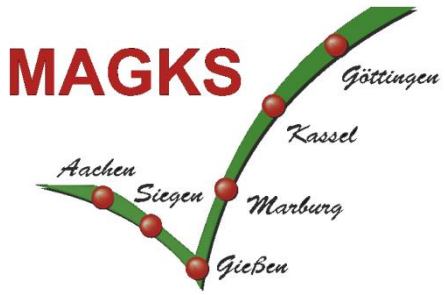

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Financial Integration and Wage Inequality: Evidence from European Countries*

Jinyeong Yun†

June 10, 2024

Abstract

In this paper, I study the impact of financial integration on between-firm wage inequality using an unbalanced panel for 20 European countries over the period 1999-2021. With the impulse response functions estimated using local projections, I find that financial integration, as measured by the sum of external assets and liabilities, is associated with increased wage inequality within industries. These effects are more pronounced in the mid-term rather than in the short-term. The direction of financial integration, i.e., whether it involves an increase in external assets or liabilities, also matters: inward financial integration significantly increases wage inequality, while outward financial integration does not. I also provide empirical evidence on the channel of distributional effects of financial integration. The financial integration shocks widen the capital intensity (the capital-to-labor ratio) gap within industries, which in turn widens the labor productivity gap. Through this channel, financial integration may affect between-firm wage inequality. Furthermore, the impact of financial integration on wage inequality depends on the external financial dependence of individual industries, while the moderating effect of financial development in each country is less definitive.

Keywords: Financial integration; wage inequality; local projections
JEL codes: D63, F36, F38, J31

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1 Introduction

Increased income inequality within countries is one of the major concerns of our time. Over the past few decades, income inequality has risen in many developed and developing countries. An increase in income inequality can reduce the purchasing power of a significant portion of households, undermining economic growth. A high level of income inequality can also fuel social unrest, distrust of government institutions, and political polarization. The various determinants of income inequality have been discussed in the literature, but there is no consensus yet.

Much of the literature has recently pointed out the role of international financial integration as a key driver of rising income inequality. Several empirical studies have argued that financial liberalization (or capital account opening) is associated with increased income inequality (Asteriou et al., 2014; de Haan & Sturm, 2017; Erauskin & Turnovsky, 2019, 2022; Furceri & Loungani, 2018; Furceri et al., 2019; Jaumotte et al., 2013; Li & Su, 2021). Similarly, some research has also found empirical evidence on the adverse distributional effects of cross-border capital flows (Liu et al., 2023; Yun, 2023). Among this recent stream of literature, however, only a few studies focus on the relationship between international financial integration and wage inequality (Eklou & Foster, 2023; Larrain, 2015).[1] Since wages (or salaries) are the most substantial portion of household income, understanding the impact of international financial integration on wage inequality is crucial to understanding the overall distributional effects of financial integration.

The existing literature studying wage inequality has mainly discussed the widening skill premium between high-skilled and low-skilled workers as the main driver of rising wage inequality. On the other hand, since the seminal work of Abowd et al. (1999), which introduced a framework to decompose wage dispersion, there has been a growing body of literature emphasizing the role of firms in explaining wage inequality (Akerman et al., 2013; Alvarez et al., 2018; Card et al., 2013; Criscuolo et al., 2020; Song et al., 2019). According to these studies, firm heterogeneity may contribute to rising wage inequality, meaning that some firms pay employees with similar skill levels higher wages than others. The literature defines and analyzes this as "between-firm wage inequality", as distinct from "within-firm wage inequality", which reflects differences in workers' characteristics such as education level, work experience, and gender. However, theoretical and empirical answers to what drives between-firm wage inequality remain controversial.

[1] Overall income inequality can be more deeply analyzed by decomposing it into different parts: changes in the distribution of production factors (roughly capital, labor, and land) among households, changes in the remuneration of production factors, and changes in transfers received and taxes paid by households (Cornia, 2011). Of these, changes in the remuneration of production factors can be further decomposed into changes in the relative remuneration of production factors and inequality in the remuneration of the same production factor, including wage inequality.

To bridge these two streams of literature and contribute to the debate on the distributional effects of international financial integration, I empirically examine the impact of financial integration on the between-firm wage inequality in European countries over the period 1999-2021, using the Competitiveness Research Network (CompNet) dataset. The distributional effects of financial integration, measured by the sum of total external assets and liabilities, may occur over the mid- to long-term rather than immediately or within a year or two. For this reason, focusing on contemporaneous or short-term effects makes it difficult to accurately analyze the factors affecting wage dispersion. To shed light not only on the short-term effect of financial integration on between-firm wage inequality but also on its dynamic mid- to long-term effects, I estimate the impulse response functions of wage inequality to financial integration shocks using local projections proposed by Jordà (2005) with high-dimensional panel regressions.

The remainder of this paper is structured as follows: Section 2 provides a brief overview of the relevant existing literature. Section 3 then describes the data, variable construction, and empirical approach used in the analysis in this paper. Next, Section 4 presents and discusses empirical results. Section 5 summarizes the main findings and concludes.

2 Conceptual framework and related literature

Between-firm wage inequality

According to the classical theory of wage determination, the market wage is determined by the equilibrium between households' labor supply and firms' labor demand, which depends on the marginal product of labor. In a competitive labor market, each firm takes this market wage as a given, and firm heterogeneity plays no role in how much firms pay their workers. From this basic view of macroeconomics and labor economics, a large strand of existing literature studying wage inequality has long focused on differences in workers' skills, which reflect their education level and work experience.

On the other hand, a growing body of literature has recently argued that firm heterogeneity plays a significant role in wage determination and wage dispersion. Since the seminal work of Abowd et al. (1999), many studies have analyzed wage inequality by separately identifying "within-firm wage inequality" and "between-firm wage inequality". Within-firm inequality refers to dispersion in wages between workers within firms. Between-firm inequality refers to the dispersion in average wages across firms, which mainly arises from firm heterogeneity. With the growing availability of administrative matched employer-employee data, they have found

that between-firm wage inequality accounts for a substantial proportion of overall wage inequality. Using Swedish manufacturing data, Akerman et al. (2013) document that much of the wage inequality exists within sectors and occupations across workers with similar characteristics. Card et al. (2013) study the contribution of firm heterogeneity in West German wage inequality using administrative data from 1985 to 2009. They argue that increasing firm heterogeneity explains a large share of the rise in wage inequality. Similarly, Alvarez et al. (2018) document that firm heterogeneity accounts for 40 percent of the total decrease in wage inequality in Brazil. With a matched employer-employee database for the United States from 1978 to 2013, Song et al. (2019) find that two-thirds of the rise in wage inequality is due to a rise in the dispersion of average earnings between firms. They also suggest that rising between-firm variance is accounted for by a widening gap between firms in the composition of their workers. Criscuolo et al. (2020) show that changes in the dispersion of average wage between firms account for about half of the changes in overall wage inequality, using a linked employer-employee dataset for 14 OECD countries.

Financial integration

To study the impacts of international financial integration (henceforth "financial integration"), we should first clarify how to define and measure it. The existing literature has used various terms, such as "financial integration", "financial globalization", and "capital account liberalization", to refer to the trend toward more closely coupled financial markets in neighboring countries, regions, and the global economy and increased cross-border capital flows. In this paper, I use "financial integration" rather than any of these concepts.[2] The term "globalization" is often used to describe a phenomenon in many different aspects: economic, political, social, and cultural. "Capital account liberalization" or "Capital account openness" is mainly used to refer to a specific point in time associated with the capital account opening or financial deregulations. Most studies use the concept of "capital account liberalization" to focus on changes in economic variables before and after the episode of capital account liberalization (Bumann & Lensink, 2016; de Haan & Sturm, 2017; Furceri & Loungani, 2018; Furceri et al., 2019; Larrain, 2015; Li & Su, 2021). However, the remarkable phenomenon of financial market integration should be understood as a continuous process that accumulates over time rather than a discontinuous process that occurs before and after a specific event at a particular time. The removal of domestic and international regulations restricting capital flows, the reform of laws and institutions, the opening of bond markets, and the

[2] However, all these concepts are closely related and are sometimes used synonymously in the relevant literature (Gräbner et al., 2021).

opening of equity markets are not simultaneous but rather a series of events. From this perspective, we can adequately capture the entire evolution of this phenomenon by using the term "financial integration" to refer to the closer interconnection of the financial markets.

Existing measures of financial integration can be categorized into two groups: "*de-jure*" and "*de-facto*" indicators.[3] De-jure measures are based on a country's institutional and regulatory environment for cross-border capital transactions. On the other hand, de facto measures are outcome-oriented indicators that reflect a country's actual position in global financial markets. As I will discuss later in Section 3.1, I use de facto, not de jure, indicators in the analysis to measure financial integration.

Link between financial integration and wage inequality

As reviewed above, several studies have emphasized the importance of firm heterogeneity for wage inequality, but the causes of rising wage inequality and firm heterogeneity remain unresolved and controversial. In this paper, I aim to study the role of financial integration as one of the drivers for those. The research question of this paper is whether financial integration leads to an increase in between-firm wage inequality. More precisely, this study hypothesizes that financial integration increases wage inequality between large businesses and small and medium enterprises (SMEs). This argument implies that the wages of big firms, which initially pay relatively high wages, may grow faster with financial integration than those of SMEs.

To varying degrees across businesses, firms rely on external capital to finance fixed costs that cannot be covered by retained earnings or internal cash flow from business operations. These fixed costs typically relate to investment in fixed capital equipment, research and development (R&D) expenditures, and marketing and advertising expenses. To meet the needs for these expenditures, firms raise funds from banks and other financial institutions or take credit directly from domestic and foreign investors. In addition, most variable costs, such as the purchases of intermediate input, wages paid to workers, and land or equipment leases, are incurred before sales revenue is realized. Therefore, firms need to finance some of these upfront variable costs through external financing.

Capital account opening and the resulting progress in financial integration (increased cross-border capital flows) provide more opportunities for firms to obtain external financing for operations and investments. These chances are critical for expanding production capacity or improving product quality. The additional external funds allow firms to grow, and firms can pay higher wages to their employees. How-

[3] For more details, see Gräbner et al. (2021)

ever, given some market imperfections, increased external finance may be unevenly distributed among firms. Under the constraints of financial markets, increased capital inflows provide more finance to large businesses already paying higher wages to their workers. Big firms publicly traded in financial markets have easier access to external finance than SMEs, while many SMEs are financially constrained. Moreover, global investors tend to invest in big firms because information asymmetries in financial markets prevent global lenders and investors from accurately valuing firms.

As mentioned in the introduction, only a few studies have examined the link between financial integration and wage inequality. Larrain (2015) studies the impact of the opening capital account on wage inequality, focusing on inequality between skilled- and unskilled workers. Using aggregate and sectoral data in 20 developed countries from 1975 to 2005, he finds that capital account liberalization increases wage inequality, particularly in industries with high external financial dependence and strong capital-skill complementarity. Eklou and Foster (2023) investigate the impact of capital account liberalization on wage inequality using firm-level data in ASEAN5 countries over the period 1995-2019. They suggest that capital account liberalization increases between-firm wage inequality because wages in initially high-wage firms grow faster than those in the lower part of the wage distribution.

3 Empirical methodology

3.1 Data

Wage inequality

In order to measure between-firm wage inequality, I use data from the CompNet dataset, which compiles data obtained from administrative and public sources. This dataset provides a variety of indicators computed at the firm level, covering non-financial corporations with at least one employee in European countries. Indicators of the CompNet dataset are aggregated to different levels according to sector definitions or firm characteristics, such as the location of firms. I employ the industry-country-year level of aggregation among these aggregation levels, where industries are classified corresponding to the 2-digit NACE Revision 2 industries. The most recent version of the CompNet dataset, the $9th$ vintage, is an unbalanced panel dataset on 22 European countries from 1999 to 2021.[4] The analysis in this paper focuses on 20 of these 22 countries, excluding Malta and the United Kingdom.[5] It is worth mentioning that all variables in the CompNet dataset are available for two

[4] For most countries, however, data are only available up to 2020.

[5] Malta's undersized economy, small sample size for individual industries, and enormous external assets and liabilities significantly limit comparability with other countries. For the UK, data at the 2-digit industry level are not available.

samples, the "all" sample and the "20e" sample, which includes only firms with 20 or more employees. I use the latter to improve the coverage of the samples and comparability between countries.[6]

To measure between-firm wage inequality within industries, I construct a variable using information on the distribution of firms' average wage (labor costs per employee). The CompNet dataset provides statistics of percentiles for all indicators included in the dataset, which allows for computing the dispersion in the firms' average wages. Wage inequality is measured by calculating the ratio of the $90th$ percentile of firms' average wage to the $10th$ percentile (90-10 ratio) and the $50th$ percentile (90-50 ratio).[7]

Table 1 reports summary statistics for between-firm wage inequality.[8] Wage inequality measured by the 90-10 and 90–50 ratios is, on average, 2.92 and 1.65, respectively, which means that the average wage of the 90th percentile firm is 192% and 65% higher than the average wage of the 10th percentile firm and the median firm in each industry, respectively. As shown in the table, the distribution of wage inequality is long-tailed to the right, indicating the presence of outliers. To address potential bias from the exceptionally high values of wage inequality, I also conduct a robustness check by excluding these observations.

Table 1: Descriptive statistics: between-firm wage inequality

	Mean	Median	SD	Min	Max	N
90-10 ratio	2.92	2.45	1.76	1.19	34.93	16,243
90-50 ratio	1.65	1.54	0.47	1.05	17.78	16,243

Source: CompNet dataset and author's calculation

The level of between-firm wage inequality varies by country. Figure A.1 in the Appendix shows the average 90-10 ratio for each country. Wage inequality in Central and Eastern European countries tends to be higher than in Western European countries. In Hungary, Latvia, and Romania, the 90th percentile firms pay their workers about four times higher than the average wage of the 10th percentile firms, while the average 90–10 ratios in Belgium, Finland, and Sweden are about two.

[6] The main reason for having two samples is that in some countries, firms are legally obliged to report their balance sheet data only when certain size thresholds are met. For more detail, see the User Guide for the 9th Vintage of the CompNet Dataset, available at `https://www.comp-net.org/fileadmin/_compnet/user_upload/9th_Vintage_User_Guide_final_102023.pdf`

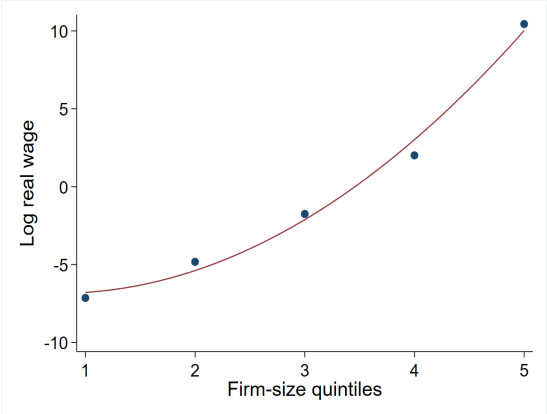
[7] While it can be assumed that workers at the same firm in the same industry generally have similar characteristics, it is worth noting that these measures of wage inequality do not control for heterogeneity in worker characteristics. Therefore, the measures computed from the data may capture not only between-firm wage inequality but also, to some extent, wage differential due to worker heterogeneity.

[8] Observations from industries with small sample sizes (less than 20) are excluded because changes in a specific firm may dictate the overall wage inequality within an industry.

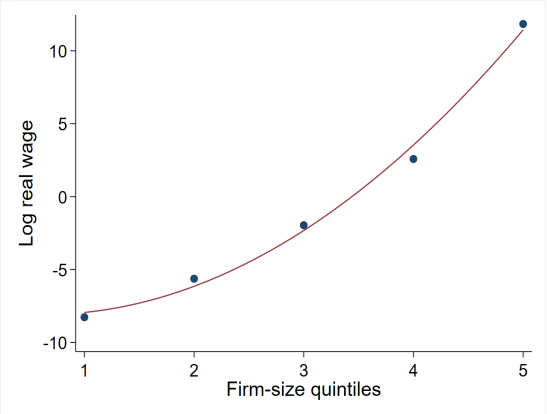
In this paper, I assume that firms operating in the same industry share similar characteristics, including production functions. The only significant difference to consider is firm size, which is a key factor in understanding the dynamics of wage inequality. Figure 1 presents the difference in average real wages (and median of real wages) across quintiles of firm size within an industry, calculated using the full sample over the entire sample period. I adjust real wages by estimating the residuals of a regression using country-, year-, and industry-fixed effects. As shown in the figure, real wages increase on average (exponentially rather than linearly) as firm size increases.

Figure 1: Real wage by firm size

(a) Mean within each quintile



(b) Median within each quintile



Source: CompNet dataset and author's calculation

Financial integration

The degree of financial integration can be measured using the *de jure* and *de facto* indicators. The *de jure* indicator of financial integration most commonly used in the literature is the Capital Account Openness Index (KAOPEN Index) developed by Chinn and Ito (2006, 2008). However, using the KAOPEN Index has some limitations for the analysis in this paper. Based on the KAOPEN index, many of the sample countries have already fully opened their capital accounts at the start of the sample period. This means that the KAOPEN indices for these countries have the same value over the sample period.

As an alternative, I use the *de facto* indicator, the sum of total external assets and liabilities, as a measure for each country's degree of financial integration. Data on total external assets and liabilities is taken from the External Wealth of Nations (EWN) database developed by Lane and Milesi-Ferretti (2007, 2018) and its update.[9] The database provides estimates of external financial assets and liabilities for

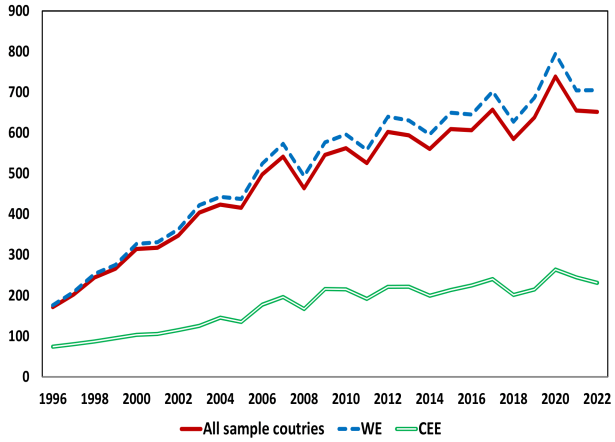
[9] I use the December 2023 version, available at `https://www.brookings.edu/articles/the-external-wealth-of-nations-database/`

212 countries over the period 1970-2022, based on International Investment Position (IIP) statistics and Balance of Payments (BOP) statistics provided and maintained by the International Monetary Fund (IMF). Progress in financial integration is reflected in the accumulation of foreign assets and liabilities. The more external assets and liabilities a country holds, the more integrated it is in international financial markets.

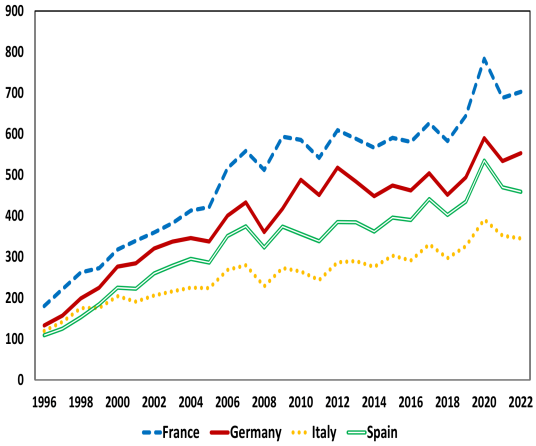
Figure 2 shows the evolution of financial integration, scaled by a percentage of GDP, in European countries in recent decades. Financial integration has been steadily progressing during this period. While this trend has been mostly driven by Western European (WE) countries, Central and Eastern European (CEE) countries have also seen a steady increase in external assets and liabilities.

Figure 2: Financial Integration

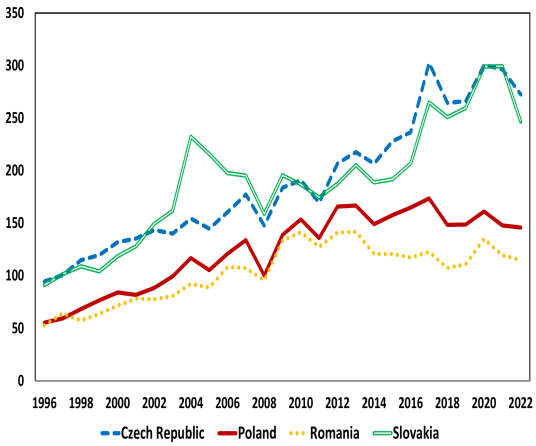
(a) All sample countries, WE, and CEE



(b) Selected countries in WE



(c) Selected countries in CEE



Note: Financial integration is measured by the sum of total external assets and liabilities as a percentage of GDP.
Source: EWN database and author's calculation

Control variables

To control the impacts of financial crises, I include a dummy of financial crises as a control variable. Data on financial crises are obtained from a database developed by Nguyen et al. (2022), which extends the Systemic Banking Crises Database by Laeven and Valencia (2020). In addition, several control variables at the industry level are also taken from the CompNet dataset. To control the dispersion in firm size within industries, I include the standard deviation of the distribution of firm size by the number of employees as control variables. I also include the industry concentration of nominal revenue, as measured by the Hirschman-Herfindahl Index (HHI),[10] and the annual growth rate of nominal revenue.

3.2 Model

To shed light on the contemporaneous as well as mid-to-long-term responses of between-firm wage inequality, I estimate impulse response functions using the local projections proposed by Jordà (2005).

The following equation is estimated

$$\begin{aligned} log(Inequality)_{i,c,t+h} = \alpha_h log(Inequality)_{i,c,t-1} + \beta_h \Delta Fin.In_{c,t} \\ + \mathbf{\Gamma}_h \mathbf{X}_{i,c,t} + \tau_i^h + \gamma_c^h + \delta_t^h + \upsilon_{i,c,t+h} \end{aligned} \tag{1}$$

for each $h = 0, 1, .., H$, which denotes the time horizon for the local projections. The indices i, c, and t represent industry, country, and year, respectively. $Inequality_{i,c,t}$ is the 90-10 ratio (and the 90-50 ratio), which is a dependent variable that measures wage inequality. To account for the persistence of wage inequality, I include one lag of the dependent variable on the right-hand side of the equation.[11]

$\Delta Fin.In_{c,t}$ is a financial integration shock that is measured by the first difference in the total external assets and liabilities as a percentage of nominal GDP. I assume that the shock of financial integration is sufficiently exogenous at the individual industry level because it is a country-level variable. The industries at 2-digit classification levels are small enough to support this assumption. Therefore, I do not use any additional restrictions to identify the shock. The parameter of interest is β_h, which represents the effects of a financial integration shock on wage inequality after h periods. Combining this parameter as a function of time horizon h provides the

[10] Cortes and Tschopp (2024) find a positive correlation between concentration and between-firm wage inequality.

[11] The ordinary least squares (OLS) estimator may not provide efficient estimates for a dynamic panel model with individual fixed effects, such as the one in equation (1), especially in settings where N is large and T is small (Nickell, 1981). In a robustness check, I use the Generalized Method of Moments (GMM) estimator proposed by Arellano and Bond (1991) to address this possible bias.

impulse response function of wage inequality to a financial integration shock. I also demean $\Delta Fin.In_{c,t}$ by each country and then normalize by its standard deviation to facilitate the interpretation of the magnitude of the impulse responses.[12] The estimated coefficients β_h, therefore, can be interpreted as a percentage change in between-firm wage inequality to a one-standard deviation increase in $\Delta Fin.In_{c,t}$.

τ_i and γ_c are industry- and country-fixed effects, which are included to control for unobserved cross-industry and cross-country heterogeneity in wage inequality, respectively.[13] Country-fixed effects can also mitigate concerns about the cross-country comparability of the CompNet dataset that may arise due to different data sources.[14] δ_t is time-fixed effects to control for global or regional shocks that affect the entire European region. $\mathbf{X}_{i,c,t}$ is a vector of control variables, and $v_{i,c,t+h}$ is projection residual. I cluster standard errors at the country-year level to control for the potential country-year correlation across industries.[15] Clustered standard errors are also robust to the presence of arbitrary heteroskedasticity.[16]

[12] To calculate the mean and standard deviation, I use data for the entire period from 1999 to 2021, while the data period used for estimation varies by country.

[13] Failure to adequately control for unobserved heterogeneity can preclude causal inferences and produce inconsistent estimates due to omitted variable bias (Gormley & Matsa, 2014).

[14] Differences in data sampling methodology in each country can cause problems comparing data across countries. For more detail, see the User Guide for the 9th Vintage of the CompNet Dataset, available at `https://www.comp-net.org/fileadmin/_compnet/user_upload/9th_Vintage_User_Guide_final_102023.pdf`

[15] Cameron and Miller (2015) argue that the inclusion of fixed effects could not ensure the elimination of the within-group correlation of the error. I assume that standard errors for a given year and country are correlated, while standard errors for different countries are uncorrelated. In this case, the robust standard error could be too small. Note that the cluster standard error can be unnecessarily large in some cases. See Abadie et al. (2023) for detailed discussion.

[16] Montiel Olea and Plagborg-Møller (2021) suggest that researchers should conduct inference based on lag-augmented local projections with heteroskedasticity-robust standard errors.

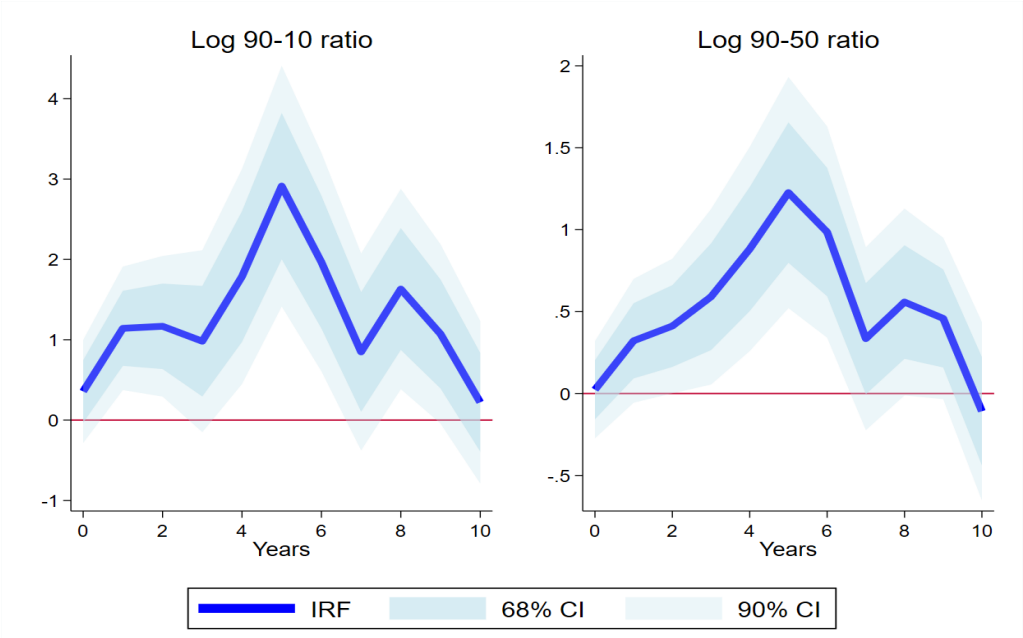
4 Results

4.1 Main results

In this section, I present the main results by looking at the impulse response functions estimated using local projections. Figure 3 presents local projection estimates and confidence intervals for the responses of wage inequality to a financial integration shock. The left panel of the figure represents the impulse response of the log 90-10 ratio of average wages, and the right panel represents the impulse response of the log 90-50 ratio.

The figure shows that financial integration increases between-firm wage inequality, and the effects are statistically significant and persistent. The estimated impulse responses of wage inequality are represented by a slightly sharp hump-shaped curve, which means that the magnitude of the response gradually increases, reaching a peak in the mid-term and then declining. More precisely, a one standard deviation shock to financial integration increases between-firm wage inequality, measured by the 90-10 ratio, to a peak of about 2.91% five years after the shock. Similarly, a financial integration shock leads to about a 1.23% increase in the 90–50 ratio five years after the shock. It is worth pointing out that the similar shape of the responses in the 90-50 and 90–10 ratios implies that an increase in average wages of high-percentile firms mainly drives an increase in overall wage inequality. This could support the argument that financial integration primarily has a favorable impact on big firms rather than SMEs.

Figure 3: Responses of between-firm wage inequality



Next, taking advantage of using the *de facto* indicator, I break down the impact of financial integration on wage inequality by direction, i.e., into inward and outward financial integration. I re-estimate the impulse response functions in equation (1) by dividing $\Delta Fin.In_{c,t}$ into external assets (outward financial integration) and external liabilities (inward financial integration). Inward and outward financial integration shocks can be conceptually interpreted as *gross* capital inflows and *gross* capital outflows, respectively.[17]

Panel (a) of Figure 4 reports the impacts of an inward financial integration shock on wage inequality. The figure shows that inward financial integration increases between-firm wage inequality. The shape of the responses is a hump, broadly similar to that in Figure 3. However, the impacts of an inward financial integration shock are more prominent over the entire forecast horizon than those of total financial integration. A one standard deviation shock to inward financial integration leads to a 4.17% increase in the 90–10 ratio five years after the shock and a 3.79% increase six years after the shock. The 90-50 ratio increases by 1.94% and 1.89% five and six years after the shock, respectively. The estimated coefficients are statistically significant for 1 to 8 years after the shock.

On the other hand, as shown in panel (b) of the figure, an outward shock leads to a reduction in between-firm wage inequality. An increase in outward financial integration by one standard deviation reduces the 90-10 ratio by about 0.20-1.75% and the 90-50 ratio by about 0.30-0.89% in each forecast period until seven years after the shock. However, these results are less definitive, as the effects are only statistically significant for two years after the shock, not for other forecast horizons.

In sum, the empirical findings presented in this section suggest that financial integration increases between-firm inequality and that the effect of inward financial integration is more pronounced than that of outward integration. These results are consistent with previous findings (Eklou & Foster, 2023; Li & Su, 2021; Liu et al., 2023), which suggest that increased income inequality (or wage inequality) is mainly associated with inward capital account liberalization rather than outward liberalization.

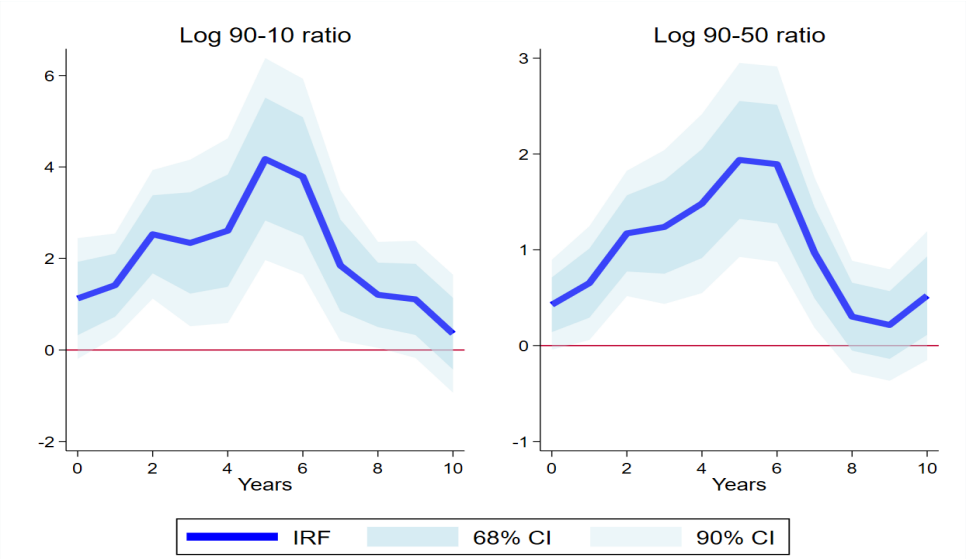
Robustness

I conduct several robustness checks on the main results. First, I re-estimate equation (1) (i) without the lagged dependent variable, and (ii) with the lagged value of the financial integration shock, respectively. Although impulse response functions estimated using local projections are known to be less sensitive to model misspecification than VARs, this robustness check tests the possibility that misspecification of

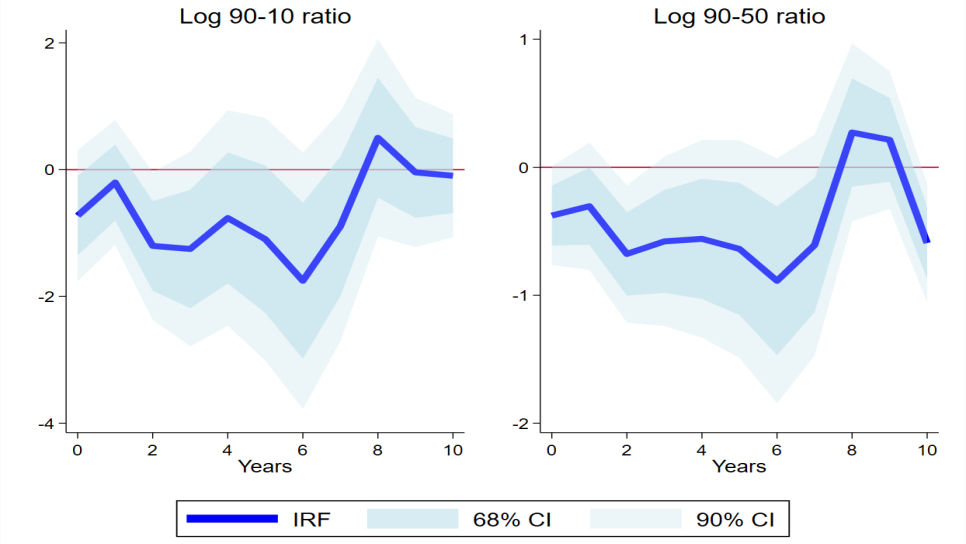
[17] Gross capital inflows refer to a net increase in domestic financial assets of non-residents. On the other hand, gross capital outflows refer to a net increase in foreign financial assets of residents.

Figure 4: Responses of wage inequality - direction of financial integration

(a) Inward



(b) Outward



the lag structure leads to bias in the estimates. Second, I exclude some observations from the full sample and re-estimate the impulse response functions. (i) I excluded industries with outliers, which are values more than three standard deviations above the average wage inequality for each country, and (ii) I conduct a robustness check with the exclusion of the Great Recession and the COVID-19 pandemic because movements in macroeconomic variables, such as cross-border capital flows and wage inequality at the national level, were unusual during this period.

Next, to check whether the main results are robust to different sources of variation, I re-estimate the impulse response functions using the various mixtures of fixed effects: (i) industry-year and country fixed effects and (ii) industry-country

and industry-year fixed effects. Finally, to address the potential bias in large N and small T settings due to the presence of a lagged dependent variable on the right-hand-side of the estimated model and individual fixed effects (Nickell, 1981), I re-estimate local projections using the GMM estimator proposed by Arellano and Bond (1991). I use the deeper lags of the dependent and independent variables as instruments for one lag term of the dependent variable.

I confirm that the main results are robust to a variety of other specifications, with the impulse response functions presented in Figures A.2–A.5 in the Appendix. All results for robustness checks are close to those obtained in the baseline specification. Inward financial integration is associated with an increase in between-firm wage inequality, and the effect is statistically significant in all results. Outward financial integration, on the other hand, has an insignificant impact on wage inequality, although it is significant in some cases.

4.2 Additional results

In this subsection, I provide plausible explanations for the following question, focusing on inward financial integration: How does financial integration affect between-firm wage inequality? This question concerns which channels and under what conditions financial integration affects wage inequality.

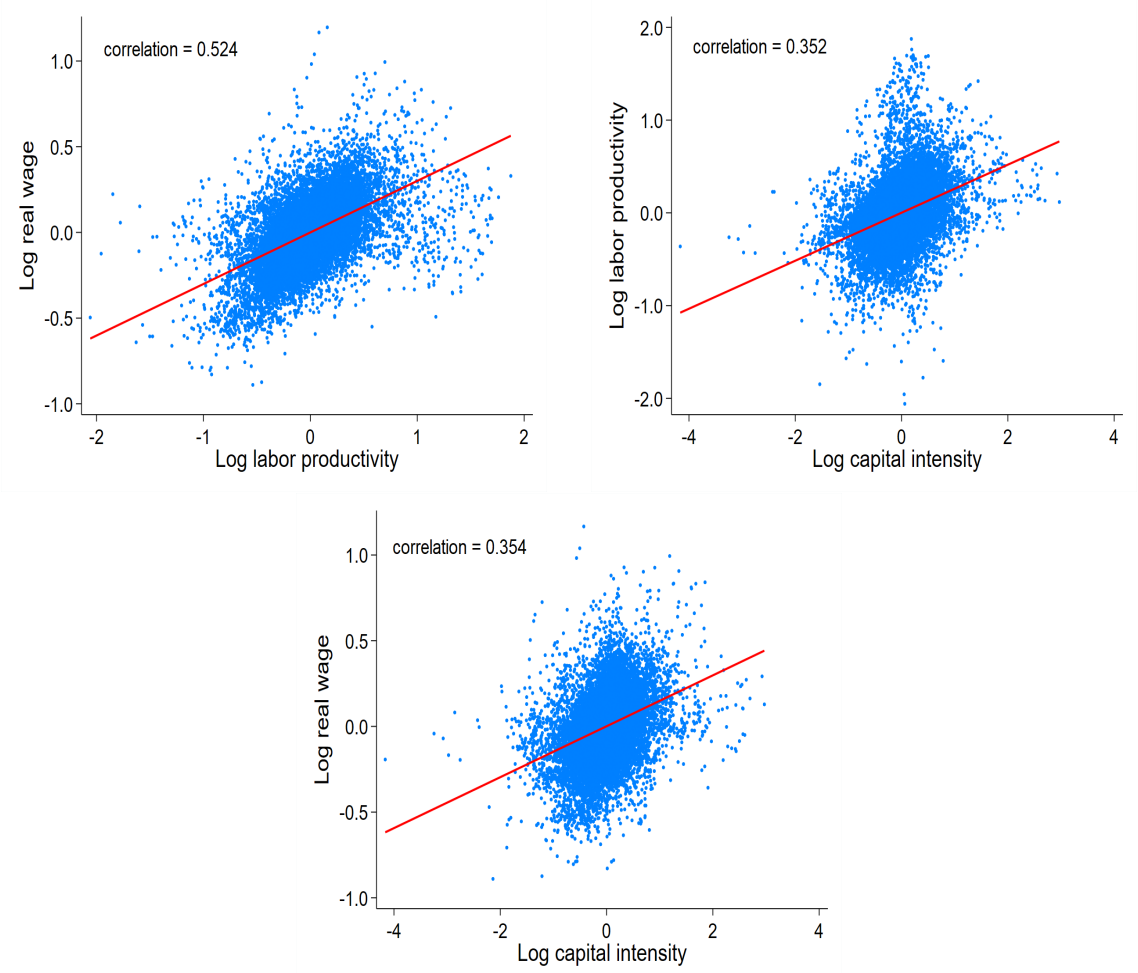
Channel: labor productivity and capital intensity

Progress in financial integration allows domestic firms to raise more physical and intangible capital than before capital account opening. Additionally, the inflow of foreign capital leads to the diffusion of technologies that are superior to domestic technologies. This makes firms more labor-productive and drives up wages. However, if these effects only involve big firms and not SMEs, then the productivity gap between big firms and SMEs widens as financial integration progresses, which in turn increases between-firm wage inequality.

We first look at the relationship between wage, labor productivity, and capital intensity using 2-digit industry-level data. Figure 5 represents the relationship between three log-transformed variables. Labor productivity is computed as real value added to the labor ratio, and capital intensity is estimated by the real capital-to-labor ratio. I adjust these variables by estimating the residuals of a regression using country- and industry-fixed effects. As shown in the upper left panel of the figure, there is a high correlation between labor productivity and wages. The upper right panel of the figure presents a positive correlation between capital intensity and labor productivity, and the bottom panel shows a positive relationship between capital intensity and wages. To put it simply, an increase in capital intensity may increase

labor productivity and, consequently, also wages.[18]

Figure 5: Wage, labor productivity, and capital intensity



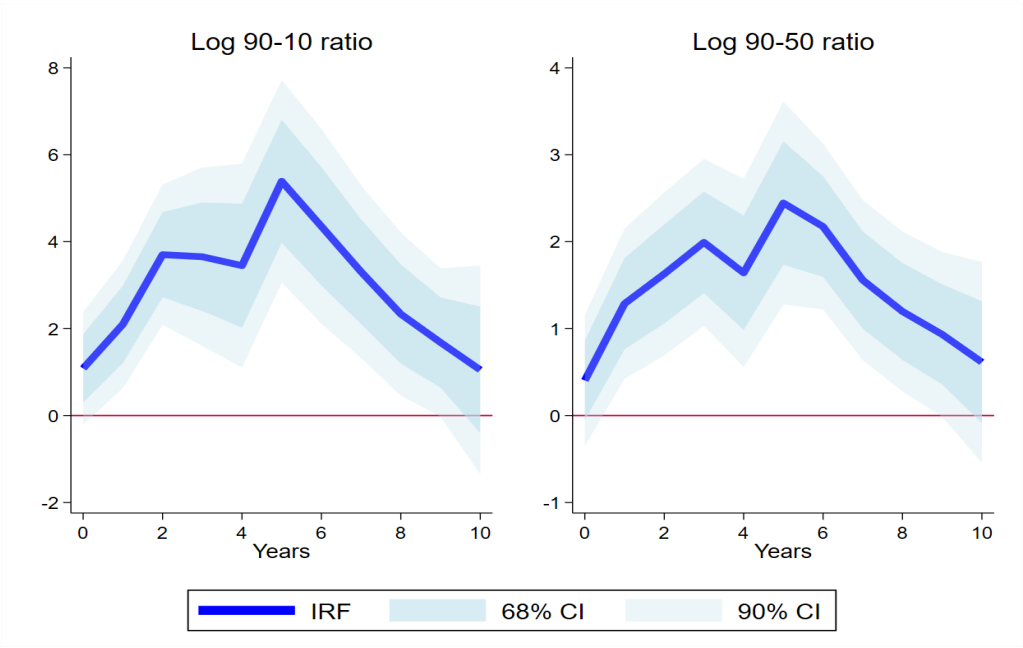
Source: CompNet dataset and author's calculation

Next, I estimate the impulse response functions by replacing the dependent variable $Ineuality_{i,c,t}$ in equation (1) with the labor productivity gap and capital intensity gap among firms within industries. These two variables are calculated equally as between-firm wage inequality is computed. First, Figure 6 shows the impulse responses of the labor productivity gap within industries to an inward financial integration shock. The 90-10 and 90–50 ratios of labor productivity positively respond to one standard deviation shock of financial integration, and the shape and magnitude of responses are broadly similar to wage inequality. In other words, inward financial integration expands the dispersion in labor productivity across firms within

[18] Many economists report that the capital-to-labor ratio is positively correlated with wages. For example, Arai (2003) finds that the capital-to-labor ratio systematically positively affects wages using the matched worker-firm data from Sweden. Leonardi (2007) provides empirical evidence of a positive relationship between the dispersion of the capital-to-labor ratio and wage inequality in the US.

industries. The impacts are statistically significant over most forecast horizons and peak five years after the shock (5.39% rise in the 90-10 ratio and 2.44% rise in the 90-50 ratio).

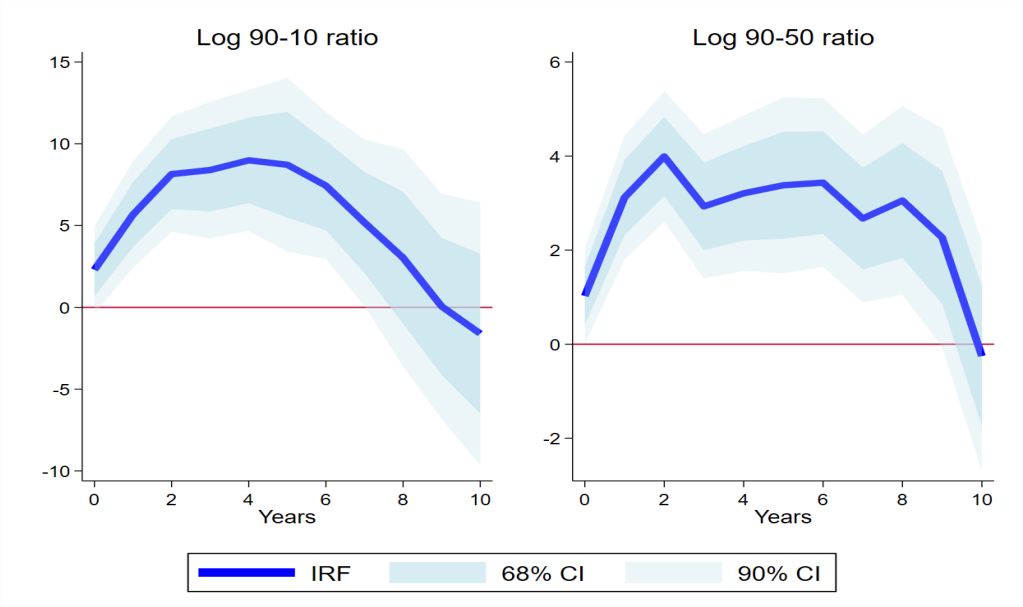
Figure 6: Responses of the labor productivity gap



Second, the results presented in Figure 7 suggest that the capital intensity gap also increases in response to an inward financial integration shock. It shows that as financial integration progresses, firms that have already accumulated relatively more capital acquire additional capital faster than firms with relatively less capital. The effects are large, statistically significant, and long-lasting. More precisely, inward financial integration is significantly associated with 5.12-8.99% increases in the 90-10 ratio of capital intensity at each horizon between one and seven years after the shock. Also, in response to a shock, the 90-50 ratio of capital intensity increases by 2.93-3.99% from one year to eight years after the shock. It is not hard to accept that the response of the capital intensity gap is larger and more statistically significant than that of the labor productivity gap and wage inequality because firms can accumulate more capital directly as a result of progress in financial integration.

As in the previous main result in subsection 4.1, the similar response shapes of the 90-10 and 90–50 ratios imply that big firms primarily drive the widening dispersion in labor productivity and capital intensity. Figures A.6 and A.7 in the Appendix show the difference in labor productivity and capital intensity across quintiles of firm size within an industry in a similar way to Figure 1. These figures suggest that the labor productivity gap and capital intensity gap across firms within an industry exist mainly between big firms and SMEs.

Figure 7: Responses of capital intensity gap



To summarize the results in this part, financial integration shocks widen the capital intensity gap within industries, which in turn widens the labor productivity gap. These results suggest that financial integration facilitates capital accumulation and productivity gains for big firms, while SMEs benefit less from financial integration. Through this mechanism, financial integration affects between-firm wage inequality.

External financial dependence

Some literature has pointed out that the distributional effects of financial integration may depend on a sector's inherent necessity for external financing. The previous empirical research exploits the methodology of external financial dependence (EFD) index developed by Rajan and Zingales (1998) to identify external financing needs for each sector (Eklou & Foster, 2023; Furceri et al., 2019; Larrain, 2015). EFD is defined as the fraction of capital expenditures not financed by internal cash flow from operations. Rajan and Zingales (1998) constructed the EFD index as a ratio of total capital expenditures minus current cash flow to total capital expenditures. Unfortunately, the original estimation of the EFD index by Rajan and Zingales (1998) cannot be replicated using the variables included in the CompNet dataset. As an alternative, I use the "financing gap" variable from the CompNet dataset. The financing gap is the ratio of nominal investment (fixed investment plus the change in net working capital) minus cash flow to nominal revenue. This variable measures indirectly the industry's demand for external financing over a given period. Although the measuring method of this variable is slightly different from EFD by Rajan and Zingales (1998), it conceptually captures similar characteristics of individual industries.

To "smooth temporal fluctuations and reduce the effects of outliers" (Rajan & Zingales, 1998, p. 564), I calculate the mean value of the financing gap for the entire sample period for each industry instead of using values in a given year. Additionally, as in original and other applications, I use the median firm's value in a given industry rather than the industry average. It is also important to note that the absolute value of the financing gap for each industry cannot be compared across countries because the financing gap is endogenous to the development of each country's financial system and credit supply. Therefore, I use the financing gap only as an indicator to rank industries within countries by their inherent demand for external financing and do not use its value directly in the analysis. With the rank of industries for each country, I divide them into industries with relatively higher external financing dependency (above the mean of all industries in a country) and industries with relatively lower external financing dependency (below the mean of all industries in a country).[19,20]

Figure 8 presents the estimated impulse response functions of wage inequality for both industry groups. The results presented here are based on a panel of 14 countries since six countries[21] are excluded from the whole sample countries due to no data availability on the financing gap. The figure suggests that inward financial integration is more significantly associated with industries with relatively higher EFD than industries with relatively lower EFD. As shown in Panel (a) of the figure, in response to an increase in total external liabilities by one standard deviation, the 90-10 ratio of wage inequality in the industries with high EFD rises by 3.06-3.34% in the mid-term (five and six years after the shock), and the 90-50 ratio rises by 1.43-1.52% at the same forecast horizon. The effects of the shock are statistically significant from one year to six years after the shock. On the other hand, the results presented in panel (b) of the figure suggest that wage inequality in industries with low EFD is less responsive to an inward financial integration shock than in industries with high EFD. In industries with low EFD, the 90-10 ratio increases by 0.25-1.50% over the period in response to a shock, but these effects are not statistically significant over most forecast horizons. The 90-50 ratio increases statistically significantly by 1.15% five years after the shock, but the effects at other forecast horizons are small and statistically insignificant.

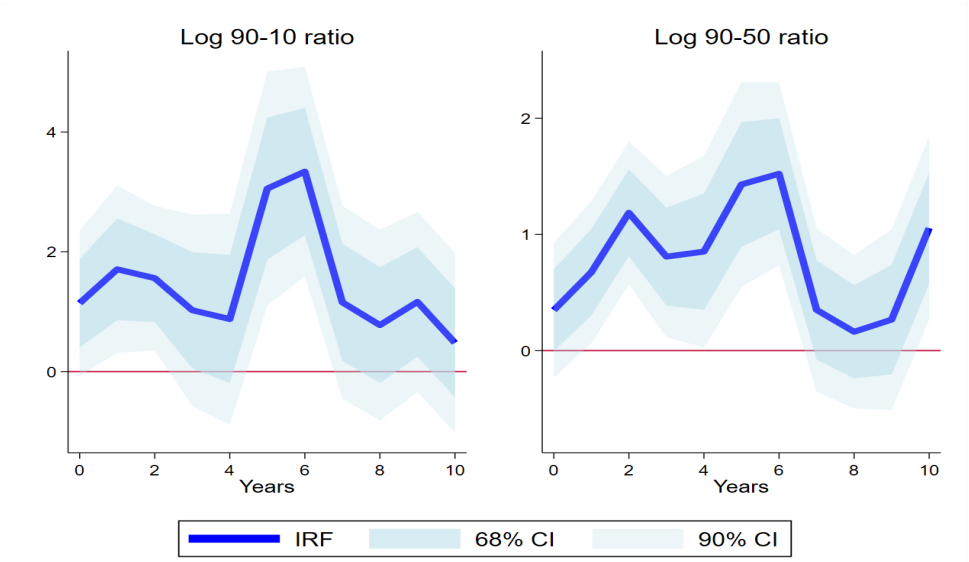
[19] Rajan and Zingales (1998) assumed that EFD does not vary across countries, but recent research has shown that this assumption is not supported by empirical evidence.(Eppinger & Neugebauer, 2022; Villani, 2021) I adopt this recent argument and calculate the ranking of industries for each country.

[20] In most countries, construction, wholesale, retail, postal and courier activities, accommodation, and real estate activities are classified as industries with high EFD. It is consistent with existing studies using the EFD (e.g., Larrain (2015), Furceri et al. (2019) among others). The sub-industries of manufacturing are categorized very differently by country.

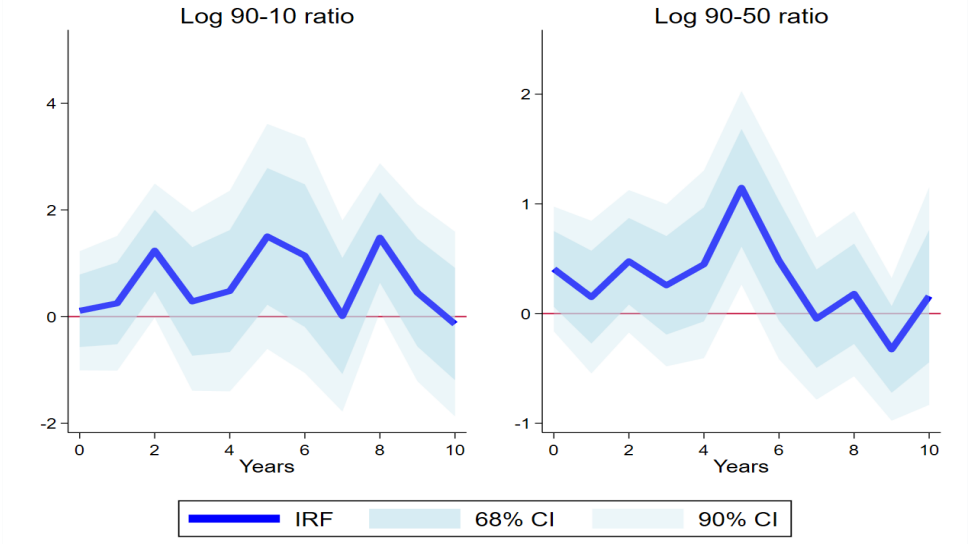
[21] Hungary, Latvia, Lithuania, Netherlands, Romania, and Slovenia

Figure 8: Responses of wage inequality - external financing dependence

(a) Industries with high EFD



(b) Industries with low EFD



These results are broadly consistent with previous empirical findings by Larrain (2015) and Furceri et al. (2019), which argued that the distributional effect of financial integration is larger in sectors with high EFD than in sectors with low EFD, although their studies did not address between-firm wage inequality.[22] However, these differ from the results in the ASEAN 5 countries by Eklou and Foster (2023).[23]

[22] Larrain (2015) has focused on wage inequality between skill- and unskilled labor, and Furceri et al. (2019) has examined the aggregate distributional effects of capital account liberalization using the Gini coefficient and labor share as measures of inequality.

[23] As Eklou and Foster (2023) argued, their results may be because ASEAN5 firms are more financially constrained than firms in Europe or advanced economies.

Financial development

The level of financial development has been discussed in much of the relevant literature as a moderator of the distributional effects of financial integration. However, there has been conflicting empirical evidence about whether financial development exacerbates or mitigates the impacts of financial integration on inequality. For instance, Bumann and Lensink (2016) suggest that capital account liberalization can lower income inequality if the financial depth, measured by private credit over GDP, is sufficiently high. On the contrary, de Haan and Sturm (2017) find that financial development enhances the effect of financial liberalization, deepening income inequality. Eklou and Foster (2023) also show that financial development dampens the impact of capital account liberalization on wage inequality.

To test whether the effects of financial integration on the between-firm wage inequality depend on the level of financial development for each country, I exploit the Financial Development (FD) index developed by Sahay et al. (2015) and Svirydzenka (2016) and maintained by the IMF. The FD index has a broader coverage and provides nine indices, the multi-dimensional measures for financial market/institution development in terms of depth, accessibility, and efficiency. I rank the sample countries using the aggregated index and divide them into two groups: countries with relatively higher financial development and countries with relatively lower financial development.[24] Figure 9 in the Appendix reports summary statistics for the FD index by country groups.

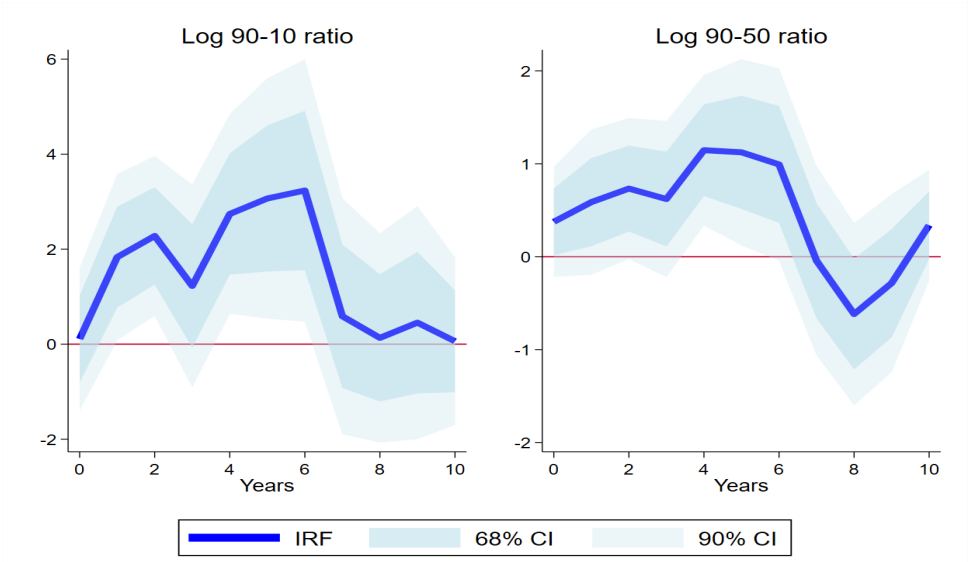
Figure 9 shows the estimated impulse response functions of wage inequality for both country groups. As shown in the figure, an inward financial integration shock increases between-firm wage inequality in both country groups. The effects peak in the mid-term and are statistically significant. However, the magnitude and shape of estimated impulse response functions differ slightly between countries with high FD and countries with low FD. In countries with low FD, an inward financial integration shock increases the 90-10 and 90–50 ratios by 4.63% and 1.63% at a peak (5 years after the shock), respectively. In countries with high FD, the 90-10 ratio increases by 3.24% six years after the shock, and the 90-50 ratio increases by 1.15% five years after the shock. These results suggest that the effects are more prominent in countries with low FD than those with high FD. In other words, financial development can mitigate the negative impact of financial integration on wage inequality. However, the difference in the magnitude of effects between the two groups is insufficient to conclude that this alleviation effect is sufficiently meaningful. Thus, it should not be interpreted as definitive.

[24] High FD countries: Belgium, Denmark, Finland, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden, and Switzerland. Low FD countries: Croatia, Czech Republic, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

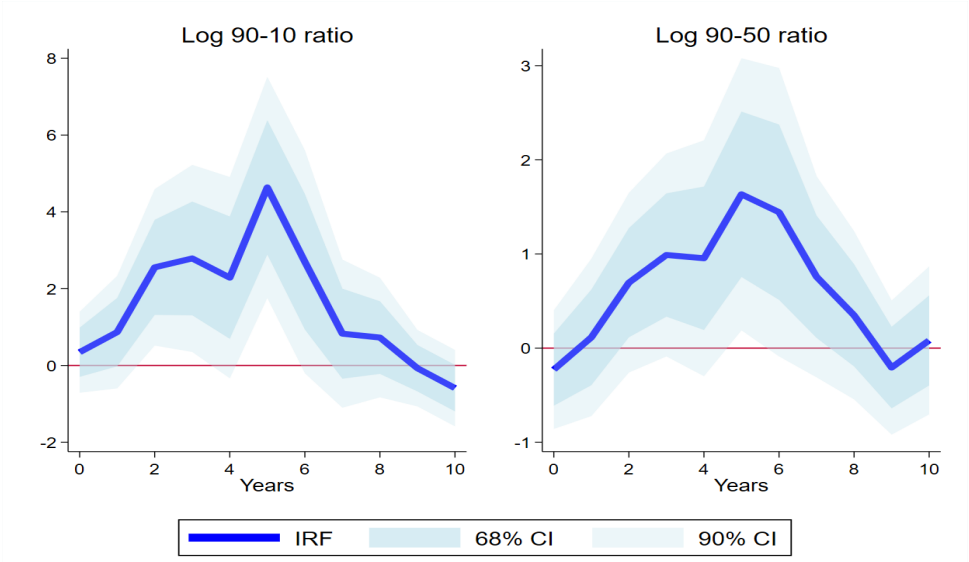
In addition, the countries categorized as having relatively low FD (mainly Central and Eastern European countries that were formerly centrally planned economies) also integrated rapidly into international financial markets after joining the EU in the mid-2000s. It would, therefore, be premature to conclude that financial development either mitigates or has no distributional effect of financial integration based on the results presented here. Further analysis should be conducted comparing developing countries outside of Europe to obtain more precise implications.

Figure 9: Responses of wage inequality - financial deveplopment

(a) Countries with high FD



(b) Countries with low FD



Categories of financial integration

Different types of financial integration may have different distributional implications.[25] EWN database provides data on subtypes of total external liabilities by dividing it into the following three categories: (i) foreign direct investment (FDI), (ii) portfolio investment, including equity and bond investments, and (iii) other investments, including loans to or deposits in non-resident entities, trade credits, etc. It allows us to look more closely at the effects of financial integration on wage inequality, separately by its subtypes.

To investigate whether the subcomponents of financial integration matter for its impact on between-firm wage inequality, I re-estimate the impulse response functions in equation (1) using data on three subtypes. Each panel in Figure 10 presents the impulse response functions of wage inequality to shocks in FDI, portfolio investment, and other investment, respectively. As shown in the figure, all three subcomponents contribute to an increase in between-firm wage inequality, but the magnitude, statistical significance, and time horizons of the effects vary somewhat depending upon the types. Among them, FDI has the most important impact. An increase in FDI by one standard deviation leads to 0.97-1.56% increases in the 90-10 ratio from one year to six years after the shock and 0.68-1.03% increases in the 90-50 ratio over the same horizons. Portfolio investment contemporaneously increases the 90-10 ratio by 1.00% and the 90-50 ratio by 0.41%. Its effects are long-lasting up to five years after the shock. In contrast, other investment has a significant impact over a longer lag than the previous two types. Its impacts on wage inequality peak in the mid-term, six and seven years after the shock (1.59-1.73% rise in the 90-10 ratio and 0.89-0.99% rise in the 90-50 ratio).

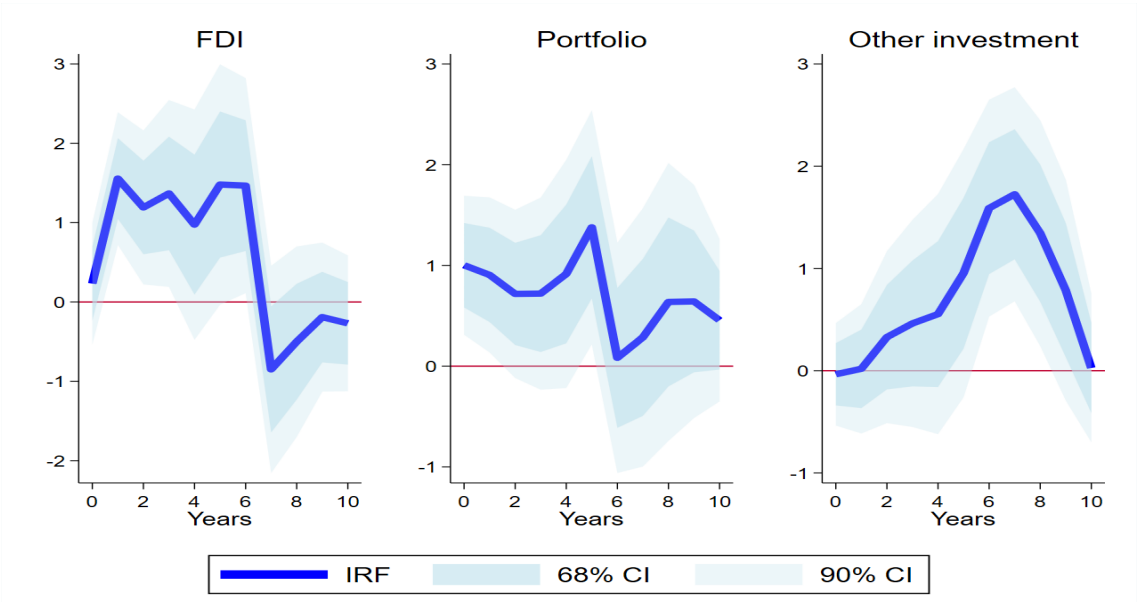
While the existing literature studying the distributional effects of financial integration by its subtypes provides no homologous empirical evidence[26], the empirical findings in this paper suggest that all three subcomponents are noteworthy for examining the impacts of financial integration on inequality. Additionally, the fact that each type affects wage inequality at different time horizons may imply that there may be specific channels of distributional effects for each type. Future research could extend the results presented here to investigate the various channels of financial integration's impact on wage inequality by separately identifying effects by subtype.

[25] For a comprehensive discussion on the distributional effects of subtypes of financial integration, see Eichengreen et al. (2021).

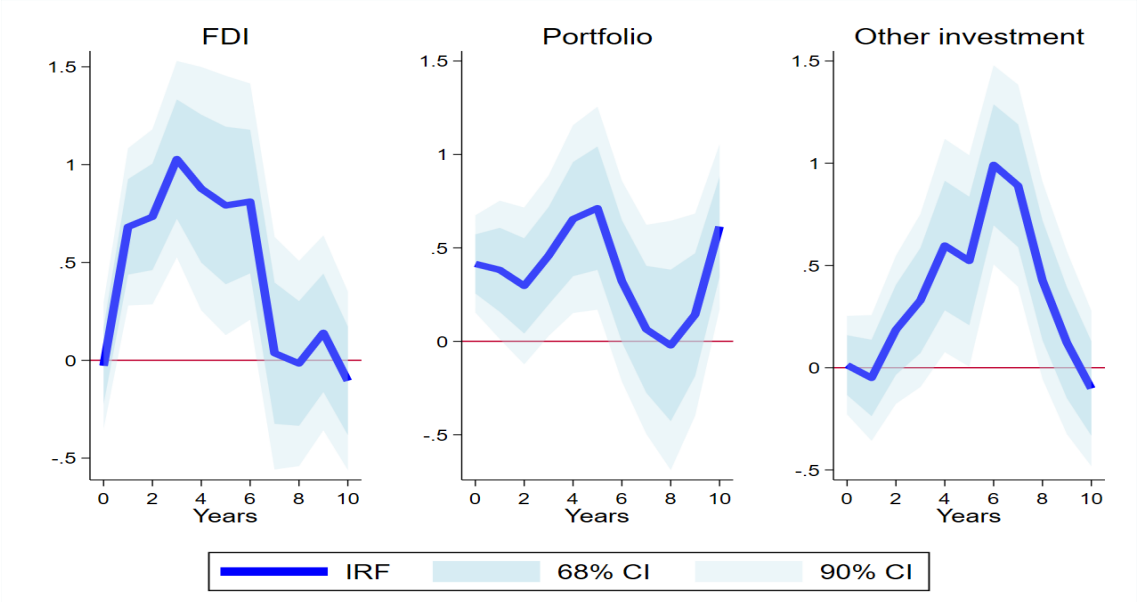
[26] For instance, Jaumotte et al. (2013) and Asteriou et al. (2014) suggest that FDI is positively correlated with increased income inequality. In contrast, Li and Su (2021) report no significant association between FDI and income inequality, while equity market liberalization is associated with increased income inequality. Eklou and Foster (2023) show that inward liberalization of equity market and FDI increases wage inequality in ASEAN 5 countries.

Figure 10: Responses of wage inequality - subtypes of financial integration

(a) Log 90-10 ratio



(b) Log 90-50 ratio



5 Conclusion

In this paper, I examine the effects of financial integration on between-firm wage inequality using an unbalanced panel for 20 European countries over the period 1999-2021. To focus on the mid- and long-term distributional effects of financial integration, I estimate the impulse response functions using local projections with multi-dimensional (industry-country-year) panel regressions. To measure between-firm wage inequality, I exploit the CompNet dataset, which provides micro-aggregated data based on firm-level data.

I find that financial integration at a national level is associated with a rise in between-firm wage inequality within industries. An increase in financing integration by one standard deviation leads to a rise in wage inequality, particularly in the mid-term. The empirical findings in this paper also suggest that the direction of financial integration does matter. Inward financial integration increases between-firm wage inequality, and the effects are statistically significant and persistent. Outward integration induces a reduction in wage inequality, but the effects are not statistically significant for most forecast horizons. These results are robust to various robustness checks and are broadly consistent with previous research findings.

I also provide empirical evidence on the channel for the distributional effects of financial integration. Similar to the response to wage inequality, the labor productivity gap and capital intensity gap among firms within industries widen in response to a financial integration shock. These results suggest that financial integration accelerates big firms to accumulate more capital and increase productivity, while SMEs benefit less from financial integration. These results provide a milestone to build a theoretical framework for the distributional effects of financial integration. Additionally, financial integration is more significantly associated with a rise in wage inequality in industries with relatively higher external financial dependence than in industries with relatively lower external financial dependence. The financial development of countries has no significant moderate impact on the distributional effects of financial integration, but it is less definitive. When comparing the impacts of subcomponents of financial integration (FDI, portfolio investment, and other investment), all subcomponents are found to widen wage inequality, while the magnitude and lag structure of the effect are slightly different.

This paper has some limitations. First, since I use data aggregated at the industry level, heterogeneity in workers' characteristics, such as education level, work experience, gender, etc., is not sufficiently controlled. Therefore, the results presented in this paper cannot be interpreted as a pure reflection of "between-firm wage inequality" but rather as a mixture of "within-firm wage inequality" to some extent. Controlling for worker characteristics would require using more compre-

hensive data on employees linked to their employers. Second, the analysis in this paper focuses on European countries, which are primarily advanced economies and already highly integrated into the global financial markets. However, the distributional effects of financial integration may vary depending on the degree of financial integration (Avdjiev & Spasova, 2022; Yun, 2023). This study, therefore, should be extended to the case of developing countries in other regions.

The findings in this paper suggest the proper policy actions that could mitigate the adverse distributional consequences of financial integration. As financial integration advances, policymakers should design policies that ensure the benefits of financial integration are more evenly distributed across all firms and all workers. We can consider a package of policies that support SMEs in raising more funds from foreign capital, increase investments in workers' education level and skills, and manage cross-border capital flows appropriately. By implementing these policies, policymakers can more equitably distribute the benefits of financial integration, fostering inclusive and sustainable economic growth for all.

References

Abadie, A., Athey, S., Imbens, G. W., & Wooldridge, J. M. (2023). When Should You Adjust Standard Errors for Clustering? *The Quarterly Journal of Economics*, *138*(1), 1–35.

Abowd, J. M., Kramarz, F., & Margolis, D. N. (1999). High wage workers and high wage firms. *Econometrica*, *67*(2), 251–333.

Akerman, A., Helpman, E., Itskhoki, O., Muendler, M.-A., & Redding, S. (2013). Sources of wage inequality. *American Economic Review*, *103*(3), 214–219.

Alvarez, J., Benguria, F., Engbom, N., & Moser, C. (2018). Firms and the Decline in Earnings Inequality in Brazil. *American Economic Journal: Macroeconomics*, *10*(1), 149–189.

Arai, M. (2003). Wages, profits, and capital intensity: Evidence from matched worker-firm data. *Journal of Labor Economics*, *21*(3), 593–618.

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, *58*(2), 277–297.

Asteriou, D., Dimelis, S., & Moudatsou, A. (2014). Globalization and income inequality: A panel data econometric approach for the EU27 countries. *Economic Modelling*, *36*(100), 592–599.

Avdjiev, S., & Spasova, T. (2022). *Financial openness and inequality* (BIS Working Papers No. 1010). Bank for International Settlements. Basel.

Bumann, S., & Lensink, R. (2016). Capital account liberalization and income inequality. *Journal of International Money and Finance*, *61*, 143–162.

Cameron, A. C., & Miller, D. L. (2015). A practitioner's guide to cluster-robust inference. *Journal of human resources*, *50*(2), 317–372.

Card, D., Heining, J., & Kline, P. (2013). Workplace heterogeneity and the rise of West German wage inequality. *The Quarterly Journal of Economics*, *128*(3), 967–1015.

Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, *81*(1), 163–192.

Chinn, M. D., & Ito, H. (2008). A new measure of financial openness. *Journal of Comparative Policy Analysis: Research and Practice*, *10*(3), 309–322.

Cornia, G. A. (2011). Economic Integration, Inequality and Growth: Latin America Versus the European Economies in Transition. *Review of Economics and Institutions*, *2*(2), Article 2.

Cortes, G. M., & Tschopp, J. (2024). Rising Concentration and Wage Inequality. *The Scandinavian Journal of Economics*, *126*(2), 320–354.

Criscuolo, C., Hijzen, A., Schwellnus, C., Barth, E., Chen, W.-H., Fabling, R., Fialho, P., Stadler, B., Upward, R., Zwysen, W., & Grabska-Romago, K. (2020). *Workforce composition, productivity and pay: the role of firms in wage inequality* (OECD Economics Department Working Papers No. 1603). OECD Publishing. Paris.

de Haan, J., & Sturm, J. E. (2017). Finance and income inequality: A review and new evidence. *European Journal of Political Economy*, *50*, 171–195.

Eichengreen, B., Csonto, B., El-Ganainy, A., & Koczan, Z. (2021). *Financial globalization and inequality: Capital flows as a two-edged sword* (IMF Working Papers No. 2021/004). International Monetary Fund. Washington, D.C.

Eklou, K., & Foster, S. (2023). *Capital Account Liberalization and Wage Inequality: Evidence from Firm Level Data* (IMF Working Papers No. 2023/048). International Monetary Fund. Washington, D.C.

Eppinger, P. S., & Neugebauer, K. (2022). External financial dependence and firms' crisis performance across europe. *Empirical Economics*, *62*(2), 887–904.

Erauskin, I., & Turnovsky, S. J. (2019). International financial integration and income inequality in a stochastically growing economy. *Journal of International Economics*, *119*, 55–74.

Erauskin, I., & Turnovsky, S. J. (2022). International financial integration, the level of development, and income inequality: Some empirical evidence. *International Review of Economics & Finance*, *82*, 48–64.

Furceri, D., & Loungani, P. (2018). The Distributional Effects of Capital Account Liberalization. *Journal of Development Economics*, *130*, 127–144.

Furceri, D., Loungani, P., & Ostry, J. D. (2019). The Aggregate and Distributional Effects of Financial Globalization: Evidence from Macro and Sectoral Data. *Journal of Money, Credit and Banking*, *51*, 163–198.

Gormley, T. A., & Matsa, D. A. (2014). Common Errors: How to (and Not to) Control for Unobserved Heterogeneity. *Review of Financial Studies*, *27*(2), 617–661.

Gräbner, C., Heimberger, P., Kapeller, J., & Springholz, F. (2021). Understanding economic openness: a review of existing measures. *Review of World Economics*, *157*(1), 87–120.

Jaumotte, F., Lall, S., & Papageorgiou, C. (2013). Rising income inequality: Technology, or trade and financial globalization? *IMF Economic Review*, *61*(2), 271–309.

Jordà, O. (2005). Estimation and inference of impulse responses by local projections. *American Economic Review*, *95*(1), 161–182.

Laeven, L., & Valencia, F. (2020). Systemic Banking Crises Database II. *IMF Economic Review*, *68*(2), 307–361.

Lane, P. R., & Milesi-Ferretti, G. M. (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970-2004. *Journal of International Economics*, *73*(2), 223–250.

Lane, P. R., & Milesi-Ferretti, G. M. (2018). The External Wealth of Nations Revisited: International Financial Integration in the Aftermath of the Global Financial Crisis. *IMF Economic Review*, *66*(1), 189–222.

Larrain, M. (2015). Capital Account Opening and Wage Inequality. *Review of Financial Studies*, *28*(6), 1555–1587.

Leonardi, M. (2007). Firm Heterogeneity in Capital-Labour Ratios and Wage Inequality. *The Economic Journal*, *117*(518), 375–398.

Li, X., & Su, D. (2021). Does Capital Account Liberalization Affect Income Inequality? *Oxford Bulletin of Economics and Statistics*, *83*(2), 377–410.

Liu, Z., Spiegel, M. M., & Zhang, J. (2023). Capital flows and income inequality. *Journal of International Economics*, *144*, Article 103776.

Montiel Olea, J. L., & Plagborg-Møller, M. (2021). Local Projection Inference Is Simpler and More Robust Than You Think. *Econometrica*, *89*(4), 1789–1823.

Nguyen, T. C., Castro, V., & Wood, J. (2022). A new comprehensive database of financial crises: Identification, frequency, and duration. *Economic Modelling*, *108*(100), Article 105770.

Nickell, S. (1981). Biases in Dynamic Models with Fixed Effects. *Econometrica*, *49*(6), 1417–1426.

Rajan, R. G., & Zingales, L. (1998). Financial dependence and growth. *The American Economic Review*, *88*(3), 559–586.

Sahay, R., Cihak, M., N'Diaye, P., Barajas, A., Ayala Pena, D., Bi, R., Gao, Y., Kyobe, A., Nguyen, L., Saborowski, C., Svirydzenka, K., & Yousefi, S. R. (2015). *Rethinking Financial Deepening: Stability and Growth in Emerging Markets* (IMF Staff Discussion Notes No. 2015/008). International Monetary Fund. Washington, D.C.

Song, J., Price, D., Guvenen, F., Bloom, N., & von Wachter, T. (2019). Firming Up Inequality. *The Quarterly Journal of Economics*, *134*(1), 1–50.

Svirydzenka, K. (2016). *Introducing a New Broad-based Index of Financial Development* (IMF Working Papers No. 2016/005). International Monetary Fund. Washington, D.C.

Villani, D. (2021). Revisiting the external financial dependence index in light of the rise of corporate net lending: What do we really measure? *Structural Change and Economic Dynamics*, *58*(100), 361–376.

Yun, J. (2023). *Capital Inflows and Income Inequality: Evidence from Panel VAR Approach* (MAGKS Joint Discussion Paper Series in Economics No. 22-2023). Philipps-University Marburg, School of Business and Economics. Marburg.

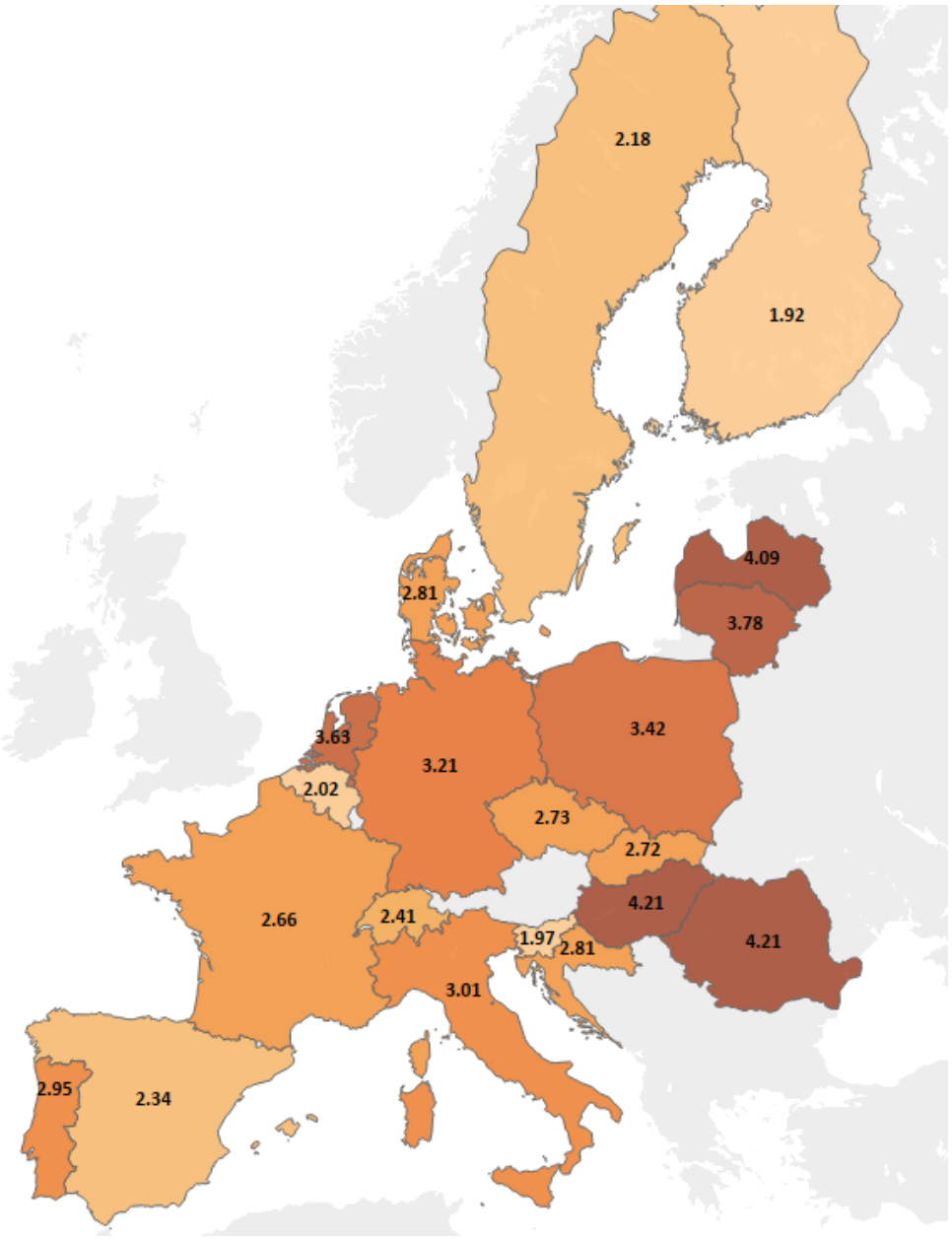
A Appendix

Table A.1: Descriptive statistics: FD index by country groups

	Mean	Median	SD	Min	Max
Countries with high FD	0.740	0.737	0.095	0.519	0.987
Countries with low FD	0.364	0.361	0.111	0.144	0.571
Total	0.565	0.597	0.214	0.144	0.987

Source: CompNet dataset and author's calculation

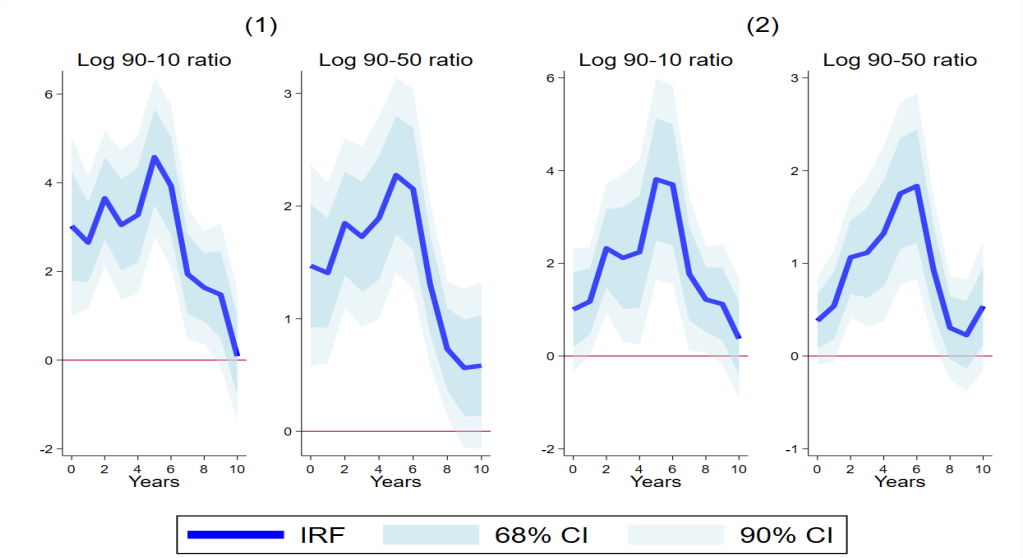
Figure A.1: Wage inequality (90-10 ratio) by country



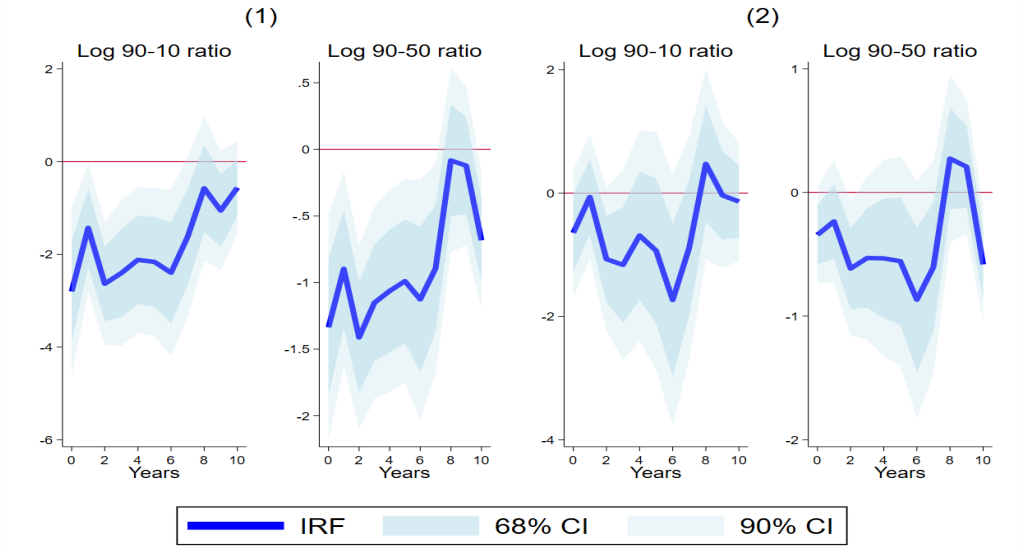
Source: CompNet dataset and author's calculation

Figure A.2: Robustness check (1) - other specifications

(a) Inward



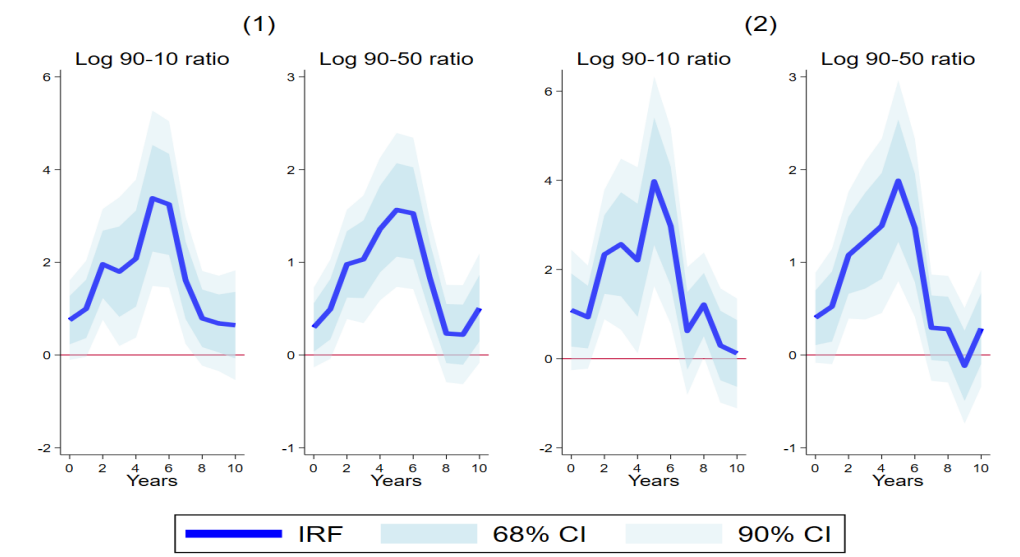
(b) Outward



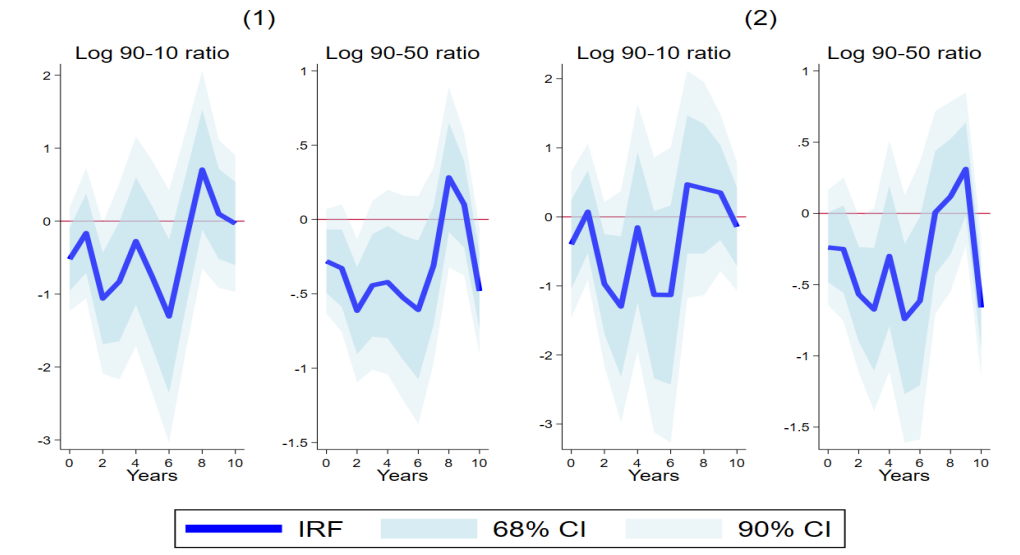
Note: (1) the impulse response function for the specification without the lagged dependent variable, (2) the impulse response function for the specification with the lagged value of the financial integration shock

Figure A.3: Robustness check (2) - excluding some observations

(a) Inward



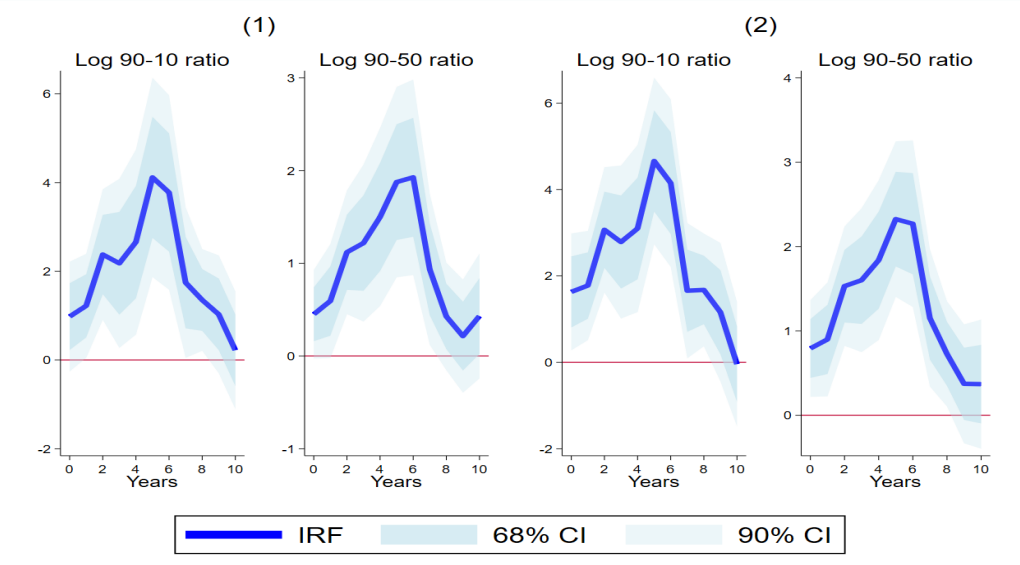
(b) Outward



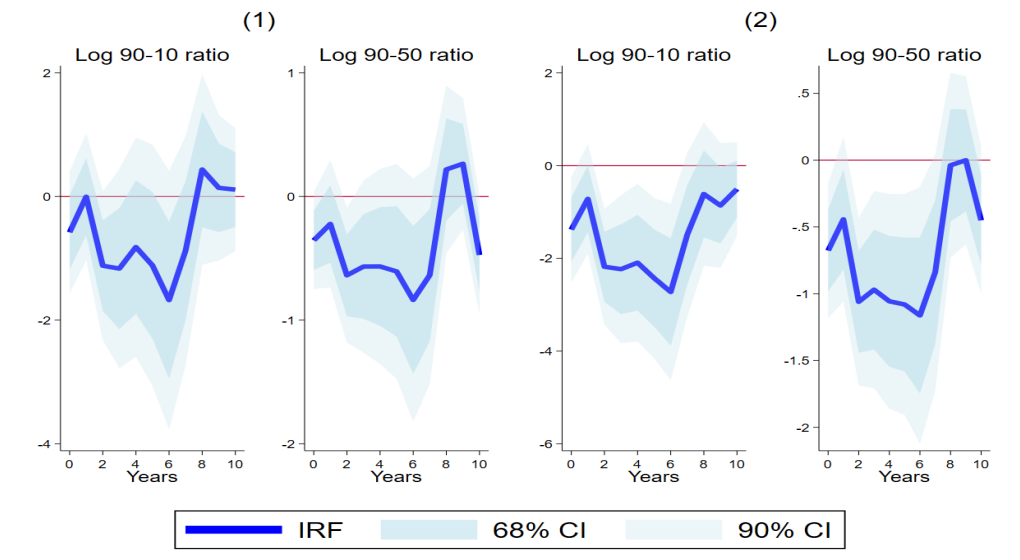
Note: (1) excluding outliers, (2) excluding observations in 2008 and 2020

Figure A.4: Robustness check (3) - various mixtures of fixed effects

(a) Inward



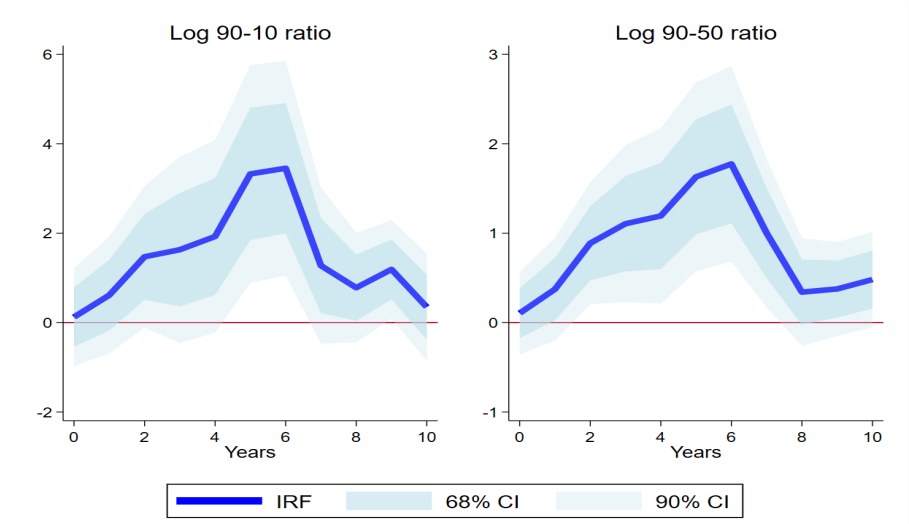
(b) Outward



Note: (1) country and industry-year fixed effects, (2) industry-country and industry-year fixed effects

Figure A.5: Robustness check (4) - GMM estimator

(a) Inward



(b) Outward

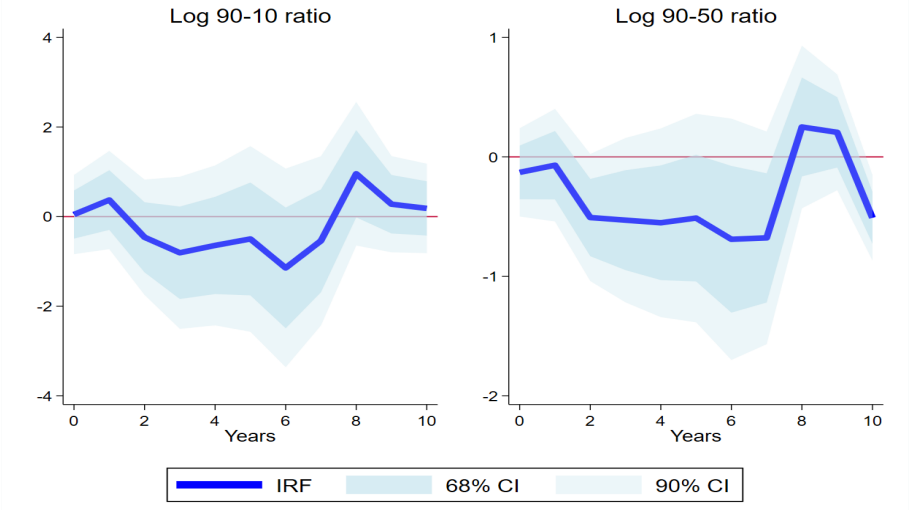
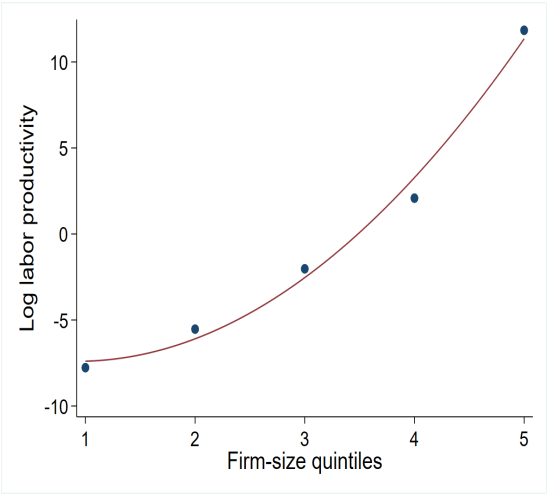
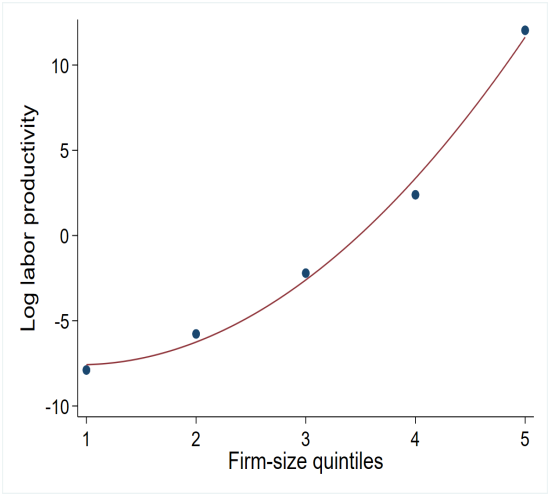


Figure A.6: Labor productivity by firm size

(a) Mean within each quintile



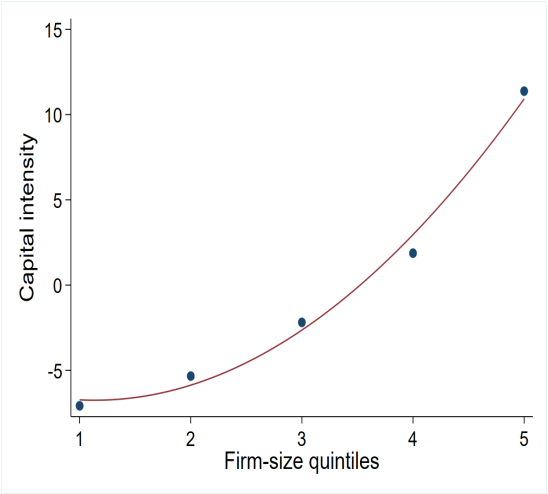
(b) Median within each quintile



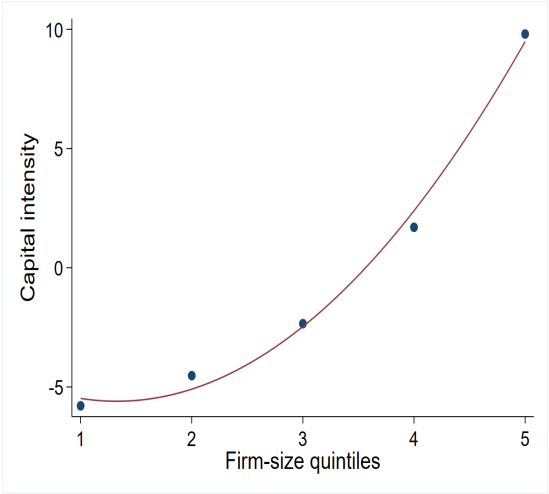
Note: Quintile 1; 0-20% percentiles, Quintile 2; 20-40% percentiles, Quintile 3; 40-60% percentiles, Quintile 4; 60-80% percentiles, and Quintile 5; 80-100% percentiles
Source: CompNet dataset and author's calculation

Figure A.7: Capital intensity by firm size

(a) Mean within each quintile



(b) Median within each quintile



Note: Quintile 1; 0-20% percentiles, Quintile 2; 20-40% percentiles, Quintile 3; 40-60% percentiles, Quintile 4; 60-80% percentiles, and Quintile 5; 80-100% percentiles
Source: CompNet dataset and author's calculation