CAPITAL ACCOUNT LIBERALIZATION AND WAGE INEQUALITY*

Mauricio Larrain†
Columbia University

This version: June 2013

Abstract

This paper analyzes the distributional consequences of capital account liberalization. Opening the capital account allows financially constrained firms to borrow capital from abroad. I argue that since capital is more substitutable for unskilled workers and more complementary to skilled workers, liberalization increases the relative demand for skilled labor, leading to higher wage inequality. Using aggregate data and exploiting the variation in the timing of capital account reforms across 23 industrialized countries, I find strong evidence that opening the capital account increases wage inequality. In order to identify the mechanism driving this effect, I use sectoral data and exploit the variation in external financial dependence and capital-skill complementarity across industries. My findings show that capital account liberalization increases wage inequality particularly in industries with both high financial needs and strong complementarity. Overall, the results suggest that liberalization is a relevant driving force behind wage inequality.

*I am deeply indebted to Yuriy Gorodnichenko, Ted Miguel, and Atif Mian for their advice and encouragement. I also thank Geert Bekaert, David Card, Fred Finan, Todd Gormley, Ross Levine, Ulrike Malmendier, Elias Papaioannou, Andres Rodriguez-Clare, David Romer, Emmanuel Saez, Shang-Jin Wei, and Daniel Wolfenzon for their helpful comments. This paper also benefited from the comments of seminar participants at the Boston Fed, Brown University, Columbia Business School, Federal Reserve Board, Notre Dame, Princeton, UBC Sauder, Chicago Booth, UC Berkeley, UC Riverside, Pac-Dev, Midwest Macro Meetings, WFA conference, LBS Summer Symposium, and several institutions in Chile. I am grateful for funding from the Kauffman Foundation and the Center for Equitable Growth at UC Berkeley. This paper was previously circulated under the title "Does Financial Liberalization Contribute to Wage Inequality? The Role of Capital-Skill Complementarity."

†Columbia Business School. Mailing address: 3022 Broadway, Uris Hall 813. New York, NY, 10027. E-mail address: mlarrain@columbia.edu.

1 Introduction

In the last four decades, many developed and developing countries have opened their capital accounts, lifting legal restrictions imposed on international capital transactions.[1] Although there is a growing consensus that capital account liberalization leads to higher economic growth (Quinn and Toyoda, 2008), it is still unclear whether liberalization benefits the whole population equally, or whether it disproportionately benefits the rich or the poor. This paper attempts to fill this gap by analyzing the effect of liberalization on the relative wage between skilled and unskilled workers.

Opening the capital account allows financially constrained firms to access the international financial market and borrow capital from more capital-abundant countries. I argue that since capital and skilled labor are more complementary as inputs than are capital and unskilled labor, liberalization increases the relative demand for skilled labor. In equilibrium, this enlarges the wage gap between skilled and unskilled workers, leading to higher inequality.

Figure 1 plots the cumulative change in capital account openness against the cumulative change in wage inequality for 23 industrialized economies from 1975-2005. Capital openness is measured with the Chinn and Ito (2006) index. Wage inequality is measured as the wage gap between workers with college and high-school education. The Figure shows a positive correlation between the change in capital openness and inequality. In this paper, I argue that the relationship is causal and that capital account liberalization leads to higher wage inequality.

[Include Figure 1 here]

This paper makes two contributions. First, it provides the first piece of empirical evidence on the effects of capital account liberalization on wage inequality. From a policy perspective, it is very important to understand both the efficiency and distributional consequences of opening the capital account. Second, wage inequality has increased in several countries in recent decades. The most common explanations for

[1] This includes, for example, allowing domestic businesses to obtain loans from foreign banks, allowing foreigners to purchase domestic debt, and allowing foreigners to invest in the domestic stock market.

this phenomenon are skill-biased technological change, trade liberalization, and changes in labor market institutions. This paper highlights the importance of capital account liberalization as an additional factor contributing to rising inequality.

I follow a two-fold empirical strategy. First, I use aggregate data and exploit the variation in the timing of capital account reforms across countries and conduct a generalized difference-in-differences test. I calculate the difference in wage inequality before and after a country opens its capital account and compare it to the same change in countries not implementing reform during that period. I find strong evidence that capital account liberalization increases wage inequality.[2] Opening the capital account increases wage inequality by 4%. In estimating this effect, I include country and year fixed effects and control for a series of time-varying determinants of wage inequality.

Second, I use sectoral data to identify the mechanism by which capital market integration leads to higher inequality. According to the mechanism, liberalization allows financially constrained firms to demand more capital, which in turn increases the relative demand for skilled labor. Both effects vary across industries. The capital stock should increase more in firms producing in industries that are typically dependent on external finance for growth. Likewise, the relative demand for skilled labor should increase more in firms producing in industries with strong complementarity between capital and skills. If labor mobility across sectors is limited, then capital account liberalization should increase wage inequality particularly in industries with high external financial dependence and strong capital-skill complementarity.[3] To identify the channel, I exploit the variation in external dependence and complementarity across sectors.

To conduct the cross-sectional analysis, I rank industries regarding the two cross-sectoral characteristics. I use the Rajan and Zingales (1998) external financial dependence index to identify an industry's need for external finance. Financial dependence is the fraction of capital expenditures not financed with internal cash flows. To obtain a measure of capital-skill complementarity, I estimate a skilled labor share equation

[2] I define liberalization as a one standard deviation increase in the Chinn and Ito (2006) index.

[3] If workers accumulate sector-specific human capital, labor will not be fully mobile across industries and wages will not be equalized across sectors. See Dickens and Katz (1987) and Krueger and Summers (1987) for evidence on large inter-industry wage differentials.

for each industry. I define complementarity as the elasticity of the share of wages paid to skilled labor with respect to capital intensity.

I start by exploiting the variation in external financial dependence across sectors and analyze the effect on the sectoral capital stock per unit of skilled labor. I calculate the before-after change in the capital stock in industries with high external dependence in a country opening its capital account and compare it to the same change in industries with low dependence within the same country. The difference-in-differences specification includes a full set of country-year, country-industry, and industry-year fixed effects. I find that capital liberalization increases the capital stock in industries that are highly dependent on external finance (75th percentile in the index) by 10% more than in industries with low dependence (25th percentile).

Next, I exploit the cross-sectoral variation in both external financial dependence and capital-skill complementarity and analyze the effect on sectoral wage inequality. I find that within above-median dependence industries, capital account liberalization increases wage inequality in industries with strong complementarity (75th percentile in the index) by 3.5% more than in industries with weak complementarity (25th percentile). Within below-median dependence industries, the effect does not vary with capital-skill complementarity. I also pool all industries together and conduct a triple difference-in-differences test. I find that liberalization increases wage inequality in industries with high external dependence and strong complementarity by 2.5% more than in the remaining industries.

Finally, I show that the results are not driven by either skill-biased technological change or trade liberalization. I also provide preliminary firm-level evidence, from an emerging market, suggesting that the transmission mechanism highlighted in this paper works at the firm level as well. I conduct a series of additional tests that further strengthen the paper's results. First, I document that the differential effect on inequality is larger for older workers, who are less mobile across industries than younger workers. Second, I find that the differential effect is larger for female workers than for male workers. Third, I document that the effect is larger in countries with strong investor protection. Lastly, I provide suggestive evidence that the effect on inequality also extends to emerging markets.

Related literature. This paper contributes to a growing literature that analyzes the real effects of capital account liberalization. The primary focus has been on economic growth.[4] There is only one paper that analyzes the effects on inequality: Das and Mohapatra (2003). The authors use aggregate data and find a positive effect of stock market liberalization on the share of income held by the top quintile. I go one step further and use sectoral data to pin down the channel by which capital liberalization affects inequality. By providing evidence of a specific mechanism, I provide a stronger test of causality.

Other papers have studied the broader link between financial development and income inequality. The evidence on this relationship is mixed. At the aggregate level, Beck et al. (2007) find a negative link, while Bumann and Lensink (2012) find a positive one. At the micro level, Beck et al. (2010) document a negative link, while Jerzmanowski and Nabar (2011) document a positive one. By tracing down a particular mechanism, I provide a better understanding on how finance affects inequality.

My work also relates to a recent literature linking finance and labor. Benmelech et al. (2011) show that the availability of credit plays an important role in firm-level employment decisions. Pagano and Pica (2012) find that financial development is associated with greater employment growth. Chari et al. (2012) show that capital market integration increases the level of wages. I contribute to this literature by analyzing the relationship between finance and the wages of workers with different levels of skills.

This paper also relates to a large literature analyzing the determinants of rising wage inequality.[5] Starting with Katz and Murphy (1992), several papers have documented that the wage gap between skilled and unskilled workers has widened in many countries during the last decades. The standard explanations include skill-biased technological progress, trade openness, and labor institution changes. The role of capital market integration, however, has been absent in this discussion. I contribute to this literature by stressing that capital account liberalization is a relevant driving force behind wage inequality.

The channel of transmission of this paper relies on the capital-skill complemen-

[4]See, among others, Henry (2000) and Bekaert et al. (2005).
[5]See Katz and Autor (1999) for a review of this literature.

tarity hypotheses. Griliches (1969) was the first to provide evidence that capital is more substitutable for unskilled workers and more complementary to skilled workers.[6] Starting with Krusell et al. (2000), several papers have linked capital accumulation to wage inequality through capital-skill complementarity. More recently, Parro (2013) and Burstein et al. (2013) show that international trade has important effects on wage inequality through its impact on the import of capital equipment. I argue that capital market integration also has important effects on inequality through the inflows of foreign capital.

Finally, the strategy of exploiting cross-sectoral heterogeneity to pin down the transmission mechanism comes from Rajan and Zingales (1998). Gupta and Yuan (2009) use cross-country, cross-industry data to analyze the relationship between capital account liberalization and growth. They find that liberalization increases growth particularly in industries heavily dependent on external finance. I also use cross-country, cross-industry data. However, I focus on inequality instead of growth. In addition, I exploit cross-sectoral variation in both external financial dependence and capital-skill complementarity to identify the effect.

2 Analytical framework

In this Section, I present a very simple framework to understand the relationship between capital account liberalization, capital-skill complementarity, and wage inequality.

2.1 Capital-skill complementarity

Consider an economy in which firms produce with a three-factor production function: $y = f(k, s, u)$, where y denotes output, k physical capital, s skilled labor, and u unskilled labor. Denote by $\sigma_{i,j}$ the elasticity of substitution between factors i and j.[7] The "capital-skill complementarity hypothesis" states that physical capital is more complementary to skilled labor than to unskilled labor, i.e., $\sigma_{k,u} > \sigma_{k,s}$. In other words, capital and skilled labor are relative complements while capital and unskilled labor are

[6] See Hamermesh (1993) for a more recent review of this literature.

[7] The Allen-Uzawa partial elasticity of substitution is defined as $\sigma_{i,j} \equiv \frac{\Delta\%(i/j)}{\Delta\%(\frac{\partial f}{\partial j}/\frac{\partial f}{\partial i})}$ for $i, j \in \{k, s, u\}$.

relative substitutes.

If labor markets are competitive, firms demand labor until the point where the marginal product of labor equals the wage: $\partial f/\partial s = w_s$ and $\partial f/\partial u = w_u$, where w_s denotes the skilled wage and w_u the unskilled wage. I define wage inequality as the relative wage between skilled and unskilled workers, i.e., (w_s/w_u). The capital-skill complementarity hypothesis implies that $\frac{\partial(w_s/w_u)}{\partial k} > 0$. Intuitively, if capital and skilled labor are relative complements, an increase in the capital stock increases the relative demand for skilled labor. Since labor is paid its marginal product, this leads to higher wage inequality.

As an example, consider the following standard, two-level CES production function:

$$y = \left[u^{\sigma} + (\lambda k^{\rho} + (1-\lambda)s^{\rho})^{\frac{\sigma}{\rho}}\right]^{\frac{1}{\sigma}}, \tag{1}$$

where λ is a parameter that governs income shares and $\sigma, \rho < 1$ are parameters that govern the elasticities of substitution. The elasticity of substitution between capital and unskilled labor is $\frac{1}{1-\sigma}$ and the elasticity of substitution between capital and skilled labor is $\frac{1}{1-\rho}$. Capital-skill complementary requires that $\sigma > \rho$. With this specification, I can log-linearize the ratio between the skilled and unskilled wage and obtain the following expression for wage inequality (Krusell et al., 2000):

$$\log\left(\frac{w_s}{w_u}\right) \simeq \left(\frac{\sigma-\rho}{\rho}\right)\left(\frac{k}{s}\right)^{\rho} + (1-\sigma)\log\left(\frac{u}{s}\right) \tag{2}$$

From equation (2), I can calculate the effect of an increase in capital on wage inequality as follows:

$$\frac{\partial \log(w_s/w_u)}{\partial(k/s)} = (\sigma-\rho)\frac{k^{\rho-1}}{s^{\rho}}$$

Under capital-skill complementarity ($\sigma > \rho$), an increase in the capital stock per unit of skilled labor increases wage inequality, $\frac{\partial \log(w_s/w_u)}{\partial(k/s)} > 0$. In the empirical analysis, I use the capital stock per unit of skilled labor as the relevant measure of capital. Equation (2) also highlights that, since $\sigma < 1$, a decrease in the relative supply of skilled labor also increases wage inequality, $\frac{\partial \log(w_s/w_u)}{\partial \log(u/s)} > 0$.

2.2 Capital account liberalization and wage inequality

In the economy, there are legal restrictions imposed on international capital transactions. Let θ denote the parameter that summarizes the degree of international capital mobility. Capital account liberalization is a policy that increases θ. This policy allows financially constrained firms to borrow from abroad. I model capital market reform through the function $k = k(\theta)$, where $\partial k/\partial\theta > 0$. I also assume that both types of labor are supplied inelastically. This simple framework delivers a series of testable implications.

Prediction 1. *Capital account liberalization increases wage inequality.*

Intuitively, the policy leads to capital accumulation. Since capital and skilled labor are relative complements, this increases the relative demand for skilled labor. In equilibrium, this increases the relative wage between skilled and unskilled workers. I can decompose the effect of capital liberalization on wage inequality into a "capital effect" and a "complementarity effect":

$$\frac{\partial(w_s/w_u)}{\partial\theta} = \underbrace{\frac{\partial(w_s/w_u)}{\partial k}}_{\text{Complementarity-effect}} \cdot \underbrace{\frac{\partial k}{\partial\theta}}_{\text{Capital-effect}}$$

The capital effect measures capital deepening, while the complementarity effect measures the extent to which capital deepening increases the relative demand for skilled labor. For a given complementarity effect, the effect on wage inequality is increasing in the capital effect. Likewise, for a given capital effect, the effect on inequality is increasing in the complementarity effect. In fact, if the capital effect is absent, there will be no complementarity effect. Within an economy, the strength of both effects varies across firms and industries.

Prediction 2. *Capital account liberalization increases the capital stock particularly in industries with high external financial dependence.*

For technological reasons, firms in some industries require more external finance to produce than in other industries. For example, firms in some industries face higher

fixed costs, and thus operate at larger scales, than in other industries. It follows that firms in these industries depend more on external financing and will be more financially constrained. Since capital account liberalization allows firms to tap international financial markets, firms in industries with high external financial needs will benefit the most. Therefore, the "capital effect" will be stronger in industries with high needs for external finance.

Prediction 3. *Capital account liberalization increases wage inequality particularly in industries with high external financial dependence and strong capital-skill complementarity.*

Again for technological reasons, the production functions in some industries exhibit stronger complementarity between capital and skills than in other industries. For example, in some industries workers carry out a limited set of activities, which can be accomplished by following explicit rules. Since capital can more easily substitute unskilled labor when unskilled workers conduct routine tasks, the production functions in these industries will exhibit strong capital-skill complementarity.[8] As a result, the relative demand for skilled labor responds strongly to an increase in the capital stock. Therefore, for a given "capital effect," the "complementarity effect" will be stronger in industries with strong complementarity between capital and skills.

If labor is fully mobile across industries, then skilled labor will flow towards the industry with strong complementarity until the relative wage is equalized across sectors. However, although all workers have the opportunity to switch sectors, not all do so and wages do not equilibrate across sectors. Workers with sufficient accumulated sector-specific human capital will not find the higher relative wage attractive enough to switch. As a result, capital account liberalization will increase wage inequality particularly in industries in which the "capital effect" and the "complementarity effect" are strong. In the long run, new generations of workers enter the labor force and wage inequality is equalized across sectors.[9]

[8] Under specification (1), a higher degree of capital-skill complementarity corresponds to a larger value of $(\sigma - \rho)$.

[9] Several studies show that trade liberalization adjustment occurs through relative wage changes rather than labor reallocation across sectors. See Goldberg and Pavcnik (2007) for a review of this literature.

3 Empirical strategy

To estimate the effect of capital account liberalization on wage inequality, I follow a two-fold empirical strategy. First, I use aggregate data and exploit the variation in the timing of capital account reforms across countries. Second, in order to pin down the transmission mechanism, I use sectoral data and exploit the variation in external financial dependence and capital-skill complementarity across sectors.

For the aggregate analysis, I exploit the cross-country, cross-time variation in the timing of capital account reforms. This allows me to identify the effect in a difference-in-differences setup. To understand the intuition, consider a country opening its capital account ("treatment group"). First, I compute the difference in inequality before and after the capital account change. However, this estimate could be affected by other global factors taking place at the same time. To control for such factors, I also estimate the before-after difference in inequality for countries that did not implement changes to the capital account during the time period ("control group"). The difference between these two differences captures the effect of capital account liberalization on aggregate inequality.

In particular, I estimate a difference-in-differences test in multiple treatment groups and multiple time periods setting (Imbens and Wooldridge, 2009). The specification includes country fixed effects, which allow me to exploit the within-country variation across time. It also includes year fixed effects to exploit the cross-country variation within a moment in time. The difference-in-differences cancels out any global factors that are common to the treatment and control groups. However, there might be other factors affecting inequality that are specific to the treatment group. I address this issue in the estimation by controlling for a series of time-varying factors that affect inequality.[10]

To provide a stronger test of causality, in the second part of the analysis I provide evidence of a specific mechanism by which capital account liberalization affects inequality. According to the analytical framework, the effect of capital account reform varies across industries. I use sectoral data and exploit the cross-sectoral variation in

[10] I control for the relative supply of skilled labor, trade openness, inflation, government expenditure to GDP, GDP per capita, and private credit to GDP. Beck et al. (2007) use a similar set of controls.

order to identify the channel. The first part of the mechanism works though capital accumulation, so I start by exploiting the variation in external financial dependence across industries. Consider a country opening its capital account. First, I calculate the difference in the capital stock before and after openness in industries with high external dependence ("treatment group"). Next, I estimate the before-after difference in industries with low dependence ("control group"). The difference between these two differences estimates the differential effect of liberalization across sectors within a country implementing reform.

The generalized difference-in-differences specification includes country-year fixed effects, which allow me to exploit the variation across industries within a country at a moment in time. It also includes country-industry fixed effects to exploit the within country-industry variation across time. Finally, the specification includes sector-year fixed effects to ensure that the estimates are not driven by global shocks affecting inequality within a certain subset of industries.

The final part of the mechanism works through capital-skill complementarity. Within industries with high external dependence, capital account liberalization should increase wage inequality particularly in industries with strong complementarity. Therefore, I exploit the cross-sectoral variation in both external dependence and capital-skill complementarity. I conduct a triple difference-in-differences estimation in which I compare inequality before and after capital account reform, between industries with high and low financing needs, and between industries with strong and weak complementarity. The identification assumption is that there are not other concurrent factors that increase inequality particularly in the subset of industries with both high financial dependence and strong complementarity. Throughout the paper, I argue that this is a highly plausible assumption.

4 Data

4.1 Capital account liberalization

The traditional approach to measuring financial openness is to use the information provided by the IMF's "Annual Report on Exchange Arrangements and Exchange

Restrictions" (AREAER), which reports the extent of rules and regulations affecting cross-border financial transactions. In this paper, I use the index of capital account openness developed by Chinn and Ito (2006), which captures both the extent and intensity of restrictions to capital mobility. The Chinn and Ito data allows me to maximize the number of countries in the sample. In Section 7, I show that the results are robust to using alternative *de jure* and *de facto* capital openness measures.

The Chinn and Ito measure is based on a set of four AREAER measures for restrictions on capital mobility: (1) openness of the capital account, (2) openness of the current account, (3) stringency of requirements for repatriation of export proceeds, and (4) existence of multiple exchange rates. These binary variables are set equal to one when restrictions are non-existent and zero otherwise. This index is the first principle component of the four binary variables. The index has a higher value for countries that are more open to cross-border financial transactions. It is constructed such that the series has a mean of zero.[11]

The sample consists of 23 industrialized countries from 1975-2005. The composition of the sample is the result of intersecting the wage dataset described below with the Chinn and Ito data. Table 1 reports the evolution of capital account openness across countries and time. There is substantial variation of capital market openness across countries and across time. Some countries (e.g., Germany and United States) have open capital accounts during the entire sample period. Eastern European countries, on the other hand, opened very quickly towards the end of the sample. The sample includes countries that opened in the 1980s (e.g., Denmark and Italy) and others that opened in the 1990s (e.g., Portugal and Spain).

[Include Table 1 here]

Capital account liberalization should decrease the cost of capital through the inflow of foreign funds from countries with more abundant capital. In Figure 2, I plot the cumulative change in capital account openness against the cumulative change in the lending interest rate of domestic banks, from 1975-2005. The Figure shows a strong negative correlation between the change in capital account openness and the interest

[11] The minimum attainable value is -1.85 and the maximum attainable is 2.45.

rate. The lower cost of capital should encourage firms to increase their capital stock. I construct a measure of aggregate capital stock from investment through the perpetual inventory method using data from the Penn World Tables (Caselli, 2005)[12]. Figure 3 plots the cumulative change in capital account openness against the cumulative percentage change in the capital stock per unit of skilled labor. According to the Figure, there is a strong positive correlation between the change in capital openness and the capital stock.

[Include Figures 2 and 3 here]

4.2 Wage inequality

The data on wage inequality comes from the EU-KLEMS dataset, a statistical and analytical research project financed by the European Commission.[13] EU-KLEMS provides sectoral data on capital stock, hours worked, and wages by skill level. I define skilled labor as the labor force with some college education and unskilled labor as the labor force with high-school education. Wage inequality is the ratio between the wage of workers with college and high-school education. The wage data is available for 23 industrialized countries over 1975-2005. There is information for 15 industries at the two-digit level of aggregation. Six industries are manufacturing, ranging from wood to machinery. The remaining nine industries are non-manufacturing, ranging from retail to construction. The physical capital data is available for a subset of only 14 countries.

Table 2 reports the evolution of wage inequality across countries and time. For any given time period, there is abundant variation in inequality across countries. Wage inequality is highest in Eastern European countries, where the wage of skilled workers is more than double the wage of unskilled workers. Wage inequality is lowest in Scandinavian countries. There is a lot of variation in inequality across time. Wage inequality between 1975 and 2005 increased in more than half of the countries in the

[12]For some countries, there are relatively few observations for investment, so it is likely that the capital stock is measured with error. I prefer to construct the aggregate capital stock myself since the wage dataset provides capital information for only 14 countries.

[13]EU-KLEMS stands for European Union level analysis of capital (K), labour (L), energy (E), materials (M), and service (S) inputs.

sample. Inequality increased particularly in Eastern European countries, but decreased in Scandinavian countries.

[Include Table 2 here]

In Table 3, I show the evolution of wage inequality, distinguishing between manufacturing and non-manufacturing industries.[14] There is considerable cross-sectoral variation in inequality, both across countries and across time. For a given year, wage inequality in manufacturing sectors is on average higher than in non-manufacturing sectors. The time variation also differs across industries. For example, the large increase in wage inequality in Eastern European countries is heavily influenced by the increase in inequality in manufacturing industries.

[Include Table 3 here]

4.3 Sectoral indices

To conduct the sectoral analysis, I rank industries based on the two cross-sectoral characteristics, external financial dependence and capital-skill complementarity.

External financial dependence. I use the external financial dependence index developed by Rajan and Zingales (1998) to identify an industry's intrinsic need for external finance. The index is defined as the fraction of capital expenditures not financed by cash flow from operations for the median publicly traded firm in each industry in the United States. I calculate the index using data from Compustat from 1975-2005. Table 4 reports the external financial dependence measure for the industries in the sample. There is substantial cross-sectoral variation in the index. Chemicals manufacturing presents the highest need for external finance. Post and telecommunications is the industry with the highest external dependence within non-manufacturing. Service sectors such as education and health exhibit low external dependence.

[Include Table 4 here]

[14] I distinguish only between manufacturing and non-manufacturing to conserve space.

The purpose of using data from publicly traded US firms is to obtain an accurate measure of the demand for external funds. These firms are large and well-established, with better access to well-developed capital markets than companies in other countries. Therefore, the external dependence index should provide a precise measure of the demand for external finance, not influenced by supply side constraints. For identification purposes, I don't require each country to have the same value of financial dependence in each sector. The identification assumption is that the ranking of financial dependence across sectors is the same in each country.

Capital-skill complementarity. I need to construct an index of sectoral capital-skill complementarity. For this, I estimate a standard skilled labor share equation for each industry.[15] I assume that capital is a quasi-fixed factor and that skilled and unskilled labor are variable factors. If the variable cost function is Translog and production exhibits constant returns to scale, cost minimization yields the following skilled labor share equation for each industry:

$$\mathcal{S} = \alpha + \beta \log(w_s/w_u) + \gamma \log(k/y), \tag{3}$$

where $\mathcal{S} \equiv w_s s/(w_s s + w_u u)$ denotes the share of wages paid to skilled labor. A positive coefficient for γ in equation (3) implies capital-skill complementarity. Intuitively, when capital and skilled labor are relative complements, an increase in capital intensity leads to an increase in the relative demand for skilled labor, causing the wage share of skilled workers to increase. The stronger the complementarity, the larger the effect. Therefore, I use the γ elasticity as a measure of complementarity. For each industry, I estimate equation (3) using data from a panel of countries across time:[16]

$$\mathcal{S}_{ct} = \alpha + \beta \log(w_s/w_u)_{ct} + \gamma \log(k/y)_{ct} + \alpha_c + \alpha_t + \varepsilon_{ct}, \tag{4}$$

where c indicates country and t indicates year. η_c and η_t are country and year fixed effects. To estimate equation (4), I must deal with the fact that capital intensity might be endogenous. For example, skill-biased technological change, which is unobserved,

[15] Berman et al. (1994) introduced this methodology to the literature of wage inequality.

[16] Ideally, I would estimate the skilled share equation using firm-level data from the United States. Unfortunately, I do not have access to such data.

could increase both capital intensity and the relative demand for skilled labor. To obtain an exogenous source of variation of capital intensity, I use lagged values of capital intensity as internal instruments.[17] I estimate equation (4) in first differences to eliminate the country fixed effect:

$$\Delta\mathcal{S}_{ct} = \beta\Delta\log(w_s/w_u)_{ct} + \gamma\Delta\log(k/y)_{ct} + \Delta\alpha_t + \Delta\varepsilon_{ct}, \tag{5}$$

where Δ denotes the time difference operator. Next, I estimate equation (5) using GMM with the following moment conditions: $\mathbb{E}[z_{ct-j}\cdot\Delta\varepsilon_{ct}] = 0$ for $j \geq 2, t \geq 3$, where $z \equiv [\mathcal{S}, \log(w_s/w_u), \log(k/y)]$. The identification assumption is that the error term in equation (4) is not serially correlated and that the explanatory variables are weakly exogenous, i.e., uncorrelated with future realizations of the error term. Intuitively, I assume that capital intensity does not adjust to future technological shocks.[18]

Table 5 reports the estimates of equation (5) for each industry. Column (4) shows the capital-skill complementarity elasticity. Complementarity is statistically different from zero in all but two industries (hotels and real estate). Capital and skilled labor are relative complements in all industries except retail, education, and health. All manufacturing industries exhibit complementarity, which is intuitive, since unskilled workers tend to perform more routine tasks in manufacturing. The industry with strongest complementarity is post and telecommunications. Telecommunications is an industry highly intensive in skilled labor, where computer capital strongly complements skilled workers in doing non-routine tasks.

[Include Table 5 here]

Remarks. Figure 4 presents a scatter plot with the financial dependence and complementarity indices. The indices are only weakly positively correlated. This is important for identification, since it provides sufficient cross-industry variation across these two

[17] Duffy et al. (2004) use the same instrumental variable approach to estimate capital-skill complementarity in aggregate production functions.

[18] Even if there is some anticipation and adjustment, for identification I only need to assume that the degree of anticipation does not vary systematically across industries.

dimensions. Chemicals and telecommunications are examples of industries that exhibit both high external dependence and strong complementarity. Capital account liberalization should have a strong effect on inequality in these industries.

[Include Figure 4 here]

I estimate the complementarity index using the complete sample period in order to maximize the sample size per estimation. However, if I only use pre-liberalization data, I could obtain a more exogenous measure. In Section 7, I show that the results are robust to using a complementarity index estimated with pre-liberalization data or pre-1990 data.

Finally, note that I am using a proxy for the true values of sectoral financial dependence and capital-skill complementarity. On the one hand, using a proxy introduces measurement error that results in attenuation bias. On the other hand, if the sectoral characteristic in the benchmark country is a better proxy in similar countries, there could be an amplification bias (Ciccone and Papaioannou, 2011). The threat of this bias is lower in my context since only one of the two sectoral characteristics is based on a benchmark country.

5 Main results

5.1 Aggregate results

First, I use country data and analyze the effect of capital account liberalization on aggregate wage inequality:

$$\log(w_s/w_u)_{ct} = \beta_1 CA_{ct} + \beta_2 X_{ct} + \alpha_c + \alpha_t + \varepsilon_{ct},$$

where c denotes country and t denotes year. CA denotes the Chinn and Ito (2006) capital account liberalization index and X is a vector of time-varying country controls.[19] The specification includes a set of country fixed effects (α_c) and year fixed effects (α_t). Country fixed effects control for all time-invariant country characteristics and year fixed effects for global trends that affect all countries equally. ε is a disturbance term.

[19] The data on the controls comes from the World Bank's "World Development Indicators" (WDI).

I cluster standard errors at the country level, which controls for the within-country correlation across time (Bertrand et al., 2004).

The parameter of interest is β_1, which is identified from the variation in the timing of capital account reforms across countries. It estimates the before-after change in wage inequality in a country opening the capital account, relative to the before-after change in countries not changing capital account policy.

Table 6 reports the results. Column (1) estimates the effect without controls and columns (2)-(7) add controls sequentially. The effect is highly significant and stable across specifications. The coefficients of the control variables all exhibit the expected signs. I define capital account liberalization as one standard deviation increase in the Chinn and Ito openness index (1.4). According to the results of column (7), the preferred specification, opening the capital account increases wage inequality by roughly 4% (2.8*1.4), which is a sizable effect.

[Include Table 6 here]

5.2 Sectoral results

In order to identify the channel leading to higher inequality, I use sectoral data and explore how the effect varies across industries. I start by tracing the effect on sectoral capital stock per unit of skilled labor:

$$\log(k/s)_{cit} = \beta_1 CA_{ct} + \beta_2 CA_{ct} \cdot EFD_i + \alpha_{ct} + \alpha_{ci} + \alpha_{it} + \varepsilon_{cit},$$

where c denotes country, i denotes industry, and t denotes year. EFD_i denotes the external dependence index of industry i. The specification includes a full set of country-year (α_{ct}), country-industry (α_{ci}), and industry-year (α_{it}) fixed effects. Country-year effects control for country-specific time trends, country-industry effects control for country-specific industry characteristics, and industry-year effects control for industry-specific time trends. I cluster standard errors at the country level.[20]

The parameter of interest is β_2, which is identified from the within-country variation in external financial dependence across industries. It estimates the before-after change

[20] This corrects for within-country correlation across time and across industries. In Section 7, I show that the results are robust to clustering standard errors at different levels.

in wage inequality in industries with high external dependence in a country opening the capital account, relative to the before-after change in industries with low external dependence within the same country.

I report the results in Table 7. Each column constitutes a different set of fixed effects. Column (1) includes country-industry and industry-year fixed effects. The interaction term is significant at the 5% level. Column (2) includes country-year and country-industry fixed effects but excludes industry-year fixed effects. The coefficient is no longer significant.[21] This highlights the importance of controlling for industry-specific trends. Column (3), which is the preferred specification, includes the full set of fixed effects. The effect is statistically and economically significant. Capital liberalization increases the capital stock in industries that are highly dependent on external finance (75th percentile in the index) by 10% more than in industries with low dependence (25th percentile).[22]

[Include Table 7 here]

Next, I analyze the effect on sectoral wage inequality. I divide the sample into industries with an external dependence index above and below the median of the index across all industries. For each subset of industries, I estimate the following specification:

$$\log(w_s/w_u)_{cit} = \beta_1 CA_{ct} + \beta_2 CA_{ct} \cdot CSC_i + \alpha_{ct} + \alpha_{ci} + \alpha_{it} + \varepsilon_{cit},$$

where CSC_i denotes the capital-skill complementarity index of industry i. Table 8 reports the results. Panel A includes the sample of industries with dependence above the median and Panel B contains industries with dependence below the median. Within above-median dependence industries, liberalization increases wage inequality particularly in industries with strong complementarity. The double interaction term is significant across all specifications. The results of column (3) of Panel A show that capital account liberalization increases wage inequality in industries with strong complementarity (75th percentile in the index) by 3.5% more than in industries with weak

[21] The direct effect of capital account liberalization is absorbed by the country-year fixed effects in the specifications of columns (2) and (3).

[22] I calculate the differential effect as 9.1*1.4*[0.475-(-0.343)]=10.4.

complementarity (25th percentile).[23] Within below-median dependence industries, the effect does not vary with capital-skill complementarity (Panel B). This confirms that if the "capital effect" is absent, there is no "complementarity effect."

[Include Table 8 here]

As an alternative to splitting the sample, I pool all industries and estimate a triple difference-in-differences specification:

$$\begin{aligned}\log(w_s/w_u)_{cit} &= \beta_1 CA_{ct} + \beta_2 CA_{ct} \cdot CSC_i + \beta_3 CA_{ct} \cdot EFD_i + \beta_4 CA_{ct} \cdot CSC_i \cdot EFD_i \\ &+ \alpha_{ct} + \alpha_{ci} + \alpha_{it} + \varepsilon_{cit}\end{aligned}$$

The parameter of interest is β_4, which is identified from the within-country variation in both external dependence and complementarity across industries. The coefficients of the double interaction terms, unlike the triple interaction term, are not scale invariant. That is, they depend on the units in which the sectoral indices are measured. Table 9 reports the results. The triple interaction term is significant across all specifications. According to the results of column (3), capital account liberalization increases wage inequality in industries with high external dependence and strong complementarity (75th percentile in the product of both indices) by 2.5% more than in industries with low dependence and weak complementarity (25th percentile).[24]

[Include Table 9 here]

Finally, I provide a graphical depiction of the results by estimating the effects of capital liberalization on wage inequality by industry:

$$\log(w_s/w_u)_{cit} = \sum_i \delta_i CA_{ct} + \alpha_{ct} + \alpha_{ci} + \alpha_{it} + \varepsilon_{cit},$$

where δ_i is a dummy variable for each industry that is equal to one if the sector is i and zero otherwise. Figure 5 plots the estimated coefficients $\hat{\delta}_i$ against the product of the external dependence and complementarity indices. The figure shows that the linear functional form imposed in the previous specifications is a good approximation. It also shows that no particular sector drives the results.

[23] The differential effect is 6.6*1.4*[0.336-(-0.039)]=3.46.

[24] The differential effect is 13.6*1.4*[0.107-(-0.025)]=2.53.

[Include Figure 5 here]

6 Alternative explanations

In this Section, I rule out different explanations that might be driving the results.

6.1 Skilled-biased technological change

During the past few decades, there has been a worldwide shift towards production technologies that favor skilled over unskilled labor by increasing its relative productivity. This has increased the relative wage of skilled workers. Technological progress could be a confounding factor only if the timing of technological change coincides with the timing of capital account liberalization. This is unlikely, since the timing of capital account reforms varies substantially across countries, while technological change behaves like a global trend. If this trend varies across industries, it will be captured by the industry-year fixed effects.

Nevertheless, even if the timing coincides, technological change would threaten identification only if it increases inequality particularly in industries with high external dependence and strong capital-skill complementarity. However, this doesn't seem to be the case. I re-estimate equation (6) and explicitly control for technological progress and its interaction with the sectoral indices. I use a standard observable measure of technology: research and development as a fraction of GDP (Machin and Van Reenen, 1998)[25]. Table 10 reports the results. The triple interaction term of capital liberalization remains unchanged. On the other hand, the triple interaction term of technological progress is not statistically significant in none of the specifications.

[Include Table 10 here]

6.2 Trade liberalization

Another potential confounding factor is trade liberalization. According to the Stolper-Samuelson Theorem, trade opening increases the relative price of a country's abun-

[25]The R&D intensity data comes from the Organization for Economic Cooperation and Development's (OECD) "Main Science and Technology Indicators."

dant factor. Given that most countries in my sample are skill-abundant, simultaneous changes in trade policy might increase the relative wage of skilled labor. In addition, since reductions in trade costs make it cheaper to import capital equipment, trade openness can lead to higher wage inequality through capital deepening and capital-skill complementarity (Burstein et al., 2013; Parro, 2013).

Even though trade costs have decreased in the past few decades, the bulk of tariff and non-tariff reductions took place at least a decade before capital account liberalization (Wacziarg and Welch, 2008). Therefore, there seems to be a time lag between capital and trade reforms. Moreover, the effects of international trade are most concentrated in the manufacturing sector. Since my sample includes both manufacturing and non-manufacturing sectors, trade is less of a concern.

However, even if trade reforms took place at the same time as capital account reforms, there is an identification threat only if trade increases inequality particularly in industries with high external dependence and strong complementarity. For this, tariffs must have decreased particularly for this subset of industries. This was not the case. I assemble data on ad valorem tariffs for manufacturing sectors during the period 1988-2005.[26] I average the tariff data across all countries. According to the data, the machinery industry faced the second largest drop in tariffs. However, within manufacturing, machinery ranks last in the product of both sectoral indices. Likewise, the chemicals industry faced the second smallest drop in tariffs, but it ranks first in the product of the sectoral indices.

Finally, I re-estimate equation (6) and explicitly control for trade openness and its interaction with the two sectoral indices. I use two alternative measures of trade: the ratio of exports and imports to GDP and the simple mean applied tariff (from the WDI). I report the results in Table 11. The table shows that the triple interaction term of capital liberalization remains unchanged. However, the triple interaction term using either trade measure is not statistically significant.

[Include Table 11 here]

[26]The data comes from the United Nations Conference on Trade and Development (UNCTAD) "Trade Analysis and Information System" (TRAINS).

6.3 Compositional effects

The transmission mechanism that I highlight in this paper works at the firm level. An alternative story is that capital account liberalization induces skill-intensive firms to expand. This would change the within-industry composition of firms towards more skill-intensive firms, increasing the relative demand for skilled labor. This compositional effect could lead to higher wage inequality, even if firms do not exhibit capital-skill complementarity. As before, there would be a threat to identification only if this between-firm effect was particularly strong in industries with high external dependence and strong complementarity.

To disentangle the within-firm and between-firm channels, I would have to conduct the analysis at the firm level. Unfortunately, I do not have access to a cross-country firm-level dataset with wage inequality information. However, I do have access to a firm-level dataset for an emerging market, Chile, which contains wage information for production (i.e., blue-collar) and non-production (i.e., white-collar) workers. The dataset, called ENIA, is an annual survey covering all manufacturing firms in Chile.[27] I conduct a firm-level estimation to analyze the effect of capital account liberalization on within-firm outcomes:

$$\log(x)_{jit} = \beta CA_t \cdot Z_i + \alpha_j + \alpha_t + \varepsilon_{jit},$$

where x is either capital stock per unit of skilled labor or wage inequality of firm j in industry i in year t.[28] Z_i denotes either external financial dependence or capital-skill complementarity of industry i. The specification includes a set of firm fixed effects (α_j) and year fixed effects (α_t). Firm fixed effects control for all time-invariant company characteristics and allow to exploit within-firm variation across time. I cluster standard errors at the industry level.

Table 12 reports the results. In column (1), I exploit variation in external financial dependence across sectors and analyze the effect on the stock. I find that capital account liberalization increases within-firm capital stock particularly in externally dependent sectors. In column (2), I exploit cross-sectoral variation in complementarity

[27] ENIA stands for "Encuesta Nacional Industrial Anual." The data covers the period 1979-1998 and comes from Alvarez and Crespi (2007).

[28] I define wage inequality as the relative wage between non-production and production workers.

and estimate the effect on wage inequality.[29] According to the results, liberalization increases within-firm inequality particularly in sectors with strong complementarity. These findings support the within-firm channel.

[Include Table 12 here]

Finally, I analyze whether opening the capital account leads skill-intensive firms to expand. To measure skill intensity, I use the lagged ratio of skilled to unskilled labor. I estimate the effect on firm-level production:

$$\log(y)_{jit} = \beta CA_t \cdot (s/u)_{j,t-1} + \alpha_j + \alpha_t + \varepsilon_{jit}$$

Column (3) of Table 12 reports the results. The results show that skill-intensive firms do not expand more than non skill-intensive firms after capital account liberalization. This finding provides evidence against the between-firm composition channel.

7 Additional results

This section provides a series of additional results that further support the main findings of the paper.

7.1 Effect across demographic groups

Capital account liberalization affects wage inequality differentially across industries only if labor is imperfectly mobile across sectors. In the economy, there are some workers that are more mobile than others. As a result, the differential effect on relative wages should vary across different types of workers. I focus on two demographic characteristics: age and sex. Since young workers have accumulated less sector-specific human capital than older workers, they are more mobile across sectors. Regarding sex, existing evidence shows that men tend to be more mobile than women.

I divide the sample according to these demographic characteristics and re-estimate equation (6) for each group. Column (1) of Table 13 reports the results for young

[29] Since there is not sufficient cross-sectional variation in the external dependence and complementarity indices within manufacturing, I only exploit variation in complementarity across sectors.

workers, which are defined as workers under the age of 30. Column (2) reports the results for older workers, those above 30. According to the results, the effect is large and significant for older workers, but is not significant for young workers. Next, I divide the sample by sex. In column (3), I show the results for male workers and in column (4) for female workers. Although the effect is significant for both groups, the magnitude of the effect for women is more than twice the magnitude of the effect for men.

[Include Table 13 here]

7.2 Investor protection

Since opening the capital account alleviates financial frictions, the impact of liberalization should be larger in countries that have strong investor protection (Henry, 2007). In this section, I analyze whether the effect on wage inequality varies across countries with different degrees of investor protection.[30] I divide the sample into two groups, depending on whether the investor protection index is above or below the median of the index across countries. I then re-estimate equation (6) for each group of countries. I report the results in Table 14. The results show that while the effect on wage inequality is large and significant for above-median protection countries, the effect is not significant for below-median protection countries.

These results also help rule out alternative explanations for the increase in inequality. In particular, consider skilled-biased technological change or trade liberalization. Neither of these factors is expected to have a particularly strong effect on inequality in countries with strong investor protection. Since I find that the effect is increasing in investor protection, the possibility that these explanations are driving the results becomes even less likely.

[Include Table 14 here]

[30] I measure country investor protection with the index developed by the "Doing Business" project of the World Bank.

7.3 Emerging markets

This paper focuses on industrialized countries since they have sectoral data on wage inequality. Nevertheless, it is interesting to understand whether the results extend to emerging markets. While I do not have wage inequality data for emerging markets across time, I can construct an indirect measure of inequality. The UNIDO dataset provides sectoral information on average wages.[31] I assume that industries that pay higher wages employ more skilled workers than those with lower wages. For a given country-year observation, I rank wages across industries from highest to lowest. I define wage inequality as the ratio between the wages of the industry in the 75th percentile of this distribution to the one in the 25th percentile.

In Figure 6, I plot the cumulative change in capital account openness against the cumulative change in the indirect measure of wage inequality for 15 emerging markets during 1975-2005. The Figure shows a positive relationship between the change in capital openness and the change in inequality. This evidence suggests that the effect highlighted in the paper extends to emerging markets.

[Include Figure 6 here]

7.4 Robustness checks

Different capital openness measures. I show that the results are robust to using alternative capital account openness indicators. First, I use three *de jure* measures. The Quinn (1997) index scores the intensity of controls for capital account receipts and capital account payments separately. Abiad et al. (2010) take into account restrictions on capital inflows, capital outflows, and unification of the exchange rate system. Kaminsky and Schmukler (2008) create an index based on restrictions on borrowing abroad and the existence of multiple exchange rates. Finally, I use the *de facto* measure of financial integration developed by Lane and Milesi-Ferretti (2007), which equals the sum of foreign assets and liabilities as a fraction of GDP. Table 15 reports the results.

[31] The "United Nations Industrial Development Organization" (UNIDO) data is compiled by the Industrial Statistics Database (INDSTAT).

Each column shows the results for a different capital openness measure. The triple interaction term is statistically significant across all measures.

[Include Table 15 here]

Different measures of complementarity. In Section 4.3, I estimated the capital-skill complementarity index using data for the whole sample period 1975-2005. This allows me to maximize the number of observations per estimation. However, since the index is calculated with post-liberalization data, it is not fully exogenous. To address this issue, I provide two alternative measures of the complementarity index. First, I re-estimate the index using only pre-liberalization data. To obtain a precise pre and post sample, I define a liberalization event as an upward increment of one standard deviation or more of the Chinn and Ito (2006) openness measure. Second, I re-estimate the index using data previous to 1990. Table 16 shows the results of estimating equation (6) using these alternative indices. The results remain statistically significant.

[Include Table 16 here]

Others. Finally, in Table 17, I report the results of additional robustness checks. First, to have a more homogenous sample, I focus only on European countries (column (1)). The effect remains the same. Second, I focus further only on Western European countries (column (2)). Again, the effect remains unchanged. Next, since country-industry observations are highly persistent, I cluster standard errors at the country-industry level (column (3)). The significance remains the same. Alternatively, I cluster errors at the year level, since consistency might come from the time dimension (column (4)). The significance of the results increases. Lastly, I cluster in two dimensions, country and year, and find that the standard errors do not change (column (5)).

[Include Table 17 here]

8 Conclusions

Capital account liberalization affects both economic growth and income inequality. While economists have thoroughly studied the effects of liberalization on growth, the

potentially enormous impact of such a policy on inequality has been under appreciated. The three volumes of the *Handbook of Income Distribution*, for example, do not mention any possible connections between inequality and capital market reforms. In this paper, I provide evidence that capital account liberalization increases wage inequality in a sample of industrialized countries from 1975-2005.

I conduct a two-fold empirical strategy. First, I use aggregate data and exploit the variation in the timing of capital account reforms across countries. Second, I focus on a particular mechanism through which capital openness affects inequality. When capital and skilled labor are relative complements, the capital that financially constrained firms borrow from abroad increases the relative demand for skilled labor. This enlarges the wage gap between skilled and unskilled workers. The effect should be stronger for firms in industries that are heavily dependent on external finance and for firms in industries with strong complementarity between capital and skills. To identify the mechanism, I use sectoral data and exploit the variation in external financial dependence and complementarity across sectors.

I find that capital account liberalization increases aggregate wage inequality by 4.0%. Regarding the mechanism, I find that opening the capital account increases the capital stock in industries that are highly dependent on external finance by 10% more than in industries with low dependence. Within above-median dependence industries, liberalization increases wage inequality in industries with strong complementarity by 3.5% more than in industries with weak complementarity. Within below-median dependence industries, the effect on inequality does not vary with capital-skill complementarity.

This paper's findings can be extended in several directions. First, it would be interesting to conduct the analysis for emerging markets. Although I provide preliminary evidence suggesting that the effect extends to emerging markets, more work is needed. Second, since the mechanism examined in this paper works within a firm, it would be useful to conduct a firm-level analysis. I provide suggestive evidence, based on an emerging market, consistent with the within-firm channel. The next step could be to conduct the analysis using a cross-country firm-level dataset. Third, in this paper I analyze how capital account liberalization affects inequality through capital accu-

mulation. But liberalization could also boost total factor productivity and improve domestic institutions. Hence, it would be interesting to analyze the effect of liberalization on inequality beyond capital deepening. Finally, this paper focuses exclusively on one aspect of income inequality, the wage gap between skilled and unskilled workers. Capital market integration could also affect cross-dynastic income differences through human capital accumulation. Extending the analysis to other inequality dimensions represents an interesting direction for further research.

References

Abiad, A., Detragiache, E., and Tressel, T. (2010). A new database of financial reforms. *IMF Staff Papers*, 57(2):281–302.

Alvarez, R. and Crespi, G. (2007). Multinational firms and productivity catching-up: The case of Chilean manufacturing. *International Journal of Technological Learning, Innovation and Development*, 1(2):136–152.

Beck, T., Demirg-Kunt, A., and Levine, R. (2007). Finance, inequality and the poor. *Journal of Economic Growth*, 12(1):27–49.

Beck, T., Levine, R., and Levkov, A. (2010). Big bad banks? The winners and losers from bank deregulation in the United States. *Journal of Finance*, 65(5):1637–1667.

Bekaert, G., Harvey, C. R., and Lundblad, C. (2005). Does financial liberalization spur growth? *Journal of Financial Economics*, 77(1):3–55.

Benmelech, E., Bergman, N. K., and Seru, A. (2011). Financing labor. *NBER working paper*, 17144.

Berman, E., Bound, J., and Griliches, Z. (1994). Changes in the demand for skilled labor within US manufacturing: Evidence from the annual survey of manufacturers. *Quarterly Journal of Economics*, 109(2):367–397.

Bertrand, M., Duflo, E., and Mullainathan, S. (2004). How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics*, 119(1):249–275.

Bumann, S. and Lensink, R. (2012). Financial liberalization does not benefit them all. *Working Paper, University of Groningen.*

Burstein, A., Cravino, J., and Vogel, J. (2013). Importing skill-biased technology. *American Economic Journal: Macroeconomics*, 5(2):32–71.

Caselli, F. (2005). Accounting for cross-country income differences. In Aghion, P. and Durlauf, S., editors, *Handbook of Economic Growth*, volume 1 of *Handbook of Economic Growth*, chapter 9, pages 679–741. Elsevier.

Chari, A., Henry, P. B., and Sasson, D. (2012). Capital market integration and wages. *American Economic Journal: Macroeconomics*, 4(2):102–32.

Chinn, M. D. and Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, 8(1):163–192.

Ciccone, A. and Papaioannou, E. (2011). Estimating cross-industry cross-country models using benchmark industry characteristics. *Mimeo, London Business School*.

Das, M. and Mohapatra, S. (2003). Income inequality: The aftermath of stock market liberalization in emerging markets. *Journal of Empirical Finance*, 10(1-2):217–248.

Dickens, W. and Katz, L. F. (1987). Inter-industry wage differences and industry characteristics. In Lang, K. and Leonard, J., editors, *Unemployment and the Structure of Labor Markets*, pages 103–40. Basil Blackwell, Oxford.

Duffy, J., Papageorgiou, C., and Perez-Sebastian, F. (2004). Capital-skill complementarity? Evidence from a panel of countries. *Review of Economics and Statistics*, 86(1):327–344.

Goldberg, P. K. and Pavcnik, N. (2007). Distributional effects of globalization in developing countries. *Journal of Economic Literature*, 45(1):39–82.

Griliches, Z. (1969). Capital-skill complementarity. *Review of Economics and Statistics*, 51(4):465–468.

Gupta, N. and Yuan, K. (2009). On the growth effect of stock market liberalizations. *Review of Financial Studies*, 22(11):4715–4752.

Hamermesh, D. S. (1993). *Labor Demand*. Princeton University Press.

Henry, P. B. (2000). Do stock market liberalizations cause investment booms? *Journal of Financial Economics*, 58(1-2):301–334.

Henry, P. B. (2007). Capital account liberalization: Theory, evidence, and speculation. *Journal of Economic Literature*, 45(4):887–935.

Imbens, G. W. and Wooldridge, J. M. (2009). Recent developments in the econometrics of program evaluation. *Journal of Economic Literature*, 47(1):5–86.

Jerzmanowski, M. and Nabar, M. (2011). Financial development and wage inequality: Theory and evidence. *Economic Inquiry*, Forthcoming.

Kaminsky, G. L. and Schmukler, S. (2008). Short-run pain, long-run gain: Financial liberalization and stock market cycles. *Review of Finance*, 12(2):253–292.

Katz, L. F. and Autor, D. H. (1999). Changes in the wage structure and earnings inequality. volume 3 of *Handbook of Labor Economics*, chapter 26, pages 1463–1555.

Katz, L. F. and Murphy, K. M. (1992). Changes in relative wages, 1963-1987: Supply and demand factors. *Quarterly Journal of Economics*, 107(1):35–78.

Krueger, A. B. and Summers, L. H. (1987). Reflections on the inter-industry wage structure. In Lang, K. and Leonard, J., editors, *Unemployment and the Structure of Labor Markets*, pages 17–47. Basil Blackwell, Oxford.

Krusell, P., Ohanian, L. E., Rios-Rull, J.-V., and Violante, G. L. (2000). Capital-skill complementarity and inequality: A macroeconomic analysis. *Econometrica*, 68(5):1029–1053.

Lane, P. R. and 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.

Machin, S. and Van Reenen, J. (1998). Technology and changes in skill structure: Evidence from seven OECD countries. *Quarterly Journal of Economics*, 113(4):1215–1244.

Pagano, M. and Pica, G. (2012). Finance and employment. *Economic Policy*, 69(1):5–55.

Parro, F. (2013). Capital-skill complementarity and the skill premium in a quantitative model of trade. *American Economic Journal: Macroeconomics*, 5(2):72–117.

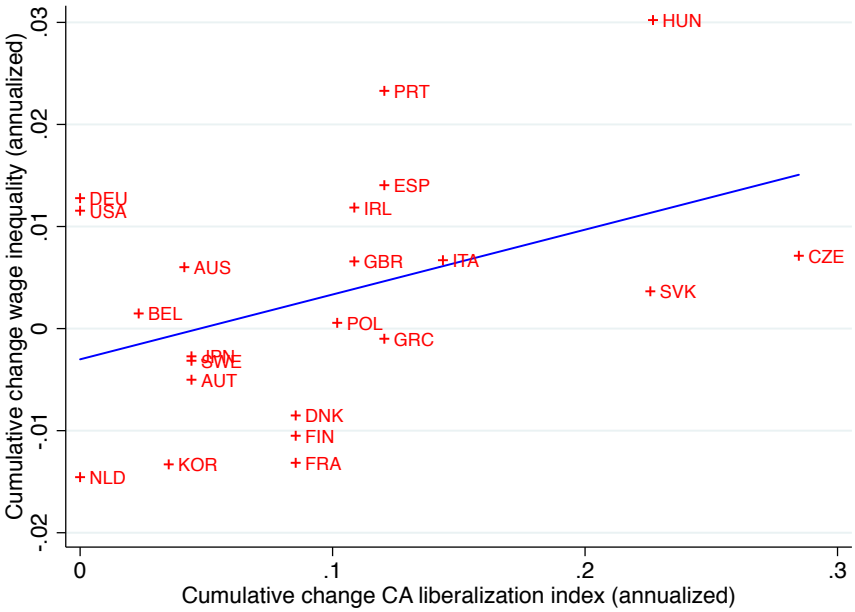
Quinn, D. P. (1997). The correlates of change in international financial regulation. *American Political Science Review*, 91(3):531–551.

Quinn, D. P. and Toyoda, A. M. (2008). Does capital account liberalization lead to growth? *Review of Financial Studies*, 21(3):1403–1449.

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

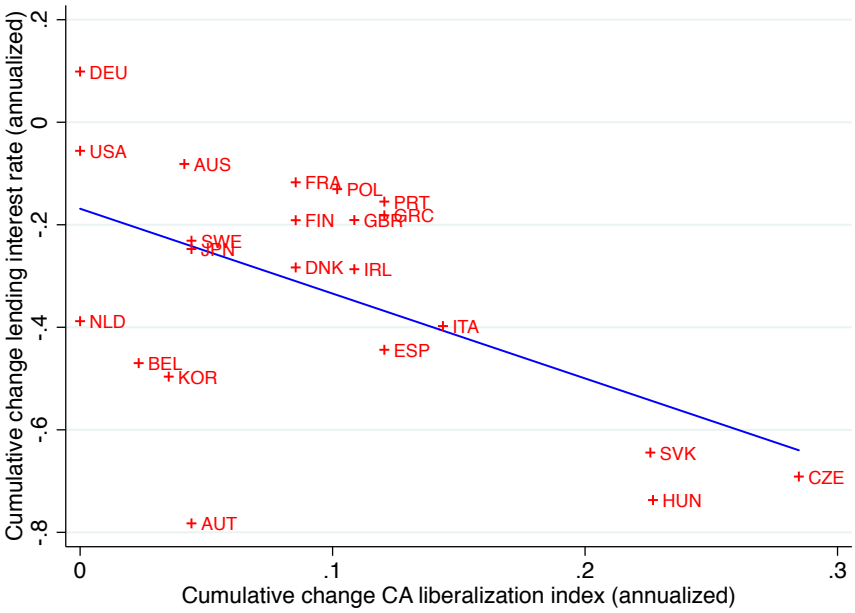
Wacziarg, R. and Welch, K. H. (2008). Trade liberalization and growth: New evidence. *World Bank Economic Review*, 22(2):187–231.

Figure 1: **Cumulative change in capital account openness and wage inequality**



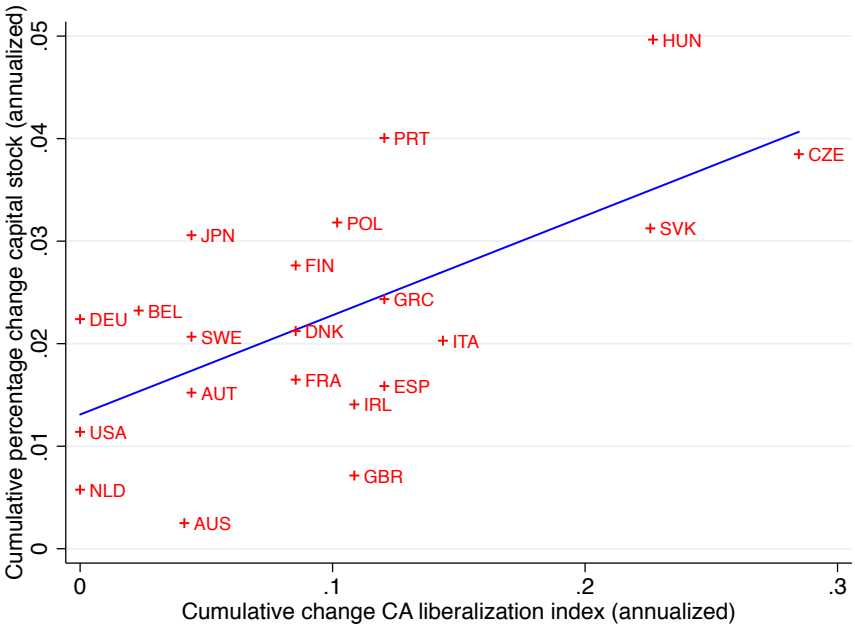
Notes: the scatter plot presents the relationship between the annualized cumulative change in capital account openness and the annualized cumulative change in wage inequality. The sample runs from 1975 and 2005 and includes 23 industrialized countries. Capital account openness is measured with the Chinn and Ito (2006) index. Wage inequality is defined as the relative wage between workers with college and high-school education. Sources: own calculations based on Chinn and Ito (2006) and EU-KLEMS.

Figure 2: **Cumulative change in capital account openness and lending interest rate**



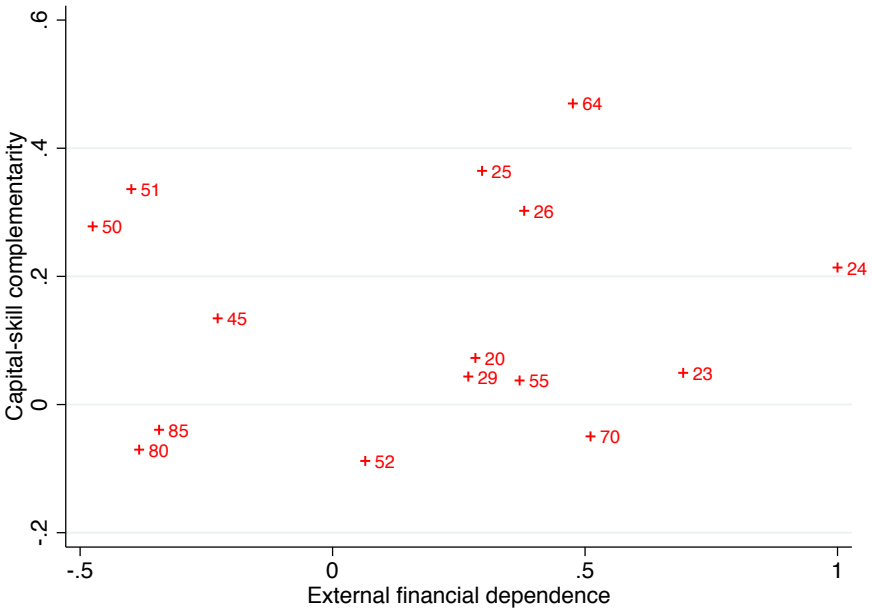
Notes: the scatter plot presents the relationship between the annualized cumulative change in capital account openness and the annualized cumulative change in the lending interest rate. The sample runs from 1975 and 2005 and includes 23 industrialized countries. Capital account openness is measured with the Chinn and Ito (2006) index. The lending rate is the nominal bank loan rate. Sources: own calculations based on Chinn and Ito (2006) and WDI.

Figure 3: **Cumulative change in capital account openness and stock of capital**



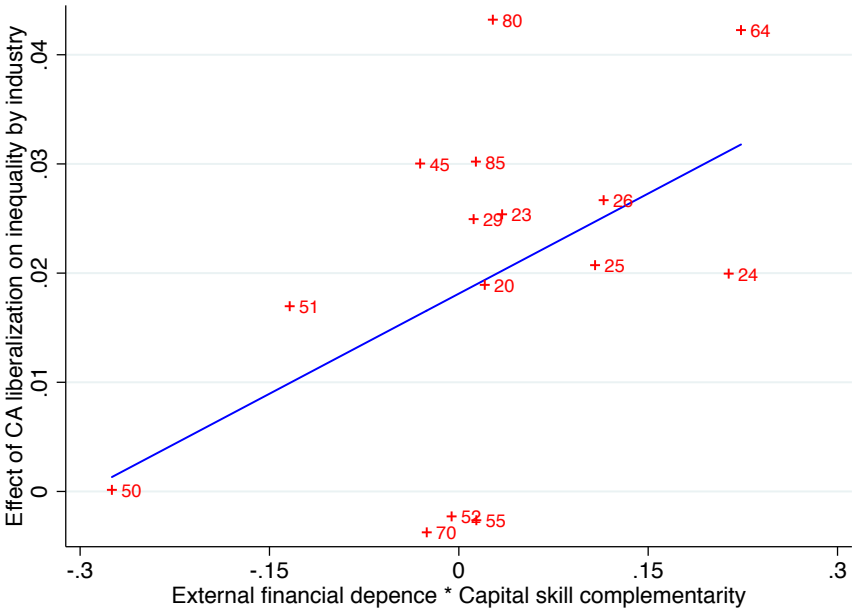
Notes: the scatter plot presents the relationship between the annualized cumulative change in capital account openness and the annualized cumulative percentage change in the aggregate capital stock per unit of skilled labor. The sample runs from 1975 and 2005 and includes 23 industrialized countries. Capital account openness is measured with the Chinn and Ito (2006) index. The capital stock is constructed using the perpetual inventory method. Sources: own calculations based on Chinn and Ito (2006) and Penn World Tables.

Figure 4: **External financial dependence and capital-skill complementarity indices**



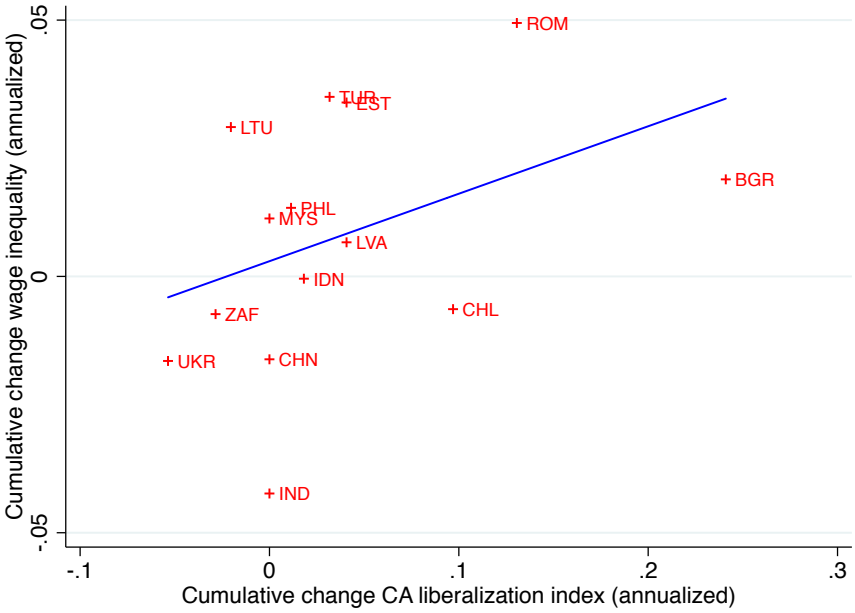
Notes: the scatter plot presents the relationship between the external financial dependence index and the capital-skill complementarity index. The sample includes 15 two-digit industries. External financial dependence is defined as the fraction of capital expenditures not financed by cash flow from operations (Rajan and Zingales, 1998) and is calculated using US publicly traded firms. Capital-skill complementarity is defined as the elasticity of the share of wages paid to skilled labor with respect to capital intensity (see equation (3)) and is estimated from a panel of countries and time. Sources: own calculations based on Compustat and EU-KLEMS.

Figure 5: **Effect of capital account liberalization on sectoral wage inequality by industry**



Notes: the scatter plot presents the relationship between the effect of capital account liberalization on wage inequality by industry and the product between the external financial dependance and capital-skill complementarity indices. The sample includes 15 two-digit industries. The effect of capital liberalization on industry inequality is computed from the estimated coefficients of equation (3). Sources: own calculations.

Figure 6: **Cumulative change in capital account openness and wage inequality in emerging markets**



Notes: the scatter plot presents the relationship between the annualized cumulative change in capital account openness and the annualized cumulative change in wage inequality. The sample runs from 1975 and 2005 and includes 15 emerging markets. Capital account openness is measured with the Chinn and Ito (2006) index. Wage inequality is defined as the ratio between the average wage of the industry lying at the 75th percentile of this distribution and the wage of the industry at the 25th percentile. Sources: own calculations based on Chinn and Ito (2006) and UNIDO.

Table 1: **Capital account liberalization index by country and decade**

	(1) Average 1970s	(2) Average 1980s	(3) Average 1990s	(4) Average 2000s	(5) Cumulative change (annualized)
Australia	-0.106	1.042	2.191	1.132	0.041
Austria	1.132	1.132	2.059	2.456	0.044
Belgium	1.016	0.521	2.218	2.191	0.023
Czech Republic	.	.	-0.106	1.808	0.285
Denmark	-0.106	0.221	2.376	2.456	0.085
Finland	0.885	1.132	2.059	2.456	0.085
France	-0.106	-0.212	1.819	2.456	0.085
Germany	2.456	2.456	2.456	2.456	0.000
Greece	-1.159	-1.159	0.022	2.105	0.121
Hungary	.	-1.856	-0.947	1.588	0.227
Ireland	-0.524	-0.106	1.555	2.456	0.109
Italy	-1.856	-0.456	1.819	2.456	0.144
Japan	1.185	2.297	2.323	2.456	0.044
Korea	-0.738	-0.738	-0.528	-0.106	0.035
Netherlands	.	2.456	2.456	2.456	0.000
Poland	.	-1.856	-1.297	-0.334	0.102
Portugal	-1.159	-0.949	1.422	2.456	0.121
Slovakia	.	.	-1.159	-0.275	0.226
Slovenia	.	.	-0.370	1.397	0.343
Spain	-0.528	-0.106	1.290	2.456	0.121
Sweden	1.132	1.132	1.794	2.456	0.044
United Kingdom	-0.363	2.297	2.456	2.456	0.109
United States	2.456	2.456	2.456	2.456	0.000

Notes: the table reports the evolution of capital account openness during 1975-2005 for the 23 industrialized countries included in the sample. Capital account openness is measured with the Chinn and Ito (2006) index. Columns (1)-(4) report the average of the index over the corresponding decade. Column (5) reports the annualized cumulative change of the index over the entire sample period. Sources: own calculations based on Chinn and Ito (2006).

Table 2: **Wage inequality by country and decade**

	(1) Average 1970s	(2) Average 1980s	(3) Average 1990s	(4) Average 2000s	(5) Cumulative change (annualized)
Australia	.	1.463	1.474	1.551	0.006
Austria	.	1.650	1.557	1.488	-0.005
Belgium	.	1.478	1.528	1.499	0.001
Czech Republic	.	.	2.239	2.283	0.007
Denmark	.	1.581	1.448	1.415	-0.009
Finland	1.870	1.697	1.550	1.565	-0.010
France	.	1.882	1.865	1.767	-0.013
Germany	.	.	1.748	1.819	0.013
Greece	.	.	1.570	1.527	-0.001
Hungary	.	.	2.315	2.477	0.030
Ireland	.	1.716	1.825	1.864	0.012
Italy	1.255	1.197	1.235	1.429	0.007
Japan	1.694	1.660	1.701	1.628	-0.003
Korea	2.014	1.962	1.632	1.526	-0.013
Netherlands	2.034	1.824	1.589	1.663	-0.015
Poland	.	.	1.573	1.546	0.001
Portugal	.	.	2.243	2.392	0.023
Slovakia	.	.	1.796	1.776	0.004
Slovenia	.	.	2.102	2.134	-0.010
Spain	.	1.435	1.615	1.670	0.014
Sweden	.	1.538	1.543	1.465	-0.003
United Kingdom	1.836	1.861	1.834	1.950	0.005
United States	1.503	1.582	1.745	1.860	0.012

Notes: the table reports the evolution of wage inequality during 1975-2005 for the 23 industrialized countries included in the sample. Wage inequality is defined as the relative wage between workers with college and high-school education. Columns (1)-(4) report the average wage inequality over the corresponding decade. Column (5) reports the annualized cumulative change of wage inequality over the entire sample period. Sources: own calculations based on EU-KLEMS.

Table 3: **Wage inequality by country, industry, and decade**

	(1) Average 1970s manuf.	(2) Average 1980s manuf.	(3) Average 1990s manuf.	(4) Average 2000s manuf.	(5) Cumulative Change (ann.)	(6) Average 1970s non-manuf.	(7) Average 1980s non-manuf.	(8) Average 1990s non-manuf.	(9) Average 2000s non-manuf.	(10) Cumulative Change (ann.)
Australia	.	1.396	1.321	1.376	-0.001	.	1.328	1.342	1.377	0.010
Austria	.	1.499	1.464	1.446	-0.004	.	1.718	1.605	1.482	-0.007
Belgium	.	1.583	1.667	1.643	0.006	.	1.765	1.723	1.679	-0.000
Czech Republic	.	.	2.781	2.790	0.010	.	.	2.203	2.238	0.004
Denmark	.	1.516	1.289	1.284	-0.009	.	1.659	1.475	1.444	-0.009
Finland	1.813	1.680	1.586	1.682	-0.004	1.806	1.616	1.445	1.461	-0.014
France	.	1.777	1.921	1.733	-0.014	.	1.907	2.012	1.967	-0.017
Germany	.	.	1.808	1.886	0.019	.	.	1.738	1.769	0.014
Greece	.	.	1.601	1.514	-0.007	.	.	1.541	1.438	-0.009
Hungary	.	.	2.674	2.695	0.004	.	.	2.388	2.426	0.009
Ireland	.	1.830	1.851	1.813	0.006	.	1.826	1.835	1.800	0.009
Italy	1.317	1.115	1.074	1.103	-0.010	1.165	1.104	1.068	1.062	-0.005
Japan	1.442	1.439	1.428	1.394	-0.001	1.446	1.457	1.472	1.429	-0.002
Korea	1.901	1.709	1.476	1.486	-0.009	2.002	1.761	1.438	1.435	-0.016
Netherlands	2.024	1.875	1.653	1.754	-0.008	2.044	1.927	1.762	1.811	-0.008
Poland	.	.	1.610	1.683	0.009	.	.	1.600	1.632	0.006
Portugal	.	.	2.242	2.167	-0.010	.	.	2.262	2.161	-0.009
Slovakia	.	.	1.942	1.979	0.013	.	.	1.830	1.839	0.003
Slovenia	.	.	2.288	2.183	-0.034	.	.	2.260	2.296	-0.013
Spain	.	1.575	1.691	1.613	0.004	.	1.474	1.589	1.565	0.005
Sweden	.	1.630	1.645	1.463	-0.007	.	1.612	1.621	1.482	-0.009
United Kingdom	1.852	1.883	1.985	2.082	-0.002	1.740	1.749	1.720	1.850	0.004
United States	1.526	1.533	1.644	1.770	0.006	1.479	1.522	1.663	1.764	0.012

Notes: the table reports the evolution of wage inequality during the period 1975-2005 for the 23 industrialized countries included in the sample, divided into manufacturing and non-manufacturing industries. Wage inequality is defined as the relative wage between workers with college and high-school education. Columns (1)-(5) report the statistics for manufacturing industries and columns (6)-(7) for non-manufacturing industries. Columns (1)-(4) [(6)-(10)] report the average wage inequality over the corresponding decade. Column (5) [(10)] reports the annualized cumulative change of wage inequality over the entire sample period. Sources: own calculations based on EU-KLEMS.

Table 4: **External financial dependence index**

Industry name	(1) Industry ISIC code	(2) Ext. financial Dependence
Manufacturing of wood	20	0.283
Manufacturing of coke, refined petroleum	23	0.694
Manufacturing of chemicals	24	1.000
Manufacturing of rubber, plastics	25	0.296
Manuf. of other non-metallic mineral products	26	0.380
Manuf. of machinery and equipment	29	0.269
Construction	45	-0.228
Sale, maintenance, repair motor vehicles	50	-0.475
Wholesale trade and commission trade	51	-0.399
Retail trade, except of motor vehicles	52	0.065
Hotels and restaurants	55	0.370
Post and telecommunications	64	0.476
Real estate activities	70	0.511
Education	80	-0.383
Health and social work	85	-0.344

Notes: the table reports the external financial dependence index for the 15 two-digit industries in the sample. External financial dependence 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. Sources: own calculations based on Compustat.

Table 5: **Estimation results of the capital-skill complementarity index**

Industry name	(1) Industry ISIC code	(2) Coeff. Beta	(3) Std. dev. Beta	(4) Coeff. Gamma	(5) Std. dev. Gamma	(6) Number Observations
Manufacturing of wood	20	0.522***	0.067	0.073**	0.034	303
Manufacturing of coke, refined petroleum	23	1.189***	0.094	0.049***	0.015	303
Manufacturing of chemicals	24	1.305***	0.078	0.214***	0.041	303
Manufacturing of rubber, plastics	25	0.288***	0.086	0.365***	0.036	303
Manuf. of other non-metallic mineral products	26	0.839***	0.099	0.302***	0.035	303
Manuf. of machinery and equipment	29	0.606***	0.082	0.044*	0.023	303
Construction	45	1.231***	0.114	0.134***	0.036	303
Sale, maintenance, repair motor vehicles	50	0.279***	0.03	0.378***	0.024	303
Wholesale trade and commission trade	51	1.895***	0.086	0.336***	0.039	303
Retail trade, except of motor vehicles	52	2.258***	0.074	-0.088***	0.032	303
Hotels and restaurants	55	1.287***	0.058	0.037	0.041	303
Post and telecommunications	64	1.192***	0.079	0.470***	0.04	303
Real estate activities	70	1.755***	0.050	-0.05	0.036	303
Education	80	0.766***	0.053	-0.070***	0.013	303
Health and social work	85	0.696***	0.061	-0.039*	0.021	303

Notes: the table reports the estimates of the skilled labor share equation (3) for each of the 15 two-digit industries in the sample. Columns (2) and (3) report the coefficient and standard deviation of the elasticity of the share of wages paid to skilled labor with respect to relative wages. Columns (4) and (5) report the coefficient and standard deviation of the elasticity of the share of wages paid to skilled labor with respect to capital intensity. The coefficient of column (4) corresponds to the capital-skill complementarity index. Standard errors are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%. Sources: own calculations based on EU-KLEMS.

Table 6: **Effect of capital account liberalization on aggregate wage inequality**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CA Liberalization	0.023***	0.022***	0.022***	0.018**	0.025***	0.020***	0.028***
	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)
Log relative supply		-0.178***	-0.178***	-0.208***	-0.249***	-0.256***	-0.245***
		(0.037)	(0.037)	(0.041)	(0.046)	(0.041)	(0.039)
Trade openness			0.000	0.000	-0.001	-0.001	-0.000
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Inflation				-0.003	-0.010	-0.001	-0.011*
				(0.008)	(0.007)	(0.007)	(0.006)
Gov to GDP					-0.025***	-0.028***	-0.026***
					(0.005)	(0.005)	(0.004)
Log GDP per capita						-0.410***	-0.432***
						(0.048)	(0.043)
Credit to GDP							0.002***
							(0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	503	503	503	478	478	478	474
R-squared	0.871	0.879	0.879	0.880	0.888	0.908	0.918

Notes: the table reports the estimates of the effect of capital account liberalization on aggregate wage inequality. Column (1) estimates the effect without controls and columns (2)-(7) add controls sequentially. Relative supply is defined as the ratio between hours by skilled and unskilled workers, trade openness is the sum of exports and imports to GDP, inflation is the percentage change in the price index, gov to GDP is government expenditure to GDP, GDP per capita is measured in PPP, credit to GDP is domestic credit to private sector to GDP. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 7: **Effect of capital account liberalization on sectoral capital stock**

	(1)	(2)	(3)
CA Liberalization	-0.016		
	(0.042)		
CA Liberalization * EFD	0.091**	0.041	0.091**
	(0.034)	(0.034)	(0.036)
C-Y fixed effects	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes
Observations	4,695	4,695	4,695
R-squared	0.979	0.984	0.986

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral capital stock per unit of skilled labor for different fixed effect specifications. Column (1) includes country-industry and industry-year fixed effects, column (2) includes country-year and country-industry fixed effects, column (3) includes country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 8: **Effect of capital account liberalization on sectoral wage inequality for industries with different financial dependence**

	(1)	(2)	(3)
	A. Above-median dependence industries		
CA Liberalization	-0.018		
	(0.018)		
CA Liberalization * CSC	0.066**	0.070**	0.066**
	(0.028)	(0.030)	(0.030)
C-Y fixed effects	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes
Observations	4,024	4,024	4,024
R-squared	0.892	0.947	0.952
	B. Below-median dependence industries		
CA Liberalization	0.000		
	(0.010)		
CA Liberalization * CSC	-0.031	-0.029	-0.031
	(0.026)	(0.018)	(0.028)
C-Y fixed effects	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes
Observations	3,521	3,521	3,521
R-squared	0.899	0.939	0.943

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality for different fixed effect specifications. Panel A includes above-median dependence industries and Panel B below-median dependence industries. Column (1) includes country-industry and industry-year fixed effects, column (2) includes country-year and country-industry fixed effects, column (3) includes country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 9: **Effect of capital account liberalization on sectoral wage inequality**

	(1)	(2)	(3)
CA Liberalization	-0.004		
	(0.011)		
CA Liberalization * EFD	-0.029	-0.034*	-0.029
	(0.020)	(0.019)	(0.021)
CA Liberalization * CSC	0.008	0.010	0.008
	(0.019)	(0.016)	(0.019)
CA Liberalization * EFD * CSC	0.136**	0.138***	0.136**
	(0.055)	(0.048)	(0.057)
C-Y fixed effects	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes
Observations	7,545	7,545	7,545
R-squared	0.896	0.937	0.942

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality for different fixed effect specifications. Column (1) includes country-industry and industry-year fixed effects, column (2) includes country-year and country-industry fixed effects, column (3) includes country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 10: **Capital account liberalization, sectoral wage inequality, and technological change**

	(1)	(2)	(3)
CA Liberalization	-0.003		
	(0.007)		
CA Liberalization * EFD	-0.027	-0.030	-0.027
	(0.019)	(0.021)	(0.020)
CA Liberalization * CSC	0.004	0.011	0.004
	(0.018)	(0.023)	(0.019)
CA Liberalization * EFD * CSC	0.116**	0.118***	0.116**
	(0.043)	(0.040)	(0.045)
R&D to GDP	-0.048		
	(0.048)		
R&D to GDP * EFD	0.065	0.001	0.065
	(0.090)	(0.021)	(0.093)
R&D to GDP * CSC	-0.204***	-0.024	-0.204***
	(0.070)	(0.034)	(0.072)
R&D to GDP * EFD * CSC	-0.110	-0.027	-0.110
	(0.209)	(0.112)	(0.216)
C-Y fixed effects	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes
Observations	6,210	6,210	6,210
R-squared	0.924	0.946	0.951

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality controlling for skilled-biased technological change. Technological change is measured as the ratio of research and development to GDP. Column (1) includes country-industry and industry-year fixed effects, column (2) includes country-year and country-industry fixed effects, column (3) includes country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence, CSC stands for capital-skill complementarity, and R&D stands for research and development. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 11: **Capital account liberalization, sectoral wage inequality, and trade liberalization**

	(1)	(2)	(3)	(4)	(5)	(6)
	Trade openness			**Average tariff**		
CA Liberalization	-0.002			0.001		
	(0.013)			(0.008)		
CA Liberalization * EFD	-0.024	-0.026	-0.024	-0.020	-0.024*	-0.020
	(0.021)	(0.018)	(0.022)	(0.014)	(0.014)	(0.015)
CA Liberalization * CSC	0.018	0.003	0.018	-0.002	-0.008	-0.002
	(0.024)	(0.026)	(0.025)	(0.029)	(0.032)	(0.030)
CA Liberalization * EFD * CSC	0.141**	0.123*	0.141**	0.091*	0.083	0.091*
	(0.062)	(0.061)	(0.065)	(0.050)	(0.062)	(0.052)
Trade openness	0.001					
	(0.001)					
Trade openness * EFD	0.000	-0.000	0.000			
	(0.001)	(0.001)	(0.001)			
Trade openness * CSC	-0.001	0.000	-0.001			
	(0.001)	(0.001)	(0.001)			
Trade openness * EFD * CSC	-0.004	-0.002	-0.004			
	(0.004)	(0.003)	(0.004)			
Average tariff				0.006		
				(0.003)		
Average tariff * EFD				0.001	0.002	0.001
				(0.004)	(0.003)	(0.004)
Average tariff * CSC				0.002	-0.000	0.002
				(0.004)	(0.004)	(0.004)
Average tariff * EFD * CSC				-0.007	0.000	-0.007
				(0.007)	(0.010)	(0.007)
C-Y fixed effects	No	Yes	Yes	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes	Yes	No	Yes
Observations	5,820	5,820	5,820	4,545	4,545	4,545
R-squared	0.898	0.942	0.946	0.928	0.950	0.953

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality controlling for trade liberalization. Columns (1)-(3) measure trade as the ratio of exports and imports to GDP, and columns (4)-(6) measures trade as the average import tariff. Column (1) includes country-industry and industry-year fixed effects, column (2) includes country-year and country-industry fixed effects, column (3) includes country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 12: **Capital account liberalization and wage inequality, firm-level evidence**

	(1) Dependent Variable: **Capital**	(2) Dependent Variable: **Inequality**	(3) Dependent Variable: **Production**
CA Liberalization * EFD	0.060*		
	(0.034)		
CA Liberalization * CSC		0.148**	
		(0.072)	
CA Liberalization * Skill intensity(-1)			0.002
			(0.002)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	14,217	13,321	11,692
R-squared	0.850	0.627	0.954

Notes: the table reports the estimates of the effect of capital account liberalization on firm-level outcomes in Chile. The firm-level data comes from ENIA. The dependent variables of columns (1), (2), and (3) are capital stock per unit of skilled labor, wage inequality, and production. EFD stands for external financial dependence, CSC stands for capital-skill complementarity, and skill intensity(-1) stands for lagged ratio of skilled to unskilled labor. All specifications include firm and year fixed effects. Standard errors in parentheses are clustered at the industry level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 13: **Capital account liberalization and sectoral wage inequality, different demographic groups**

	(1)	(2)	(3)	(4)
	Effect by age		**Effect by sex**	
	Young Workers	Old Workers	Male Workers	Female Workers
CA Liberalization * EFD	0.005	-0.043	-0.036*	-0.076*
	(0.018)	(0.027)	(0.020)	(0.045)
CA Liberalization * CSC	0.063**	-0.015	0.007	-0.157**
	(0.026)	(0.017)	(0.024)	(0.068)
CA Liberalization * EFD * CSC	-0.013	0.196**	0.170**	0.353**
	(0.083)	(0.088)	(0.072)	(0.171)
C-Y fixed effects	Yes	Yes	Yes	Yes
C-I fixed effects	Yes	Yes	Yes	Yes
I-Y fixed effects	Yes	Yes	Yes	Yes
Observations	6,273	6,288	6,299	6,274
R-squared	0.920	0.928	0.928	0.973

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality for different demographic groups. Columns (1)-(2) divide the sample by age and columns (3)-(4) by sex. Column (1) includes workers younger than 30 and column (2) workers older than 30. Column (3) includes male workers and column (4) female workers. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. All specifications include country-year, country-industry, and industry-year fixed effects. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 14: **Capital account liberalization and sectoral wage inequality, different investor protection**

	(1)	(2)	(3)	(4)	(5)	(6)
	Above-median protection countries			**Below-median protection countries**		
CA Liberalization	-0.010			0.003		
	(0.018)			(0.009)		
CA Liberalization * EFD	-0.047	-0.052*	-0.047	-0.008	-0.007	-0.008
	(0.030)	(0.025)	(0.031)	(0.009)	(0.010)	(0.009)
CA Liberalization * CSC	0.006	0.009	0.006	0.015	0.011	0.015
	(0.032)	(0.026)	(0.033)	(0.012)	(0.014)	(0.013)
CA Liberalization * EFD * CSC	0.177**	0.197***	0.177**	0.095	0.050	0.095
	(0.072)	(0.054)	(0.074)	(0.054)	(0.042)	(0.056)
C-Y fixed effects	No	Yes	Yes	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes	Yes	No	Yes
Observations	4,275	4,275	4,275	3,270	3,270	3,270
R-squared	0.881	0.925	0.932	0.932	0.957	0.965

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality for countries with different degrees of investor protection. The data on investor protection comes from the "Doing Business" project of the World Bank. Columns (1)-(3) include above-median protection countries and columns (4)-(6) below-median protection countries. Columns (1) and (4) include country-industry and industry-year fixed effects, columns (2) and (5) include country-year and country-industry fixed effects, columns (3) and (6) include country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 15: **Capital account liberalization and sectoral wage inequality, different capital openness measures**

	(1) Quinn	(2) Abiad et al.	(3) Kaminsky-Reinhart	(4) Lane-Milesi
CA Liberalization * EFD	-0.150**	-0.028*	-0.045**	-0.010**
	(0.067)	(0.016)	(0.021)	(0.005)
CA Liberalization * CSC	-0.023	-0.018	0.003	0.006
	(0.103)	(0.019)	(0.031)	(0.009)
CA Liberalization * EFD * CSC	0.558**	0.120*	0.177**	0.035*
	(0.266)	(0.067)	(0.079)	(0.020)
C-Y fixed effects	Yes	Yes	Yes	Yes
C-I fixed effects	Yes	Yes	Yes	Yes
I-Y fixed effects	Yes	Yes	Yes	Yes
Observations	6,900	6,825	5,040	7,620
R-squared	0.936	0.944	0.910	0.936

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality for different measures of capital openness. Column (1) uses the Quinn (1997) index, column (2) the Abiad et al. (2010) index, column (3) the Kaminsky and Schmukler (2008) index, and column (4) the Lane and Milesi-Ferretti (2007) index. All specifications include country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 16: **Capital account liberalization and sectoral wage inequality, different complementarity measures**

	(1)	(2)	(3)	(4)	(5)	(6)
	CSC estimated with pre-liberalization data			**CSC estimated with pre-1990 data**		
CA Liberalization	-0.006			-0.008		
	(0.004)			(0.006)		
CA Liberalization * EFD	-0.005	-0.010	-0.005	-0.019	-0.024*	-0.019
	(0.003)	(0.008)	(0.003)	(0.017)	(0.012)	(0.014)
CA Liberalization * CSC	-0.000	0.001	-0.000	0.022	0.029*	0.022
	(0.012)	(0.030)	(0.012)	(0.023)	(0.016)	(0.017)
CA Liberalization * EFD * CSC	0.099***	0.130*	0.099***	0.074	0.067*	0.074*
	(0.029)	(0.073)	(0.030)	(0.053)	(0.038)	(0.041)
C-Y fixed effects	No	Yes	Yes	No	Yes	Yes
C-I fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
I-Y fixed effects	Yes	No	Yes	Yes	No	Yes
Observations	7,545	7,545	7,545	7,545	7,545	7,545
R-squared	0.895	0.937	0.941	0.895	0.936	0.941

Notes: the table reports the estimates of the effect of capital account liberalization on sectoral wage inequality for different measures of the capital-skill complementarity index. Columns (1)-(3) use an index estimated using pre-liberalization data and columns (4)-(6) use an index estimated using pre-1990 data. Columns (1) and (4) include country-industry and industry-year fixed effects, columns (2) and (5) include country-year and country-industry fixed effects, columns (3) and (6) include country-year, country-industry, and industry-year fixed effects. EFD stands for external financial dependence and CSC stands for capital-skill complementarity. Standard errors in parentheses are clustered at the country level. ***, **, * denote statistical significance at 1%, 5%, and 10%.

Table 17: **Capital account liberalization and sectoral wage inequality, robustness checks**

	(1) Europe countries	(2) W-Europe countries	(3) Cluster C-I	(4) Cluster year	(5) Cluster two-way
CA Liberalization * EFD	-0.022	-0.029	-0.029*	-0.029***	-0.029
	(0.021)	(0.028)	(0.015)	(0.005)	(0.025)
CA Liberalization * CSC	-0.002	0.001	0.008	0.008	0.008
	(0.023)	(0.026)	(0.020)	(0.006)	(0.024)
CA Liberalization * EFD * CSC	0.140*	0.163*	0.136**	0.136***	0.136**
	(0.069)	(0.084)	(0.054)	(0.020)	(0.065)
C-Y fixed effects	Yes	Yes	Yes	Yes	Yes
C-I fixed effects	Yes	Yes	Yes	Yes	Yes
I-Y fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	5,790	5,010	7,545	7,545	7,545
R-squared	0.944	0.928	0.942	0.942	0.942

Notes: the table reports robustness checks for the estimates of the effect of capital account liberalization on sectoral wage inequality. Column (1) includes only European countries, column (2) includes only Western European countries, column (3) clusters standard errors at the country-industry level, column (4) clusters standard errors at the year level, and column (5) uses two-way clustering at the country and year level. All specifications include country-year, country-industry, and industry-year fixed effects. Standard errors are in parentheses. ***, **, * denote statistical significance at 1%, 5%, and 10%.