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International Capital Markets and Domestic Employment: Evidence from worldwide publicly listed large firms.

Abstract

We study how access to the international capital market affects domestic employment. Using a large firm-level panel dataset that covers over 60 countries between 1982 and 2014, we find that access to the international capital market positively affects firm-level employment, and the magnitude of this impact is economically significant. This causal effect is identified through a generalised triple-differences identification strategy that exploits variations in both external financial dependence and the progress of capital account openness. We also show that there are substantial heterogeneous effects across countries and firms; the effect is more pronounced for firms in industries that depend more on external finance and those in countries with weaker employment protection legislation. In addition, financially constrained firms respond more positively to international capital market access. Overall, our findings suggest that a strategy of gradually opening international capital markets will support employment.

JEL Classification: F66, F38.

Keywords: Employment; capital account liberalisation; external finance dependence; financial constraints; employment protection legislation.

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1. Introduction

Consensus on the economic benefits of capital account liberalisation is limited. For a start, the theoretical predictions of capital account liberalization are not unequivocal. Capital account opening is supposedly beneficial, as it allows for more efficient allocation of capital across industries and countries, providing a higher rate of return on savings and boosting growth and employment creation (Henry, 2007; Quinn and Toyoda, 2008). Other contributions have stressed that capital account liberalisation may not support economic growth in developing countries (Quinn and Toyoda, 2008), and its beneficial effect may depend on whether an economy is saving-constrained or investment-constrained (Rodrik and Subramanian, 2009).

In recognition of the potential benefits arising from capital account liberalization, in the last few decades many industrial economies have embraced consistent policy responses to free capital flows. However, many emerging market economies and low-income developing countries still apply restrictions on capital account transactions to limit the high welfare costs associated with increased financial and macroeconomic instability that comes with free capital markets (Klein, 2012; Erten et al., 2021).

Employment creation is one of the imperatives of policy making in developed and developing countries alike. Despite the relative abundance of papers on the impact of capital account liberalization on social outcomes such as poverty, income distribution and the labour share (e.g., Arestis and Caner (2010), Furceri and Loungani (2018), van Treeck and Wacker (2020)), few have addressed the question of the effects of capital account liberalization on employment and firm-level employment decisions.

In this paper, we contribute to the important debate on the global effects of capital market liberalisation by exploring how firm-level employment responds to changes in access to international capital markets. The literature on capital controls suggests that capital account liberalisation should boost firm-level employment creation to the extent the capital mobility supports economic growth, savings availability, investment opportunities, innovation and firms' access to financial resources.

We employ a comprehensive cross-country firm-level dataset containing 21,000 publicly listed firms in 60 countries from 1982 to 2014 (174,785 firm-year observations). Note that these firms are relatively large with a median of 925 employees. Our analysis includes internationally comparable

firm-level data on employment and financial conditions, industry- and sector-level information on financial dependence and information on changes in capital control policies at the national level. We approach this research question through a set of quasi-experiments that exploit variations before and after policy changes on firm-level employment.

Our results show that capital account liberalisation has a significant positive effect on firm employment and that the magnitude of this impact is economically significant. We also show that there are substantial heterogeneous effects across countries and firms. We find that the employment effects are more pronounced for firms in industries that depend more on external finance, and that employment in financially constrained firms responds more positively to liberalisation. These findings are consistent with a transmission channel that links capital account liberalisation and employment creation via the relaxation of firm-level financial constraints. Consistently with previous insights into the impact of labour market institutions on firms' employment decisions, we find that the employment-boosting effects of capital market liberalisation are relatively weaker for firms in countries with stronger employment protection legislation. Through an analysis of the subcategories of liberalisation indices, we find that capital inflows and equity market liberalisation have large effects on firm employment. These results are consistent with the hypothesis that the relaxation of stock market controls affects economic performance via firm-level innovation, boosting investments by facilitating risk-sharing and lowering the cost of capital (Henry, 2000; Gupta and Yuan, 2009).

We test our results by conducting a series of robustness exercises, including those involving alternative measures for both the dependent and independent measures, alternative sampling methods (both at the firm and aggregate level), and the inclusion of various concurrent economic reforms. Overall, our worldwide firm-level evidence suggests a positive impact of capital account liberalisation on employment.

The rest of this paper is organised as follows. In Section 2, we present our theoretical framework and review the literature that support our empirical investigation. Section 3 illustrates our empirical strategy. Section 4 describes the data and variables used in this study. Section 5 reports the empirical results. In Section 6, we illustrate our robustness tests, and Section 7 concludes.

2. Theoretical Background and Literature Review

To learn more about the channels through which capital account liberalisation affects employment, we present a theoretical framework that draws on Carpenter and Petersen (2002). We then relate the existing empirical work to this theoretical framework, and then discuss the effects of capital account liberalisation on employment.

2.1 Theoretical Discussion

Carpenter and Petersen (2002) focus on firms' decisions about financing expansion plans, including those related to assets, employment and investments. In the face of imperfect information in capital markets, a firm's growth opportunities are limited by its internal financial resources and by its access to external finance. For the typical firm, the supply of finance reflects a standard financing hierarchy: first, a firm will use its internal finance options, determined by its cash flow, at a constant shadow cost R . Once internal finance is exhausted, firms must turn to debt finance, which is substantially more expensive when capital markets are imperfect. Lastly, when the marginal cost of debt reaches a sufficiently high value, V , firms may choose to access finance resources via the equity market. The total flow of finance will determine decisions related to fixed investment but also all other elements, such as inventory investment and employment growth.

In Carpenter and Petersen (2002), the firm uses financial resources to satisfy its appetite for expansion, which responds negatively to the cost of financing and reflects the marginal returns of expanding the firm's assets. The authors thus combine a downward sloping marginal revenue of expansion (MRP_{ex}) schedule with the supply of financial resources (the hierarchy of internal and external sources described above) to identify an equilibrium expansion plan. The marginal return of expanding the firms' assets reflects both product market conditions and technological factors.

In this theoretical framework, capital account liberalisation impacts on employment through three main channels. First, a rightward shift of the MRP_{ex} curve illustrates the increase in the appeal of expansion induced by a growth and *productivity effect*. Second, if capital account liberalisation boosts economic growth, the firms' increased sales will produce larger cash flows, which, in turn, increase the internal finances firms can use to expand—a *cash-flow effect*. Lastly, capital account liberalisation may significantly change the cost of accessing debt finance—a *cost-of-finance effect*,

which would be expressed by a clockwise rotation of the upward segment of the debt finance schedule as in Carpenter and Petersen (2002).

This theoretical discussion allows us to make some empirical predictions:

1. The employment effect of capital account liberalisation will depend on the relative size of the three effects mentioned above: the productivity effect, the cash-flow effect and the cost-of-finance effect.
2. If the impact of capital account liberalisation on employment operates by easing firms' access to finance, the effect on employment will be larger in industries that rely more on external finance and smaller in firms with limited access to finance.
3. The impact of capital market liberalisation policies on firms' expansion plans (e.g., capital accumulation) is shaped not only by markets but also by institutional factors (Forbes, 2007a; Henry, 2007; Kose et al., 2009; Chari and Henry, 2012). Specifically, labour market institutions may alter the effect of capital account liberalisation on firms' employment (Du et al., 2019).
4. If the effect of capital account liberalisation on employment operates by easing firms' financial constraints, those constraints will explain some of the effect's heterogeneity.

Before testing our empirical predictions, we discuss the empirical evidence that links firms' financial resources to their expansion plans.

2.2 Firms' financial resources and firms' growth: empirical evidence

The importance of binding financial constraints for firms' expansion and growth has been recognized in economic analysis since the 1980s (Fazzari et al., 1988). Evidence at the industry level indicates that industries with more reliance on external credit suffer disproportionately during a period of financial crisis and are the slowest to subsequently recover (Kroszner et al., 2007; Abiad et al., 2011). Other studies (including Popov and Rocholl (2018), Giroud and Mueller (2017), Bentolila et al., (2017), Berg, (2018), Caggese et al., (2018), Ersahin and Irani (2018), Benmelech et al., (2019)), report evidence of contractions of the workforce in the face of credit crunches. Siemer (2019) estimates that, during the US 2007–2009 recession, financial constraints reduced employment growth

by 4 to 8 per cent in small firms when compared to large firms, and by 7 to 9 per cent in young firms compared to their more established counterparts.

Lack of internal funds puts a strain on firms experiencing restrictive financing options. For such firms, the decision to invest and to what level any investments can be made are highly sensitive to the firm's internal financial position. Fazzari and Petersen (1993) find that the firm's decision to invest in capital is sensitive to proxies of financial constraints, namely cash flows and working capital. Evidence shows that financially constrained firms plan deep cuts in employment as well as in capital spending (Campello et al., 2010). With international evidence from OECD countries, lack of access to external finance has been shown to be the most direct and robust determinant of firm dynamism amongst Small and Medium Enterprises (SMEs) (for example, Ayyagari et al., 2008; Bridges and Guariglia, 2008; Gill and Biger, 2012).

When a firm's limited external and internal finances combine with labour market frictions, financial constraints may have a considerable impact on employment decisions. For example, Caggese and Cuñat (2008) argue that financing constraints not only increase the volatility of all types of employment but also shift demand towards temporary, more flexible workers. Using firm-level data from Spain, Laeven et al., (2018) illustrate that the real effects of credit shocks on employment, for example during financial crises, differ across firms, in ways that depend on the strength of employment protection regulations.

This selective literature review supports the view that financial constraints impact on firms' expansion plans. Capital account liberalisation policies may support employment creation by affecting firms' finance, and labour market institutions matter to understand these effects. Before turning to our empirical analysis, we briefly review the evidence of an impact of capital account liberalisation on firms' performance.

2.3 Capital account liberalization and firms' performance.

Consistently with studies that link the relaxation of financial constraints to large productivity gains (e.g., Caggese and Cuñat, 2013), Bekaert et al. (2011) find a positive impact of the easing of capital flow controls on capital stock growth and total factor productivity. Using firm-level data from 10 Eastern European countries, Campello and Larrain (2015) find that capital account liberalisation is

associated with sizeable productivity gains and reductions in the variance of the marginal revenue product of capital, particularly in sectors that are more dependent on external finance. Empirical evidence from a large firm-level data set for Eastern European countries, allows Larrain and Stumpner (2017) to argue that capital account liberalisation decreases the dispersion in the return of capital across firms. This result is particularly strong in sectors that are relatively dependent on external finance. Using firm-level data from the deregulation of international financial flows in Hungary, Varela (2018) shows that easier access to international capital markets leads to productivity gains by relaxing firms' financial constraints and by supporting technological investments that firms make in the face of tougher market competition. Using country-level and industry-level data, Moshirian et al. (2020) explore the transmission mechanism from capital market liberalisation to improved economic performance by focusing on technological innovation before and after capital flow liberalisation. This study shows that economies exhibit a higher level of innovation output after liberalisation and that this effect is disproportionately strong in more innovative industries.

By bringing in scarce capital, global capital flows increase the availability of loanable funds and allow the weakening of firms' financial constraints, which are often a primary obstacle to investment, process and product innovation as well as export orientation. However, if foreign investors borrow heavily from domestic banks, they may exacerbate financing constraints by crowding host-country firms out of domestic capital markets.

Alfaro et al., (2017) find evidence of an increase in the cost of capital for Brazilian firms following capital control announcements, and more so for small and medium firms than for large firms. Forbes (2007b) illustrates that the Chilean capital controls implemented between 1991 and 1998 increased firms' financial constraints; these effects were particularly strong among smaller firms. Harrison et al. (2004) use firm-level data to focus on foreign direct investment and showed that capital flow liberalisation reduced firm-level financing constraints. Manova (2008) shows that equity market liberalisation increases exports and that this effect is disproportionately strong in financially vulnerable sectors that require more outside finance or that employ fewer collateralisable assets. Manova (2013) finds that credit constraints affect the willingness of firms to export. Interestingly, about 20–25% of the impact of credit constraints on trade is driven by reductions in total output.

Taken together, Manova's two studies suggest a possible effect of capital account liberalisation on employment via financial constraints and output.

Although these studies suggest a potentially beneficial effect of capital account liberalisation on employment, few directly engage with this important question. One exception is Larrain (2014), who relies on the idea of capital skill complementarity. Larrain (2014) argued that opening capital accounts allows financially constrained firms to raise capital from abroad. Since capital and skilled labour are relative complements, this increases the relative demand for skilled labour more than unskilled labour. This implies that the employment creation effect of capital account liberalisation may be different depending on whether we observe skilled, unskilled or aggregate employment. Using aggregate data for 20 (primarily European) countries from 1975 to 2005, Larrain (2014) finds evidence of a positive effect of capital account liberalisation on employment.

Finally, labour market institutions are important for determining the effects of capital account liberalisation on the labour market (Du et al., 2019) and, more generally, its impact on firms' job allocation (Bassanini et al., 2009; Potrafke, 2010; Bartelsman et al., 2016).

In our study, we investigate the link between capital account liberalisation and employment using a large firm-level dataset. We establish causality by exploiting the variation in the timing of policies intended to relax capital account controls across countries, the variations in financial conditions across firms and the variation in dependence on external finance across sectors.

3. Empirical Strategy

Our baseline specification is a generalised difference-in-differences (i.e., multiperiod, multigroup) regression as in Bertrand et al. (2004), Hansen (2007) and Imbens and Wooldridge (2009):

$$\begin{aligned} \ln(emp)_{i,j,c,t} = & \alpha_1 + \beta_1 Kaopen_{c,t} + \vartheta X_{i,j,c,t} + \rho C_{c,t} \\ & + \varphi_i + \mu_j + \delta_c + \gamma_t + \varepsilon_{i,j,c,t} \end{aligned} \quad (1)$$

where i, j, c and t denote firm, industry, country and year, respectively; $\ln(emp)_{i,j,c,t}$ is a measure of employment at the firm level as defined below; $Kaopen_{c,t} \in [0,1]$ is the capital account liberalisation index for country c in year t , where a larger index indicates a more open capital account; $X_{i,j,c,t}$ is a set of firm-level control variables and $C_{c,t}$ is a group of country-level control variables,

including GDP per capita (logarithmic), inflation, levels of financial development and trade openness. The terms φ_i , μ_j , δ_c and γ_t capture firm, industry, country and time fixed effects, respectively; α_1 is a constant. Conditional on time and group effects, the coefficient of interest, β_1 , captures the differential effect on firms' employment of opening a capital account in country c in year t .

As in Imbens and Wooldridge (2009), the policy variable ($Kaopen_{c,t}$ in our case) is a continuous variable capturing the degree of capital account liberalisation. The identifying assumption of the above generalised difference-in-differences specification is that countries in both the control and treatment groups share common shocks.

Intuitively, this generalised difference-in-differences specification (1) compares employment changes in firms in the treatment group (countries that open their capital accounts) with employment changes of firms in the control group (countries that do not open their capital accounts) over time.

3.1 Identification

In estimating the causal effect of capital account liberalisation on employment, our identification strategy addresses the possibility of reverse causality in three main ways. Firstly, our cross-country firm-level panel data offers a level of firm-level variation across countries and industries. It is unlikely that a firm-level variable, such as firm employment, would affect a country-level variable such as $Kaopen$. Secondly, our generalised difference-in-difference-in-differences (DDD or triple differences) approach as in Imbens and Wooldridge, (2009), exploits variation within firms, industry, country exploiting before/after policy changes across time for multiple decades:

$$\begin{aligned} \ln(emp)_{i,j,c,t} = & \alpha_1 + \beta_1 ka_open_{c,t} + \beta_2 ka_open_{c,t} * ExtFin_j \\ & + \vartheta X_{i,j,c,t} + \rho C_{c,t} + \delta_{c,j} + \delta_{j,t} + \varepsilon_{i,j,c,t} \end{aligned} \quad (2)$$

In (2) $ExtFin_j$ measures the degree of an industry's dependence on external finance, as first proposed by Rajan and Zingales (1998) and widely used in the literature. An industry's dependence on external finance can be regarded as exogenous to firms, as it captures the financing 'technology' of an industry.

A third set of considerations to address any remaining reverse causality concerns and to support our claims on a casual interpretation of any impact of $Kaopen$ on firm-level employment starts from acknowledging that if a firm-level variable (e.g., firm employment) moves in sync with an omitted country-level variable, it may behave like a country's employment level—which may drive

the right-hand side variable, *Kaopen*. To address this possibility, our equation (2) include country–industry fixed effects ($\delta_{c,j}$) to control for country-specific sectoral changes, industry–year fixed effects ($\delta_{j,t}$) to control for time-variant industry shocks, and country–year fixed effects $C_{c,t}$ to control for time-varying country-level confounding factors.

The coefficient of the interaction term, $Kaopen_{c,t} * ExtFin_j$, β_2 in equation (2), is identified through within-country, cross-sectional variation dependent on external finance. This focal coefficient captures the differential effect on firms’ employment in more external-finance-dependent industries compared with less external-finance-dependent industries before and after capital accounts are liberalised (Larrain and Stumpner, 2017).

Our theoretical discussion in Section 2.1 illustrates that one of the channels through which capital account liberalisation may affect firms’ employment expansion relies on the reduced cost of firms’ access to external finance. The interaction term for capital account liberalisation and industries’ dependence on external finance in equation (2) allows us to test the second implication of our theoretical discussion: if freeing capital mobility reduces the cost of firms’ access to external finance, the coefficient of this interaction term should be positive and statistically significant.

3.2 Extension

Several studies have documented the important role that institutional characteristics play on firms’ employment decisions (Bartelsman et al., 2016; Ellul et al., 2018). To the extent that capital account liberalisation induces changes in employment, the cost of implementing these changes, such as hiring and firing costs, will vary with the institutional framework that firms face in their labour markets.

To capture the role of a country’s institutional legislation, we estimated the following regression:

$$\ln(emp)_{i,j,c,t} = \alpha + \beta_1 Kaopen_{c,t} * ExtFin_j * EPL_{ct} + \beta_2 ExtFin_j * EPL_{ct} + \beta_3 Kaopen_{c,t} * ExtFin_j + \vartheta X_{i,j,c,t} + \delta_{c,t} + \delta_{c,j} + \delta_{j,t} + \varepsilon_{i,j,c,t} \quad (3)$$

where EPL_{ct} is an employment protection legislation index that captures the degree of rigidity of a country’s labour market. The coefficient of interest, β_1 , identifies the role that cross-country variation

in the legal protection of workers plays in determining the impact of capital account liberalisation on firms' employment.

Finally, our theoretical discussion in Section 2.1 illustrates the role of financial constraints. The effect of capital account liberalisation policies on firms' expansion plans, including those related to employment, is likely to depend on what types of finances firms can access (i.e., internal finance, debt finance or equity finance). This implies that firms with different financial constraints may behave differently after the opening of a capital account. To examine whether substantial heterogeneous effects exist across firms, we estimated regressions as follows:

$$\ln(emp)_{i,j,c,t} = a_1 + \beta_1 Kaopen_{c,t} * ExtFin_j * FC_{i,j,c,t} + \beta_2 Kaopen_{c,t} * FC_{i,j,c,t} + \beta_3 ExtFin_j * FC_{i,j,c,t} + \beta_4 FC_{i,j,c,t} + \vartheta X_{i,j,c,t} + \rho C_{c,t} + \delta_{c,j} + \delta_{j,t} + \gamma_i + \varepsilon_{i,j,c,t} \quad (4)$$

where $FC_{i,j,c,t}$ measures the degree of financial constraints at the firm level and β_1 captures how cross-sectional variation in firms' financial constraints affects the impact of capital account liberalisation on employment.

4. Data and Variables

Our main data are derived from Compustat Global, which is a third-party commercial database. The data that support the findings of this study are available from Compustat Global. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the authors with the permission of Compustat Global. Our country-level measure of capital account liberalisation is obtained from Chinn and Ito (2008). This is a *de jure* measure based on information from the Annual Report of Exchange Arrangements and Exchange Restrictions published by the International Monetary Fund (IMF) for 1970–2014. The measure captures the degree of openness in a country's capital account, which varies from zero to one, with one equivalent to full openness. In the literature on the measurement of capital controls, the Chinn-Ito index (2008) and the Fernandez et al. (2016) index are the two widely used indexes, both of which were constructed by extracting information compiled in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). While the recently introduced Fernandez et al. (2016) index provides more disaggregated information, for example, on capital controls by inflows and outflows and by 10 asset categories, it has a relatively shorter period coverage (starting from 1995). In contrast,

the Chinn-Ito index (2008) offers much longer time series dating back to 1970 though with less disaggregate categories. Since many policy decisions regarding capital account liberalisation happened around 1985-1995 (as shown in figure 1), especially for high income economies, it is therefore important to include the sample period 1985-1995 in our estimation. We thus use the Chinn and Ito (2008) index as our main measure of liberalization. Nevertheless, we also use the Fernandez et al. (2016) index in the analysis of the impact of different categories of capital account liberalization to shed light on the underlying economic mechanisms (see Section 6.4). Noteworthy, the correlation between these two indices is more than 0.8. Furthermore, our robustness checks also involve the use of alternative measures of capital account liberalisation, namely the capital account restrictions index from Fernández et al., (2016) and the financial liberalisation index from Quinn and Toyoda (2008).

To estimate the impact of capital account liberalisation on firms' employment, we combined three types of data in our empirical analysis: firm-level, industry-level, and country-level data.

Firm-level employment and financial data outside the United States (US) are obtained from Capital IQ Global and North America, which provides historical data from the financial reports of publicly listed companies. This dataset covers publicly listed firms from more than 100 countries and has been used frequently in prior literature for international studies (e.g., Chen et al. 2017; Kim et al. 2016). The firm-level variables employed in this study are employment, age, size (we use the natural logarithm of total assets as the proxy for firm size), asset growth, leverage (the sum of long-term debt and debt in current liabilities divided by total assets at the beginning of the year), capital expenditure and profitability. It is very typical in finance and accounting to use the natural logarithm of total assets as a proxy for firm size.

Our sample contains listed firms in 60 countries during the 1982–2014 period. We exclude firms from financial industries (2-digit SIC: 60–69), those that did not have employment data for at least two years, and those that had missing data for the firm-level control variables. We also restricted our sample countries to those with at least 100 firm–year observations during our sample period. There were 21,481 unique firms remaining, with 174,785 firm–year observations in our final sample.

Our industry-level variable is a measure of industry-specific external finance dependence, *ExtFin*, as in Rajan and Zingales (1998). *ExtFin* is based on Compustat data for each industry in the US from 1980 to 1990. The measure is calculated as capital expenditures not financed by operational

cash flow divided by capital expenditures for the median publicly traded firm. As in Rajan and Zingales (1998), we assume that this industry-specific measure of financial dependence can be generalised to the same industries in countries other than the US. *ExtFin* is a rank measure based on the value of an industry's external finance dependence; a higher rank indicates that an industry is more dependent on external finance.

Country-level control variables are from World Bank data (World Development Indicators database; WDI). These provide measures of financial development, including the ratio of banks' private credit to GDP, trade openness (the sum of imports and exports of goods and services divided by GDP), total labour force and inflation. As some studies suggest that government expenditure is correlated with firms' decision-making (e.g., Woodford, 2011), we include the share of government expenditure in GDP as a control variable.

To capture the role that employment protection regulations play in affecting the impact of capital account liberalisation on employment, we employ time series employment protection indexes from the Organisation for Economic Co-operation and Development (OECD) Employment Protection Legislation (EPL) database, which captures the regulatory costs of worker dismissal.

5. Empirical Results

5.1 Descriptive Statistics

Table 1 displays the number of firms and firm-year observations for each of the 60 countries in our sample. Japan, the United Kingdom, India and Canada had the largest samples. Several countries, including some middle-income economies such as Morocco and Colombia, had the lowest number of firm-year observations. The total number of firms in our sample increased over the years as stock markets expanded. However, the changing number of firms is not a major concern for our regression estimation, as all our regressions include year fixed effects.

[Table 1 here]

Table 2 reports the summary statistics of employment, capital account liberalisation index and firm- and country-level characteristics for the firms in our main sample. Following the literature (e.g., Carpenter and Petersen, 2002; Fernandes et al., 2014), we winsorised all continuous firm-level control variables at the first and ninety-ninth percentiles of their distributions to mitigate the effect of outliers

in the empirical analysis. On average, firms had 5,712 employees, with a relatively lower median of 925, suggesting left-skewness in the raw number of employees. To minimise this skewness, we used the natural logarithm of the number of employees as our main dependent variable. The mean of *Kaopen*, the capital account liberalisation index, (0.849) suggests that countries in the sample had a relatively high degree of liberalisation over the sample period. Concerning the firm-level characteristics, on average, firms were listed in the Capital IQ Global for 11 years, with a mean size of 5.463 (natural logarithm of US\$ million total assets). The firms registered an average sales growth of 16.0 percent, and a mean profitability (return on assets, or ROA) of 8.0 percent. The firms included in our sample also spent 1.9 percent and 6.8 percent on research and development (R&D) and capital expenditure in total assets, respectively. Lastly, the average firm leverage ratio was 25.1 percent.

[Table 2 here]

Figure 1 shows the overall trend of the capital account liberalisation index. The patterns of our capital account liberalisation index show substantial variations across countries and time, a distinctive feature of our identification strategy. For example, advanced countries exhibit relatively high and stable levels of capital account openness. Figure 1 also illustrates that capital account liberalization indexes in emerging market economies and other developing countries significantly changed over time (e.g., before and after 2008). Key emerging market economies such as Brazil, Mexico and Russia have substantially opened their capital accounts since the late 1990s or early 2000s. In contrast, Indonesia's capital account openness has experienced a gradual decline, while China and India show a relatively stable and low degree of capital account openness.

[Figure 1 here]

5.2 Main Results

In Table 3, we report regression results from estimating Eq. (1). We focus on our measure of capital account liberalisation in specification (1). When we include firm fixed effects and year fixed effects, the univariate regression of *Kaopen* on employment generated a statistically significant coefficient of 0.259, indicating a positive association. We then sequentially add firm-level covariates and both firm-level and country-level covariates in specifications (2) and (3), respectively. Both specifications (2) and (3) in Table 3 include firm fixed effects (which absorb both country and industry fixed effects)- and year fixed effects. In specification (2), after accounting for firm-level

covariates, the coefficient on *Kaopen* remained positive and significant. Some firm characteristics that were commonly known to be important determinants of employment were also significant in our context. First, firm investment, as captured by capital expenditure (CAPX), had the expected positive effect on firm employment, indicating that the higher the firm investment, the more employment. Second, firm size was positively associated with employment while firms' return on assets (ROA), an indicator of firms' profitability, was also statistically significant and associated with higher employment. Similarly, the firms' R&D expenditure and leverage had positive and significant effects.

[Table 3 here]

Our results remained largely unchanged when we further control for country-level covariates, as shown in specification (3) in Table 3. At the country level, higher growth in GDP per capita does not automatically translate to higher growth in employment. For example, a one percent increase in a country's GDP per capita led to a 0.37 percent decrease in firm employment. While this result may confirm the widespread concern that economic growth per se is not a sufficient condition for inclusive growth, it is important to emphasise that growth in GDP per capita does not deliver information about the structural composition of output or changes in that composition. As GDP increases, the industrial sector may decline while the service sector expands, and these structural changes may have disparate implications for employment creation (Wadho et al., 2019; Turco and Maggioni, 2013). Interestingly, higher trade openness corresponds with lower total firm-level employment (the sum of skilled and unskilled employment), with other aspects equal. Additionally, high levels of financial development and government spending do not appear to contribute positively to firm-level employment. Finally, by accounting for only country, industry, and year fixed effects in specification (4) of Table 3, we find that the coefficient on capital account liberalisation remains positive and significant.

Overall, our results from Table 3 showed that the coefficient of the main variable of interest, *Kaopen*, is positive and statistically significant across all four specifications. We consider (3) as our preferred specification as it includes all time-varying firm-level variables, all country-level variables but also the largest set of fixed effects (firm and year fixed effects). It thus represents the most conservative estimates of our regression results on the impact. Based on results from specification (3) in Table 3, an increase by one standard deviation (0.290) in the *Kaopen* index led to a 6.3 percent (0.216×0.290) increase in firm employment, indicating that the magnitude of this impact is also

economically significant. We conclude that our results suggest a positive and significant impact of capital account liberalization on employment.

To check whether capital account liberalization differently impacts on firms that differ by size, we define “large” firms as those with total assets above the sample median. Large firms are identified by an indicator variable *Large*, which equals to one if a firm is “large”. We then rerun regressions as in Table 3 but add a *Kaopen*Large* interaction term. Specification (1) in Table A2 reproduces specification (1) in Table 3. Specification (3) in Table A2 in the Appendix, our preferred specification, shows regression results that include time-varying firm variables, time-varying country-level variables as well as the largest set of firm and year fixed effects. Based on specification (3)’s estimated results, including a coefficient of the interaction term *Kaopen*Large* that is positive and significant, we conclude that capital account liberalization appears to have a much larger impact on the employment of “large” firms than “small” firms.

Our findings, which rely on comprehensive cross-country firm-level data, confirm that capital account liberalization has a positive and significant effect on domestic employment. These results cast support to the argument according to which access to international capital markets may operate at the firm-level by reducing the cost of capital and by relaxing firm-level financial constraints (see Alfaro et al., (2017); Forbes (2007b); Harrison et al. (2004)).

We further explore this hypothesis. If indeed capital account liberalisation policies enables firms to expand and create more jobs through the reduction in the cost of capital and the relaxation of financial constraint, firms in more external finance-dependent industries should have larger increase in employment. We investigate the impact of capital account liberalisation on firms operating in industries with varying degrees of external finance dependence by estimating the DDD (triple differences) equation (2). As equation (2) exploits the within-country, cross-sectional variation in the degree of external finance dependence, it further addresses reverse causality concerns as discussed in Section 3.1.

The external financial dependence *ExtFin* variable is defined as the fraction of capital expenditures not financed by cash flow from operations (Rajan and Zingales 1998). The index is calculated as the median of this fraction across US publicly traded firms for each industry (at the 2-digit SIC level). Therefore, this variable has no time-variance, and it is invariant across countries.

Also, firms rarely switch from one industry to another at the SIC 2-digit level. For these reasons, the effect of *ExtFin* alone is absorbed by the progressively larger set of fixed effects that the various specifications of Table 4 report. The coefficient on the interaction term $Kaopen_{c,t} * ExtFin_j$ captures the differential effect on firms' employment in more external-finance-dependent industries compared with less external-finance-dependent industries before and after capital mobility is freed.

[Table 4 here]

In Table 4, the coefficient of interest, the interaction term, $ka_open_{c,t} * ExtFin_j$, is not statistically significant in specification (1), but it becomes positive and statistically significant (at the 10 percent level) in specifications (2) and (3). Compared to (1), these specifications include a fuller set of control variables. In specification (4), which includes all fixed effects, the estimated coefficient of the interaction term, $ka_open_{c,t} * ExtFin_j$, remains positive and becomes significant at the five percent level.

We use the estimated coefficients reported in specification (4) of Table 4 to compute the percent change in employment following a one standard deviation increase in *Kaopen* (0.290).

Because of the interaction term $Kaopen * ExtFin$, the partial derivative of employment with respect to *Kaopen* now depends on *ExtFin*. A one standard deviation increase in *Kaopen* (0.290) leads to a 11.6 percent ($0.01 * 39.992 * 0.290$) increase in employment when *ExtFin* is set at the sample mean (39.992).

Importantly, for firms located in industries where *ExtFin* is above the sample mean, the effect of capital account liberalisation is larger than 11.6 percent. The signs of all other firm- and country-level control variables remain similar as in Table 3. Table 4 allows us to conclude that capital account liberalization had a disproportionately larger impact on firm-level employment in industries that are more dependent on external finance. Table 4 also illustrates that there are significant within-country, cross-industry variations of the impact of capital account liberalisation on firm employment. We further explore this variation in what follows.

6. Additional Results

We further explore whether capital account liberalisation affects all countries and firms equally and provide evidence on the significance of the heterogeneous effects of liberalisation across countries and firms.

6.1 The Role of Employment Protection Legislation

Employment protection legislation (EPL) has long been documented as an important factor that affects employment (Lazear, 1990; Autor et al., 2004). To address how important labour market institutions such as EPLs alter the impact of capital market liberalisation policies, we draw on information from the OECD EPL database on employment protection legislation in 43 countries. The database includes two related measures of employment protection: EPL1 measures the strictness of protection against individual dismissal, and EPL2 measures the strictness of protection against individual dismissal and collective dismissal. Higher indexes indicate stronger country-level employment protection. Table 5 presents our regression results.

Using the results reported in Table 5, we conclude that one standard deviation change in *Kaopen*, leads to a +15.3 percent change in employment when the partial derivative $\frac{\partial \ln(emp)}{\partial Kaopen}$ is computed at the sample means of *ExtFin* and *EPL1* (39.992 and 1.781 respectively).¹ For countries with stricter employment protection laws than the sample mean, this positive effect reduces in size and even become negative at the sample maximum level of *EPL1*. With a similar procedure for estimates results in specification (2) of Table 5 we estimate that one standard deviation change in *Kaopen*, leads to a +23.3 percent change in employment at the sample means of *ExtFin* and *EPL2*. Table 5 clearly indicates that the positive impact of capital account liberalisation on employment is significantly weaker in countries with more stringent employment protection compared to countries with less stringent protection. These results reflect the inclusion of various fixed effects. As Potrafke (2010) shows, the protection of regular employment contracts is often diminished in contexts of rapid economic deregulation. Because capital account liberalisation policies could be accompanied by labour market institutional changes that also impact on employment, the estimated impact of *Kaopen* in all regressions where labour market institutions are omitted would be a combination of the direct impact of this variable and the indirect (omitted) impact of *Kaopen* on labour market institutions. For

¹ Note that, because of the interaction terms in the estimated specifications in Table 5, $\frac{\partial \ln(emp)}{\partial Kaopen} = -0.010 * ExtFin * EPL1 + 0.031 * ExtFin$ when we use the estimated results from specification (1). Similarly, using the estimated coefficients in specification (2) of Table 5 leads to $\frac{\partial \ln(emp)}{\partial Kaopen} = -0.027 * ExtFin * EPL2 + 0.078 * ExtFin$.

this reason, we suggest some caution in interpreting regression results where the effect of labour market institutions is not explicitly accounted for.

[Table 5 here]

6.2 Firm Heterogeneity

We now address the question of how firms' heterogeneity affects the impact of capital account liberalisation measures. One hypothesis follows from the analytical framework in Section 2: if the impact of capital account liberalisation on employment operates by easing firms' financial constraints, firms' financial constraints should explain some of the heterogeneity across firms in the effects of capital account liberalisation on employment. To test this hypothesis, we use two firm-level measures of financial constraints.

As reported in Table A1, the financial constraint *SA_index* is constructed following Hadlock and Pierce (2010)'s established argument on the role of firms' size and age in determining financial constraints. The firm-level *SA_index* increases as a firm becomes more financially constrained. The *WW_Index* of firm-level financial constraints is computed following Whited and Wu (2006) (see Table A1 for a full description of this variable). Both financial constraints indexes refer to year $t - 1$.

Table 6 clearly illustrates that firms' financial constraints, however financial constraints are measured, negatively impact on employment. This result confirms what the empirical literature, which is reviewed in Section 2 (see, for example, Fazzari and Petersen (1993) and Campello et al., (2010), reports. Importantly, Table 6 shows that the coefficients of the triple interaction term (among financial constraints, external finance dependence and capital account opening measures) are positive and statistically significant in both columns. These results importantly support our hypothesis: on average, firms with more stringent financial constraints at $t - 1$ (before liberalisation) created significantly more jobs after the opening of capital accounts. This suggests that capital account liberalisation boosts firm-level employment, possibly by relaxing firms' financial constraints.

[Table 6 here]

6.3 Differential Effects Across Regions

From the data on the capital account liberalisation index, we note that most countries in Western Europe had already liberalised their capital accounts at the beginning of our sample period. In contrast, countries in regions such as Asia and Africa have undergone rapid liberalisation in recent

years. To further explore the sources of heterogeneity in the effects of capital account liberalisation, we interact regional dummy variables with the capital account opening variable (Table 7). The results indicate that the positive effect of capital account liberalisation is stronger in East Asia and South Africa than in Europe and other regions. In this latter group, the estimated impact of capital account liberalisation on employment is statistically insignificant. Importantly, the effect of a one standard deviation rise in *Kaopen* (at the sample mean of *ExtFin*) on employment is economically significant in both East Asia and South Africa (9.5 percent rise and 13.4 percent rise in these two regions, respectively). The lack of evidence of positive effects of capital account liberalisation Europe supports views on how complex processes of de-industrialisation and offshoring impact employment growth in many European economies (e.g., Huwart and Verdier, 2013). The results using three-way interactions with external finance dependence also indicate that the boosting effect of *Kaopen* on employment in East Asia and South Africa intensifies in industries with stronger dependence on external finance in both these regions.

[Table 7 here]

6.4 Subcategories of Capital Account Liberalisation

We draw on Fernández et al. (2016) to test the robustness of our results to changes in the measure of capital account openness, focusing on sub-categorical indices of capital account liberalisation to identify those that affect employment. Our *KA* variable equals one minus the standardised overall capital account restrictions index from Fernández et al. (2016). *KA Inflow (KA outflow)* is one minus the capital inflow (outflow) controls index. *Equity Openness (Bond Openness)* equals one minus the overall equity (bond) market restrictions index.

As shown in specification (1) of Table 8, our main results are robust to the use of the alternative capital account liberalisation index from Fernández et al. (2016). Specifications (2) and (3) in Table 8 present the effect of capital account liberalisation inflows and outflows. The coefficients of the interaction terms show that the effect of liberalisation inflows is approximately double that of outflows, which is consistent with our intuition that capital inflows bring about more opportunities for domestic employment growth than outflows. The results in specification (4) show that equity market liberalisation has a positive impact on firm employment. However, the liberalisation of the bond market does not appear to have any significant impact on employment (Table 8, specification 5).

[Table 8 here]

6.5 Robustness

6.5.1 Different Sampling Criteria

Our full sample includes countries that did not make any policy changes to their capital accounts over the sample period. We test the robustness of our results by excluding these countries. The main finding is that the statistical and economic significance of our variable of interest, $Kaopen*ExtFin$, is comparable to our previously reported results (Table 9, Panel A). When we use the estimated coefficients from specification (1) in Table 9, a one standard deviation change in $Kaopen$ at the mean level for $ExtFin$ (39.99) leads to an 11.6 percent change in employment.

We also test the sensitivity of our results to the exclusion of countries with less than 300 firms reporting employment data (Table 9, Panel A, specification 2). Again, the coefficient of the variable of interest, $Kaopen*ExtFin$, remains positive and statistically significant at the one percent level. A one standard deviation change in $Kaopen$ leads to a 10.4 percent change in employment at the sample means.

[Table 9 here]

6.4.2 Alternative Measures of External Finance Dependence

To test the robustness of our results to changes in the measurement of external finance dependence, we employ the following measures: an industry-level measure of external equity finance dependence, which Rajan and Zingales (1998) define as the fraction of the amount of net equity issuance to capital expenditures for the median publicly traded firm in each industry in the United States from 1980 to 1990; an industry-level measure of investment intensity, which measures, as in Rajan and Zingales (1998), the fraction of capital expenditures to net property, plants, and equipment for the median publicly traded firm in each industry in the United States from 1980 to 1990; and an industry-level measure of the intensity of the use of information technology hardware, software and IT services constructed following Mann (2012).

Panel B of Table 9 illustrates that our main results are robust to changes in the finance dependence measures. Again, the coefficient of the interaction terms of openness and alternative finance dependence measures remain positive and statistically significant at the 10 percent level across all three columns.

6.4.3 Concurrent Economic Reforms

To test the robustness of our results, we extend our set of control variables to measures of trade liberalisation, financial development and technology development. To capture the extent of trade reform, we follow Jaumotte, Lall, and Papageorgiou (2013), creating a measure of tariff reduction calculated as 100 minus tariff rates (weighted mean). The variable MCAP/GDP measures the domestic stock market development and is defined as the percentage of the market capitalisation of listed domestic companies to GDP. Finally, we use internet penetration, the percentage of the number of users within a country that have access to the internet compared to the whole population, to control for technological change. The impact of capital account liberalisation on firm-level employment remains positive and statistically significant (Table 9, Panel C).

In summary, our main results are robust to sample selection, alternative measures of both the dependent and independent variables and the inclusion of controls for the impact of concurrent economic reforms and technological development.

7. Conclusion

Using a large firm-level panel dataset that covers over 60 countries between 1982 and 2014, we report extensive firm-level empirical evidence of the positive employment effects of capital account liberalisation. Our identification strategy exploits variation in both the timing of capital account liberalisation policies and in external financial dependence across firms and industries. We show that there are substantial heterogeneous effects across countries and firms. Importantly, financially constrained firms respond more positively to international capital market access. We also show that capital inflows and equity market liberalisation have larger effects on firm employment than capital outflow or bond market liberalisation. Our results are robust to changes in sampling methods, measures of capital market liberalisation and controls for fixed effects. Overall, our findings suggest that a strategy of gradually opening international capital markets will support employment.

Table 1. Sample Composition

Panel A: Country Breakdown

	<i>No. of firms</i>	<i>% of total firms</i>	<i>No. of firm-years</i>	<i>% of total firm-years</i>	<i>Year of First Observation</i>
Argentina	24	0.11	167	0.1	1994
Australia	1,046	4.87	5,490	3.14	1986
Austria	93	0.43	885	0.51	1995
Bangladesh	114	0.53	467	0.27	2003
Belgium	129	0.6	1,144	0.65	1983
Brazil	157	0.73	1,018	0.58	1994
Canada	1,952	9.09	14,538	8.32	1982
Chile	80	0.37	456	0.26	1994
China	712	3.31	4,329	2.48	1986
Colombia	17	0.08	99	0.06	1997
Croatia	32	0.15	224	0.13	1996
Cyprus	25	0.12	143	0.08	1999
Czech Republic	24	0.11	166	0.09	1997
Denmark	179	0.83	1,769	1.01	1983
Estonia	18	0.08	138	0.08	2000
Finland	156	0.73	1,803	1.03	1994
France	908	4.23	7,246	4.15	1983
Germany	837	3.9	6,770	3.87	1994
Greece	164	0.76	1,082	0.62	1997
Hong Kong	1,150	5.35	10,232	5.85	1986
Hungary	27	0.13	208	0.12	1997
Iceland	14	0.07	100	0.06	2001
India	1,413	6.58	8,594	4.92	2001
Indonesia	373	1.74	3,182	1.82	1995
Ireland	130	0.61	1,399	0.8	1984
Israel	185	0.86	1,629	0.93	1986
Italy	290	1.35	2,164	1.24	1984
Japan	3,738	17.4	43,257	24.75	1982
Kenya	21	0.1	113	0.06	2001
Korea, Rep.	27	0.13	137	0.08	2000
Kuwait	31	0.14	123	0.07	2004
Latvia	29	0.14	225	0.13	2005

Lithuania	40	0.19	327	0.19	2004
Malaysia	768	3.58	4,144	2.37	1992
Mexico	87	0.41	766	0.44	1983
Morocco	24	0.11	90	0.05	2004
Netherlands	276	1.28	2,703	1.55	1985
New Zealand	72	0.34	414	0.24	1994
Nigeria	89	0.41	558	0.32	2003
Norway	311	1.45	2,333	1.33	1988
Oman	49	0.23	264	0.15	2003
Pakistan	260	1.21	1,086	0.62	1998
Peru	23	0.11	166	0.09	1998
Philippines	168	0.78	1,481	0.85	1983
Poland	75	0.35	371	0.21	1998
Portugal	63	0.29	453	0.26	1995
Russia	79	0.37	428	0.24	2000
Singapore	480	2.23	2,614	1.5	1994
Slovenia	23	0.11	184	0.11	1997
South Africa	295	1.37	2,256	1.29	1989
Spain	138	0.64	1,045	0.6	1993
Sri Lanka	160	0.74	1,000	0.57	2002
Sweden	384	1.79	3,346	1.91	1986
Switzerland	259	1.21	2,789	1.6	1996
Thailand	410	1.91	1,992	1.14	1994
Turkey	128	0.6	1,001	0.57	1997
United Arab	25	0.12	108	0.06	2003
United Kingdom	2,629	12.24	23,231	13.29	1983
Vietnam	48	0.22	207	0.12	2007
Zimbabwe	23	0.11	131	0.07	1998
Total	21,481	100	174,785	100	1982

Panel B: Year Breakdown

<i>Year</i>	<i>No. of firms</i>	<i>% of total firms</i>	<i>Year</i>	<i>No. of firms</i>	<i>% of total firms</i>
1990 and before	2,954	1.69	2003	9,559	5.47
1991	613	0.35	2004	9,857	5.64

1992	1,072	0.61	2005	8,576	4.91
1993	1,172	0.67	2006	10,635	6.08
1994	1,743	1.00	2007	10,834	6.20
1995	1,941	1.11	2008	10,557	6.04
1996	2,205	1.26	2009	10,410	5.96
1997	3,364	1.92	2010	10,798	6.18
1998	3,888	2.22	2011	10,888	6.23
1999	6,152	3.52	2012	10,781	6.17
2000	7,622	4.36	2013	11,053	6.32
2001	8,334	4.77	2014	10,784	6.17
2002	8,993	5.15			
Total	174,785	100.00			

Note: This table reports the sample composition in our main regression. Panel A reports the sample distribution by country. Panel B presents the sample distribution by year. *No. of firms* is the number of unique firms. *% of total firms* is the ratio of unique firms in a specific country (year) to the total number of unique firms. *No. of firm-years* is the total number of firm-year observations. *% of total firm-years* is the percentage of firm-year observations in a specific country to the total number of firm-year observations in the sample. *Year of First Observation* is the first year of firms that are observed in a specific country.

Table 2. Descriptive Statistics

Variable	N	Mean	SD	Min	Median	Max
<i>Employees</i>	174,785	5712	15295	3	925	107300
<i>Ln(EMP)</i>	174,785	6.837	2.029	1.386	6.830	11.586
<i>Kaopen</i>	174,785	0.849	0.290	0.000	1.000	1.000
Firm Characteristics						
<i>Age</i>	174,785	11	7	2	10	33
<i>Size</i>	174,785	5.463	2.042	0.502	5.370	10.628
<i>Growth</i>	174,785	0.160	0.547	-0.561	0.055	3.928
<i>ROA</i>	174,785	0.080	0.195	-1.069	0.095	0.554
<i>XRD</i>	174,785	0.019	0.056	0.000	0.000	0.385
<i>Capex</i>	174,785	0.068	0.098	0.000	0.037	0.653
<i>Leverage</i>	174,785	0.250	0.246	0.000	0.201	1.385
<i>SA_Index</i>	174,785	-2.940	0.719	-4.233	-3.044	-0.664
<i>WW_Index</i>	155,946	4.494	2.870	0.000	4.000	9.000
Industry Characteristics						
<i>ExtFin</i>	174,755	39.992	15.478	1.000	43.000	72.000
<i>Equity FinDep</i>	174,755	0.371	0.751	-0.063	0.285	25.090
<i>Invest Intensity</i>	174,755	0.262	0.076	0.022	0.264	0.501
<i>IT Intensity</i>	158,507	0.634	0.482	0.000	1.000	1.000
Country Characteristics						
<i>KA</i>	155,705	0.808	0.321	0.000	0.970	1.000
<i>KA Inflow</i>	155,705	0.818	0.305	0.000	1.000	1.000
<i>KA Outflow</i>	155,705	0.799	0.345	0.000	1.000	1.000
<i>Equity Openness</i>	155,705	0.807	0.348	0.000	1.000	1.000
<i>Bond Openness</i>	151,562	0.814	0.343	0.000	1.000	1.000
<i>LGDP</i>	174,785	9.945	1.144	5.524	10.434	11.542
<i>Inflation</i>	174,785	0.024	0.157	-0.270	0.017	23.028
<i>Government Expenditure</i>	174,782	0.174	0.045	0.020	0.182	0.383
<i>Financial Development</i>	167,239	4.697	0.588	2.099	4.842	5.570
<i>Trade Openness</i>	172,272	0.808	0.905	0.139	0.525	4.427
<i>Labour Force</i>	172,245	17.112	1.408	11.997	17.220	20.502
<i>Tariff Reduction</i>	172,593	0.973	0.035	-1.546	0.983	1.000
<i>Internet Penetration</i>	171,385	50.862	29.606	0.000	60.800	98.160
<i>MCAP/GDP</i>	160,588	1.371	2.124	0.012	0.833	12.545

<i>EPL1</i>	129,855	1.781	0.710	0.920	1.670	4.580
<i>EPL2</i>	116,704	2.145	0.466	0.890	2.140	4.100

Note: This table presents the descriptive statistics of main variables used in the empirical analysis. N is the total number of firm-year observations. Mean is the average value of each variable. SD is the standard deviation of each variable. Min is the minimum of the variable, Max is the maximum of each variable. All variables are defined in Table A1. The sample period is from 1982 to 2014. Following prior literature, all firm-level continuous variables are winsorised at 1% tails.

Table 3. The Effect of Capital Account Liberalisation on Firm-Level Employment

VARIABLES	(1) <i>Ln(EMP)</i>	(2) <i>Ln(EMP)</i>	(3) <i>Ln(EMP)</i>	(4) <i>Ln(EMP)</i>
<i>Kaopen</i>	0.259** (0.104)	0.239* (0.124)	0.216*** (0.072)	0.400*** (0.097)
<i>Firm-level controls</i>				
<i>Age</i>		0.015** (0.007)	0.009 (0.010)	0.016*** (0.002)
<i>Size</i>		0.658*** (0.029)	0.690*** (0.023)	0.837*** (0.012)
<i>Growth</i>		-0.162*** (0.015)	-0.170*** (0.016)	-0.258*** (0.025)
<i>ROA</i>		0.145* (0.075)	0.138** (0.064)	0.669*** (0.107)
<i>XRD</i>		1.108*** (0.135)	1.115*** (0.127)	-0.161 (0.179)
<i>CAPX</i>		0.317*** (0.088)	0.305*** (0.100)	0.543** (0.235)
<i>Leverage</i>		0.075*** (0.024)	0.093*** (0.021)	0.018 (0.038)
<i>Country-level controls</i>				
<i>ln(GDPP)</i>			-0.370*** (0.063)	-0.381*** (0.111)
<i>Inflation</i>			0.029*** (0.006)	0.025*** (0.006)
<i>Government Expenditure</i>			-0.774 (0.656)	-0.871 (1.086)

<i>Financial Development</i>			-0.156***	-0.222***
			(0.056)	(0.078)
<i>Trade Openness</i>			-0.284***	-0.197**
			(0.066)	(0.085)
<i>Labour Force</i>			-0.296	-0.307
			(0.193)	(0.289)
Observations	174,785	174,785	162,545	162,771
Adjusted R-squared	0.933	0.959	0.960	0.797
Firm fixed effects	Yes	Yes	Yes	No
Year fixed effects	Yes	Yes	Yes	No
Country fixed effects	No	No	No	Yes
Industry fixed effects	No	No	No	Yes
Cluster by Country	Yes	Yes	Yes	Yes

Note: This table reports the main effects of capital account liberalisation on firm-level employment. *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index. The higher the index, the more open a country's capital account. Robust standard errors clustered by country are in parentheses. ***, **, * denotes statistical significance levels at 1%, 5% and 10%, respectively. Country-, industry-, (Firm-) and year- fixed effects are included in the regressions. All variables are defined in Table A1.

Table 4. Capital Account Liberalisation, Sectoral Finance Dependence and Firm Employment

VARIABLES	(1)	(2)	(3)	(4)
	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>
<i>Kaopen</i>	0.265** (0.113)	-0.008 (0.194)		
<i>Kaopen* ExtFin</i>	-0.001 (0.003)	0.009* (0.005)	0.008* (0.004)	0.010** (0.004)
<i>Age</i>	0.009 (0.010)	0.015*** (0.002)	0.016*** (0.002)	0.016*** (0.002)
<i>Size</i>	0.690*** (0.023)	0.834*** (0.012)	0.832*** (0.012)	0.832*** (0.012)
<i>Growth</i>	-0.170*** (0.016)	-0.248*** (0.024)	-0.240*** (0.022)	-0.241*** (0.023)
<i>ROA</i>	0.138** (0.064)	0.533*** (0.087)	0.516*** (0.083)	0.501*** (0.083)
<i>XRD</i>	1.115*** (0.127)	0.113 (0.203)	0.248 (0.234)	0.269 (0.233)
<i>Capex</i>	0.305*** (0.100)	0.569*** (0.187)	0.438** (0.176)	0.462** (0.179)
<i>Leverage</i>	0.094*** (0.021)	0.025 (0.043)	0.034 (0.049)	0.032 (0.050)
<i>Country factors</i>	YES	YES		
Observations	162,515	165,566	177,753	177,595
Adjusted R-squared	0.960	0.827	0.830	0.830
Firm fixed effects	Yes	No	No	No
Year fixed effects	Yes	No	No	No
Country-industry fixed effects	No	Yes	Yes	Yes
Industry-year fixed effects	No	Yes	No	Yes
Country-Year fixed effects	No	No	Yes	Yes
Cluster by Country	Yes	Yes	Yes	Yes

Note: This table reports results examining the role of external finance dependence in the impact of capital account liberalisation on firm's employment. *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index.

ExtFin is the rank based on the value of external finance dependence which is constructed following Rajan and Zingales (1998). The higher the rank, the more dependent on external finance the industry is. Time-varying *Country factors* in the regression but not reported for brevity includes *ln(GDPP)*, *Inflation*, *Government Expenditure*, *Financial Development*, *Trade Openness* and *Labour Force*, as reported in Table 3. Robust standard errors clustered by country are in parentheses. ***, **, * denote significance levels at 1%, 5% and 10%, respectively. All variables are defined in Table A1.

Table 5. Capital Account Liberalisation, Employment Protection Legislation and Firm Employment

VARIABLES	(1) <i>Ln(EMP)</i>	(2) <i>Ln(EMP)</i>
<i>Kaopen * ExtFin * EPL1</i>	-0.010*** (0.003)	
<i>EPL1 * ExtFin</i>	0.008** (0.003)	
<i>Kaopen * ExtFin * EPL2</i>		-0.027*** (0.009)
<i>EPL2 * ExtFin</i>		0.022** (0.008)
<i>Kaopen * ExtFin</i>	0.031*** (0.009)	0.078*** (0.025)
<i>Firm factors</i>	YES	YES
Observations	129,595	116,580
Adjusted R-squared	0.855	0.852
Country-Industry fixed effects	Yes	Yes
Industry-Year fixed effects	Yes	Yes
Country-Year fixed effects	Yes	Yes
Cluster by Country	Yes	Yes

Note: This table reports results examining the role of employment protection legislation on the impact of capital account liberalisation on firm employment. *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index. *ExtFin* is the rank based on the value of external finance dependence which is constructed following Rajan and Zingales (1998). The employment protection legislation indexes are from the OECD employment protection database where we obtain two alternative measures that are available for the majority of our sample countries. The higher the indexes, the stronger employment protection legislation in the country. Time-varying firm-level control factors as reported in Table 3 are included in the regression but not reported here for brevity. Robust standard errors clustered by country are in parentheses. ***, **, * denote significance levels at 1%, 5% and 10%, respectively. All variables are defined in Table A1.

Table 6. Capital Account Liberalisation, Financial Constraints and Firm Employment

VARIABLES	(1) <i>Ln(EMP)</i>	(2) <i>Ln(EMP)</i>
<i>Kaopen * ExtFin * SA_Index</i>	0.011** (0.005)	
<i>Kaopen * SA_Index</i>	-1.008*** (0.344)	
<i>ExtFin * SA_Index</i>	-0.005 (0.005)	
<i>SA_Index</i>	-1.799*** (0.295)	
<i>Kaopen * ExtFin * WW_Index</i>		0.022* (0.012)
<i>Kaopen * WW_Index</i>		-1.323* (0.721)
<i>ExtFin * WW_Index</i>		-0.015 (0.012)
<i>WW_Index</i>		-3.852*** (0.647)
<i>Kaopen * ExtFin</i>	0.047*** (0.016)	0.001 (0.010)
<i>Firm factors</i>	YES	YES
Observations	174,492	155,674
Adjusted R-squared	0.734	0.737
Country-Industry fixed effects	Yes	Yes
Industry-Year fixed effects	Yes	Yes
Country-Year fixed effects	Yes	Yes
Cluster by Country	Yes	Yes

Note: This table reports results examining the role of firm characteristics on the effect of capital account liberalisation on firm employment. *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index. *ExtFin* is the rank based on the value of external finance dependence which is constructed following Rajan and Zingales (1998). We use two measures of financial constraints: *SA_index* is an index calculated in year $t - 1$ following Hadlock and Pierce (2010); *WW_index* is an index calculated in year $t - 1$ following Whited and Wu (2006). Time-varying firm-level control factors,

as reported in Table 3, are included in the regression but not reported here for brevity. Robust standard errors clustered by country are in parentheses. ***, **, * denote significance levels at 1%, 5% and 10%, respectively. All variables are defined in Table A1.

Table 7. The Effect of Capital Account Liberalisation on Firm Employment by Region

VARIABLES	(1)	(2)
	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>
<i>Kaopen * Eastern Asia Pacific</i>	0.328*** (0.086)	
<i>Kaopen * Europe</i>	0.200 (0.223)	
<i>Kaopen * South Africa</i>	0.463*** (0.152)	
<i>Kaopen * Other regions</i>	0.101 (0.117)	
<i>Kaopen * Eastern Asia Pacific * ExtFin</i>		0.008** (0.003)
<i>Kaopen * Europe * ExtFin</i>		0.008 (0.005)
<i>Kaopen * South Africa * ExtFin</i>		0.025*** (0.003)
<i>Kaopen * Other regions * ExtFin</i>		0.012 (0.010)
<i>Firm factors</i>	YES	YES
<i>Country factors</i>	YES	
Observations	162,545	174,492
Adjusted R-squared	0.960	0.830
Firm & Year fixed effects	Yes	No
Country-Industry fixed effects	No	Yes
Industry-Year fixed effects	No	Yes
Country-Year fixed effects	No	Yes
Cluster by Country	Yes	Yes

Note: This table reports results of the impact of capital account liberalisation on firm's employment in different regions. *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index. *ExtFin* is the rank based on the value of external finance dependence which is constructed following Rajan and Zingales (1998). Regions are defined according to the World Bank regions' classification (note that Canada is included in the Europe region). Time-varying firm-level and country-level control factors, as reported in Table 3, are included in the regression but not reported here for brevity.

Robust standard errors clustered by country are in parentheses. ***, **, * denote significance levels at 1%, 5% and 10%, respectively. All variables are defined in Table A1.

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Table 8. Subcategories of Capital Account Liberalisation and Firm Employment

VARIABLES	(1)	(2)	(3)	(4)	(5)
	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>
<i>KA * ExtFin</i>	0.010** (0.005)				
<i>KA Inflow * ExtFin</i>		0.011* (0.006)			
<i>KA Outflow * ExtFin</i>			0.005* (0.003)		
<i>Equity Openness * Extfin</i>				0.004* (0.002)	
<i>Bond Openness * Extfin</i>					0.001 (0.002)
<i>Firm Factors</i>	YES	YES	YES	YES	YES
Observations	155,594	155,594	155,594	155,594	151,462
Adjusted R-squared	0.828	0.828	0.828	0.828	0.827
Country-industry fixed effects	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes
Country-Year fixed effects	Yes	Yes	Yes	Yes	Yes
Cluster by Country	Yes	Yes	Yes	Yes	Yes

Note: This table reports the robustness of a country's opening of capital account on firm-level employment with inclusion of other concurrent economic reforms. All capital account liberalisation indices in this table are obtained from Fernández et al. (2016). *KA* equals one minus the standardised overall capital account restrictions index. *KA Inflow* (*KA outflow*) is one minus the capital inflow (outflow) controls index. *Equity Openness* (*Bond Openness*) equals one minus the overall equity (bond) market restrictions index. *ExtFin* is the rank based on the value of external finance dependence which is constructed following Rajan and Zingales (1998). Time-varying firm-level control factors, as reported in Table 3, are included in the regression but not reported here for brevity. Standard errors in parentheses are reported based on robust standard errors clustered by country. ***, **, * denote significance levels at 1%, 5% and 10%, respectively. All other variables are defined in Table A1.

Table 9. Capital Account Liberalisation and Firm-level Employment: Robustness Check

Panel A. Alternative Sampling Criteria

VARIABLES	(1)	(2)
	Excluding countries do not have changes in <i>Kaopen</i> index <i>Ln(EMP)</i>	Excluding countries with firm-year observations < 300 <i>Ln(EMP)</i>
<i>Kaopen * ExtFin</i>	0.010** (0.005)	0.009* (0.005)
<i>Firm Factors</i>	YES	YES
Observations	125,495	171,540
Adjusted R-squared	0.843	0.831
Country-industry fixed effects	Yes	Yes
Industry-year fixed effects	Yes	Yes
Country-Year fixed effects	Yes	Yes
Cluster by Country	Yes	Yes

Panel B. Alternative Measures of Finance Dependence

VARIABLES	(1)	(2)	(3)
	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>	<i>Ln(EMP)</i>
<i>Kaopen * Equity FinDep</i>	0.373* (0.207)		
<i>Kaopen * Invest Intensity</i>		3.820*** (0.941)	
<i>Kaopen * IT Intensity</i>			0.243* (0.145)
<i>Firm Factors</i>	YES	YES	YES
Observations	162,622	162,622	147,036
Adjusted R-squared	0.829	0.830	0.830
Country-industry fixed effects	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes
Country-Year fixed effects	Yes	Yes	Yes

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Cluster by Country

Yes

Yes

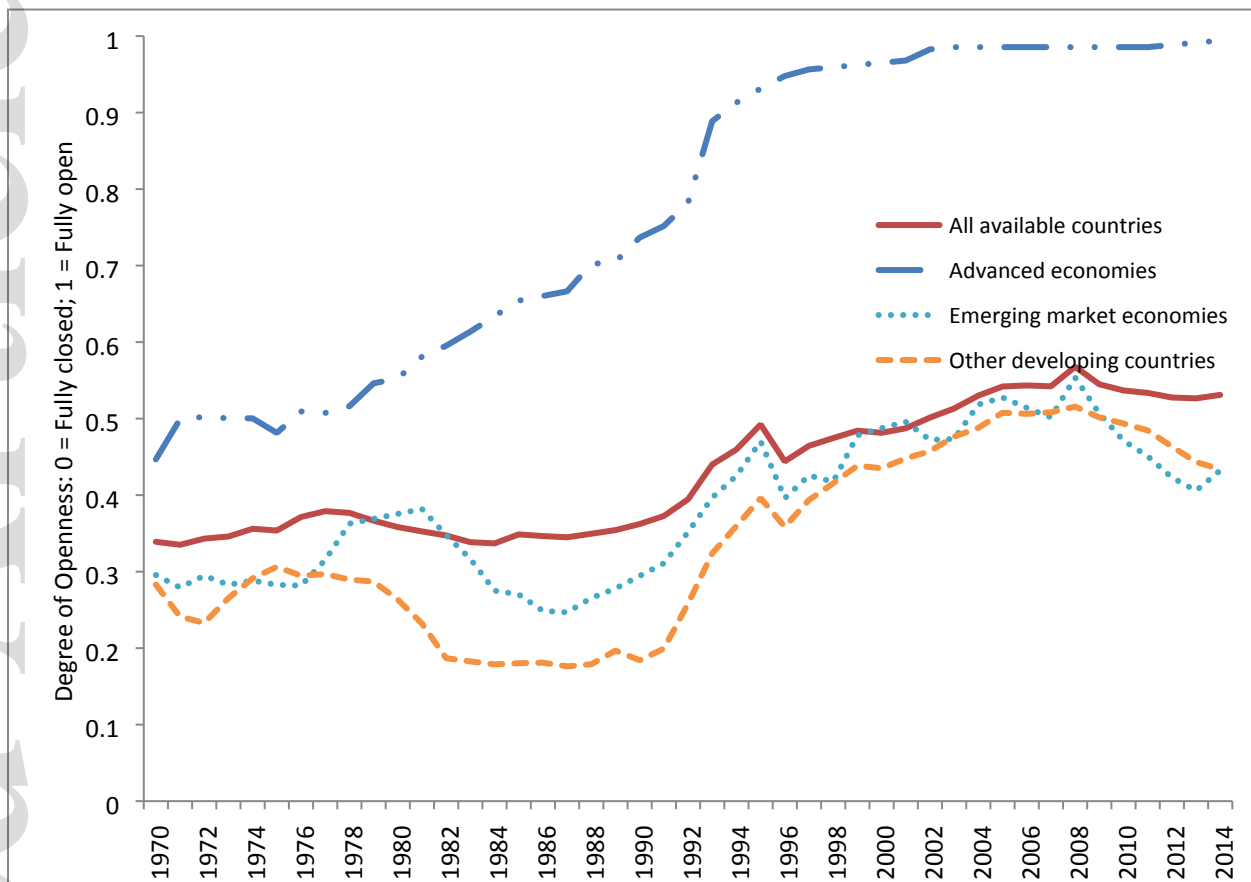
Yes

Panel C. Inclusion of Other Concurrent Economic Reforms

VARIABLES	(1) <i>Ln(EMP)</i>	(2) <i>Ln(EMP)</i>	(3) <i>Ln(EMP)</i>	(4) <i>Ln(EMP)</i>
<i>Kaopen * ExtFin</i>	0.011** (0.004)	0.010* (0.005)	0.011** (0.005)	0.011** (0.005)
<i>Tariff Reduction * ExtFin</i>	-0.002 (0.005)			0.003 (0.004)
<i>Internet Penetration * ExtFin</i>		0.010** (0.004)		0.010** (0.004)
<i>MCAP/GDP * ExtFin</i>			-0.043*** (0.010)	-0.037*** (0.009)
<i>Firm factors</i>	YES	YES	YES	YES
Observations	172,404	171,227	160,305	157,110
Adjusted R-squared	0.829	0.828	0.828	0.825
Country-industry fixed effects	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes
Country-year fixed effects	Yes	Yes	Yes	Yes
Cluster by Country	Yes	Yes	Yes	Yes

Note: This table reports robustness checks of the main effects of capital account liberalisation on firm employment. *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index. *ExtFin* is the rank based on the value of external finance dependence which is constructed following Rajan and Zingales (1998). Panel A shows robustness of our main results based on different sample criteria. Panel B shows the robustness of our results using alternative measures of external finance dependence. Panel C shows the robustness of our results by including other concurrent economic reforms such as trade liberalisation, stock market development, and internet penetration rate in the regressions. Time-varying firm-level control factors, as reported in Table 3, are included in the regression but not reported here for brevity. Robust standard errors clustered by country are in parentheses. ***, **, * denote significance levels at 1%, 5% and 10%, respectively. All variables are defined in Table A1.

Figure 1 Average Chinn and Ito (2008) Capital Account Liberalisation Index: 1970-2014.



Note:

This graph presents the mean variation in *Kaopen* index of different income groups over time. *Kaopen* index is from Chinn and Ito (2008) with recent updates available on the author's website which measures the degree of capital account openness for 182 countries. This index (re-scaled) ranges from 0 (capital account more restricted) to 1 (capital account more liberalised). The classification of countries is consistent with Kose et al. (2009).

Appendix

Table A1. Variables Definition

Variables	Variables Definition	Data Source
<i>Ln(EMP)</i>	The total number of firms' employees. We take the natural logarithm of the value in all empirical analysis.	Capital IQ Global
<i>Kaopen</i>	Standardised capital account liberalisation index from Chinn and Ito (2008). It varies from 0 to 1: fully open if <i>Kaopen</i> = 1; fully closed if <i>Kaopen</i> =0.	Chinn and Ito (2008)
Firm Characteristics		
<i>Age</i>	Firm age. It is measured as the total number of years since the first appearance in Capital IQ Global.	Capital IQ Global
<i>Size</i>	Firm size. It is measured as the natural logarithm of total assets (in millions US \$).	Capital IQ Global
<i>Growth</i>	Growth of total assets. It is calculated using the change in total assets divided by year beginning total assets.	Capital IQ Global
<i>ROA</i>	Return on assets. It is measured as the operating income before depreciation deflated by year beginning total assets.	Capital IQ Global
<i>XRD</i>	R&D expenditure scaled by year beginning total assets.	Capital IQ Global
<i>Capex</i>	The total value of firms' capital expenditures divided by year beginning total assets.	Capital IQ Global
<i>Leverage</i>	Sum of long-term debt and debt in current liabilities divided by year beginning total assets.	Capital IQ Global
<i>SA_Index</i>	The financial constraint index constructed following Hadlock and Pierce (2010). It is defined as $(-0.737 * Size_{it-1}) + (0.043 * Size_{it-1}^2) - (0.040 * Age_{it-1})$.	Capital IQ Global
<i>WW_Index</i>	The financial constraint index constructed following Whited and Wu (2006). It is defined as $-0.091 * CF_{it-1} - 0.062 * DIVPOS_{it-1} + 0.021 * TLTD_{it-1} - 0.044 * Size_{it-1} + 0.102 * ISG_{it-1} - 0.035 * SG_{it-1}$, where CF is cash flow from operations scaled by total assets, DIVPOS is an dummy variable equals one if the firm pays cash dividends, TLTD is long-term debt scaled by total assets, Size is the natural logarithm of total assets, ISG is the firm's three-digit SIC industry sales growth, and SG is the firm's sales growth.	Capital IQ Global
Industry Characteristics		

<i>ExtFin</i>	Industry-level measure of external finance dependence following Rajan and Zingales (1998). It is defined as the fraction of capital expenditures not financed by cash flow from operations to capital expenditures for the median publicly traded firm in each industry in the United States from 1980 to 1990.	Capital America	IQ	North
<i>Equity FinDep</i>	Industry-level measure of external equity finance dependence following Rajan and Zingales (1998). It is defined as the fraction of the amount of net equity issuance to capital expenditures for the median publicly traded firm in each industry in the United States from 1980 to 1990.	Capital America	IQ	North
<i>Invest Intensity</i>	Industry-level measure of investment intensity following Rajan and Zingales (1998). It is defined as the fraction of capital expenditures to net property, plant, and equipment for the median publicly traded firm in each industry in the United States from 1980 to 1990.	Capital America	IQ	North
<i>IT Intensity</i>	Industry-level measure of intensity of use of information technology hardware, software and IT-services constructed following Mann (2012).	Capital America	IQ	North
<i>Total Employment</i>	Total employment (EMPEN and FTEN) includes all persons engaged in domestic production including self-employed. The domestic concept of employment (recommended in SNA08) is generally used by OECD countries - all persons engaged in the domestic production of a country are included whether or not they are resident in that country.	OECD STAN database		
<i>Employees</i>	Number of employees (EMPE and FTEE) excludes the Self-employed (SELF) and unpaid family workers.	OECD STAN database		

Country characteristics

<i>ln(GDPP)</i>	The natural logarithm of GDP per capita (current US\$)	World Bank WDI		
<i>Inflation</i>	Inflation, GDP deflator (annual %)	World Bank WDI		
<i>Government Expenditure</i>	General government final consumption expenditure (% of GDP)	World Bank WDI		
<i>Financial Development</i>	Financial Development measured as Private credit by deposit money banks and other financial institutions to GDP (%)	World Bank database	Bank	GFD
<i>TradeOpen</i>	Trade openness measured as the sum of imports and exports of goods and services divided by GDP.	World Bank WDI		
<i>Labour force</i>	Labour force, total (in natural logarithm transformation).	World Bank WDI		

Employment Protection Legislation

<i>EPLI</i>	This indicator incorporates 8 data items concerning regulations for	OECD	Employment	
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EPL2

individual dismissals. It is measured on a scale of 0.92 (weak employment protection) to 4.58 (strong employment protection). Data availability: 1985-2013. Protection Database Annual time series data

This indicator is the weighted sum of sub-indicators concerning the regulations for individual dismissals (weight of 5/7) and additional provisions for collective dismissals (2/7). It incorporates 12 detailed data items. It is measured on a scale of 0.89 (weak employment protection) to 4.1 (strong employment protection). Data availability: 1998-2013. OECD Employment Protection Database Annual time series data

Table A2. The Differential Effect of Capital Account Liberalisation on Firm-Level Employment:

Firm Size	(1)	(2)	(3)	(4)
VARIABLES	ln(emp)	ln(emp)	ln(emp)	ln(emp)
<i>Kaopen</i>	0.259** (0.104)	0.186* (0.102)	0.172 (0.133)	0.720** (0.306)
<i>Kaopen</i> × <i>Large</i>		0.174 (0.111)	0.175* (0.101)	0.197 (0.280)
Firm-level controls	No	Yes	Yes	Yes
Country-level controls	No	No	Yes	Yes
Observations	174,785	174,785	162,545	162,771
Adjusted R-squared	0.933	0.938	0.939	0.587
Firm fixed effects	Yes	Yes	Yes	No
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	No	No	Yes
Industry fixed effects	Yes	No	No	Yes
Cluster by Country	Yes	Yes	Yes	Yes

Note: This table reports the differential effects of capital account liberalisation on firm-level employment by firm size. We construct an indicator variable (*Large*), which takes value = 1 if a firm's size is higher than median (large firm); = 0 if lower than median (small firm)). *Kaopen* is the standardised Chinn and Ito (2008) capital account liberalisation index. The higher the index, the more open a country's capital account. Robust standard errors clustered by country are in parentheses. ***, **, * denotes statistical significance levels at 1%, 5% and 10%, respectively. All variables are defined in Table A1.

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