_{i,c,q} =$

$$\frac{\sum_{s\in i,c,f}\max\left(0, N_{s,f,q}P_{s,q} - N_{s,f,q-4}P_{s,q}\right)\times I\{Flow_{f,q} > PCT90_q\} - \sum_{s\in i,c,f}\max\left(0, N_{s,f,q-4}P_{s,q} - N_{s,f,q}P_{s,q}\right)\times I\{Flow_{f,q} < PCT10_q\}}{\sum_{s\in i,c,f} N_{s,f,q-4}P_{s,q-4}},$$

where $N_{s,f,q}$ refers to the number of shares of company s held by fund f in quarter q, and $P_{s,q}$ refers to the price of company s in the same quarter, $s \in i,c,f$ represents the set of companies in industry i of country c that held by fund f, $\max\left(0, N_{s,f,q}P_{s,q} - N_{s,f,q-4}P_{s,q}\right)$ refers to the maximum value between zero and $N_{s,f,q}P_{s,q} - N_{s,f,q-4}P_{s,q}$, i.e., it equals to the increase in stock investment if fund purchases additional shares and zero otherwise, $\max\left(0, N_{s,f,q-4}P_{s,q} - N_{s,f,q}P_{s,q}\right)$ refers to the maximum value between zero and $N_{s,f,q-4}P_{s,q} - N_{s,f,q}P_{s,q}$, i.e., it equals to the decrease in stock investment if fund sells existing shares and zero otherwise, $Flow_{f,q}$ refers to the flow of fund f in quarter q, $PCT90_q$ and $PCT10_q$ refer to 90th percentile and 10th percentile of fund flow among all funds in the same domicile country as fund f in quarter q, $I\{Flow_{f,q} > PCT90_q\}$ refers to an indicator function that equals one if fund flow is above the 90th percentile in the same country and zero otherwise, $I\{Flow_{f,q} < PCT10_q\}$ refers to an indicator function that equals one if fund flow is below the 10th percentile in the same country and zero otherwise. The flow shock measures the net difference between severe inflow-induced purchases and severe outflow-induced

sales. The annual industry flow shock is the average of quarterly industry flow shocks within a year. In a similar manner, we can also define country-level flow shocks in a given quarter or year by directly aggregate fire sale/purchase flows moving in and out of all stocks in a country.

Importantly, we split industry flow shock into domestic flow shock (*Flow_Shock_Dom*) and foreign flow shock (*Flow_Shock_For*) based on the domicile countries of the funds. To construct these two measures, we basically aggregate fire sales and fire purchases of, respectively, domestic and foreign mutual funds. Following the literature, a mutual fund is classified as domestic (foreign) if its domicile country is the same as (different from) the country of its portfolio investment. A detailed description is reported in the Appendix B.

We can also measure normal industry-level fund flows in a given quarter as: $Flow_{i,c,q} = \frac{\sum_{s \in i,c,f} N_{s,f,q} P_{s,q} - N_{s,f,q-4} P_{s,q}}{\sum_{s \in i,c,f} N_{s,f,q-4} P_{s,q-4}}$, where all variables are defined the same as in *Flow_Shock*. The annual industry flow is the average of quarterly flows within a year. We can again measure country-level normal flows in a given quarter or year, and split aggregate industry- or country-level flows into domestic (*FlowDom*) and foreign (*FlowFor*) based on the domicile countries of funds.

C. Accounting and Financial Data

Data on accounting variables such as sales and total assets come from Bureau van Dijk (especially for the private firms), from Datastream/Worldscope and from Compustat. Stock market information is from Datastream/WorldScope.

In order to correctly measure the assets and profitability of each individual affiliated firm, we need to ensure that the reported figures are not affected by the equity stakes that a firm holds in other firms. Whenever the reported figures are consolidated or are subject to the equity method,[12] we use the equity stakes from Bureau van Dijk and the accounting information of the held firms to back out the exact amount by which these accounting figures have been adjusted (see Almeida, Park, Subrahmanyam, and Wolfenzon (2011). A detailed description of all variables is reported in the Appendix B.

D. Descriptive Statistics

We report some descriptive statistics in Table 1. Panel A reports the mean, median, standard deviation, and the quantile distribution of the level and annual change in top income from sales at industry-level and country-level, annual industry and market flow, as well as other annual industry and country characteristics. Panel B reports the correlation matrix of the main industry-level and country-level dependent and

[12] Recording firm A's share of firm B's equity as an asset for firm A, and firm A's share of firm B's profits as a source of non-operating income for firm A.

independent variables. The change in industry-level (country-level) income inequality is negatively related to the industry (market) flow shock, especially for portfolio flows from foreign institutions. These observations are in general consistent with our hypothesis that foreign portfolio flows help to reduce inequality. Of course, it is difficult to conclude from these summary statistics, we therefore move on to multivariate regressions to formally establish this key relationship.

III. Delegated Portfolios Flows and WWID Income Inequality

To investigate the relationship between delegated portfolio flows and income inequality, we start from country-level tests in which we relate standard measures of income inequality to mutual fund flows. More explicitly, we estimate the following panel specification:

$$\Delta TopIncome\_WWID_{c,t} = \alpha + \beta Flow\_Shock_{c,t-1} + \gamma N_{c,t-1} + e_{c,t}, \quad (1)$$

where $\Delta TopIncome\_WWID_{c,t}$ is the change in the top income measures provided by World Wealth and Income Database (WWID) for country c in year t, $Flow\_Shock_{c,t-1}$ refers to the exogenous shocks in delegated portfolio investment flows attributable to fire sales and fire purchases. The vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judicial, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Appendix B provides detailed descriptions of the data. We include year fixed effects and cluster the standard errors at both the country and year level.

We report the results in Table 2. Models (1) to (10) examine the influence of capital flow shocks delegated through the global mutual fund industry on the share of income received by the top 1% population as reported by WWID, one of the most widely cited income inequality measure in the literature. From Model (1), we can see that exogenous capital flow shocks are negatively related to income inequality. Furthermore, when we identify the geographic origins of these flow shocks—i.e., those attributable to foreign funds and domestic funds as reported respectively in Models (2) and (3), we find that the mitigating effect comes mainly from the capital flow shocks of foreign funds. When the two are jointly used as tabulated in Model (4), foreign portfolio flow shocks remain highly significant.

Models (5) to (6) replace flow shocks with large portfolio flows. Large flows are those in the top quintile of flows across all countries. We see that large foreign flows are still negatively associated with income inequality after controlling for flows in other quintiles (Model 5), suggesting that foreign-delegated portfolio flows help reduce income inequality. In addition to cross-border portfolio flows, financial globalization also facilitates more foreign direct investment (FDI). FDI usually takes place at high-skilled

and technology-intensive sectors, and an increase in FDI could thus increase the demand for, and wages of, skilled labor and increase inequality (e.g., Cragg and Epelbaum, 1996; Jaumotte, Lall, and Papageorgiou, 2013). Model (6) further controls for the potential influence of FDI flows, proxied by changes in inward FDI as a percentage of GDP. Again, the result on large foreign flows remains unchanged. To better establish the causal relationship, our later specifications focus on exogenous flow shocks, especially the foreign flow shocks.

Next, we re-estimate Models (1) and (4), while control for the potential influence of competing capital flows of financial globalization, including both normal portfolio investment flows and FDI-inferred capital flows. Unreported tests suggest that normal portfolio flows (*Flow*) are not related to income inequality. Moreover, when we control this variable in Models (7) and (8), we find that it does not affect the results of delegated foreign capital flow shocks. The coefficients and statistical significance of delegated foreign capital flow shocks remains largely unchanged in these two models (compared to Models 1 and 4). Therefore, normal portfolio flows play a minor role compared to large shocks especially in foreign flows. Its insignificance, however, tells us useful information about the potential economic grounds, which we will come back in later sections. Models (9) and (10) further control for the FDI flows, and the explanatory power of delegated foreign capital flow shocks remains unchanged.

From the above comparisons, we can see that the potential influence of delegated portfolio flow shocks is highly robust. The economic effect is also sizable. For instance, a one-standard-deviation higher overall and foreign mutual fund flow shocks is related to 22.72% (Model 9) and 15.75% (Model 10) lower income inequality for the top 1% income group (scaled by the standard deviation of change in income inequality measure).[13] Moreover, when we expand the analysis to other top income measures, including Top 10% (Models 11 to 12) and Top 0.1% (Models 13 to 14), the results are largely the same. A one-standard-deviation higher overall and foreign mutual fund flow shocks is related to 17.53% (Model 11) and 12.82% (Model 12) lower income inequality for the Top 10% income group and 21.61% (Model 13) and 15.89% (Model 14) lower income inequality for the Top 0.1% income group (scaled by the standard deviation of change in income inequality measure).

Given that delegated foreign portfolio flow shocks are largely exogenous to the economic conditions of the investing country, our results suggest that financial globalization in terms of delegated portfolio flows may help reduce inequality. To shed more light on this inference, we need to address the question of why

[13] The economic magnitude of the income inequality regression $y = \beta \times x$ is computed as $\beta\sigma_x/\sigma_y$, where y and x are the dependent and independent variables, respectively, β is the regression coefficient, and σ_y and σ_x are the standard deviation of y and x, respectively. For instance, the standard deviation of foreign mutual fund flow shocks (*Flow_Shock_For* at country level) is 0.084, the standard deviation of change in top 1% income share (Δ*Top 1% Income*) is 1.048, and the regression coefficient in Model 10 is −1.965. We compute the economic magnitude as $-1.965 \times 0.084/1.048 = -15.75\%$.

foreign portfolio investment could possibly help reduce inequality. The next section takes on this task by examining our new variable of cash flow rights inequality.

IV. Delegated Portfolios Flows and Income Inequality from Sales

In this section, we move on to investigate why foreign portfolio investment could help reduce inequality. Since the majority wealth of the society exists in the form of companies, the companies' cash flow rights become the prime source of wealth and income for the richest families. We therefore examine income inequality from the perspective of sharing companies' sales revenues or cash flows, i.e., the fraction of the industry sales accrued to rich families through their direct and indirect block ownership (*TopIncome_Sales*).

A. Income Inequality from Sales

We start from the general relationship between delegated portfolio investment flows and *TopIncome_Sales* by applying the country-level analysis as reported in Table 2 to cash flow rights inequality. More explicitly, we replace the dependent variable of top 1% income with *TopIncome_Sales*. The results are reported in Models (1) to (6) Table 3. The layout of the country-level analysis on *TopIncome_Sales* is similar to that of Table 2, except that to save space we only tabulate a few models.

We can see that the negative relationship between delegated portfolio flow shocks and inequality remains highly significant when we measure inequality from the cash flow rights in sharing the sales revenue generated by firms. Moreover, delegated portfolio flow shocks originated from foreign funds still dominate the results. By contrast, normal flows and delegated portfolio flow shocks originated from domestic funds fail to achieve a similar effect—at least when jointly used with flow shocks or foreign flow shocks. Finally, our findings are robust to the inclusion of change in capital flows from foreign direct investment. The fact that *TopIncome_Sales* and *TopIncome_WWID* yield similar results in country-level test lends support to the notion that our measure captures the firm-level economic root of the latter.

Next, we exploit the richness of the data by extending the analysis from country level to country-industry level. We estimate the following annual panel specification at the country-industry level:

$$\Delta TopIncome\_Sales_{i,c,t} = \alpha + \beta Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t}, \quad (2)$$

where $\Delta TopIncome\_Sales_{i,c,t}$ is the change in the top income from sales of industry i in country c in year t, and $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables defined the same as in Equation (1). We include a combination of year, industry, and country fixed effects (depending on model

specifications) and cluster the standard errors at both the country and year level. Since FDI data is only available at the country level, we do not directly compare it with the industry-specific portfolio flows in this specification (including county-level FDI does not affect our results).

The results are reported in Models (7) to (14) of Table 3. More specifically, Models (7) to (10) include year, industry and country fixed effects, whereas Models (11) to (14) replace the country fixed effects with a list of explicit country characteristics. Consistent with country-level analysis, we can see that delegated portfolio shocks in general and foreign delegated portfolio shocks in particular are negatively related to cash flow rights inequality. Given the exogenous nature of foreign delegated portfolio shocks, we again interpret this result as a causal influence from foreign delegated portfolio investment to cash flow rights inequality.

Its economic effect is sizable. For instance, with year, industry and country fixed effects, a one-standard-deviation increase in overall and foreign flow shocks is associated with a 5.63%-standard-deviation (Model 9) and 5.64%-standard-deviation (Model 10) reduction in inequality (*TopIncome_Sales*). Although this within-country effect is smaller in magnitude than the case of WWID top 1% income inequality as reported in Table 2, it better identifies the influence of delegated portfolio investment in that not only the influence is identified based on exogenous foreign portfolio flows, but any persistent country- or industry-specific characteristics affecting inequality are controlled for as well.

B. Economic Grounds

We now move on to examine the channel through which delegated portfolio investment of foreign funds can reduce inequality. A large wave in foreign portfolio investment would induce local rich families holding concentrated ownership in the firm to sell their shares and lose future sales income of firms associated with these shares. Furthermore, if their selling industries subsequently outperform their holding ones, such misallocation behavior will reduce income inequality ("asset misallocation channel"). In particular, for each ultimate owner in a given country-industry pair, we compute the allocation efficiency in a given year t as follows: $AE_{u,i,c,t} = \sum_{s \in i,c}(w_{s,u,t} - w_{s,u,t-1}) \times ROA_{s,t}$, where $w_{s,u,t}$ refers to the investment weight of company s held by ultimate owner u in year t, and $ROA_{s,t}$ refers to the return on assets (ROA) of company s in year t. $s \in i,c$ represents the set of companies in industry i of country c in ultimate owner u's portfolio, including firms held by the ultimate owner in either year t or year $t-1$. The allocation efficiency measures the difference between the realized ROA of an ultimate owner and its implied ROA assuming the asset reallocation does not occur. Next, we compute the equal-weighted average of allocation efficiency for all ultimate owners in each country-industry in each year, i.e., $AE_{i,c,t}$. To understand whether foreign portfolio flows may affect inequality through the misallocation channel, we use our new measure of Top

Income from Sales, and link it to exogenous flow shocks in the following annual two-stage panel regressions at the country-industry level:

$$1st\ stage: AE_{i,c,t} = a + \beta Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t}, \quad (3)$$

$$2nd\ stage: \Delta TopIncome\_Sales_{i,c,t} = \alpha + \theta \widehat{AE}_{i,c,t} + \gamma_1' M_{i,c,t-1} + \gamma_2' N_{c,t-1} + e_{i,c,t}, \quad (4)$$

where $Flow\_Shock_{i,c,t-1}$ is the average quarterly fund flow shocks of industry i in country c in year $t-1$, $AE_{i,c,t}$ is the allocation efficiency of industry i in country c in year t, $\widehat{AE}_{i,c,t}$ is its projected value attributable to $Flow\_Shock_{i,c,t-1}$, and $\Delta TopIncome\_Sales_{i,c,t}$ is the change in the Top Income from Sales of industry i in country c in year t. Vectors *M* and *N* stack all other country-industry and country control variables as defined in Equation (2). We include various combinations of year, industry, and country fixed effects (specified in each model) and cluster the standard errors at both the country and year level.

In the first stage, the parameter of interest is β, where a negative coefficient means that large swings of foreign portfolio inflows reduce the allocation efficiency, suggesting that the industries sold by ultimate owners subsequently outperform their holding ones. In the second stage, if this asset misallocation mechanism reduces inequality, we should see a positive coefficient of θ.

The results are reported in Table 4. Models (1) to (4) focus on the influence of large delegated portfolio flow shocks, whereas in Models (5) to (8) we employ those originated from foreign funds in our first stage analysis. From first stage analysis in Models (1), (3), (5), and (7), we can see that large swings of portfolio flows in general and foreign portfolio flows in particular can significantly reduce the allocation efficiency. In Internet Appendix Table IA1 we apply the same test to domestic portfolio flow shocks, which fail to yield a similar result.

In the second stage, as tabulated in Models (2), (4), (6), and (8), we further see that lower allocation efficiency (induced by large inflow shocks of foreign portfolio investment) lead to lower cash flow rights inequality. In particular, a one-standard-deviation increase in foreign flow shocks transforms into 10.61%-standard-deviation reduction in inequality through the pricing channel (Models 7 and 8).[14] Jointly, results from this two-stage analysis suggest that rich families surrender their shares to foreign portfolio flows, triggering a misallocation behavior which further reduces the portion of future income that they can reap from the sales revenue of companies.

[14] The economic magnitude of the two-stage regression is computed as $\beta\sigma_x \times \theta/\sigma_y$, where β and θ are the regression coefficients in the first stage and second stage, respectively, x is the independent variable in the first stage, y is the dependent variable in the second stage, and σ_x and σ_y are the standard deviation of x and y, respectively. For instance, the standard deviation of foreign mutual fund flow shocks (*Flow_Shock_For* at country-industry level) is 0.286, the standard deviation of change in Top Income from Sales (Δ*TopIncome_Sales* at country-industry level) is 10.126, the first stage regression coefficient in Model 7 is −0.112, and the second stage regression coefficient in Model 8 is 33.539. We compute the economic magnitude as −0.112 × 0.286 × (33.539)/10.126 = −10.61%.

C. Exit of Ultimate Owners

To further understand the economic ground of globalization-induced family misallocation, we examine one of the most representative and important reallocation decisions of rich families upon the occurrence of large foreign delegated flows: exit, giving up the controlling ownership from a particular industry. The existing ultimate owners could be incentivized to cash out their assets for various reasons. First, ultimate owners have more knowledge and experience in the firm and domestic market, and might time their selling to capitalize more profit, e.g., sell the shares at its peak price. Moreover, ultimate owners may take this opportunity to consolidate and restructure their business assets, e.g., upgrade from traditional manufacturing sectors to technology-intensive sectors. Finally, ultimate owners holding concentrated ownership in the firm could benefit from diversification by cashing out their positions. To analyze the determinants of their exit decision, we estimate the following annual panel regressions at ultimate owner-country-industry level:

$$Exit_{u,i,c,t} = \alpha + \beta_1 Flow\_Shock_{i,c,t-1} + \beta_2 Flow\_Shock_{i,c,t-1} \times Char_{u,i,c,t-1} + \beta_3 Char_{u,i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{u,i,c,t}, \quad (5)$$

where $Exit_{u,i,c,t}$ is a dummy variable equals one if the ultimate owner u no longer accounts for at least 20% of the industry sales of industry i in country c in year t, and zero otherwise. Let $Sale_{u,i,c,t}$ denote the sales of ultimate owner u in industry i in country c in year t, and $IndSale_{i,c,t}$ denote the total sales of industry i in country c in year t. To be consistent with the *TopIncome_Sales* proxies previously defined at country-industry level, we require (1) the sales revenue of ultimate owner u accounts for more than 20% of the industry sales in year $t-1$, i.e., $Sale_{u,i,c,t-1}/IndSale_{i,c,t-1} > 0.2$; (2) ultimate owner u significantly sells those shares in year t and its portion in industry sales drops below the threshold, i.e., $Sale_{u,i,c,t}/IndSale_{i,c,t} \leq 0.2$. $Flow\_Shock_{i,c,t-1}$ is the average quarterly fund flow shocks of industry i in country c in year $t-1$. $Char_{u,i,c,t-1}$ refers to a list of ultimate owner characteristics, including *UOROA*, defined as value-weighted average of ROA for all firms held by the same ultimate owner in each country-industry; *UORET*, defined as value-weighted average of stock returns for all firms held by the same ultimate owner in each country-industry; *Manufacturing*, defined as a dummy variable equals one if industry i belongs to consumer non-durables, consumer durables or manufacturing industry, and zero otherwise; and *Core*, defined as a dummy variable equals one if the sales of a country-industry pair is ranked the highest within the ultimate owner's portfolio, and zero otherwise. Vectors *M* and *N* stack all other country-industry and country control variables as defined in Equation (2). We include year and industry fixed effects and cluster the standard errors at both the ultimate owner and year level.

Several findings are noteworthy. First, large swings of portfolio flows and especially foreign portfolio flows indeed induce existing ultimate owners to sell their shares. Second, ultimate owners tend to sell their core assets to foreign institutions, suggesting that diversification plays an important role in rich families' exit decisions. Finally, the exit of ultimate owners is not likely to be driven by their informational advantage or preference to chase hot sectors. Overall, financial globalization provides an easy access to global capital market for domestic rich families to liquidate their assets and enjoy more diversification. However, taken together with our previous findings on asset misallocation, the exit of rich families could have some unintended consequences because the diversification is achieved via the selling of more profitable industries.

D. Firm Profitability

Finally, we investigate how firm profitability can be influenced by delegated portfolio flow shocks, exit of ultimate owners, and their interactions. In particular, we first estimate the following annual panel specification at the country-industry level:

$$ROA_{i,c,t} = \alpha + \beta_1 Exit_{i,c,t-1} + \beta_2 Flow\_Shock_{i,c,t-1} + \beta_3 Exit_{i,c,t-1} \times Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t}, \quad (6)$$

where $ROA_{i,c,t}$ is the return on assets of industry i in country c in year t, and $Flow\_Shock_{i,c,t-1}$ is the average quarterly fund flow shocks of industry i in country c in year $t-1$. $Exit_{i,c,t-1}$ is a dummy variable equals one if at least one ultimate owner no longer accounts for 20% of the industry sales of industry i in country c in year $t-1$. Vectors *M* and *N* stack all other country-industry and country control variables as defined in Equation (2). We include year and industry fixed effects and cluster the standard errors at both the country and year level.

We report the results in Table 6 Models (1) to (3). We find that, the exit of ultimate owners does not affect firm profitability on its own, suggesting that a simple change in ownership from rich families to the rest of the domestic market will not improve firm profitability either. More interestingly, the interaction between the ultimate owners' exit and delegated portfolio flow shocks yields a significant effect with a positive sign, suggesting that foreign capital flows can benefit more in terms of firm profitability when rich families surrender their future cash flow rights—i.e., when they sell their shares to foreign funds. Foreign portfolio flows, in this regard, bring in real benefit to local investors. Models (4) to (6) conduct similar tests at the ultimate owner-country-industry level, and our findings remain intact. To conclude, these results suggest that portfolio flows help to reduce cash flow rights inequality, meanwhile also improve the profitability and lead to higher growth.

V. Additional Analyses: Alternative Channels and Robustness Checks

In this section, we first provide additional analysis by investigating alterative channels on income inequality. We then conduct robustness checks using sub-samples of domestic and foreign rich families. Finally, our results are robust to alternative definitions of inequality measures.

A. Alternative Channels

Cash flow rights may be affected because foreign investors affect corporate governance of local firms (e.g., Aggarwal, Erel, Ferreira, and Matos, 2011). A better corporate governance may reduce the probability for block owners to benefit themselves at the price of other small investors. If agency issue contributes to the wealth and income of rich families in some countries, then improved corporate governance would also reduce inequality. Similar to the asset misallocation channel, this governance channel can also generate within-country cross-industry effects. In addition, country-level policies and characteristics, such as tax and transfer system (e.g., Alvaredo, Atkinson, Piketty, and Saez, 2013; Kaymak and Poschke, 2016), labor market conditions (e.g., Autor and Dorn, 2013), technology changes, education (Jaumotte, Lall, and Papageorgiou, 2013), and financial development (Henry, 2000; Bekaert, Harvey, and Lundblad, 2005, 2009) can all influence the way earnings are generated and distributed in an economy. They can also provide economic grounds for financial globalization to influence income inequality. Different from the asset misallocation and governance channel, however, we can only conduct country-level tests to verify whether financial globalization influences inequality through these channels (i.e., by influencing these country characteristics).

Hence, we relate the change in income inequality from sales to delegated foreign portfolio flows via these alternative channels. The analytic tool is similar to Table 4, expect that we replace allocation efficiency with the alternative channels one by one. We report the results in Table 7. Models (1) to (2) test the governance channel at the country-industry level. Here, we aggregate the firm-specific corporate governance index (constructed from 41 individual attributes as in Aggarwal, Erel, Ferreira, and Matos, 2011) for all firms in each country-industry pair. Models (3) to (12) test the remaining country-level alternative channels, including tax policies (proxied by corporate tax rates), labor market conditions (proxied by unemployment rates), technology diffusion (proxied by the adoption of computer technology), education (proxied by the access to post-secondary education) and financial development (proxied by the ratio between stock market capitalization and GDP).

We find that all these alternative channels fail to deliver a similar result of linking capital flows to reduced inequality. The insignificance of corporate governance is reasonable for our setting. For the governance channel to work, fund managers need to carefully manage their portfolio flows in order to exert the governance influence. When exogenous shocks (fire sale/purchase) occur, however, managers may not have the flexibility of manage their investment in a way to influence governance—it is more likely that

managers simply buy and sell assets highly related to the existing holdings in order to absorb the request of fire sales/purchases from investors (e.g., Coval and Stafford, 2007). Our results are consistent with this operational process. A somewhat more interesting finding, however, is that normal flows—which include the endogenous actions of fund managers—still fail to support the governance channel, suggesting that governance may indeed not be the main mechanism in mitigating the issue of inequality.

Similarly, our findings do not support the notion that financial globalization influences inequality through tax, labor, technology, education, and financial development. Note that we are not saying that these country-level characteristics are not important in terms of inequality. Our tests do not refute the possibility that they may intertwine with financial globalization in influencing inequality as well. What our tests tell is that they are not the main mechanism through which foreign portfolio investments affect inequality. Hence, if these country characteristics joint force with delegated foreign portfolio flows, it is likely that they join force with the mechanism identified in this paper—the asset misallocation channel—in affecting income inequality.

B. Domestic vs. Foreign Rich Families

If we differentiate ultimate owners by their countries of origin, our findings should be more significant for the rich domestic families, as they are likely to hold concentrated domestic assets with higher diversification needs. By contrast, foreign rich families may have already diversified, therefore the influence of foreign flow shocks to them is likely to be attenuated. Hence, we separate domestic and foreign rich families in computing their Top Income from Sales, and then repeat our main analyses to each of the group.

We first relate the change in income inequality from sales to portfolio investment flows, and report the results in Table 8. The layout is similar to that of Table 3, while to save space we only select the main model specifications and apply the same analysis to domestic ultimate owners as well as foreign ultimate owners. Models (1) to (4) test at the country level, while Models (5) to (8) test at the country-industry level. We find that the influence of flow shocks from foreign-delegated portfolio investment mainly affects Top Income from Sales attributable to rich domestic families across all model specifications, while the impact on rich foreign families is insignificant. For instance, a one-standard-deviation increase in foreign flow shocks is associated with a 5.44%-standard-deviation (Model 6) reduction in inequality attributable to domestic ultimate owners. Unreported results test the asset misallocation channel and apply the two-stage test of Table 4. We find that given the increase in asset price upon large foreign portfolio inflows, only domestic ultimate owners sell their shares, leading to lower income inequality from sales. Overall, the empirical evidence suggest that the influence of foreign portfolio flows applies mostly to domestic rich families.

C. Alternative Definitions

We finally conduct robustness checks by using alternative definitions of income inequality measure. In our main analyses, we require the sales of an ultimate owner accounts for at least 20% of the total sales in the industry. As a robustness check, we employ alternative breakpoint of 10%, and the top income from sales in specific industry-country-year can be measured accordingly as follows: $TopIncome\_Sales_{i,c,t}^{P10} = \frac{\sum_u Sale_{u,i,c,t} \times I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.1\}}{IndSale_{i,c,t}}$, where $I\{\cdot\}$ is an indicator function that equals one if $Sale_{u,i,c,t}/IndSale_{i,c,t}$ is larger than 0.1 and zero otherwise, and all other variables are defined the same as in *TopIncome_Sales* at industry level. Similarly, we also use this alternative threshold to construct top income from sales in a specific country in any given year.

We report the results in Table 9, and the layout is the same as in Table 3. Models (1) to (4) report the results at country level following Equation (1), while the dependent variable is replaced with changes in country-level *TopIncome_Sales* based on 10% breakpoint. Models (5) to (12) expand the analysis to country-industry level following Equation (2), while the dependent variable is replaced with changes in industry level *TopIncome_Sales* based on 10% breakpoint. The results confirm that exogenous shocks in portfolio flows reduce the inequality at both country and country-industry level, and the mitigating effect is concentrated in the capital flow of foreign mutual funds. Unreported tests show similar results when using 50% breakpoint.

VI. Conclusion

While financial globalization related to foreign direct investment often enhances inequality, we document a surprising finding that large swings of capital flows delegated through the global mutual fund industry can actually reduce the income of the top 1%. To rationalize this observation, we construct a new dataset of worldwide ownership of the richest persons (i.e., ultimate owners) for both private and publicly listed firms for the 2001─2013 period, which allows us to measure the (gross) income inequality by the fraction of sales accrued to these rich persons in each country/industry.

In addition, we find that large inflows of foreign capital incentivizes existing local ultimate owners to cash out their assets, especially their core business to benefit from diversification. However, such asset reallocation turns out to be inefficient as their selling industries subsequently outperform their holding ones. This reduces the portion of future income that they can reap from the sales revenue of companies, and as a result further reduces the degree of income inequality. We also show that alternative channels, such as corporate governance, taxation, labor market conditions, technology shocks, education, and financial development fail to explain the influence of flow on inequality. Our results have important normative

implications, suggesting that, different from the case of labor market and foreign direct investment, an effective global financial market in terms of delegated portfolio investment might help mitigate the issue of income inequality.

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Appendix A: Construction of Control Relations

We use a method for identifying control relations in complex ownership structures that uses both the firm-specific ownership map and the corporate network in which the firm is embedded (Aminadav, Bachrach, Kosenko, Rosenschein, and Wilf (2011)). We use the ownership data from the Bureau van Dijk databases and proceed as follows. We first set the required parameters for the control identification process: the majority quota needed to pass a vote to 50% (a number between 0% and 100%) and the Shapley-Shubik (1954) power index control threshold to 75% (a number between 50% and 100%). According to the control identification method we use, a shareholder (or a specific concert of shareholders, as will be explained below) in a firm is said to directly control that firm if given the majority quota of 50% the Shapley-Shubik power index of this shareholder is at least as large as the control threshold of 75%. The power index is calculated for the shareholders of the firm as a player-set in a weighted majority game with weights equal to their fraction of voting rights in the firm. If for a given firm there is no shareholder with direct holdings that fulfills the conditions above, then we say that this firm is not directly controlled, i.e., the firm is widely held.

After determining the direct controllers, for each controlled firm we identify the ultimate owner by searching up the direct control links that lead to that controlled firm. The ultimate owner is defined as a single non-controlled shareholder that directly or indirectly - via other shareholders controls the firm.

Once the ultimate owners of all the controlled firms were identified for the first time (first iteration of the method), we extract cases where several shareholders of each firm are directly or indirectly controlled by the same identified ultimate owner. We will refer to each such subset of shareholders in each firm a "concert of shareholders". The set of shareholders of a certain firm may contain several concerts of shareholders. However, given the uniqueness of control relations and of the ultimate owner, these concerts must be disjoint sets.

In the next stage we consider concerts of shareholders as one voter, i.e., a bloc whose weight is equal to the sum of the weights of its members. Thus, for each such bloc (concert) we calculate the power index of the entire bloc rather than the individual index of each member. We perform the Shapley-Shubik power index control test again; find direct controllers, ultimate owners and concerts of shareholders and so on. After repeating the same procedure for a finite number of iterations the outcomes will remain fixed for all subsequent iterations, and the method converge into a final solution. This solution is the set of all control relations, where each controlled firm is linked to its direct controlling concert (or one controlling shareholder) and to its ultimate owner. Furthermore, for each controlled firm we obtain the ultimate owner's direct and indirect ownership stake, the number of control links between the firm and the ultimate owner (the level in a pyramid), and the minimal stake required for control given the ownership stakes of all the

other non-controlling shareholders (concerts) and the predetermined majority quota of 50% and control threshold of 75% (by solving the inverse Shapley-Shubik power index problem).

Appendix B: Variable Definitions

Variables	Definitions
A. Industry-Level Inequality Measures	
TopIncome_Sales	Top income from sales at industry level in a given year t is computed as follows: $TopIncome\_Sales_{i,c,t} = \frac{\sum_u Sale_{u,i,c,t} \times I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{IndSale_{i,c,t}}$, where $Sale_{u,i,c,t}$ refers to the sales of ultimate owner u in industry i in country c in year t, $IndSale_{i,c,t}$ refers to the total sales of industry i in country c in year t, and $I\{\cdot\}$ refers to an indicator function that equals one if $Sale_{u,i,c,t}/IndSale_{i,c,t}$ is larger than 0.2 and zero otherwise.
TopIncome_Sales_Dom	Top income from sales among domestic ultimate owners in a given year t is computed as follows: $TopIncome\_Sales\_Dom_{i,c,t} = \frac{\sum_{u \in c} Sale_{u,i,c,t} \times I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{IndSale_{i,c,t}}$, where $u \in c$ represents the set of ultimate owners domiciled in country c, and all other variables are defined the same as in *TopIncome_Sales* above.
TopIncome_Sales_For	Top income from sales among foreign ultimate owners in a given year t is computed as follows: $TopIncome\_Sales\_For_{i,c,t} = \frac{\sum_{u \notin c} Sale_{u,i,c,t} \times I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{IndSale_{i,c,t}}$, where $u \notin c$ represents the set of ultimate owners not domiciled in country c, and all other variables are defined the same as in *TopIncome_Sales* above.
B. Country-Level Inequality Measures	
Top 1% Income	The share of total pre-tax national income accruing to the top 1% income holders, as reported by the World Wealth and Income Database.
Top 10% Income	The share of total pre-tax national income accruing to the top 10% income holders, as reported by the World Wealth and Income Database.
Top 0.1% Income	The share of total pre-tax national income accruing to the top 0.1% income holders, as reported by the World Wealth and Income Database.
TopIncome_Sales	Top income from sales at country level in a given year t is computed as follows: $TopIncome\_Sales_{c,t} = \frac{\sum_u UOSale_{u,c,t} \times \max_{u,c,t} I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{MktSale_{c,t}}$, where $UOSale_{u,c,t}$ refers to the total sales of ultimate owner u in country c in year t, $\max_{u,c,t} I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}$ refers the maximum value of $I\{\cdot\}$ across all industries for ultimate owner u in country c in year t, $MktSale_{c,t}$ refers to the total sales in country c in year t, and all other variables are defined the same as in *TopIncome_Sales* at industry level.
TopIncome_Sales_Dom	Top income from sales among domestic ultimate owners in a given year t is computed as follows: $TopIncome\_Sales\_Dom_{c,t} = \frac{\sum_{u \in c} UOSale_{u,c,t} \times \max_{u,c,t} I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{MktSale_{c,t}}$, where $u \in c$ represents the set of ultimate owners domiciled in country c, and all other variables are defined the same as in *TopIncome_Sales* at industry level and country level.
TopIncome_Sales_For	Top income from sales among foreign ultimate owners in a given year t is computed as follows: $TopIncome\_Sales\_For_{c,t} = \frac{\sum_{u \notin c} UOSale_{u,c,t} \times \max_{u,c,t} I\{Sale_{u,i,c,t}/IndSale_{i,c,t} > 0.2\}}{MktSale_{c,t}}$, where $u \notin c$ represents the set of ultimate owners not domiciled in country c, and all other variables are defined the same as in *TopIncome_Sales* at industry level and country level.
C. Industry-Level Mutual Fund Flow Measures	
Flow	Industry flow in a given quarter q is computed as follows: $Flow_{i,c,q} = \frac{\sum_{s \in i,c,f} N_{s,f,q} P_{s,q} - N_{s,f,q-4} P_{s,q}}{\sum_{s \in i,c,f} N_{s,f,q-4} P_{s,q-4}}$, where $N_{s,f,q}$ refers to the number of shares of company s held by fund f in quarter q, and $P_{s,q}$ refers to the price of company s in the same quarter. $s \in i,c,f$ represents the set of companies in industry i of country c that held by fund f. The annual industry flow is the average of quarterly flows within a year.
FlowDom	Domestic industry flow in a given quarter q is computed as follows: $FlowDom_{i,c,q} = \frac{\sum_{f \in c, s \in i,c,f} N_{s,f,q} P_{s,q} - N_{s,f,q-4} P_{s,q}}{\sum_{f \in c, s \in i,c,f} N_{s,f,q-4} P_{s,q-4}}$, where $f \in c$ represents the set of mutual funds domiciled in country c, and all other variables are defined the same as in *Flow* above. The annual domestic industry flow is the average of quarterly flows within a year.
FlowFor	Foreign industry flow in a given quarter q is computed as follows: $FlowFor_{i,c,q} = \frac{\sum_{f \notin c, s \in i,c,f} N_{s,f,q} P_{s,q} - N_{s,f,q-4} P_{s,q}}{\sum_{f \notin c, s \in i,c,f} N_{s,f,q-4} P_{s,q-4}}$, where $f \notin c$ represents the set of mutual funds not domiciled in country c, and all other variables are defined the same as in *Flow* above. The annual foreign industry flow is the average of quarterly flows within a year.
Flow_Shock	Industry flow shock in a given quarter q is computed as follows: $Flow\_Shock_{i,c,q} = \frac{\sum_{s \in i,c,f} \max(0, N_{s,f,q} P_{s,q} - N_{s,f,q-4} P_{s,q}) \times I\{Flow_{f,q} > PCT90_q\} - \sum_{s \in i,c,f} \max(0, N_{s,f,q-4} P_{s,q} - N_{s,f,q} P_{s,q}) \times I\{Flow_{f,q} < PCT10_q\}}{\sum_{s \in i,c,f} N_{s,f,q-4} P_{s,q-4}}$,

	where $\max(0, N_{s,f,q}P_{s,q} - N_{s,f,q-4}P_{s,q})$ refers to the maximum value between zero and $N_{s,f,q}P_{s,q} - N_{s,f,q-4}P_{s,q}$, $\max(0, N_{s,f,q-4}P_{s,q} - N_{s,f,q}P_{s,q})$ refers to the maximum value between zero and $N_{s,f,q-4}P_{s,q} - N_{s,f,q}P_{s,q}$, $Flow_{f,q}$ refers to the flow of fund f in quarter q, $PCT90_q$ and $PCT10_q$ refer to 90th percentile and 10th percentile of fund flow among all funds in the same domicile country as fund f in quarter q, $I\{Flow_{f,q} > PCT90_q\}$ refers to an indicator function that equals one if fund flow is above the 90th percentile in the same country and zero otherwise, $I\{Flow_{f,q} < PCT10_q\}$ refers to an indicator function that equals one if fund flow is below the 10th percentile in the same country and zero otherwise, and all other variables are defined the same as in *Flow* above. The annual industry flow shock is the average of quarterly flow shocks within a year.
Flow_Shock_Dom	Domestic industry flow shock in a given quarter q is computed as follows: $Flow\_Shock\_Dom_{i,c,q} = \frac{\sum_{f\in c,s\in i,c,f}\max(0,N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q})\times I\{Flow_{f,q}>PCT90_q\}-\sum_{f\in c,s\in i,c,f}\max(0,N_{s,f,q-4}P_{s,q}-N_{s,f,q}P_{s,q})\times I\{Flow_{f,q}<PCT10_q\}}{\sum_{f\in c,s\in i,c,f}N_{s,f,q-4}P_{s,q-4}}$, where $f \in c$ represents the set of mutual funds domiciled in country c, and all other variables are defined the same as in *Flow_Shock* above. The annual domestic industry flow shock is the average of quarterly flow shocks within a year.
Flow_Shock_For	Foreign industry flow shock in a given quarter q is computed as follows: $Flow\_Shock\_For_{i,c,q} = \frac{\sum_{f\notin c,s\in i,c,f}\max(0,N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q})\times I\{Flow_{f,q}>PCT90_q\}-\sum_{f\notin c,s\in i,c,f}\max(0,N_{s,f,q-4}P_{s,q}-N_{s,f,q}P_{s,q})\times I\{Flow_{f,q}<PCT10_q\}}{\sum_{f\notin c,s\in i,c,f}N_{s,f,q-4}P_{s,q-4}}$, where $f \notin c$ represents the set of mutual funds not domiciled in country c, and all other variables are defined the same as in *Flow_Shock* above. The annual foreign industry flow shock is the average of quarterly flow shocks within a year.
D. Country-Level Mutual Fund Flow Measures	
Flow	Market flow in a given quarter q is computed as follows: $Flow_{c,q} = \frac{\sum_{s\in c,f}N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q}}{\sum_{s\in c,f}N_{s,f,q-4}P_{s,q-4}}$, where $N_{s,f,q}$ refers to the number of shares of company s held by fund f in quarter q, and $P_{s,q}$ refers to the price of company s in the same quarter. $s \in c, f$ represents the set of companies in country c held by fund f. The annual market flow is the average of quarterly flows within a year.
FlowDom	Domestic market flow in a given quarter q is computed as follows: $FlowDom_{c,q} = \frac{\sum_{f\in c,s\in c,f}N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q}}{\sum_{f\in c,s\in c,f}N_{s,f,q-4}P_{s,q-4}}$, where $f \in c$ represents the set of mutual funds domiciled in country c, and all other variables are defined the same as in *Flow* at country level. The annual domestic market flow is the average of quarterly flows within a year.
FlowFor	Foreign market flow in a given quarter q is computed as follows: $FlowFor_{c,q} = \frac{\sum_{f\notin c,s\in c,f}N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q}}{\sum_{f\notin c,s\in c,f}N_{s,f,q-4}P_{s,q-4}}$, where $f \notin c$ represents the set of mutual funds not domiciled in country c, and all other variables are defined the same as in *Flow* at country level. The annual foreign market flow is the average of quarterly flows within a year.
Flow_Top_Dom	Top domestic market flow in a given year equals to *FlowDom* (at country level) if *FlowDom* is in the top quintile across all countries at that time and zero otherwise.
Flow_Top_For	Top foreign market flow in a given year equals to *FlowFor* (at country level) if *FlowFor* is in the top quintile across all countries at that time and zero otherwise.
Flow_Other	Other market flow in a given year equals to *Flow* (at country level) if *Flow* is in the bottom four quintiles across all countries at that time and zero otherwise.
Flow_Shock	Market flow shock in a given quarter q is computed as follows: $Flow\_Shock_{c,q} = \frac{\sum_{s\in c,f}\max(0,N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q})\times I\{Flow_{f,q}>PCT90_q\}-\sum_{s\in c,f}\max(0,N_{s,f,q-4}P_{s,q}-N_{s,f,q}P_{s,q})\times I\{Flow_{f,q}<PCT10_q\}}{\sum_{s\in c,f}N_{s,f,q-4}P_{s,q-4}}$, where all variables are defined the same as in *Flow_Shock* at industry level. The annual market flow shock is the average of quarterly flow shocks within a year.
Flow_Shock_Dom	Domestic market flow shock in a given quarter q is computed as follows: $Flow\_Shock\_Dom_{c,q} = \frac{\sum_{f\in c,s\in c,f}\max(0,N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q})\times I\{Flow_{f,q}>PCT90_q\}-\sum_{f\in c,s\in c,f}\max(0,N_{s,f,q-4}P_{s,q}-N_{s,f,q}P_{s,q})\times I\{Flow_{f,q}<PCT10_q\}}{\sum_{f\in c,s\in c,f}N_{s,f,q-4}P_{s,q-4}}$, where $f \in c$ represents the set of mutual funds domiciled in country c, and all other variables are defined the same as in *Flow_Shock* at industry level. The annual domestic market flow shock is the average of quarterly flow shocks within a year.
Flow_Shock_For	Foreign market flow shock in a given quarter q is computed as follows: $Flow\_Shock\_For_{c,q} = \frac{\sum_{f\notin c,s\in c,f}\max(0,N_{s,f,q}P_{s,q}-N_{s,f,q-4}P_{s,q})\times I\{Flow_{f,q}>PCT90_q\}-\sum_{f\notin c,s\in c,f}\max(0,N_{s,f,q-4}P_{s,q}-N_{s,f,q}P_{s,q})\times I\{Flow_{f,q}<PCT10_q\}}{\sum_{f\notin c,s\in c,f}N_{s,f,q-4}P_{s,q-4}}$, where $f \notin c$ represents the set of mutual funds not domiciled in country c, and all other variables are defined the same as in *Flow_Shock* at industry level. The annual foreign market flow shock is the average of quarterly flow shocks within a year.
Panel E: Other Industry Characteristics	
Industry Size/GDP	The end-of-year stock market capitalization in each industry divided by nominal GDP in each country.
Industry Return	The value-weighted average of return for all firms in the industry in each country.
ROA	The total assets weighted average of return on assets for all firms in the industry in each country. The return on assets in a given quarter q is computed as follows: $ROA_{s,q} = IB_{s,q}/(AT_{s,q} + DPACT_{s,q})$, where $IB_{s,q}$ refers to the income

	before extraordinary items of stock s in quarter q, $AT_{s,q}$ refers to the total assets, $DPACT_{s,q}$ refers to the accumulated depreciation.
Allocation Efficiency	The equal-weighted average of allocation efficiency for all ultimate owners in the industry in each country. Allocation efficiency in a given year t is computed as follows: $AE_{u,i,c,t} = \sum_{s \in i,c}(w_{s,u,t} - w_{s,u,t-1}) \times ROA_{s,t}$, where $w_{s,u,t}$ refers to the investment weight of company s held by ultimate owner u in year t, and $ROA_{s,t}$ refers to the return on assets of company s in year t. $s \in i,c$ represents the set of companies in industry i of country c in ultimate owner u's portfolio, including firms held by the ultimate owner in either year t or year $t-1$.
CorpGov	The equal-weighted average of corporate governance index for all firms in the industry in each country. The corporate governance index is constructed from 41 individual attributes, following Aggarwal, Erel, Ferreira, and Matos (2011).
Panel F: Other Country Characteristics	
Inward FDI/GDP	The net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors divided by GDP, as reported by the World Bank. Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor.
Tax	The amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a percentage of commercial profits, as reported by the World Bank.
Unemployment	The percentage of the labor force that is without work but available for and seeking employment, as reported by the World Bank.
Computer Adoption	The number of personal computers per 100 people, as reported by the World Bank. Personal computers are self-contained computers designed to be used by a single individual.
Post-Secondary	The percentage of population ages 25 and over that attained or completed post-secondary non-tertiary education, as reported by the World Bank.
Stock Market Turnover	The total value of shares traded during the year divided by the average market capitalization, as reported by the World Bank. Average market capitalization is calculated as the average of the year-end values for current and previous year.
Stock Market/GDP	The end-of-year stock market capitalization divided by nominal GDP, as reported by the World Bank.
Private Bond Market/GDP	The end-of-year domestic credit value to the private sector divided by nominal GDP, as reported by the World Bank. Domestic credit to the private sector refers to financial resources provided to the private sector by financial corporations.
Common Law	A dummy variable equals one if the origin of the commercial law of a country is English Common Law, and zero otherwise, following La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999).
Judical	The average of the following four variables (each ranging from 0 to 10): the efficiency of the judicial system, rule of law, risk of expropriation and risk of contract repudiation, following La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998).
Good Government Index	The sum of the following three indices from the International Country Risk Guide (each ranging from 0 to 10): government corruption, the risk of expropriation of private property by the government, and the risk of the government repudiating contracts, following Karolyi, Lee, and van Dijk (2012).
Anti-Self-Dealing Index	The anti-self-dealing index is the average of ex ante and ex post private control of self-dealing, following Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008).
Disclosure	The disclosure intensity is defined on the basis of the prevalence of disclosures concerning research and development (R&D) expenses, capital expenditures, product and geographic segment data, subsidiary information, and accounting methods, from the 1995 International Accounting and Auditing Trends from the Center for Financial Analysis and Research (CIFAR), following Bushman, Piotroski, and Smith (2004).
Property Rights Index	A rating of property rights in each country (ranging from 0 to 15), following Holmes, Johnson, and Kirkpatrick (1997) and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999).
Control Premium	The difference between the price per share paid for the control block and the exchange price two days after the announcement of the control transaction, divided by the exchange price and multiply by the ratio of the proportion of cash flow rights represented in the controlling block, following Dyck and Zingales (2004), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008).
Ownership Concentration	Average percentage of common shares owned by the top three shareholders in the ten largest non-financial, privately owned domestic firms in a given country, following La Porta, Lopez-de-Silanes, and Shleifer (2006), and Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008).
Panel G: Ultimate Owner Characteristics	
UOROA	The value-weighted average of return on assets for all firms held by the same ultimate owner in each country-industry.
UORET	The value-weighted average of stock returns for all firms held by the same ultimate owner in each country-industry.
Manufacturing	A dummy variable equals one if a given industry belongs to consumer non-durables, consumer durables or manufacturing industry, and zero otherwise. The industry classification is based on SIC codes and Fama and French (1997) 48-industry classification, and these 48 industries are further aggregated to 10 main industry groups following Kacperczyk, Sialm, and Zheng (2005).
Core	A dummy variable equals one if the sales of a country-industry pair is ranked the highest within the ultimate owner's portfolio, and zero otherwise.

Table 1: Summary Statistics

This table presents the summary statistics for the data used in the paper during the 2001–2013 period. Panel A reports the mean, median, standard deviation, and the quantile distribution of the level and annual change in top income from sales at industry-level and country-level, annual industry and market flow, as well as other annual industry and country characteristics. Panel B reports the correlation matrix of the main industry-level and country-level dependent and independent variables. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Panel A: Quantile Distribution of Industry and Country Characteristics							
	Mean	Std.Dev.	Quantile Distribution				
			10%	25%	Median	75%	90%
Panel A1: Industry Characteristics							
TopIncome_Sales	56.302	26.147	24.715	31.792	51.494	79.705	97.508
ΔTopIncome_Sales	-1.640	10.126	-14.868	-4.911	-0.413	2.757	8.360
Flow	0.355	1.077	-0.305	-0.095	0.068	0.412	1.176
FlowFor	0.378	1.125	-0.311	-0.100	0.086	0.431	1.280
FlowDom	0.319	1.114	-0.400	-0.165	0.017	0.380	1.248
Flow_Shock	0.003	0.278	-0.011	-0.003	0.003	0.018	0.050
Flow_Shock_For	0.006	0.286	-0.013	-0.003	0.005	0.023	0.060
Flow_Shock_Dom	0.007	0.027	-0.011	-0.003	0.002	0.011	0.033
Industry Size/GDP	2.559	7.027	0.027	0.113	0.512	2.108	5.690
Industry Return	0.882	3.510	-3.161	-0.792	1.002	2.754	4.700
Allocation Efficiency	-0.064	2.628	-1.348	-0.125	0.000	0.101	1.123
CorpGov	0.478	0.086	0.369	0.424	0.469	0.517	0.585
ROA	3.059	5.393	-0.920	0.954	2.701	4.979	8.277
Panel A2: Country Characteristics							
Top 1% Income	10.730	3.574	7.300	8.520	9.450	12.910	16.680
ΔTop 1% Income	0.086	1.048	-0.640	-0.190	0.090	0.380	0.960
Top 10% Income	34.947	6.076	27.490	30.690	33.285	39.650	43.530
ΔTop 10% Income	0.201	1.474	-0.760	-0.320	0.175	0.670	1.200
Top 0.1% Income	3.939	1.834	2.200	2.485	3.355	4.835	7.370
ΔTop 0.1% Income	0.025	0.704	-0.380	-0.080	0.050	0.220	0.400
TopIncome_Sales	15.417	13.037	2.196	5.161	11.787	21.729	31.900
ΔTopIncome_Sales	-0.053	4.808	-4.734	-1.673	0.108	2.041	5.150
Flow	0.195	0.418	-0.098	-0.023	0.079	0.247	0.566
FlowFor	0.181	0.423	-0.102	-0.024	0.074	0.214	0.514
FlowDom	0.233	0.836	-0.243	-0.063	0.055	0.250	0.759
Flow_Shock	0.004	0.084	-0.008	-0.001	0.005	0.017	0.036
Flow_Shock_For	0.005	0.084	-0.009	-0.001	0.006	0.018	0.038
Flow_Shock_Dom	0.004	0.017	-0.006	-0.001	0.001	0.009	0.021
ΔInward FDI/GDP	-0.168	6.316	-3.967	-1.189	-0.103	1.046	3.011
Tax	45.524	19.758	25.100	33.500	40.200	51.100	72.600
Unemployment	7.403	4.766	3.400	4.100	6.000	9.200	11.500
Computer Adoption	36.045	25.780	5.378	9.221	37.594	56.317	68.981
Post-Secondary	24.290	10.919	10.974	12.993	24.036	31.697	39.357
Stock Market Turnover	74.915	61.875	11.640	26.987	62.262	105.672	151.711
Stock Market/GDP	105.237	148.338	23.245	37.668	68.630	121.665	190.470
Private Bond Market/GDP	98.839	51.184	23.895	63.839	99.353	138.159	167.353
Common Law	0.383	0.487	0.000	0.000	0.000	1.000	1.000
Judical	7.954	1.707	5.533	6.298	7.993	9.495	9.745
Good Government Index	23.999	4.666	16.832	20.169	24.851	27.888	28.980
Anti-Self-Dealing Index	0.530	0.256	0.213	0.333	0.450	0.757	0.950
Disclosure	83.694	19.269	57.250	70.290	88.410	100.000	100.000
Property Rights Index	4.364	0.743	3.000	4.000	5.000	5.000	5.000
Control Premium	0.112	0.130	0.010	0.020	0.070	0.160	0.280
Ownership Concentration	0.456	0.130	0.230	0.390	0.510	0.560	0.580

Table 1—Continued

Panel B: Correlation Matrix Between Top Income from Sales and Flow	
Panel B1: Correlation at Country-Industry Level	
	ΔTopIncome_Sales
Flow	-0.016
FlowFor	-0.016
FlowDom	0.001
Flow_Shock	-0.043**
Flow_Shock_For	-0.045**
Flow_Shock_Dom	0.059***
Panel B2: Correlation at Country Level	
	ΔTopIncome_Sales
Flow	-0.156***
FlowFor	-0.156***
FlowDom	-0.063
Flow_Shock	-0.164***
Flow_Shock_For	-0.164***
Flow_Shock_Dom	0.015

Table 2: Income Inequality and Mutual Fund Flows

This table presents the results of the following annual panel regressions with year fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_WWID_{c,t} = \alpha + \beta Flow\_Shock_{c,t-1} + \gamma N_{c,t-1} + e_{c,t},$$

where $\Delta TopIncome\_WWID_{c,t}$ refers to the change in a list of income inequality proxies in country c in year t, including the share of top 1% (Models 1 to 10), 10% (Models 11 to 12), and 0.1% (Models 13 to 14) income in total income, respectively. $Flow\_Shock_{c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{c,t-1}$) and domestic mutual funds ($Flow\_Shock\_Dom_{c,t-1}$). We also consider $Flow\_Top\_For_{c,t-1}$ ($Flow\_Top\_Dom_{c,t-1}$), defined as average quarterly flows from foreign (domestic) mutual funds of country c if it is in the top quintile across all countries in year $t-1$ and zero otherwise; $Flow\_Other_{c,t-1}$, defined as average quarterly mutual fund flows of country c in year $t-1$ if it is in the bottom four quintiles across all countries in year $t-1$ and zero otherwise; $Flow_{c,t-1}$, defined as the average quarterly mutual fund flows of country c in year $t-1$; $\Delta FDI_{c,t-1}$, defined as the change in inward foreign direct investment as a percentage of GDP of country c in year $t-1$. Vector N stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 2—Continued

Out-of-sample Change in Income Inequality (in %) Regressed on Mutual Fund Flows														
	ΔTop 1% Income										ΔTop 10% Income		ΔTop 0.1% Income	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
Flow_Shock	-2.834***						-2.834***		-2.840***		-3.076**		-1.811***	
	(-4.23)						(-4.14)		(-4.06)		(-2.36)		(-5.13)	
Flow_Shock_For		-2.006***		-1.966***				-1.965***		-1.960***		-2.250**		-1.332***
		(-4.98)		(-4.98)				(-4.88)		(-4.88)		(-2.86)		(-5.45)
Flow_Shock_Dom			-1.827	-1.425				-1.432		-1.662		3.059		-0.434
			(-0.79)	(-0.61)				(-0.62)		(-0.73)		(0.47)		(-0.22)
Flow_Top_For					-0.017**	-0.017*								
					(-2.53)	(-2.17)								
Flow_Top_Dom					-0.000	-0.000								
					(-0.07)	(-0.08)								
Flow_Other					0.074	0.073								
					(0.76)	(0.75)								
Flow							0.026	0.026	0.025	0.025	-0.009	-0.007	0.018	0.018
							(0.60)	(0.56)	(0.56)	(0.53)	(-0.15)	(-0.14)	(0.64)	(0.61)
ΔInward FDI/GDP						-0.005			-0.005	-0.006				
						(-0.84)			(-0.81)	(-0.96)				
Stock Market	-0.001	-0.001	-0.001*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000	-0.001	-0.001
Turnover	(-1.33)	(-1.52)	(-1.95)	(-1.69)	(-1.15)	(-1.12)	(-1.65)	(-1.39)	(-1.13)	(-1.06)	(-0.03)	(-0.00)	(-0.81)	(-0.82)
Stock Market/GDP	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000
	(0.27)	(0.24)	(0.12)	(0.26)	(0.12)	(0.15)	(0.24)	(0.22)	(0.28)	(0.25)	(0.37)	(0.32)	(0.28)	(0.30)
Private Bond	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.001	0.000	0.001
Market/GDP	(0.21)	(0.27)	(0.28)	(0.27)	(0.48)	(0.47)	(0.30)	(0.30)	(0.27)	(0.31)	(0.23)	(0.26)	(0.36)	(0.33)
Common Law	0.115	0.128	0.088	0.125	0.082	0.073	0.103	0.112	0.094	0.102	0.046	0.056	0.084	0.091
	(0.51)	(0.66)	(0.47)	(0.57)	(0.47)	(0.41)	(0.45)	(0.50)	(0.40)	(0.44)	(0.18)	(0.19)	(0.58)	(0.66)
Judical	0.061	0.060	0.060	0.053	0.127	0.137	0.074	0.066	0.085	0.077	-0.209	-0.279	0.041	0.039
	(0.64)	(0.63)	(0.72)	(0.55)	(0.94)	(1.01)	(0.74)	(0.65)	(0.89)	(0.77)	(-0.27)	(-0.36)	(0.52)	(0.51)
Good Government	-0.071	-0.069	-0.078	-0.069	-0.100	-0.105	-0.078	-0.076	-0.084	-0.082	-0.005	0.032	-0.056	-0.054
Index	(-0.83)	(-0.79)	(-0.71)	(-0.83)	(-0.82)	(-0.86)	(-0.86)	(-0.87)	(-0.93)	(-0.96)	(-0.02)	(0.12)	(-1.01)	(-1.30)
Anti-Self-Dealing	-0.341	-0.360	-0.315	-0.330	-0.416	-0.426	-0.353	-0.342	-0.364	-0.349	0.028	0.089	-0.362	-0.366
Index	(-0.64)	(-0.77)	(-0.72)	(-0.69)	(-1.28)	(-1.38)	(-0.66)	(-0.71)	(-0.70)	(-0.74)	(0.02)	(0.06)	(-1.07)	(-1.16)
Disclosure	-0.002	-0.002	-0.000	-0.002	-0.001	-0.001	-0.002	-0.001	-0.002	-0.002	0.009	0.011	0.001	0.001
	(-0.26)	(-0.21)	(-0.02)	(-0.23)	(-0.16)	(-0.17)	(-0.23)	(-0.22)	(-0.26)	(-0.24)	(0.31)	(0.38)	(0.19)	(0.21)
Property Rights	0.051	0.042	0.070	0.054	0.043	0.047	0.056	0.059	0.060	0.065	0.364	0.348	0.079	0.077
Index	(0.42)	(0.33)	(0.51)	(0.40)	(0.26)	(0.28)	(0.48)	(0.47)	(0.50)	(0.51)	(1.39)	(1.39)	(0.62)	(0.56)
Control Premium	0.454	0.541	0.432	0.438	0.314	0.276	0.371	0.355	0.332	0.295	2.143	2.750	0.114	0.139
	(0.26)	(0.30)	(0.24)	(0.24)	(0.17)	(0.15)	(0.21)	(0.20)	(0.19)	(0.16)	(0.83)	(0.91)	(0.09)	(0.11)
Ownership	-0.546***	-0.578***	-0.504***	-0.510**	-0.534***	-0.518***	-0.546***	-0.509**	-0.528***	-0.479**	-0.871	-1.162	-0.302	-0.301
Concentration	(-3.97)	(-3.36)	(-3.55)	(-2.80)	(-4.97)	(-4.59)	(-4.05)	(-2.82)	(-4.45)	(-2.66)	(-0.92)	(-1.14)	(-1.70)	(-1.36)
Adj-Rsq.	0.131	0.129	0.118	0.130	0.125	0.126	0.132	0.130	0.133	0.132	0.069	0.070	0.151	0.150
Obs	150	150	150	150	150	150	150	150	150	150	141	141	127	127
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 3: Income Inequality from Sales and Mutual Fund Flows

Models 1 to 6 present the results of the following annual panel regressions with year fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_Sales_{c,t} = \alpha + \beta Flow\_Shock_{c,t-1} + \gamma N_{c,t-1} + e_{c,t},$$

where $\Delta TopIncome\_Sales_{c,t}$ is the change in the top income from sales of country c in year t, and $Flow\_Shock_{c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{c,t-1}$) and domestic mutual funds ($Flow\_Shock\_Dom_{c,t-1}$). We also consider $Flow_{c,t-1}$, defined as the average quarterly mutual fund flows of country c in year $t-1$; $\Delta FDI_{c,t-1}$, defined as the change in inward foreign direct investment as a percentage of GDP of country c in year $t-1$. Vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 7 to 14 present the results of the following annual panel regressions with fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_Sales_{i,c,t} = \alpha + \beta Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

where $\Delta TopIncome\_Sales_{i,c,t}$ is the change in the top income from sales of industry i in country c in year t, and $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{i,c,t-1}$) and domestic mutual funds ($Flow\_Shock\_Dom_{i,c,t-1}$). We also consider $Flow_{i,c,t-1}$, defined as the average quarterly mutual fund flows of industry i in country c in year $t-1$. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables as above. Models 7 to 10 include year, industry and country fixed effects, while Models 11 to 14 include year and industry fixed effects. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 3—Continued

Out-of-sample Change in Top Income From Sales (in %) Regressed on Mutual Fund Flows														
	Country Level						Country-Industry Level							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
Flow_Shock	-1.432***		-1.914***		-1.914**		-2.091***		-2.052***		-1.983**		-2.070**	
	(-9.63)		(-3.07)		(-2.97)		(-4.72)		(-3.79)		(-2.95)		(-2.93)	
Flow_Shock_For		-1.427***		-1.830***		-1.827***		-2.040***		-1.996***		-2.004***		-2.107***
		(-9.78)		(-3.64)		(-3.57)		(-4.17)		(-3.44)		(-3.10)		(-3.24)
Flow_Shock_Dom				2.317		1.775				29.617*				31.261*
				(0.33)		(0.25)				(1.93)				(2.07)
Flow			0.017	0.015	0.017	0.014			-0.001	-0.001			0.002	0.002
			(0.68)	(0.67)	(0.66)	(0.64)			(-0.23)	(-0.27)			(0.81)	(0.88)
ΔInward FDI/GDP					-0.075	-0.074								
					(-0.76)	(-0.72)								
Industry Size/GDP							0.048**	0.048*	0.048	0.046	0.040	0.040	0.040	0.039
							(2.24)	(1.93)	(1.75)	(1.60)	(1.17)	(1.16)	(1.19)	(1.08)
Industry Return							0.144*	0.144**	0.149*	0.150*	0.101	0.101	0.110	0.110
							(1.96)	(2.24)	(1.91)	(2.10)	(0.65)	(0.64)	(0.69)	(0.57)
Stock Market Turnover	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	0.016	0.016	0.015	0.015	0.007	0.007	0.007	0.007
	(-1.18)	(-1.17)	(-1.13)	(-1.15)	(-1.20)	(-1.18)	(0.70)	(0.74)	(0.73)	(0.78)	(0.77)	(0.78)	(0.58)	(0.82)
Stock Market/GDP	0.002	0.002	0.002	0.002	0.002	0.002	0.008*	0.008*	0.008*	0.008*	0.003	0.003	0.003	0.003
	(0.37)	(0.36)	(0.46)	(0.48)	(0.54)	(0.55)	(2.02)	(2.07)	(1.95)	(2.09)	(0.87)	(0.89)	(0.95)	(1.06)
Private Bond Market/GDP	0.001	0.001	0.001	0.001	0.001	0.001	0.029*	0.029*	0.027*	0.030*	-0.004	-0.004	-0.005	-0.006
	(0.13)	(0.12)	(0.13)	(0.11)	(0.16)	(0.15)	(1.98)	(2.04)	(1.81)	(2.06)	(-0.25)	(-0.24)	(-0.32)	(-0.33)
Common Law	-0.432	-0.429	-0.432	-0.446	-0.424	-0.434					-0.605	-0.590	-0.735	-0.562
	(-0.29)	(-0.29)	(-0.30)	(-0.31)	(-0.30)	(-0.30)					(-0.65)	(-0.64)	(-0.79)	(-0.62)
Judical	-0.814	-0.820	-0.811	-0.835	-0.827	-0.847					1.726	1.720	1.588	1.604
	(-0.35)	(-0.35)	(-0.35)	(-0.36)	(-0.35)	(-0.36)					(1.20)	(1.20)	(1.11)	(1.06)
Good Government Index	0.247	0.249	0.246	0.254	0.248	0.255					-0.581	-0.578	-0.527	-0.544
	(0.35)	(0.35)	(0.34)	(0.36)	(0.35)	(0.36)					(-1.05)	(-1.05)	(-0.98)	(-1.00)
Anti-Self-Dealing Index	1.295	1.290	1.279	1.293	1.229	1.239					-1.658	-1.667	-1.527	-1.766
	(0.47)	(0.47)	(0.46)	(0.47)	(0.45)	(0.46)					(-0.71)	(-0.72)	(-0.66)	(-0.78)
Disclosure	0.033	0.033	0.033	0.033	0.033	0.034					0.013	0.013	0.013	0.013
	(0.58)	(0.58)	(0.59)	(0.60)	(0.58)	(0.58)					(0.22)	(0.22)	(0.24)	(0.24)
Property Rights Index	0.940	0.938	0.946	0.924	0.956	0.938					-0.631	-0.637	-0.649	-0.697
	(0.60)	(0.60)	(0.61)	(0.59)	(0.62)	(0.61)					(-0.67)	(-0.67)	(-0.68)	(-0.71)
Control Premium	5.776	5.767	5.620	5.601	5.700	5.688					-1.677	-1.674	-1.796	-1.726
	(0.74)	(0.74)	(0.72)	(0.71)	(0.73)	(0.72)					(-0.34)	(-0.34)	(-0.39)	(-0.38)
Ownership Concentration	-2.379	-2.397	-2.306	-2.476	-2.393	-2.531					-2.432	-2.444	-2.834	-3.243
	(-0.87)	(-0.88)	(-0.87)	(-0.96)	(-0.91)	(-0.98)					(-1.13)	(-1.15)	(-1.25)	(-1.44)
Adj-Rsq.	0.101	0.101	0.102	0.102	0.105	0.105	0.077	0.077	0.078	0.079	0.062	0.062	0.063	0.065
Obs	363	363	363	363	363	363	3,249	3,249	3,232	3,232	2,427	2,427	2,419	2,419
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Country FE	N	N	N	N	N	N	Y	Y	Y	Y	N	N	N	N

Table 4: Allocation Efficiency, Industry Inequality, and Mutual Fund Flows

This table presents the results of the following annual two-stage panel regressions with fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\text{First stage: } AE_{i,c,t} = \alpha + \beta Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

$$\text{Second stage: } \Delta TopIncome\_Sales_{i,c,t} = \alpha + \theta \widehat{AE}_{i,c,t} + \gamma_1' M_{i,c,t-1} + \gamma_2' N_{c,t-1} + e_{i,c,t},$$

where $AE_{i,c,t}$ is the allocation efficiency of industry i in country c in year t, and $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. $\widehat{AE}_{i,c,t}$ is the projected allocation efficiency attributable to $Flow\_Shock_{i,c,t-1}$. $\Delta TopIncome\_Sales_{i,c,t}$ is the change in the top income from sales of industry i in country c in year t. $Flow\_Shock_{i,c,t-1}$ can further be replaced with flow shock from foreign mutual funds ($Flow\_Shock\_For_{i,c,t-1}$) in the first stage. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 1, 2, 5 and 6 include year, industry and country fixed effects, while Models 3, 4, 7 and 8 include year and industry fixed effects. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Two-stage Regression of Change in Top Income From Sales (in %, Country-Industry Level)								
	1st Stage Model 1	2nd Stage Model 2	1st Stage Model 3	2nd Stage Model 4	1st Stage Model 5	2nd Stage Model 6	1st Stage Model 7	2nd Stage Model 8
Allocation Efficiency		39.143***		34.541***		38.674***		33.539***
		(4.52)		(6.03)		(4.06)		(5.20)
Flow_Shock	-0.104***		-0.110***					
	(-3.99)		(-4.48)					
Flow_Shock_For					-0.104***		-0.112***	
					(-3.84)		(-4.10)	
Industry Size/GDP	0.019	-0.745	0.017**	-0.587	0.019	-0.737	0.017**	-0.569
	(1.57)	(-1.17)	(2.30)	(-0.00)	(1.55)	(-1.12)	(2.54)	(-0.00)
Industry Return	0.034	-1.180	0.023	-0.544	0.034	-1.164	0.023	-0.520
	(1.35)	(-0.97)	(0.60)	(-0.58)	(1.35)	(-0.93)	(0.61)	(-0.56)
Stock Market Turnover	-0.001	0.027	-0.001	-0.004	-0.001	0.027	-0.001	-0.005
	(-0.51)	(0.36)	(-0.25)	(-0.14)	(-0.51)	(0.35)	(-0.25)	(-0.15)
Stock Market/GDP	-0.000	0.021**	-0.001	0.033**	-0.000	0.021**	-0.001	0.032***
	(-0.30)	(2.45)	(-0.53)	(2.78)	(-0.31)	(2.45)	(-0.54)	(3.14)
Private Bond Market/GDP	-0.001	0.070	0.001	-0.053	-0.001	0.070	0.001	-0.052
	(-0.30)	(0.41)	(0.21)	(-0.90)	(-0.30)	(0.41)	(0.22)	(-0.92)
Common Law			0.066	-6.391			0.066	-6.339
			(0.52)	(-1.64)			(0.52)	(-1.66)
Judical			0.005	2.737			0.005	2.731
			(0.02)	(0.43)			(0.02)	(0.44)
Good Government Index			-0.024	0.302			-0.024	0.281
			(-0.34)	(0.13)			(-0.34)	(0.12)
Anti-Self-Dealing Index			0.196	2.720			0.197	2.931
			(0.99)	(0.46)			(0.99)	(0.50)
Disclosure			0.003	-0.070			0.003	-0.068
			(0.42)	(-0.68)			(0.43)	(-0.64)
Property Rights Index			-0.023	1.998			-0.024	1.981
			(-0.21)	(0.70)			(-0.21)	(0.70)
Control Premium			0.706**	-23.376			0.706**	-22.703
			(2.63)	(-1.71)			(2.63)	(-1.64)
Ownership Concentration			-0.294	19.685			-0.296	19.435
			(-1.19)	(1.74)			(-1.19)	(1.73)
Obs	2,892	2,892	2,109	2,109	2,892	2,892	2,109	2,109
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
Country FE	Y	Y	N	N	Y	Y	N	N

Table 5: Exit of Ultimate Owner and Mutual Fund Flows

This table present the results of the following annual panel regressions with year and industry fixed effects and their corresponding t-statistics with standard errors clustered at both the ultimate owner and year level,

$$Exit_{u,i,c,t} = \alpha + \beta_1 Flow\_Shock_{i,c,t-1} + \beta_2 Flow\_Shock_{i,c,t-1} \times Char_{u,i,c,t-1} + \beta_3 Char_{u,i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{u,i,c,t},$$

where $Exit_{u,i,c,t}$ is a dummy variable equals one if the ultimate owner u no longer accounts for at least 20% of the industry sales of industry i in country c in year t, and zero otherwise. That is, $Sale_{u,i,c,t-1}/IndSale_{i,c,t-1} > 0.2$ and $Sale_{u,i,c,t}/IndSale_{i,c,t} \leq 0.2$, where $Sale_{u,i,c,t}$ refers to the sales of ultimate owner u in industry i in country c in year t, $IndSale_{i,c,t}$ refers to the total sales of industry i in country c in year t. $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{i,c,t-1}$). $Char_{u,i,c,t-1}$ refers to a list of characteristics of ultimate owner u in industry i in country c in year $t-1$, including UOROA, defined as value-weighted average of return on assets for all firms held by the same ultimate owner in each country-industry; UORET, defined as value-weighted average of stock returns for all firms held by the same ultimate owner in each country-industry; Manufacturing, defined as a dummy variable equals one if industry i belongs to consumer non-durables, consumer durables or manufacturing industry, and zero otherwise; and Core, defined as a dummy variable equals one if the sales of a country-industry pair is ranked the highest within the ultimate owner's portfolio, and zero otherwise. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Appendix B provides detailed definitions of each variable. Only the main variables are tabulated for brevity. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 5—Continued

Out-of-sample Ultimate Owner Exit Regressed on Mutual Fund Flows (Ultimate Owner-Country-Industry Level)										
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Flow_Shock	2.145***	1.755***	1.319**	1.207**	1.394***					
	(6.54)	(3.36)	(2.24)	(2.57)	(4.46)					
Flow_Shock_For						2.086***	1.590***	1.168*	1.098*	1.346***
						(6.81)	(3.03)	(2.14)	(2.05)	(3.91)
Flow_Shock × UOROA		-0.080								
		(-1.03)								
Flow_Shock × UORET			-0.027							
			(-0.23)							
Flow_Shock × Manufacturing				0.262						
				(0.41)						
Flow_Shock × Core					1.307**					
					(2.56)					
Flow_Shock_For × UOROA							-0.061			
							(-0.88)			
Flow_Shock_For × UORET								-0.021		
								(-0.18)		
Flow_Shock_For × Manufacturing									0.331	
									(0.46)	
Flow_Shock_For × Core										1.287**
										(2.43)
UOROA		-0.124					-0.124			
		(-0.42)					(-0.43)			
UORET			-0.298					-0.296		
			(-1.09)					(-1.09)		
Manufacturing				3.228					3.229	
				(1.27)					(1.27)	
Core_Sale					2.525					2.523
					(1.05)					(1.05)
Industry Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Adj-Rsq.	0.257	0.280	0.285	0.271	0.257	0.257	0.280	0.285	0.271	0.257
Obs	2,594	1,940	1,977	2,011	2,594	2,594	1,940	1,977	2,011	2,594
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 6: Industry Profitability, Exit of Ultimate Owner, and Mutual Fund Flows

Models 1 to 3 present the results of the following annual panel regressions with year and industry fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$ROA_{i,c,t} = \alpha + \beta_1 Exit_{i,c,t-1} + \beta_2 Flow\_Shock_{i,c,t-1} + \beta_3 Exit_{i,c,t-1} \times Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

where $ROA_{i,c,t}$ is the return on assets of industry i in country c in year t, $Exit_{i,c,t-1}$ is a dummy variable equals one if at least one ultimate owner no longer accounts for 20% of the industry sales of industry i in country c in year $t-1$. $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{i,c,t-1}$) and domestic mutual funds ($Flow\_Shock\_Dom_{i,c,t-1}$). Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 4 to 6 present the results of the following annual panel regressions with year and industry fixed effects and their corresponding t-statistics with standard errors clustered at both the ultimate owner and year level,

$$UOROA_{u,i,c,t} = \alpha + \beta_1 Exit_{u,i,c,t-1} + \beta_2 Flow\_Shock_{i,c,t-1} + \beta_3 Exit_{u,i,c,t-1} \times Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

where $UOROA_{u,i,c,t}$ is the value-weighted average of return on assets for all firms held by ultimate owner u in industry i in country c in year t, $Exit_{u,i,c,t-1}$ is a dummy variable equals one if the ultimate owner u no longer accounts for at least 20% of the industry sales of industry i in country c in year $t-1$, and zero otherwise. All other variables are defined the same as above. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 6—Continued

Out-of-sample ROA (in %) Regressed on Ultimate Owner Exit and Mutual Fund Flows						
	Country-Industry Level			Ultimate Owner-Country-Industry Level		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Exit	-0.546	-0.547	-0.560	-0.487	-0.488	-0.499
	(-1.10)	(-1.10)	(-1.13)	(-1.34)	(-1.34)	(-1.38)
Flow_Shock	-0.510***			-0.502***		
	(-3.78)			(-8.49)		
Flow_Shock_For		-0.506***	-0.506***		-0.495***	-0.495***
		(-3.67)	(-3.51)		(-7.97)	(-7.98)
Flow_Shock_Dom			-1.004			-0.093
			(-0.28)			(-0.02)
Exit × Flow_Shock	0.666***			0.635***		
	(4.37)			(8.09)		
Exit × Flow_Shock_For		0.665***	0.663***		0.635***	0.633***
		(4.49)	(3.56)		(7.81)	(7.69)
Exit × Flow_Shock_Dom			6.069			4.908
			(0.80)			(0.66)
Industry Size/GDP	0.001	0.001	0.001	-0.012	-0.012	-0.012
	(0.03)	(0.03)	(0.03)	(-0.43)	(-0.42)	(-0.42)
Industry Return	0.074	0.074	0.073	0.073	0.073	0.073
	(1.17)	(1.18)	(1.11)	(1.58)	(1.58)	(1.57)
Stock Market Turnover	-0.003	-0.003	-0.003	-0.003	-0.003	-0.002
	(-0.59)	(-0.56)	(-0.69)	(-0.68)	(-0.68)	(-0.64)
Stock Market/GDP	0.002	0.002	0.002	0.002	0.002	0.002
	(0.79)	(0.75)	(0.86)	(0.75)	(0.72)	(0.74)
Private Bond Market/GDP	0.017*	0.017	0.017	0.018**	0.018**	0.018**
	(1.79)	(1.75)	(1.78)	(2.23)	(2.22)	(2.20)
Common Law	0.397	0.396	0.398	0.534	0.533	0.535
	(0.62)	(0.62)	(0.62)	(0.56)	(0.56)	(0.56)
Judical	0.819	0.817	0.821	0.876	0.875	0.875
	(1.21)	(1.21)	(1.21)	(1.17)	(1.17)	(1.17)
Good Government Index	-0.544**	-0.544**	-0.546**	-0.562**	-0.562**	-0.563**
	(-2.37)	(-2.38)	(-2.35)	(-2.36)	(-2.36)	(-2.36)
Anti-Self-Dealing Index	-1.049	-1.047	-1.036	-1.096	-1.093	-1.084
	(-0.59)	(-0.59)	(-0.58)	(-0.53)	(-0.53)	(-0.52)
Disclosure	0.008	0.008	0.008	0.007	0.007	0.008
	(0.68)	(0.59)	(0.65)	(0.52)	(0.51)	(0.51)
Property Rights Index	-0.752	-0.752	-0.759	-0.749	-0.749	-0.756
	(-1.58)	(-1.58)	(-1.58)	(-1.44)	(-1.44)	(-1.44)
Control Premium	-5.382**	-5.379**	-5.382**	-4.907**	-4.904**	-4.905**
	(-2.52)	(-2.52)	(-2.52)	(-2.21)	(-2.21)	(-2.21)
Ownership Concentration	-0.009	-0.013	-0.033	-0.036	-0.039	-0.072
	(-0.00)	(-0.01)	(-0.02)	(-0.01)	(-0.02)	(-0.03)
Adj-Rsq.	0.239	0.239	0.239	0.224	0.224	0.225
Obs	1,768	1,768	1,768	1,923	1,923	1,923
Year FE	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y	Y	Y
Country FE	N	N	N	N	N	N

Table 7: Alternative Channels on Industry Inequality

Models 1 to 2 present the results of the following annual two-stage panel regressions with year and industry fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

First stage: $CorpGov_{i,c,t} = \alpha + \beta Flow\_Shock\_For_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t}$,

Second stage: $\Delta TopIncome\_Sales_{i,c,t} = \alpha + \theta \widehat{CorpGov}_{i,c,t} + \gamma_1' M_{i,c,t-1} + \gamma_2' N_{c,t-1} + e_{i,c,t}$,

where $CorpGov_{i,c,t}$ is the average firm-level governance of industry i in country c in year t, and $Flow\_Shock\_For_{i,c,t-1}$ is the average quarterly exogenous shocks in foreign mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. $\widehat{CorpGov}_{i,c,t}$ is the projected corporate governance attributable to $Flow\_Shock\_For_{i,c,t-1}$. $\Delta TopIncome\_Sales_{i,c,t}$ is the change in the top income from sales of industry i in country c in year t. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 3 to 4 present the results of the following annual two-stage panel regressions with year fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

First stage: $Tax_{c,t} = \alpha + \beta Flow\_Shock\_For_{c,t-1} + \gamma N_{c,t-1} + e_{c,t}$,

Second stage: $\Delta TopIncome\_Sales_{c,t} = \alpha + \theta \widehat{Tax}_{c,t} + \gamma' N_{c,t-1} + e_{c,t}$,

where $Tax_{c,t}$ is the total corporate tax rate of country c in year t, and $Flow\_Shock\_For_{c,t-1}$ is the average quarterly exogenous shocks in foreign mutual fund flows attributable to fire sales and fire purchases of country c in year $t-1$. $\widehat{Tax}_{c,t}$ is the projected tax rate attributable to $Flow\_Shock\_For_{c,t-1}$. $\Delta TopIncome\_Sales_{c,t}$ is the change in the top income from sales of country c in year t. Vector *N* stacks all other country control variables as above. Models 5 to 12 present similar statistics when $Tax_{c,t}$ is replaced with $Unemployment_{c,t}$ (defined as the total unemployment as a percentage of total labor force, Models 5 to 6), $Computer\ Adoption_{c,t}$ (defined as the number of personal computers per 100 people, Models 7 to 8), $Post\ Secondary_{c,t}$ (defined as the percentage of population ages 25 and over that at least completed post-secondary education, Models 9 to 10), and $MktDev_{c,t}$ (defined as the stock market capitalization-to-GDP ratio, Models 11 to 12). Appendix B provides detailed definitions of each variable. Only the main variables are tabulated for brevity. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 7—Continued

Two-stage Regression of Change in Top Income From Sales (in %)												
	Country-Industry Level						Country Level					
	1st Stage Model 1	2nd Stage Model 2	1st Stage Model 3	2nd Stage Model 4	1st Stage Model 5	2nd Stage Model 6	1st Stage Model 7	2nd Stage Model 8	1st Stage Model 9	2nd Stage Model 10	1st Stage Model 11	2nd Stage Model 12
CorpGov		0.311										
		(0.05)										
Tax				-31.615								
				(-0.15)								
Unemployment						15.339						
						(0.86)						
Computer Adoption								-3.077				
								(-1.75)				
Post-Secondary										-2.338*		
										(-1.83)		
MktDev												-6.322
												(-0.11)
Flow_Shock_For	1.286		0.043		-0.093		0.494		1.430*		0.225	
	(0.56)		(0.15)		(-0.83)		(1.64)		(1.99)		(0.11)	
Obs	1,529	1,529	210	210	357	357	166	166	130	130	357	357
Industry Controls	Y	Y	N	N	N	N	N	N	N	N	N	N
Country Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	Y	Y	N	N	N	N	N	N	N	N	N	N

Table 8: Inequality and Mutual Fund Flows: Domestic vs. Foreign Ultimate Owners

Models 1 to 2 present the results of the following annual panel regressions with year fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_Sales\_Dom_{c,t} = \alpha + \beta Flow\_Shock_{c,t-1} + \gamma N_{c,t-1} + e_{c,t},$$

where $\Delta TopIncome\_Sales\_Dom_{c,t}$ is the change in the top income from sales among domestic ultimate owners of country c in year t, and $Flow\_Shock_{c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{c,t-1}$). Vector N stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 3 to 4 replace $\Delta TopIncome\_Sales\_Dom_{c,t}$ with the change in the top income from sales among foreign ultimate owners ($\Delta TopIncome\_Sales\_For_{c,t}$). Models 5 to 6 present the results of the following annual panel regressions with year and industry fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_Sales\_Dom_{i,c,t} = \alpha + \beta Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

where $\Delta TopIncome\_Sales\_Dom_{i,c,t}$ is the change in the top income from sales among domestic ultimate owners of industry i in country c in year t, and $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{i,c,t-1}$). Vector M stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector N stacks all other country control variables as above. Models 7 to 8 replace $\Delta TopIncome\_Sales\_Dom_{i,c,t}$ with the change in the top income from sales among foreign ultimate owners ($\Delta TopIncome\_Sales\_For_{i,c,t}$). Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 8—Continued

Out-of-sample Change in Top Income From Sales (in %) Regressed on Mutual Fund Flows								
	Country Level				Country-Industry Level			
	Domestic UO		Foreign UO		Domestic UO		Foreign UO	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Flow_Shock	-1.489***		0.057		-1.875***		-0.108	
	(-17.14)		(1.11)		(-3.60)		(-0.45)	
Flow_Shock_For		-1.484***		0.057		-1.882***		-0.123
		(-19.67)		(1.13)		(-3.84)		(-0.49)
Industry Size/GDP					0.014	0.014	0.026	0.026
					(0.28)	(0.29)	(0.84)	(0.84)
Industry Return					-0.039	-0.038	0.139	0.139
					(-0.20)	(-0.20)	(1.24)	(1.24)
Stock Market Turnover	-0.011	-0.011	0.002	0.002	0.006	0.006	0.001	0.001
	(-0.77)	(-0.75)	(0.74)	(0.74)	(0.47)	(0.46)	(0.20)	(0.20)
Stock Market/GDP	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.001
	(0.28)	(0.28)	(0.37)	(0.37)	(0.61)	(0.65)	(0.25)	(0.25)
Private Bond Market/GDP	0.005	0.005	-0.004	-0.004	0.003	0.003	-0.007	-0.007
	(0.39)	(0.38)	(-0.50)	(-0.50)	(0.16)	(0.17)	(-0.39)	(-0.39)
Common Law	1.135	1.138	-1.567	-1.567	-1.386	-1.371	0.780	0.781
	(0.78)	(0.78)	(-1.66)	(-1.66)	(-1.60)	(-1.59)	(0.59)	(0.59)
Judical	0.563	0.557	-1.377	-1.377	2.226***	2.220***	-0.500	-0.500
	(0.88)	(0.87)	(-0.94)	(-0.94)	(4.30)	(4.29)	(-0.57)	(-0.57)
Good Government Index	-0.152	-0.150	0.399	0.399	-0.784**	-0.781**	0.203	0.203
	(-0.47)	(-0.46)	(0.88)	(0.88)	(-2.95)	(-2.97)	(0.50)	(0.50)
Anti-Self-Dealing Index	-1.764	-1.770	3.060	3.060	0.582	0.573	-2.240	-2.240
	(-1.10)	(-1.11)	(1.20)	(1.20)	(0.23)	(0.23)	(-0.75)	(-0.75)
Disclosure	-0.005	-0.005	0.038	0.038	-0.005	-0.005	0.018	0.018
	(-0.12)	(-0.11)	(1.00)	(1.00)	(-0.10)	(-0.09)	(0.66)	(0.67)
Property Rights Index	0.274	0.273	0.666	0.666	-0.643	-0.649	0.012	0.011
	(0.39)	(0.39)	(0.64)	(0.64)	(-0.68)	(-0.69)	(0.02)	(0.02)
Control Premium	1.880	1.870	3.896	3.897	-2.804	-2.804	1.127	1.130
	(0.60)	(0.60)	(0.87)	(0.87)	(-0.87)	(-0.88)	(0.54)	(0.54)
Ownership Concentration	-1.782	-1.800	-0.598	-0.597	0.734	0.724	-3.165	-3.168
	(-0.76)	(-0.77)	(-0.25)	(-0.25)	(1.02)	(1.03)	(-1.21)	(-1.21)
Adj-Rsq.	0.119	0.119	0.073	0.073	0.050	0.050	0.030	0.030
Obs	363	363	363	363	2,427	2,427	2,427	2,427
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	N	N	N	N	Y	Y	Y	Y

Table 9: Alternative Definition of Income Inequality from Sales

Models 1 to 4 present the results of the following annual panel regressions with year fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_Sales_{c,t}^{P10} = \alpha + \beta Flow\_Shock_{c,t-1} + \gamma N_{c,t-1} + e_{c,t},$$

where $\Delta TopIncome\_Sales_{c,t}^{P10}$ is the change in the top income from sales of country c in year t, and $Flow\_Shock_{c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{c,t-1}$) and domestic mutual funds ($Flow\_Shock\_Dom_{c,t-1}$). We also consider $Flow_{c,t-1}$, defined as the average quarterly mutual fund flows of country c in year $t-1$. Vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 5 to 12 present the results of the following annual panel regressions with fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\Delta TopIncome\_Sales_{i,c,t}^{P10} = \alpha + \beta Flow\_Shock_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

where $\Delta TopIncome\_Sales_{i,c,t}^{P10}$ is the change in the top income from sales of industry i in country c in year t, and $Flow\_Shock_{i,c,t-1}$ is the average quarterly exogenous shocks in mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. The aggregate mutual fund flow shocks can further be replaced with flow shocks from foreign mutual funds ($Flow\_Shock\_For_{i,c,t-1}$) and domestic mutual funds ($Flow\_Shock\_Dom_{i,c,t-1}$). We also consider $Flow_{i,c,t-1}$, defined as the average quarterly mutual fund flows of industry i in country c in year $t-1$. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables as above. Models 5 to 8 include year, industry and country fixed effects, while Models 9 to 12 include year and industry fixed effects. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Table 9—Continued

Out-of-sample Change in Top Income From Sales (in %) Regressed on Mutual Fund Flows												
	Country Level				Country-Industry Level							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Flow_Shock	-1.345***		-2.338***		-1.843***		-2.474***		-1.679***		-2.273***	
	(-7.27)		(-3.96)		(-10.81)		(-11.79)		(-5.74)		(-6.37)	
Flow_Shock_For		-1.343***		-2.254***		-1.865***		-2.504***		-1.722***		-2.341***
		(-7.39)		(-4.53)		(-9.09)		(-9.70)		(-5.71)		(-6.18)
Flow_Shock_Dom				3.716				12.591				10.778
				(0.46)				(0.86)				(0.81)
Flow			0.036	0.033			0.009**	0.009**			0.008***	0.009**
			(1.52)	(1.60)			(3.00)	(2.87)			(3.27)	(2.47)
Industry Size/GDP					0.054*	0.054*	0.055*	0.055	0.052	0.052	0.052	0.052
					(1.89)	(1.95)	(1.95)	(1.56)	(0.91)	(0.90)	(0.93)	(1.26)
Industry Return					0.073	0.073	0.081	0.082	0.044	0.044	0.053	0.054
					(0.71)	(0.71)	(0.72)	(0.78)	(0.31)	(0.31)	(0.28)	(0.29)
Stock Market Turnover	-0.008	-0.008	-0.007	-0.008	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.002
	(-1.09)	(-1.09)	(-1.07)	(-1.09)	(0.27)	(0.41)	(0.16)	(0.20)	(0.23)	(0.24)	(0.23)	(0.29)
Stock Market/GDP	0.002	0.002	0.002	0.002	0.009**	0.009**	0.009**	0.009**	0.004	0.004	0.004	0.004
	(0.40)	(0.40)	(0.53)	(0.55)	(2.71)	(2.96)	(2.44)	(2.20)	(1.37)	(1.37)	(1.38)	(1.42)
Private Bond Market/GDP	0.001	0.000	0.000	-0.000	-0.015	-0.015	-0.015	-0.013	-0.011	-0.011	-0.013	-0.013
	(0.06)	(0.05)	(0.03)	(-0.00)	(-0.58)	(-0.58)	(-0.54)	(-0.50)	(-0.59)	(-0.59)	(-0.66)	(-0.57)
Common Law	-0.418	-0.415	-0.420	-0.443					0.072	0.090	0.039	0.108
	(-0.29)	(-0.29)	(-0.29)	(-0.30)					(0.06)	(0.08)	(0.03)	(0.06)
Judical	-1.033	-1.038	-1.029	-1.064					1.665**	1.667**	1.640**	1.650**
	(-0.48)	(-0.48)	(-0.47)	(-0.49)					(2.85)	(2.86)	(2.68)	(2.90)
Good Government Index	0.355	0.357	0.353	0.364					-0.516*	-0.516*	-0.501*	-0.510
	(0.52)	(0.52)	(0.51)	(0.53)					(-2.05)	(-2.05)	(-1.98)	(-1.69)
Anti-Self-Dealing Index	1.344	1.339	1.311	1.335					-1.316	-1.323	-1.263	-1.320
	(0.47)	(0.47)	(0.45)	(0.46)					(-0.62)	(-0.62)	(-0.60)	(-0.60)
Disclosure	0.029	0.029	0.028	0.029					0.027	0.027	0.026	0.026
	(0.52)	(0.53)	(0.52)	(0.52)					(0.75)	(0.75)	(0.75)	(0.53)
Property Rights Index	0.954	0.952	0.966	0.933					-0.696	-0.702	-0.798	-0.830
	(0.66)	(0.66)	(0.67)	(0.64)					(-1.02)	(-1.03)	(-1.16)	(-1.47)
Control Premium	6.593	6.583	6.270	6.227					-1.705	-1.693	-2.285	-2.246
	(0.86)	(0.86)	(0.82)	(0.81)					(-0.33)	(-0.33)	(-0.45)	(-0.43)
Ownership Concentration	-3.130	-3.146	-2.978	-3.233					-3.531	-3.564	-3.683	-3.901
	(-1.01)	(-1.01)	(-1.02)	(-1.13)					(-1.20)	(-1.22)	(-1.27)	(-1.32)
Adj-Rsq.	0.099	0.099	0.101	0.101	0.050	0.050	0.051	0.051	0.045	0.045	0.046	0.046
Obs	366	366	366	366	4,906	4,906	4,880	4,880	3,647	3,647	3,634	3,634
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry FE	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Country FE	N	N	N	N	Y	Y	Y	Y	N	N	N	N

Table IA1: Allocation Efficiency, Industry Inequality, and Domestic Fund Flows

This table presents the results of the following annual two-stage panel regressions with fixed effects and their corresponding t-statistics with standard errors clustered at both the country and year level,

$$\text{First stage: } AE_{i,c,t} = \alpha + \beta Flow\_Shock\_Dom_{i,c,t-1} + \gamma_1 M_{i,c,t-1} + \gamma_2 N_{c,t-1} + e_{i,c,t},$$

$$\text{Second stage: } \Delta TopIncome\_Sales_{i,c,t} = \alpha + \theta \widehat{AE}_{i,c,t} + \gamma_1' M_{i,c,t-1} + \gamma_2' N_{c,t-1} + e_{i,c,t},$$

where $AE_{i,c,t}$ is the allocation efficiency of industry i in country c in year t, and $Flow\_Shock\_Dom_{i,c,t-1}$ is the average quarterly exogenous shocks in domestic mutual fund flows attributable to fire sales and fire purchases of industry i in country c in year $t-1$. $\widehat{AE}_{i,c,t}$ is the projected allocation efficiency attributable to $Flow\_Shock\_Dom_{i,c,t-1}$. $\Delta TopIncome\_Sales_{i,c,t}$ is the change in the top income from sales of industry i in country c in year t. Vector *M* stacks all other country-industry control variables, including Industry Size/GDP and Industry Return, and vector *N* stacks all other country control variables, including Stock Market Turnover, Stock Market/GDP, Private Bond Market/GDP, Common Law, Judical, Good Government Index, Anti-Self-Dealing Index, Disclosure, Property Rights Index, Control Premium and Ownership Concentration. Models 1 and 2 include year, industry and country fixed effects, while Models 3 and 4 include year and industry fixed effects. Appendix B provides detailed definitions of each variable. Numbers with "*", "**", and "***" are significant at the 10%, 5%, and 1% levels, respectively.

Two-stage Regression of Change in Top Income From Sales (in %, Country-Industry Level)				
	1st Stage	2nd Stage	1st Stage	2nd Stage
	Model 1	Model 2	Model 3	Model 4
Allocation Efficiency		-137.676		-100.992
		(-0.24)		(-0.35)
Flow_Shock_Dom	-0.445		-0.638	
	(-0.23)		(-0.32)	
Industry Size/GDP	0.019	2.593	0.018**	1.801
	(1.61)	(0.25)	(2.35)	(0.37)
Industry Return	0.035	4.941	0.024	2.651
	(1.35)	(0.23)	(0.85)	(0.33)
Stock Market Turnover	-0.001	-0.157	-0.001	-0.077
	(-0.48)	(-0.23)	(-0.33)	(-0.44)
Stock Market/GDP	-0.000	-0.024	-0.001	-0.128
	(-0.22)	(-0.00)	(-0.86)	(-0.41)
Private Bond Market/GDP	-0.001	-0.169	0.001	0.021
	(-0.32)	(-0.22)	(0.22)	(0.09)
Common Law			0.051	0.654
			(0.38)	(0.04)
Judical			-0.005	1.944
			(-0.02)	(0.08)
Good Government Index			-0.021	-2.546
			(-0.29)	(-0.27)
Anti-Self-Dealing Index			0.211	31.185
			(1.08)	(0.57)
Disclosure			0.003	0.310
			(0.48)	(0.30)
Property Rights Index			-0.017	-0.346
			(-0.14)	(-0.05)
Control Premium			0.668**	67.701
			(2.42)	(0.34)
Ownership Concentration			-0.242	-14.133
			(-0.78)	(-0.15)
Obs	2,892	2,892	2,109	2,109
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Country FE	Y	Y	N	N