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Investor Sentiment and Employment

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Investor Sentiment and Employment*

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Abstract

We find that investor sentiment should affect a firm's employment policy in a world with moral hazard and noise traders. Consistent with the model's predictions, we show that higher sentiment among US investors leads to: (1) higher employment growth worldwide; (2) lower labor productivity, as the growth in employment is not matched by real value added growth; and (3) positive wage growth in countries with a greater proportion of high-skill labor, but negative wage growth otherwise. We also find evidence that sentiment induces greater labor instability during financial crises, which sheds new light on the view that financial development has a "dark side". Overall, the results suggest that sentiment has real effects, especially in countries that attract more foreign direct investments from the US and that are perceived as more popular among US investors.

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1 Introduction

It is well known that financial development is positively correlated with a country's economic growth (King and Levine, 1993; Beck, Levine and Loayza, 2000a, 2000b; Demirg-Kunt and Levine, 2001). Especially for the industries that are most dependent on external finance, the services the financial sector provides are an essential catalyst of value added growth (Rajan and Zingales, 1998) and employment growth (Pagano and Pica, 2012). An important question that remains unanswered, however, is whether investor sentiment plays a role in this picture. In fact, recent research shows that sentiment affects firms' investments (Morck, Shleifer and Vishny, 1990; Chirinko and Schaller, 2001; Baker, Stein and Wurgler, 2003; Polk and Sapienza, 2009), capital structure (Baker and Wurgler, 2000) and stock prices (Baker and Wurgler, 2006, 2007), but it is not clear whether it also has an impact on employment. In this paper, we try to shed some light on this issue both theoretically and empirically.

To this purpose, we analyze the stock issue of a firm in a world with asymmetric information and two categories of investors, arbitrageurs and noise traders. We find that when the firm seeks equity financing, investor sentiment should affect a firm's employment policy. Consistent with the model's predictions, we show that higher investor sentiment in the US leads to: (1) higher employment growth worldwide; (2) lower labor productivity, as the growth in employment is not matched by real value added growth; and (3) positive wage growth in countries with a greater proportion of high-skill labor, but negative wage growth otherwise. We also find evidence that sentiment induces greater labor instability during financial crises, which sheds new light to the view that financial development has a "dark side". All the results are both statistically and economically significant.

The main intuition behind the mechanism is as follows. Following high investor sentiment among US investors, US firms issue more equity and increase their investments. Since part of these operations takes place outside the national boundaries, foreign countries also experience higher investments from the US and thereby higher employment growth. Note, however, that this additional hiring is inefficient as it is generated by sentiment-driven capital, rather than an improvement in the economic outlook or production technology. The main innovation of this paper therefore lies in the fact that this is, to the best of our knowledge, the first study that looks into the causal effects of investor sentiment on employment. In fact, previous literature finds correlation between these two measures but does not establish causality (McLean and Zhao, 2014).

We consider the economy from Pagano and Pica (2012), where a manager/entrepreneur needs to fund a project, but with two important differences: (1) the project is risky, with a binary outcome (repay or default); (2) we replace the banking sector with a stock market. The manager then launches an IPO and caters to a population of two categories of investors, arbitrageurs and noise traders. The difference between these two groups is that the arbitrageurs know the exact probability of default of the project, which allows them to correctly estimate the expected final cash flow from the stock. Noise traders instead are affected by sentiment and estimate the probability of default with a bias, which can be either positive or negative.

Neither arbitrageurs nor noise traders however can verify the firm's cash flow, which creates a moral hazard issue. In particular, the manager can extract private benefits by appropriating a proportion of the firm's cash flow. This proportion is in turn a decreasing function of the level of development of the financial system (Pagano and Pica, 2012), which encompasses features such as monitoring ability and legal protection of investors. Upon receiving the funding the manager hires new employees, starts production, extracts private benefits, pays the employees[1] and leaves the remainder to the shareholders.

Investors face transaction costs as in Hong and Sraer (2013). Therefore, optimal demand for the stock is an inverse function of the severity of transaction costs and a direct function of the difference between the subjective valuation of the firm's final cash flow and the current stock price. This implies that the equilibrium price of the stock is a weighted average of all individual valuations, where the weights are the relative sizes of the arbitrageur and noise trader populations. The effect of sentiment on the stock price then depends on the size of the noise trader cohort as well as the size of noise traders' bias in their estimate of their final cash flow.

Note that in this framework the labor market equilibrium also depends on investor sentiment. In fact, optimal labor demand is a function of the firm's technology, the project's probability of default and the amount of funding the firm is able to raise on the stock market. Then, when noise traders are affected by positive sentiment, the firm hires more workers than it should and ends up with an inefficient level of employment. We call this phenomenon sentiment-driven over-hiring.

Next, we extend the analysis to a framework with two types of industry and n countries. Within each country, industries can hire either high-skill or low-skill workers and therefore have either high or low productivity respectively. We assume workers face high switching costs to move across the

[1] As insiders, employees can observe cash flows.

two industries (such as e.g. training), so the two labor markets are essentially separate with two different market clearing wages. In particular, the high productivity industry pays a wage premium, due to the higher cost of entry.

On the other hand, countries with higher financial development pay higher wages. Therefore, the optimal hiring strategy for a high-productivity firm is to seek high-skill labor in countries that feature: (1) lower financial development; and (2) higher elasticity of labor supply in the high-productivity industry, i.e. a greater net supply of high-skill labor. A symmetrical argument applies to low-productivity firms.

Note that sentiment driven over-hiring can have an amplified effect in this setting. In the presence of positive investor sentiment in the local stock market, the firm finds it optimal to increase its investments and hire new labor. But as long as the firm carries out part of its operations abroad, its decisions have an impact on employment and wages in foreign countries too. Therefore, local sentiment can have a global impact.

In order to test the main predictions from the model, we study the effects of US investor sentiment on labor markets worldwide. There are three main reasons why we choose the US as our reference country: (1) it represents the largest and one of most financially developed economies, (2) its firms typically carry out a nontrivial part of their operations abroad; (3) it is essentially the only country for which a widely accepted measure of investor sentiment is available (Baker and Wurgler, 2006, 2007; Baker, Wurgler and Yuan, 2012).

To analyze the labor market, we consider a large panel of non-US countries from the Unido Indstat-3 2006 database[2], which spans the period 1970-2003. The dataset provides annual country-sector statistics on the growth in employment, real wages and real value added. We only consider countries for which at least 10 observations are available, for a total of 113 countries and 28 industries.

We define investor sentiment as Baker and Wurgler's (2006) index, which captures changes in asset demand not explained by fundamentals. This measure is based on a number of sentiment proxies suggested in previous works, including: the closed-end fund discount; the NYSE share turnover; the number and average first-day returns on IPOs; the equity share in new issues; and the dividend premium. Baker and Wurgler carefully purge their index from economic fundamentals and convinc-

[2]United Nations Industrial Development Organization, Industrial Statistics. Following Pagano and Pica (2012) we consider the 2006 release, as the following ones have more missing observations.

ingly show that it has cross-sectional effects: when beginning-of-period proxies for sentiment are low, subsequent returns are relatively high for stocks that are harder to arbitrages and/or evaluate. This measure also grants us an important advantage in our setting: it is unlikely to suffer from reverse causality issues.

Our empirical methodology follows Rajan and Zingales (1998), but also includes a time dimension as in Pagano and Pica (2012). Therefore, our battery of controls includes a country's level of financial development; an industry's need for external finance; the lagged share of real value added, employment and real wages of any given country-industry; country-year and sector fixed effects. Standard errors are robust and clustered by country.

Consistent with the model predictions, we find that a one standard deviation increase in US investor sentiment in a given year is followed by a 3.29% increase in employment growth worldwide (t-stat 3.93). The effect is more pronounced for developing countries (4.05%, t-stat 2.79) than for developed countries (2.69%, t-stat 4.94). This is consistent with the model's prediction that following high sentiment, countries with higher financial development have an incentive to hire workers in countries with lower financial development. However, this increase in employment coincides with a general decrease in labor productivity (-2.46%, t-stat -2.69), which is especially strong for OECD countries (-2.96%, t-stat -6.47).

Rajan and Zingales (1998) point out that since financial markets and institutions help firms overcome asymmetric information issues, financial development should help industries relying on external finance grow disproportionately faster. Consistent with this conjecture, they find that real value added growth of externally dependent industries is significantly higher in financially developed countries. Pagano and Pica (2012) find a similar effect on employment growth.

In our analysis we manage to replicate both results. The annual rate of growth of value added and employment are respectively 5.17% (t-stat 2.57) and 3.26% (t-stat 2.11) higher in industries with greater need for external finance located in countries with higher financial development. However, we also find that the employment effect is much stronger if we condition the analysis on the previous year's level of US investor sentiment. In particular, it increases by a further 2.23% (t-stat 2.18), i.e. it is almost 70% larger. In order to test the effect of sentiment on wages we identify two subsamples that should be characterized by a large proportion of high-skill labor: the so-called "Nordic" countries, i.e. Denmark, Finland, Iceland, Norway, and Sweden, which represent some of the leading countries in the world in terms of research and development expenditure, both in

absolute and relative terms, as well as education expenditure; and the leading financial economies, defined as the set of countries characterized by the top 5% ratio of stock market capitalization over GDP. We find that a one standard deviation increase in investor sentiment is followed by an increase in real wages growth by 1.07% in Nordic countries (t-stat 2.87) and 13.07% in the most financially developed economies (t-stat 17.27), while the effect is negative otherwise. This is consistent with the model's cross-sectional predictions.

An important question to answer is how exactly US investor sentiment affects employment abroad. There are two potential channels: US foreign direct investments and US portfolio investments. Since US foreign direct investments allow investors to exercise a certain degree of influence and control (at least 10%) over the company, we expect them to constitute the primary channel for sentiment.

We test this hypothesis using data on US foreign direct investments from the Bureau of Economic Analysis and on US portfolio investments from the International Monetary Fund's Coordinated Portfolio Investment Survey. In particular, we consider two series of foreign direct investments: a general one, defined as the direct investment position abroad on a historical-cost basis (US FDI); and a labor-specific one, defined as the direct investment in employment at majority-owned nonbank foreign affiliates (US FDIL). Consistent with our conjecture, we find that conditioning sentiment on the level of US FDI and/or US FDIL, the results still hold and even get statistically stronger. On the contrary, the results do not hold for portfolio investments.

Hwang (2011) proposes an index of foreign country's popularity among Americans and shows that it is correlated with US firms' investments in that country. Since country popularity might matter in our setting too, we check whether the effect of sentiment-driven US FDI is stronger in more popular countries. Therefore, we rate a country's popularity along the following three dimensions from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998): a country's institutional framework, quality of institutions, and democratic score. The intuition is that US investors should hold a given foreign country in higher regard if it appears to promote values that are popular in the US, such as honesty and democracy, as well as feature a similar institutional framework.

Consistent with the conjecture, we find that the coefficient of the interaction term between US investor sentiment and US FDI is positive and highly significant for the subset of countries with British legal origin, above-median quality of institutions, and above-median democratic score, but not significant otherwise. We find similar results replacing US FDI with its labor-specific counter-

part, US FDIL.

Interestingly, the same industries that benefit the most from financial development are also those that are hit the hardest during economic downturns (Braun and Larrain, 2005) and financial crises (Kroszner, Laeven and Klingebiel, 2007). The effect has been called the "dark side" of financial development and seems to exist not only for real value added growth, but also for employment growth and real wages growth (Pagano and Pica, 2012). In light of this, we look into whether investor sentiment somehow exacerbates this aspect. To this purpose, we consider the list of banking crises from Laeven and Valencia (2010). Conditioning on the previous year's level of US FDI and investor sentiment, we find that a financial crisis prompts a highly significant drop in employment growth, real value added growth, labor productivity, and real wages growth. When controlling for sentiment and US FDI, neither a country's financial development nor an industry's external dependence seem to have an impact on the severity of a crisis.

We also test whether the detrimental effect of crises on employment growth is more pronounced for countries that are more popular among US investors. Consistent with the conjecture, conditioning on the previous year's level of US FDI and investor sentiment we find that a financial crisis negatively affects employment growth in countries with British legal origin, above-median quality of institutions, and above-median democracy score, whereas the effects are not significant otherwise.

The rest of the paper is organized as follows. Section 2 briefly reviews the relevant literature we refer to. Section 3 introduces the model. Section 4 shows the empirical results. Section 5 concludes.

2 Literature review

We refer to two main strands of research. The first one is the vast empirical literature that tries to shed light on the causal link between finance and growth. Many studies have tackled this question using country-level data. King and Levine (1993a, 1993b) analyze the impact of lagged financial development on a country's rate of economic growth, where the former is defined as the size of the financial sector at the beginning of the sample period. Demirg-Kunt and Maksimovic (1996) find that the proportion of firms whose rate of growth exceeds the one prompted by self-financing is positively related to stock market turnover and to a measure of law enforcement. Levine and Zervos (1998) find that measures of market liquidity are positively correlated with growth, capital accumulation and productivity, whereas more traditional measures of development such as stock

market capitalization are not as robustly related. Beck, Levine and Loayza (2000a) use legal origin as an instrument for financial development and find that the size of the financial sector is positively and robustly related to the rate of growth of per capita GDP and total factor productivity.

Other papers have addressed the causality issue using natural experiments, such as changes in financial market regulation. Jayaratne and Strahan (1996) find that the liberalization of the banking sector in different states in the US has had a positive influence on the state's growth. Dehejia and Lleras-Muney (2007) analyze changes in state-level banking regulation between 1900 and 1940 and document similar and robust results. This methodology however could be harder to apply to different countries or different questions.

Another line of research has used industry-level data to establish causality. In their seminal paper, Rajan and Zingales (1998) find that industries typically dependent on external finance for growth develop disproportionately faster in countries with high financial development. The intuition comes from the fact that financial markets and institutions help firms overcome asymmetric information problems, thus lowering the cost of capital. This test has two main advantages. First, it looks into a specific mechanism by which finance affects growth, which is a necessary ingredient in the analysis of causality. Second, it introduces the possibility to correct for country (and industry) fixed effects.

Interestingly, the same industries that benefit the most from financial development also seem to be the ones that are hit the hardest during economic downturns. Braun and Larrain (2005) analyze the production growth rates for 28 manufacturing industries in 111 countries between 1963 and 1999 from the Unido Indstat-3 2001 database, and show that industries that are more dependent on external finance fare worse during recessions. In particular, more dependent industries are more strongly affected in recessions when located in countries with poor financial contractibility, and when their assets are softer or less protective of financiers.

Kroszner, Laeven and Klingebiel (2007) specifically focus on the impact of banking crises on growth. Using data from the United Nations Statistics Division's Industrial Statistical yearbook on 36 sectors from 38 countries, and 45 banking crises from Caprio and Klingebiel (2002), they find that industries that are highly dependent on external finance tend to experience a significantly larger contraction in value added during a banking crisis in countries with greater financial development. The impact is larger for industries dominated by young firms that are highly dependent on external finance and for industries with high levels of intangible assets. The authors suggest that

their findings unveil a "dark side" of financial development.

Pagano and Pica (2012) use the same methodology as in Rajan and Zingales (1998) to extend their analysis to labor markets. They consider the growth in employment, real value added and real wages growth for 28 industries from 63 countries between 1970 and 2003, from the Unido Indstat-3 2006 database. Consistent with their model's predictions, they find that standard measures of financial development are associated with greater employment growth in externally dependent industries, although only in non-OECD countries. The finding suggests that financial development matters only up to some threshold, as the most developed countries seem to be not affected. On the other hand, they do not find any effect on labor productivity and real wage growth. Consistent with the idea that financial development has a "dark side", they find that employment growth slows down significantly more during financial crises in externally dependent industries located in financially developed countries. In essence, the sensitivity of growth to financial development has both an upside and a downside.

The second strand of research our paper is related to studies the relationship between firm decisions and investor sentiment. The extant literature shows that sentiment affects firm investment decisions in at least three ways. First, Morck, Shleifer and Vishny (1990) point out that managers may infer information from share prices. A price inflated with sentiment could therefore cause managers to infer high expected cash flow or low discount rates, both of which would stimulate more investment. Second, Polk and Sapienza (2009) contend that firm managers can increase short-term firm value through catering to investor beliefs. Consistent with this idea, they find that periods of high investor sentiment (defined as firm-level mispricing) prompt more investment, controlling for investment opportunities and financial slack. Third, Baker, Stein and Wurgler (2003) find that stock prices have a stronger impact on the investment of "equity-dependent" firms, i.e. firms that need external equity to finance marginal investments. In particular, such firms may forego investment if their securities are undervalued and even modify their capital structure accordingly (Baker and Wurgler, 2002). Hence investment and external finance should both be increasing in sentiment. This finding seems to hold outside the US as well, as Chirinko and Schaller (2001) find that the 1980s stock market boom in Japan led to high levels of investment.

However, none of the above papers look into the implications of sentiment-driven investment on labor. Only recently McLean and Zhao (2014) try to address this issue. They find that both investment and employment are less sensitive to Tobin's q and more sensitive to cash flow during

recessions and low investor sentiment periods. Their innovation lies in the fact that they (1) use sentiment as a state variable and (2) let sentiment and fundamental variables interact with each other. Also, they incorporate the insights of Lamont and Stein (2006), Shiller (2001) and Samuelson (1998) and consider an aggregate measure of sentiment rather than some form of firm-level mispricing, as opposed to Baker, Stein and Wurgler (2003) and Polk and Sapienza (2009). However their analysis of the labor market is only marginal and does not test whether sentiment has any causal effect on labor.

In this paper we try to extend these studies. Since greater speculative demand implies higher prices and lower cost of capital, we expect investor sentiment to play an important role in the labor market. In order to derive some theoretical guidance, we introduce a modified version of Pagano and Pica's (2012) model to study the effect of sentiment on growth, in a setting with countries with different levels of financial development and industries with either low or high productivity. In fact, we combine the two above strands of literature. Consistent with the model predictions we find that when US investor sentiment is high, there is a boost in employment growth worldwide but a decrease in labor productivity. This is consistent with the idea that firms "over-hire" in times of positive sentiment and correspondingly low cost of capital. We also find strong evidence consistent with the idea that financial development has a dark side. In fact, the effect of financial crises on growth is stronger following periods of high investor sentiment.

3 The model

This section first introduces the model with one industry and one country, then presents the extension to two industries and n countries.

3.1 One-industry one-country model

We consider the economy from Pagano and Pica (2012), where a manager/entrepreneur needs to fund a project, but with two important differences. First, the project is risky and can fail with probability π. Second, we replace the banking sector with a stock market. Then the representative risk-neutral manager-entrepreneur, in addition to his initial wealth I, needs to launch an IPO to

fund the project[3].

Workers can observe the firm's cash flow, but shareholders cannot, which creates a moral hazard problem. In particular, the manager can appropriate a fraction $1-\lambda$ of the firm's operating profits. Therefore, λ can be thought of as a measure of financial development, such as e.g. monitoring ability or investor protection.

The timing is as follows. Upon receiving external funding F, the firm hires workers L. Then the firm produces $\tilde{y}$, the manager gets private benefit $\tilde{B}$, workers get wL and shareholders receive the remainder. In particular, firm's revenues are generated by a Cobb-Douglas production function:

$$\tilde{y} = \tilde{\theta} K^{1-\alpha} L^{\alpha} \tag{1}$$

where $\tilde{\theta}$ is a parameter that captures firm profitability, K is the firm's capital, given by the sum of the manager's initial wealth I plus the amount of equity funding F he can get, and L is the labor demand of the firm. Profitability is stochastic and is distributed as:

$$\tilde{\theta} = \begin{cases} \theta & 1-\pi; \\ 0 & \pi. \end{cases} \tag{2}$$

such that expected revenues are equal to:

$$E(\tilde{y}) = (1-\pi)\theta K^{1-\alpha} L^{\alpha} \equiv \bar{\theta} K^{1-\alpha} L^{\alpha} \tag{3}$$

where $\bar{\theta} \equiv (1-\pi)\theta$. The manager maximizes his expected private benefits:

$$\max_{L} E(\tilde{B}) = (1-\lambda)\left(E(\tilde{y}) - wL\right) \tag{4}$$

subject to the participation constraint $E(\tilde{B}) \geq I$, where w represents workers' wage in a perfectly competitive labor market. The first-order condition yields:

$$L^{*} = \left(\frac{\alpha}{w}\bar{\theta}\right)^{\frac{1}{1-\alpha}} K \tag{5}$$

[3]Note that the arguments that follow would hold for SEOs as well. However, we use the IPO setting for ease of exposition.

which in turn implies the following private benefit for the manager:

$$E(B^*) = (1-\lambda)\phi K \tag{6}$$

where ϕ represents the profit per dollar invested and is defined as:

$$\phi \equiv (1-\alpha)\left(\frac{\alpha}{w}\right)^{\frac{\alpha}{1-\alpha}} \bar{\theta}^{\frac{1}{1-\alpha}} \tag{7}$$

The complement to (6) then represents pledgeable income, i.e. cash flow to external financiers:

$$E(\tilde{v}) = \lambda\phi K \equiv \bar{v} \tag{8}$$

Investors are risk-neutral and can be either arbitrageurs (type A) or noise traders (type B), whose populations are normalized to have unit mass. The difference between these two groups is that the arbitrageurs know the exact probability of default of the project, whereas noise traders estimate it with a bias ($\hat{\pi} \neq \pi$).

We consider a stock market from Hong and Sraer (2013), where investor j solves:

$$\max_{n_j} n_j(\bar{v}_j - p) - \frac{1}{2}\frac{n_j^2}{\gamma} \tag{9}$$

where n is the number of shares traded, γ captures transaction costs[4], p is the stock price and $\bar{v}_j$ is his subjective evaluation of the stock:

$$\bar{v}_j = \begin{cases} \bar{v} & j = A; \\ \bar{v}s & j = B. \end{cases} \tag{10}$$

where $s \neq 1$ represents noise trader sentiment and using (8) can be defined as:

$$S = \frac{\bar{v}_B}{\bar{v}} \equiv \left(\frac{1-\hat{\pi}}{1-\pi}\right)^{\frac{1}{1-\alpha}} \tag{11}$$

[4]Note that a type of transaction cost that is characterized by a convex function as in (8) is the bid-ask spread, as larger trades are typically associated with more unfavorable price movements.

The first-order condition yields the optimal demand for the stock for investor j:

$$n_j^* = \gamma(\bar{v}_j - p) \tag{12}$$

Given unit stock supply, the equilibrium price is:

$$p^* = \frac{1+s}{2}\bar{v} - \frac{1}{2\gamma} \tag{13}$$

or following from (8):

$$p^* = S\lambda\phi K - \frac{1}{2\gamma} \tag{14}$$

where $S \equiv \frac{1+s}{2}$. Therefore, a positive bias in noise traders' evaluations also inflates the equilibrium price.

Since $K^* = I + F$ and $F = p^*$, then the firm's optimal level of capital is:

$$K^* = \left(I - \frac{1}{2\gamma}\right)(1 - \lambda\phi S)^{-1} \tag{15}$$

and, from (5), the optimal level of employment is:

$$L^* = \left(\frac{\alpha}{w}\bar{\theta}\right)^{\frac{1}{1-\alpha}} \left(I - \frac{1}{2\gamma}\right)(1 - \lambda\phi S)^{-1} \tag{16}$$

Note that (17) is made up of two pieces. One is set by the manager and incorporates the true probability of default of the project. The other instead depends on the stock market and is therefore affected by sentiment.

In equilibrium, investor sentiment increases the level of employment:

$$\frac{dL^*}{dS}\frac{S}{L^*} = \frac{\lambda\phi S}{1 - \lambda\phi S + \frac{1-(1-\alpha)\lambda\phi S}{(1-\alpha)\epsilon}} > 0 \tag{17}$$

as long as the elasticity of labor supply (ϵ) is finite[5]. The mechanism is as follows. For each sentiment-driven euro received, a fraction $1 - \lambda$ is kept by the manager and the rest is used to hire new workers. However, if sentiment is positive, this leads to over-hiring because the demand for

[5]As in Pagano and Pica (2012), we do not model labor supply. Rather, we consider a generic upward-sloping function.

the firm's product does not change with sentiment. Therefore, the firm becomes less profitable and labor correspondingly less productive.

Note that the impact of sentiment on labor is an increasing function of two factors: (1) financial development (λ), which strengthens the effect of financial markets on the real economy; (2) firm profitability (ϕ), as more profitable firms are also those that rely more on the stock market.

3.2 Two-industry n-country model

Next, we analyze an economy with n countries and two industries. The n countries differ in their level of financial development λ, while the two industries are characterized by high and low productivity respectively ($\theta_1 > \theta_2$). Workers cannot move freely across industries because employment in a given industry requires specific and irreversible investments in training. The high-productivity industry thus hires high-skill workers, and pays a wage premium:

$$\frac{dw^*}{d\theta}\frac{\theta}{w^*} = \frac{1}{(1-\lambda\phi S)(1-\alpha)\epsilon + 1 - (1-\alpha)\lambda\phi S} > 0 \tag{18}$$

whose size is related to the elasticity of labor supply ϵ. On the other hand, countries with higher financial development pay higher wages:

$$\frac{dw^*}{d\lambda}\frac{\lambda}{w^*} = \frac{\lambda\phi S}{(1-\lambda\phi S)\epsilon + \frac{1-(1-\alpha)\lambda\phi S}{1-\alpha}} > 0 \tag{19}$$

Therefore, the optimal hiring strategy for a high-productivity firm is to seek high-skill labor in countries that feature: (1) lower financial development; and (2) higher elasticity of labor supply in the high-productivity industry, i.e. a greater net supply of high-skill labor. A symmetrical argument applies to low-productivity firms.

This strategy implies two potential patterns of wage growth in the country in which the firm invests. Consider the country's average wage at time t:

$$w_t = \sum_{i=1,2} \frac{w_i L_{it}}{\sum_{i=1,2} L_{it}} \equiv w_2 + \delta_t(w_1 - w_2) \tag{20}$$

where w_i is the competitive equilibrium wage in industry i; L_{it} is the number of workers currently employed in industry i; and δ_t is the fraction of high-skill workers over total workforce in the country.

If a foreign firm hires new local employees at time $t + \Delta$, wage growth between t and $t + \Delta$ is:

$$\frac{w_{t+\Delta} - w_t}{w_t} = \frac{\delta_{t+\Delta} - \delta_t}{\delta_t + \frac{w_2}{w_1 - w_2}} \tag{21}$$

whose sign depends on $\delta_{t+\Delta} - \delta_t$. Then, wage growth will be positive if the foreign firm picks local high-skill workers, and negative otherwise. This implies that an increase in labor demand from foreign firms should be followed by positive wage growth in countries with greater net supply of high-skill labor, but negative wage growth in other countries.

Note that investor sentiment plays an important role in this picture. If the hiring firm faces positive investor sentiment in its local stock market, it finds it optimal to invest more and hire new workers. But as long as the firm carries out part of its operations abroad, its decisions have an impact on labor and wages in foreign countries. Therefore, local sentiment can have a global effect.

3.3 Model predictions

The main predictions from the model can be summarized as follows. An increase in investor sentiment should lead to: (1) higher employment growth worldwide, especially in countries with higher financial development (λ) and industries that rely more on capital markets (K); (2) lower labor productivity, as the firm chooses a sub-optimal level of employment and thus becomes less profitable; (3) positive wage growth in countries with a greater proportion of high-skill labor, but negative wage growth otherwise. Next, we take these predictions to the data.

4 Data and methods

Our empirical analysis studies the effects of US investor sentiment on labor markets worldwide. The reason we choose the US as our reference country is that it represents one of most financially developed economies and its firms typically carry out a nontrivial part of their operations abroad. Also, the US is virtually the only country for which a widely accepted measure of investor sentiment is available (Baker and Wurgler, 2006, 2007; Baker, Wurgler and Yuan, 2012).

In order to analyze the effect of US sentiment on non-US labor markets, we consider a large panel of countries from the Unido Indstat-3 database (United Nations Industrial Development Organization, Industrial Statistics), which spans the period 1970-2003. Following Pagano and Pica

(2012) we consider the 2006 release, as the following ones have more missing observations. We analyze 28 industries and only consider countries for which at least 10 observations are available, for a total 113 countries[6]. The dataset provides annual country-level statistics on the growth in employment, real wages and real value added.

We measure investor sentiment using Baker and Wurgler's (2006) index, which they define as the "propensity to speculate" and captures changes in asset demand not explained by fundamentals. This measure is orthogonalized to several macroeconomic variables and based on a number of sentiment proxies suggested in previous works, including: the closed-end fund discount; the NYSE share turnover; the number and average first-day returns on IPOs; the equity share in new issues; and the dividend premium.

One major advantage of this measure in our setting is that it is unlikely to suffer from reverse causality issues. In fact, the reverse causality story would be that US investor sentiment may rise in anticipation of improving world economic conditions. However, the index is orthogonalized to US economic indicators. Since the US economy is integrated with the rest of the world, it appears unlikely that the index might reflect the future state of the economy in foreign countries. Furthermore, we find that sentiment predicts a worldwide decrease in the efficiency of labor – lower labor productivity. This feature also appears to be an unlikely driver of US investor sentiment.

Table 1 presents some sample statistics. The sample size includes more than sixty thousand observations, of which almost two thirds are for non-OECD countries. The average annual employment growth in the full sample is 2.05%. However, there is a sharp difference between OECD countries and non-OECD countries. The former exhibit near-zero growth (-0.15%) whereas the latter has strong positive growth (3.19%). Average real value added growth is 3.80% in the full sample and is fairly stable across both OECD and non-OECD countries (2.98% vs. 4.20%). Labor productivity is 1.76% overall, but it is much higher for OECD countries (3.25%) than it is for

[6]The countries we consider are: Algeria, Argentina, Australia, Austria, Bahamas, Bangladesh, Barbados, Belgium, Benin, Bolivia, Botswana, Bulgaria, Burkina-Faso, Burundi, Cameroon, Canada, Central African Republic, Chile, China, Colombia, Congo, Costa Rica, Cote d'Ivoire, Cuba, Cyprus, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Eritrea, Ethiopia, Ethiopia and Eritrea, Fiji, Finland, France, Gabon, Germany, Ghana, Greece, Guatemala, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Kuwait, Latvia, Libyan Arab Jamahiriya, Luxembourg, Madagascar, Malawi, Malaysia, Malta, Mauritius, Mexico, Morocco, Myanmar, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, Russia, Rwanda, Senegal, Seychelles, Singapore, Slovenia, Somalia, South Africa, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Syrian Arab Republic, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, United Kingdom, United Republic of Tanzania, Uruguay, Venezuela, Yugoslavia, Zambia, Zimbabwe.

non-OECD countries (1.00%). Average wage growth is 1.37% for the full sample, but again it is much stronger for OECD countries (3.10%) than for non-OECD countries (0.50%). Interestingly, non-OECD countries exhibit a higher standard deviation and a wider range across all four measures considered.

Our baseline specification is as follows:

$$\begin{aligned} y_{cit} = \beta_0 + \beta_1 S_{t-1} + \beta_2 share_{cit-1} + \beta_3 FD_c + \beta_4 ED_i + \beta_5 (FD_c \times ED_i) + \\ \beta_6 (S_{t-1} \times FD_c) + \beta_7 (S_{t-1} \times ED_i) + \beta_8 (S_{t-1} \times FD_c \times ED_i) + \\ \mu_{ct} + \mu_i + \epsilon_{cit} \end{aligned} \tag{22}$$

where y_{cit} represents the following four dependent variables in country c, sector i at time t: employment growth; real value added growth; labor productivity, defined as the difference between real value added growth and employment growth; and real wages growth. The other variables are as follows: $share_{cit-1}$ denotes the industry's share of y_{cit} in the manufacturing sector in the previous year; S_{t-1} is Baker and Wurgler's (2006) index of investor sentiment, orthogonalized to business cycle indicators and lagged one year; FD_c is financial development of country c, defined as stock market capitalization over GDP (1980-95 average); ED_i is external dependence of firms in sector i, defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database; μ_{ct} and μ_i are country-year and sector fixed effects respectively. Standard errors are clustered by country.

5 Empirical results

5.1 Investor sentiment, financial development, and external dependence

Table 2 presents the main results. In Panel A, we find that employment growth seems indeed to be affected by sentiment. A one standard deviation increase in sentiment in a given year is followed by an increase in employment growth worldwide by 3.29% (t-stat 3.93). The effect is more pronounced for developing countries (4.05%, t-stat 2.79) than for developed countries (2.69%, t-stat 4.94). This is consistent with the model's prediction that following high sentiment, countries with

higher financial development have an incentive to hire workers in countries with lower financial development. Interestingly, however, sentiment does not affect much real value added growth. The coefficient for the full sample is positive but not significant (1.15%, t-stat 1.46). However, it is near-zero for OECD countries (-0.29%, t-stat -0.47) but positive and significant for non-OECD countries (2.27%, t-stat 2.03). Therefore, it seems that the economies of developing countries are stimulated by US investor sentiment.

In Table 2, Panel B, we find that labor productivity is negatively affected by sentiment. In fact, a 1% standard deviation increase in US investor sentiment is followed by a decrease in labor productivity by 2.46% (t-stat -2.69). The effect is quite similar across OECD countries (-2.96%, t-stat -6.47) and non-OECD countries (-2.20%, t-stat -1.29), except that the latter is not significant. Finally, the effect of sentiment on real wage growth is negative overall. A 1% standard deviation increase in sentiment is followed by a decrease in wage growth by 2.91% (t-stat -3.36) and the effect is similar across OECD countries (-2.94%, -3.71) and non-OECD countries (-3.22%, t-stat -2.02).

Rajan and Zingales (1998) find that financial development helps industries that rely more on external finance grow disproportionately faster than other industries. Pagano and Pica (2012) document that this finding applies not only to real value added growth, but also to employment growth – even though only for non-OECD countries. The model we propose suggests that in the presence of sentiment this measure should have an even stronger effect. To test this conjecture, Table 2 includes a triple interaction term between a country's level of financial development, an industry's need for external finance and lagged US investor sentiment. We find that employment growth is 3.26% higher (t-stat 2.11) for externally dependent industries in financially developed countries, but the effect increases by another 2.23% (t-stat 2.18) when conditioning on sentiment. A breakdown in OECD vs. non-OECD countries shows that the result is essentially driven by the latter (2.42%, t-stat 1.95), as the coefficient become insignificant for OECD countries (1.45%, t-stat 1.55). On the other hand, the triple interaction term seems to have no effect on the other dependent variables we consider. Overall, these results complement Pagano and Pica's (2012) findings.

5.2 Investor sentiment and real wages growth

There is a widespread consensus among economists that a significant driving force behind increases in private productivity is research and development (R&D) activity. The so-called "Nordic coun-

tries", i.e. Denmark, Finland, Iceland, Norway, and Sweden, are a leading example in this respect. They traditionally exhibit some of the highest rates of research and development expenditure in the world, both per capita and scaled by GDP, high education expenditure, and a high quality of institutions characterized by a legal system of their own, the Scandinavian one .

In light of this, we test whether the effect of investor sentiment on wages differs in this peculiar subset of countries as opposed to the rest of the sample. In particular, we expect Nordic countries to exhibit a higher share of high-skill labor, and thus experience positive real wages growth following high US investor sentiment. The results are in Table 3, columns (1) and (2). We find that a one standard deviation increase in investor sentiment is followed by an increase in real wages growth by 1.07% in Nordic countries (t-stat 2.87), but it is followed by a decrease in real wages growth by 3.02% in the rest of the sample (t-stat -3.38). This pattern is consistent with the model's cross-sectional predictions.

We also propose another test of these predictions based on a country's financial development. In fact, a more developed financial system typically relies on a higher fraction of high-skilled workers. Therefore, we split the sample in two subsamples: the most financially developed economies on the one hand, defined as the set of countries characterized by the top 5% ratio of stock market capitalization over GDP; and the less developed economies on the other hand, defined as the rest of the sample. The results are in Table 3, columns (3) and (4). We find that a one standard deviation increase in investor sentiment is followed by a sharp increase in real wages growth by 13.07% in the most financially developed economies (t-stat 17.27), but it is followed by a decrease in real wages growth by 3.01% in the rest of the sample (t-stat -3.64). The results are again consistent with the model's cross-sectional predictions.

5.3 Investor sentiment and investments in foreign countries

It is important to shed light on the channel through which US investor sentiment affects employment abroad. There are two natural candidates: US foreign direct investments and US portfolio investments. Portfolio investments are passive investments, in the sense that they not entail active management of the firm and their only purpose is the pursuit of a financial gain. On the contrary, foreign direct investments allow investors to exercise a certain degree of influence and control (at least 10%) over the company, including employment decisions.

The mechanism is as follows. The model predicts that the manager, upon observing positive sentiment, should hire more workers in his foreign subsidiaries. However, the effect might not be equal across subsidiaries located in different countries. In fact, other things being equal, the manager should prefer countries in which the firm finds it more advantageous to carry out its operations. Therefore, the impact of investor sentiment on employment should be stronger in countries in which the US invests more. In order to test for this effect empirically, we interact Baker and Wurgler's (2006) measure of investor sentiment with the level of US investments in a given foreign country.

To this purpose, we use US foreign direct investments data from the Bureau of Economic Analysis. In particular, we consider two series: a general one, defined as the direct investment position abroad on a historical-cost basis (US FDI), available as of 1983 and expressed in USD billions; and a more labor-specific one, defined as the direct investment in employment at majority-owned nonbank foreign affiliates (US FDIL), available as of 1998 and expressed in millions of employees. Due to the sharp difference in sample size, we pick US FDI as our main specification. However, we show that all the results carry over for US FDIL too.

On the other hand, we retrieve data on US portfolio investments data (US PI) from the International Monetary Fund's Coordinated Portfolio Investment Survey, expressed in USD billions. The series, however, have two major issues: they are only available as of 1997 and many observations are missing.

On the other hand, we also need to take into account the potential impact of country-specific sentiment. If a given country's investors are over-optimistic, and the country structurally relies on foreign capital, then foreign investors might want to exploit local sentiment and invest more in that country. In order to account for a country's reliance on foreign capital, we consider country-level net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries. In fact, if FDI inflows are consistently greater than FDI outflows, the country has a strong need for foreign capital in order to grow – as opposed to a country which also has a comparable amount of FDI outflows.

We consider the series of net FDI from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources, and expressed in USD billions. On the other hand, we exploit the fact that Baker and Wurgler's (2006) measure of investor sentiment is positively correlated with sentiment measures from a few other major economies (Baker, Wurgler and Yu, 2012). Therefore,

it can interpreted as a (noisy) proxy for local sentiment. According to this story, the impact of sentiment on employment should be stronger for countries with negative net FDI. In fact, sentiment should matter more for countries that receive more foreign investments, not necessarily from the US. In order to capture this effect, we introduce an interaction term between investor sentiment and net FDI.

The results are in Table 4. In column (1), the dependent variable is employment growth. The coefficient of the interaction term between US investor sentiment and US FDI is positive and highly significant (0.0006, t-stat 3.47), and explains away the effect of investor sentiment alone (0.0053, t-stat 0.35). Therefore, the effect of US investor sentiment on local employment is zero for countries that receive no US foreign direct investments. However, if we consider countries that attract one standard deviation of US foreign direct investments (32.92 USD millions), a one standard deviation increase in US investor sentiment is followed by a 1.98% increase in employment growth. The effect is then quite sizeable.

Interestingly, the coefficient of the interaction term between investor sentiment and net FDI is negative and also highly significant (-5.03e-13, t-stat -2.94), even though its magnitude is rather small. In fact, for countries that attract one standard deviation of net foreign direct investments (9.38 USD billions), a one standard deviation increase in US investor sentiment is followed by a 0.01% increase in employment growth. Hence, even though the two sentiment stories proposed above might actually co-exist, the effect through US FDI seems to be largely dominant.

The coefficient of the interaction between US FDI and net FDI is negative and significant (-1.12e-14, t-stat -2.58), which suggests that the impact of US FDI on employment growth is stronger for economies that rely more on foreign capital, independently of the presence of sentiment. We also interact US FDI with the two key variables from the previous literature, financial development (FD) and external dependence (ED). The coefficient of the interaction term between US FDI and FD is also positive, but not significant (0.0003, t-stat 0.34). The coefficient of the interaction term between US FDI and ED is positive and significant (0.0003, t-stat 3.44), which suggests that FDI should matter more for industries that are structurally more dependent on external capital.

In Table 4, column (2), we run the same regression for real value added growth. The coefficient of the interaction term between investor sentiment and US FDI is positive but not significant (0.0001, t-stat 0.16). The coefficient of sentiment alone is not significant and even flips sign (-0.0172, t-stat -0.79). The coefficient of the interaction term between investor sentiment and net FDI is also not

significant and flips sign (-1.07e-13, t-stat -0.30). The only coefficient that is (marginally) significant is that of the interaction term between US FDI and ED (0.0003, t-stat 1.75).

The results for labor productivity are in Table 4, column (3). The coefficient of the interaction term between investor sentiment and US FDI is negative and marginally significant (-0.0005, t-stat -1.67). The coefficient of the interaction term between investor sentiment and net FDI is positive but not significant (5.19e-13, t-stat 1.19). Interestingly, the coefficient of investor sentiment alone is negative and marginally significant (-0.0320, t-stat -1.72). The results suggest that the US FDI channel can explain, at least in part, the drop in labor productivity that follows high investor sentiment, while the net FDI channel cannot. However, it seems that investor sentiment alone still accounts for part of the picture. In particular, a one standard deviation increase in US investor sentiment is followed by a 3.20% decrease in labor productivity. However, the effect is 1.65% larger in absolute value for countries that attract one standard deviation of US foreign direct investments.

In Table 4, column (4), we test whether the above measures affect real wages growth. We find that the coefficient of the interaction term between investor sentiment and US FDI is negative but not significant (-0.0003, t-stat -1.18). The coefficient of investor sentiment alone is also negative but slightly outside the rejection region (-0.0371, t-stat -1.54). The coefficient of the interaction term between investor sentiment and net FDI is positive but not significant (1.59e-13, t-stat 0.34).

Next, we repeat the same analysis but replace US FDI with its labor-specific counterpart, US FDIL. The results for employment growth are in Table 5, column (1). The coefficient of the interaction term between investor sentiment and US FDIL is positive and significant (0.0601, t-stat 1.99). On the contrary, the coefficient of investor sentiment alone is positive but not significant (0.0045, t-stat 0.22). The coefficient of the interaction term between investor sentiment and net FDI is positive but not significant (8.08e-14, t-stat 0.44). Therefore, the only effect that survives in this specification is the one for the foreign direct investments channel. In particular, for countries that attract one standard deviation of US foreign direct investments in labor (0.36 millions of employees), a one standard deviation increase in US investor sentiment is followed by a 2.16% increase in employment growth. Interestingly, the magnitude of this effect is quite similar to that from Table 4.

The results for real value added growth are in Table 5, column (2). The coefficient of the interaction term between investor sentiment and US FDIL is negative but not significant (-0.0812, t-stat -1.18). The coefficient of investor sentiment alone is negative but not significant (-0.0162, t-stat

-0.64). The coefficient of the interaction term between investor sentiment and net FDI is positive but not significant (4.57e-13, t-stat 0.66).

In Table 5, column (3), we run the regression for labor productivity. The coefficient of the interaction term between investor sentiment and US FDIL is negative and significant (-0.1310, t-stat -2.03). Interestingly, this result is statistically stronger than its counterpart from Table 4. The coefficient of investor sentiment alone is negative but slightly outside the rejection region (-0.0349, t-stat -1.51). The coefficient of the interaction term between investor sentiment and net FDI is positive but not significant (7.46e-13, t-stat 1.06). Again, the foreign direct investments channel is the only hypothesis that explains the results.

In Table 5, column (4), we report the results for real wages growth. The coefficient of the interaction term between investor sentiment and US FDIL is negative and marginally significant (-0.0915, t-stat -1.66). Similarly, the coefficient of investor sentiment alone is negative and marginally significant (-0.0571, t-stat -1.65). The coefficient of the interaction term between investor sentiment and net FDI is positive but not significant (7.74e-13, t-stat 1.27).

Next, we test the portfolio investments channel hypothesis. The results for employment growth are in Table 6, column (1). The coefficient of the interaction term between investor sentiment and US PI is not significant and even flips sign (-0.0001, t-stat -0.41). Similarly, the coefficient of the interaction term between investor sentiment and net FDI is not significant and turns negative (-7.77e-13, t-stat -0.64). The coefficient of sentiment alone instead is positive, but again not significant (0.0347, t-stat 0.87). Similarly, in columns (2) and (4) we find no statistical significance for the results for real value added growth and real wages growth. The only significant coefficient is in column (3), where we find that investor sentiment alone exerts a negative and significant effect on labor productivity (-0.0909, t-stat -2.33).

Overall, the foreign direct investment channel hypothesis explains most of our findings, with the only exception of labor productivity – for which investor sentiment alone is also significant. On the contrary, we find no evidence for the portfolio investments channel hypothesis. Since portfolio investments are effectively stock market investments, they should be particularly sensitive to local sentiment. Therefore, these findings suggest that it is indeed US investor sentiment, rather than local sentiment, that drives our results. Consistent with this interpretation, the country-specific sentiment hypothesis finds no support in the data either, with the only exception of employment growth in the US FDI setting. However, the magnitude is tiny and its explanatory power goes away

in the labor-specific US FDIL regressions.

5.4 Country popularity

Hwang (2011) proposes an index of foreign country's popularity among Americans ("Country Popularity Score") and shows that it is correlated with US firms' investments in that country. His measure is based on a Gallup survey, which entails telephone interviews with a national representative adult sample of 1,007 people. In the survey, respondents are asked the following question regarding 42 countries: "Is your overall opinion of country X very favorable, mostly favorable, mostly unfavorable, or very unfavorable?". Then, he constructs a Country Popularity Score as the sum of the percentage of survey participants in the US thinking very favorably of a country multiplied by four, most favorably of a country multiplied by three, mostly unfavorably of a country multiplied by two, and very unfavorably of a country multiplied by one.

His sample covers 17 countries from 1992 to 2008. Then he calculates the correlation between a given country's popularity score and its population, defined as the logarithm of a country's population; its distance from the US, defined as the logarithm of the distance in kilometers between Washington, DC, and the country's capital city; its language, defined as a dummy variable that equals one if English is the country's official language or one of the country's primary languages; its religion, defined as a dummy that equals one if a country is predominantly Christian; its cultural distance from the US, defined as the difference in the Hofstede Index[7] between the US and the country in question; its governance quality, defined as the Corruption Perceptions Index as published by Transparency International; the fraction of the Gallup survey participants who feel they do not have sufficient information to form an overall opinion of a country and opt for "no opinion"; the fraction of US citizens with ancestors from the country in question. He finds that the dimensions that correlate significantly with a country's popularity score are cultural distance (-0.80, p-value < 0.01), governance quality (0.72, p-value < 0.01), language (0.42, p-value < 0.10), and ancestry (0.42, p-value < 0.10).

Note that country popularity might matter in our setting too. When sentiment is higher, and capital is correspondingly cheaper, a firm's manager decides to invest more in countries in which he finds it more advantageous to invest, i.e. those in which the firm makes more FDI. However, if

[7]The Hofstede Index measures a country's culture along the following five dimensions: power distance, individualism, masculinity, uncertainty avoidance, and long-term orientation.

two countries receive the same level of FDI from the firm, the manager will tend to prefer the one that ranks higher in terms of popularity. In fact, even if he is not prone to the country popularity bias himself, he can cater to the part of his investor base who is (e.g. noise traders).

In light of this, we check whether the effect of sentiment-driven US foreign direct investments is stronger in more popular countries. However, we decide not to use the Gallup survey in our analysis because of the following concerns: (1) most series are available only as of the early 1990s, whereas our sample starts in 1970; (2) many observations are missing; (3) relatively few foreign countries are covered, and certainly much fewer than those in our sample (42 vs. 113). Instead, we proxy popularity using variables that are similar to the ones analyzed by Hwang (2011).

In particular, we rate a country's popularity along the following three dimensions from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998): a country's institutional framework, defined as a dummy that takes on value one if the country has British legal origin; quality of institutions, defined as the International Country Risk guide's assessment of the corruption in a country's government, where lower scores indicate that "high government officials are likely to demand special payments" and "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, policy protection, or loans"; democratic score, defined as the Data Sharing for Demographic Research Polity III index, and constructed as the average of two indicators of regime type (autocracy and democracy) and eight indicators of political authority (regulation of executive recruitment, competitiveness of executive recruitment, openness of executive recruitment, monocratism, constraints on the chief executive, regulation of political participation, competitiveness of political participation, and centralization of state authority).

The intuition is that US investors should hold a given foreign country in higher regard if it appears to promote values that are popular in the US, such as honesty and democracy, as well as feature a similar institutional framework. Note that the first two measures capture the two dimensions that exhibit higher correlation with Hwang's (2011) country popularity score, i.e. cultural distance and governance quality. This strategy also allows us to avoid the low frequency issues of the Gallup survey, keep most of our countries and exploit the full length of our sample period.

If country popularity matters in our framework, the effect of sentiment on employment should be larger for countries with British legal origin, above-median quality of institutions and above-median democracy score. We test this hypothesis in Table 7. In columns (1) and (2) we break

the sample into countries with British and non-British legal origin respectively. The estimates for the subsample of countries with British legal origin are strikingly similar to the results for the full sample. The effect of US investor sentiment on employment growth is positive but not significant (0.0149, t-stat 0.45); the coefficient of the interaction term between US investor sentiment and US FDI is positive and highly significant (0.0007, t-stat 3.91); the coefficient of the interaction term between US investor sentiment and net FDI is negative but slightly outside the rejection region (-6.26e-13, t-stat -1.42); the coefficient of the interaction term between US FDI and net FDI is negative and highly significant (-1.15e-14, t-stat -3.23); the coefficient of the interaction term between US FDI and ED is positive and highly significant (0.0003, t-stat 2.92); and the coefficient between US FDI and FD is positive but not significant (0.0008, t-stat 1.34). The results for the subsample of countries with non-British legal origin feature two important differences: the coefficient of the interaction term between US investor sentiment and US FDI is no longer significant and even flips sign (-0.0006, t-stat -1.37); and the coefficient of the interaction term between US FDI and ED is positive but no longer significant (0.0006, t-stat 1.31). Therefore, sentiment-induced US FDI only affect employment growth in countries with British legal origin.

In columns (3) and (4) of Table 7 we split the sample into countries with above-median and below-median quality of institutions respectively. The results for the subsample of countries with above-median quality of institutions are similar to those for the full sample, with the only exception of the coefficient of US investor sentiment – which is positive and marginally significant (0.0173, t-stat 1.74). The coefficient of the interaction term between US investor sentiment and US FDI is positive and significant (0.0004, t-stat 3.57); the coefficient of the interaction term between US investor sentiment and net FDI is negative and significant (-3.88e-13, t-stat -2.44); the coefficient of the interaction term between US FDI and net FDI is negative and significant (-7.37e-15, t-stat -1.98); the coefficient of the interaction term between US FDI and ED is positive and marginally significant (0.0001, t-stat 1.69); and the coefficient of the interaction term between US FDI and FD is negative and not significant (-0.0005, t-stat -0.56).

In the subsample of countries with below-median quality of institutions, all the coefficients lose their significance, with the only exception of the interaction term between US investor sentiment and net FDI, which is marginally significant (9.66e-12, t-stat 1.67) and flips sign. The coefficient of the interaction term between US investor sentiment and US FDI is no longer significant and even flips sign (-0.0005, t-stat -0.21); and the coefficient of the interaction term between US FDI and ED

is positive but no longer significant (0.0045, t-stat 1.56). Therefore, the joint impact of US FDI and US investor sentiment on foreign labor is only present in countries with high quality of institutions. Similarly, sentiment alone and its interaction term with net FDI only affects employment growth in the first subsample, but not in the second one.

Finally, in columns (5) and (6) of Table 7 we break the sample into countries with above-median and below-median democracy score respectively. In the subsample of countries with above-median democracy score, only two coefficients are positive and significant: the interaction term between US investor sentiment and US FDI (0.0003, t-stat 2.04), and the interaction term between US FDI and ED (0.0002, t-stat 3.00). In the subsample of countries with below-median democracy score, instead, none of the coefficients are significant at any conventional level.

Overall, then, the results are consistent with Hwang's (2011) finding that US firms tend to invest more in countries that are more popular among Americans. In fact, the impact of investor sentiment on employment growth is only present in the subsample of countries that are more popular in the US.

A line of reasoning suggests that our dimensions of popularity pick the "best" countries in the world, which in turn are more likely to attract US investments in the first place. However, positive sentiment typically increases demand for investments that are characterized by an overall lower quality (see e.g. Baker and Wurgler, 2006, 2007). If anything, then, the breakdown we propose should go against our results.

As a robustness check, we replace US FDI with its labor-specific counterpart, US FDIL, and perform the same sample breakdown. The results are in Table 8. Due to the much smaller sample size, many of the coefficients of our variables of interest are no longer significant. However, the impact of the interaction term between US investor sentiment and US FDIL on employment growth follows a strikingly similar pattern to that from Table 7. In fact, the coefficient is positive and significant for the subsample of countries with British legal origin (0.0854, t-stat 2.65), high quality of institutions (0.0607, t-stat 2.02), and high democracy score (0.0710, t-stat 1.88), and not significant otherwise. On the other hand, the coefficient of investor sentiment alone is only significant for countries with British legal origin (-0.0570, t-stat 1.99), whereas the coefficient of the interaction term between investor sentiment and net FDI is not significant in any of the subsamples. The findings support the idea that it is indeed US suboptimal investments in foreign labor that drive our main results.

5.5 Investor sentiment and employment during financial crises

Previous literature shows that financial development may have a "dark side". Braun and Larrain (2005) find that the more financially dependent industries are hit harder in recessions but that this effect is less severe in countries with high accounting standards and in industries with more tangible assets. Kroszner, Laeven and Klingebiel (2007) find that sectors that are heavily dependent on external finance suffer a much sharper contraction of value added in countries with a higher degree of financial development. Pagano and Pica (2012) find that the same effects carry over, to some extent, on employment growth and real wages growth, which slow down significantly more in financially dependent industries during financial crises.

In light of these results, we conjecture that a financial crisis in a given country has a stronger negative effect on growth, conditional on the level of sentiment-driven US FDI that the country received in the previous year. To this purpose, we consider the list of country-level banking crises from Laeven and Valencia (2010).

The results for employment growth are in Table 9, column (1). As in the baseline specification, we find that the interaction term between US investor sentiment and US FDI is positive and highly significant (0.0006, t-stat 4.28). However, when a financial crises hits, sentiment-driven US FDI prompts a highly significant drop in employment growth (-0.0008, t-stat -2.82). In particular, for countries that receive one standard deviation of US foreign direct investments, a one standard deviation increase in sentiment in the previous year amplifies the impact of a crisis on employment growth in the following year by 2.63%.

Interestingly, neither a country's financial development nor an industry's external dependence seem to have an impact on the severity of a crisis: the coefficient of the interaction term between external dependence and the crisis dummy is positive and not significant (0.0104, t-stat 0.47), and neither is the coefficient of the interaction term between financial development, external dependence and the crisis dummy (-0.0202, t-stat -0.50).

The results for real value added growth are in Table 9, column (2). The interaction term between US investor sentiment and US FDI is positive but not significant (0.0002, t-stat 0.82). However, a financial crisis conditional on sentiment-driven US FDI is associated with a large decrease in real value added growth (-0.0018, t-stat -2.87). In particular, for countries that receive one standard deviation of US foreign direct investments, a one standard deviation increase in sentiment in the

previous year amplifies the impact of a crisis on real value added growth in the following year by 5.93%.

Again, neither a country's financial development nor an industry's external dependence seem to exacerbate the effect of financial crises: the coefficient of the interaction term between financial development, external dependence and the crisis dummy is negative but not significant (-0.1070, t-stat -0.88), whereas the coefficient of the interaction term between external dependence and the crisis dummy is positive and not significant (0.0310, t-stat 0.68).

In Table 9, column (3), we find that conditional on the previous year's level of sentiment-driven US FDI, labor productivity exhibits a larger drop during financial crises (-0.0010, t-stat -1.72). In particular, for countries that receive one standard deviation of US foreign direct investments, a one standard deviation increase in sentiment in the previous year amplifies the impact of a crisis on labor productivity in the following year by 3.29%. On the contrary, an industry's dependence on external funds does not exacerbate the impact of a crisis (-0.0310, t-stat 0.68), and neither does a country's level of financial development (-0.0807, t-stat -0.87).

In Table 9, column (4), we analyze the effect of crises on real wages growth. We find that the coefficient of the interaction term between investor sentiment, US FDI and the crisis dummy is negative and significant (-0.0010, t-stat -2.46). In particular, for countries that receive one standard deviation of US foreign direct investments, a one standard deviation increase in sentiment in the previous year amplifies the impact of a crisis on real wages growth in the following year by 3.29%. On the other hand, the coefficient of the interaction term between financial development, external dependence and the crisis dummy is negative but not significant (-0.0299, t-stat -0.97), and neither is the coefficient of the interaction term between external dependence and the crisis dummy (0.0157, t-stat 1.28).

Next, we test whether the detrimental effect of crises on employment growth is more pronounced for countries that are more popular among US investors. The results are in Table 10. We find that the coefficient of the interaction term between investor sentiment, US FDI and the crisis dummy is negative and significant for countries with British legal origin (-0.0276, t-stat -2.02), above-median quality of institutions (-0.0006, t-stat -2.77), and above-median democracy score (-0.0005, t-stat -1.96), but not significant otherwise. The coefficient of the interaction term between financial development, external dependence and the crisis dummy is not significant in any of the subsamples, and neither is the coefficient of the interaction terms between external dependence and the crisis

dummy. Then, we find that the same subsets of countries that benefit the most from sentiment-driven US FDI are also the ones that are hit the hardest by financial crises.

Overall, the findings support the idea that finance has a dark side. The results complement those of Braun and Larrain (2005) and Kroszner, Laeven and Klingebiel (2007), as we find a negative effect of financial crises on growth. In particular, we document a detrimental effect on employment growth and real wages growth as in Pagano and Pica (2012). However, our results differ from theirs in two important ways: (1) we find strong, rather than mild, statistical evidence for the detrimental effect of financial crises on growth; (2) we show that controlling for investor sentiment and the channel through which it affects growth, both financial development and external dependence lose their explanatory power.

6 Conclusion

We find that in a world with moral hazard and noise traders, investor sentiment should affect a firm's employment policy. Consistent with the model's predictions, we show that higher US sentiment leads to higher employment growth worldwide. However, the increase in employment is not justified by economic fundamentals. In fact, firms hire a suboptimal number of employees, which leads to a general decrease in labor productivity. The effect of sentiment on wage growth is mixed. In fact, following high sentiment, wage growth increases in countries with a higher proportion of high-skill workers but decreases in other countries. The intuition is that it is optimal for firms to hire workers in countries where the particular type of work they look for (high-skill or low-skill) is in greater net supply, which then creates a cross-sectional pattern.

We also document that sentiment exacerbates the effect of financial crises on labor, especially for firms that rely more on external finance. This is consistent with the idea that financial development has a dark side, i.e. the firms that benefit the most from financial development are also the ones that are hit the hardest during financial crises. Our findings suggest that sentiment amplifies this mechanism.

Interestingly, we find that all the effects are especially strong in countries that attract more foreign direct investments from the US and that rank high in terms of popularity among US investors.

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A Appendix

Table 1. Sample statistics

Sample statistics for employment growth (Panel A), real value added growth (Panel B), labor productivity (Panel C) and real wage growth (Panel D) from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset includes 28 industries and 113 countries. The sample period is 1970-2003.

Panel A. Employment growth

	Obs.	Mean	St. Dev.	Min	Max
Full sample	61626	0.0205	0.2594	-5.3122	6.5796
OECD	20970	-0.0015	0.1338	-3.2355	2.2907
Non-OECD	40656	0.0319	0.3040	-5.3122	6.5796

Panel B. Real value added growth

	Obs.	Mean	St. Dev.	Min	Max
Full sample	64105	0.0380	0.4128	-22.8624	8.1424
OECD	21145	0.0298	0.2364	-4.0404	3.8498
Non-OECD	42960	0.0420	0.4761	-22.8625	8.1424

Panel C. Labor productivity

	Obs.	Mean	St. Dev.	Min	Max
Full sample	61626	0.0176	0.3289	-7.7062	5.3125
OECD	20970	0.0325	0.2070	-4.2949	3.8942
Non-OECD	40656	0.0100	0.3764	-7.7062	5.3125

Panel D. Real wage growth

	Obs.	Mean	St. Dev.	Min	Max
Full sample	59417	0.0137	0.2723	-14.9357	4.8288
OECD	20061	0.0310	0.1508	-1.8079	3.2429
Non-OECD	39356	0.0050	0.3164	-14.9357	4.8288

Table 2. Investor sentiment and growth

Panel regression of employment growth (Panel A, columns 1-3), real value added growth (Panel A, columns 4-6), labor productivity (Panel B, columns 1-3), defined as the difference between real value added growth and employment growth, and real wages growth (Panel B, columns 4-6), on lagged US investor sentiment (S), defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators and normalized to have zero mean and unit variance. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The controls are: country-year and sector fixed effects; financial development (FD), defined as stock market capitalization over GDP (1980-95 average); external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database; the interaction between the two (FD x ED); the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. In both panels, columns (1) and (4) report the results for the full sample; columns (2) and (5) report the results for the subsample of OECD countries; columns (3) and (6) report the results for the subsample of non-OECD countries.

Panel A

	Employment Growth			**Real Value Added Growth**		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	OECD	Non-OECD	Full	OECD	Non-OECD
Share (-1)	-0.2335***	-0.1025***	-0.3247***	-0.5452***	-0.3876***	-0.6708***
	(-4.34)	(-2.79)	(-4.37)	(-6.40)	(-3.93)	(-5.63)
FD x ED	0.0326**	0.0100	0.0395**	0.0517**	-0.0085	0.0672***
	(2.11)	(0.81)	(1.97)	(2.57)	(-0.48)	(2.59)
S (-1)	0.0329***	0.0269***	0.0405***	0.0115	-0.0029	0.0227**
	(3.93)	(4.94)	(2.79)	(1.46)	(-0.47)	(2.03)
S (-1) x FD x ED	0.0223**	0.0145	0.0242*	0.0245	0.0288*	0.0242
	(2.18)	(1.55)	(1.95)	(1.55)	(1.89)	(1.25)
Observations	43293	18758	24535	44856	18900	25956
R-squared	0.0329	0.0603	0.0284	0.0438	0.1818	0.0280

Panel B

	Labor Productivity			**Real Wage Growth**		
	(1)	(2)	(3)	(4)	(5)	(6)
	Full	OECD	Non-OECD	Full	OECD	Non-OECD
Share (-1)	-0.3923***	-0.3098***	-0.4647***	-0.0981***	-0.0878***	-0.1072***
	(-5.19)	(-4.59)	(-4.47)	(-8.77)	(-7.40)	(-7.55)
FD x ED	0.0196**	-0.0154*	0.0296***	0.0015	-0.0168**	0.0057
	(2.38)	(-1.68)	(2.97)	(0.21)	(-2.09)	(0.61)
S (-1)	-0.0246***	-0.0296***	-0.0220	-0.0291***	-0.0294***	-0.0322**
	(-2.69)	(-6.47)	(-1.29)	(-3.36)	(-3.71)	(-2.02)
S (-1) x FD x ED	0.0059	0.0145	0.0040	0.0062	0.0030	0.0071
	(0.62)	(0.90)	(0.38)	(1.18)	(0.63)	(1.15)
Observations	42033	18199	23834	43293	18758	24535
R-squared	0.0839	0.3056	0.0650	0.0412	0.1809	0.0241

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3. Investor sentiment and real wages growth

Panel regression of real wages growth on lagged US investor sentiment (S), defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The sample is broken down into four subsamples: Nordic countries (column 1), i.e. Denmark, Finland, Iceland, Norway, and Sweden; non-Nordic countries (column 2); top economies (column 3), defined as the set of countries characterized by the top 5% ratio of stock market capitalization over GDP; and other economies (column 4), defined as the set of countries that exhibit a ratio of stock market capitalization over GDP that does not fall into the top 5%. The controls are: country-year and sector fixed effects; financial development (FD), defined as stock market capitalization over GDP (1980-95 average); external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database; the interaction between the two (FD x ED); the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country.

	(1) Nordic countries	(2) Non-Nordic countries	(3) Top economies	(4) Other economies
Share (-1)	-0.1116***	-0.1009***	-0.0743***	-0.1003***
	(-22.47)	(-8.45)	(-7.56)	(-8.44)
FD x ED	-0.0309	0.0027	0.0250	-0.0004
	(-1.60)	(0.36)	(0.77)	(-0.03)
S (-1)	0.0107***	-0.0302***	0.1307***	-0.0301***
	(2.87)	(-3.38)	(17.27)	(-3.64)
S (-1) x FD x ED	-0.0073	0.0066	0.0817**	0.0179*
	(-0.66)	(1.26)	(2.54)	(1.69)
Observations	3850	38183	2461	39572
R-squared	0.5284	0.0754	0.2523	0.0848

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4. Growth and US foreign direct investments

Panel regression of employment growth (column 1), real value added growth (column 2), labor productivity (column 3), and real wages growth (column 4) on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators and normalized to have zero mean and unit variance; an interaction term between US investor sentiment and US foreign direct investments (US FDI), defined as the US direct investment position abroad on a historical-cost basis, expressed in USD billions, from the Bureau of Economic Analysis; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US FDI and net FDI; an interaction term between US FDI and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US FDI and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database. The set of controls includes: country-year and sector fixed effects; US foreign direct investments; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US foreign direct investments however is only available as of 1983.

	(1) Employment Growth	(2) Value Added Growth	(3) Labor Productivity	(4) Real Wages Growth
US Sentiment (-1)	0.0053	-0.0172	-0.0320*	-0.0371
	(0.35)	(-0.79)	(-1.72)	(-1.54)
US Sentiment (-1)	0.0006***	0.0001	-0.0005*	-0.0003
x US FDI (-1)	(3.47)	(0.16)	(-1.67)	(-1.18)
US Sentiment (-1)	-5.03e-13***	-1.07e-13	5.19e-13	1.59e-13
x Net FDI (-1)	(-2.94)	(-0.30)	(1.19)	(0.34)
US FDI (-1)	-1.12e-14***	9.44e-15	2.28e-14**	2.13e-14**
x Net FDI (-1)	(-2.58)	(1.08)	(2.47)	(2.04)
US FDI (-1)	0.0003	-0.0015	-0.0021	-0.0018
x FD	(0.34)	(-1.28)	(-1.35)	(-1.06)
US FDI (-1)	0.0003***	0.0003*	-0.0000	-0.0000
x ED	(3.44)	(1.75)	(-0.16)	(-0.41)
Observations	22165	22614	22165	21719
R-squared	0.0324	0.0488	0.0412	0.0958

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5. Growth and US foreign direct investments in labor

Panel regression of employment growth (column 1), real value added growth (column 2), labor productivity (column 3), and real wages growth (column 4) on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators; an interaction term between US investor sentiment and US foreign direct investments in labor (US FDIL), defined as the direct investment in employment at majority-owned nonbank foreign affiliates, expressed in millions of employees, from the Bureau of Economic Analysis; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US FDIL and net FDI; an interaction term between US FDIL and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US FDIL and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database. The set of controls includes: country-year and sector fixed effects; US foreign direct investments in labor; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US foreign direct investments in labor however is only available as of 1998.

	(1) Employment Growth	(2) Value Added Growth	(3) Labor Productivity	(4) Real Wages Growth
US Sentiment (-1)	0.0045	-0.0162	-0.0349	-0.0571*
	(0.22)	(-0.64)	(-1.51)	(-1.65)
US Sentiment (-1)	0.0601**	-0.0812	-0.1310**	-0.0915*
x US FDIL (-1)	(1.99)	(-1.18)	(-2.03)	(-1.66)
US Sentiment (-1)	8.08e-14	4.57e-13	7.46e-13	7.74e-13
x Net FDI (-1)	(0.44)	(0.66)	(1.06)	(1.27)
US FDIL (-1)	-1.11e-12	2.38e-12	3.24e-12	2.59e-12
x Net FDI (-1)	(-1.61)	(0.90)	(1.42)	(1.07)
US FDIL (-1)	-0.0744	0.0221	-0.0507	-1.1130**
x FD	(-0.40)	(0.03)	(-0.07)	(-2.01)
US FDIL (-1)	0.0272	0.0569	0.0055	0.0065
x ED	(1.34)	(1.33)	(0.16)	(0.31)
Observations	4212	4282	4212	4130
R-squared	0.0729	0.0637	0.0616	0.157

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Growth and US portfolio investments

Panel regression of employment growth (column 1), real value added growth (column 2), labor productivity (column 3), and real wages growth (column 4) on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators and normalized to have zero mean and unit variance; an interaction term between US investor sentiment and US portfolio investments (US PI), expressed in USD billions, from from the International Monetary Fund's Coordinated Portfolio Investment Survey; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US PI and net FDI; an interaction term between US PI and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US PI and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database. The set of controls includes: country-year and sector fixed effects; US portfolio investments; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US portfolio investments however is only available as of 1997.

	(1) Employment Growth	(2) Value Added Growth	(3) Labor Productivity	(4) Real Wages Growth
US Sentiment (-1)	0.0347	-0.0330	-0.0909**	-0.0733
	(0.87)	(-1.03)	(-2.33)	(-1.50)
US Sentiment (-1)	-0.0001	0.0001	0.0002	-0.0002
x US PI (-1)	(-0.41)	(0.08)	(0.44)	(-0.29)
US Sentiment (-1)	-7.77e-13	-3.11e-12	-2.57e-12	-1.54e-12
x Net FDI (-1)	(-0.64)	(-1.39)	(-1.13)	(-0.80)
US PI (-1)	0.0000	0.0000	0.0000	0.0000
x Net FDI (-1)	(1.33)	(0.43)	(0.34)	(0.78)
US PI (-1)	-0.0031	-0.0057	-0.0046	-0.0102
x FD	(-0.93)	(-0.61)	(-0.67)	(-1.29)
US PI (-1)	0.0001	0.0002	0.0001	0.0001
x ED	(0.40)	(0.66)	(0.43)	(0.63)
Observations	1923	2005	1923	1916
R-squared	0.1050	0.1270	0.1350	0.3130

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7. Employment growth, US foreign direct investments and country popularity

Panel regression of employment growth on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators and normalized to have zero mean and unit variance; an interaction term between US investor sentiment and US foreign direct investments (US FDI), defined as the US direct investment position abroad on a historical-cost basis, expressed in USD billions, from the Bureau of Economic Analysis; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US FDI and net FDI; an interaction term between US FDI and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US FDI and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database. The set of controls includes: country-year and sector fixed effects; US foreign direct investments; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The sample is split along three dimensions of country popularity from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998): a country's institutional framework (columns 1 and 2), defined as a dummy that takes on value one if the country has British legal origin; quality of institutions (columns 3 and 4), defined as the International Country Risk guide's assessment of the corruption in a country's government; and democratic score (columns 5 and 6), defined as the Data Sharing for Demographic Research Polity III index. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US foreign direct investments however is only available as of 1983.

	(1) British legal origin	(2) Non-British legal origin	(3) High Quality	(4) Low Quality	(5) High Dem. Score	(6) Low Dem. Score
US Sentiment (-1)	0.0149	-0.0029	0.0173*	-0.0204	0.0131	-0.0174
	(0.45)	(-0.13)	(1.74)	(-0.40)	(1.40)	(-0.23)
US Sentiment (-1)	0.0007***	-0.0006	0.0004***	-0.0005	0.0003**	-0.0008
x US FDI (-1)	(3.91)	(-1.37)	(3.57)	(-0.21)	(2.04)	(-0.44)
US Sentiment (-1)	-6.26e-13	3.53e-13	-3.88e-13**	9.66e-12*	-2.07e-13	5.33e-12
x Net FDI (-1)	(-1.42)	(0.97)	(-2.44)	(1.67)	(-1.21)	(1.03)
US FDI (-1)	-1.15e-14***	-5.29e-14***	-7.37e-15**	1.21e-13	-3.79e-15	1.25e-13
x Net FDI (-1)	(-3.23)	(-3.62)	(-1.98)	(0.76)	(-0.95)	(0.60)
US FDI (-1)	0.0008	-0.0019	-0.0005	-0.0114	-0.0014	-0.0001
x FD	(1.34)	(-1.32)	(-0.56)	(-0.77)	(-1.53)	(-0.05)
US FDI (-1)	0.0003***	0.0006	0.0001*	0.0045	0.0002***	0.0026
x ED	(2.92)	(1.31)	(1.69)	(1.56)	(3.00)	(1.05)
Observations	8057	14108	12205	9960	14677	7488
R-squared	0.0384	0.0350	0.0499	0.0381	0.0379	0.0415

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8. Employment growth, US foreign direct investments in labor and country popularity

Panel regression of employment growth (column 1), real value added growth (column 2), labor productivity (column 3), and real wages growth (column 4) on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators; an interaction term between US investor sentiment and US foreign direct investments in labor (US FDIL), defined as the direct investment in employment at majority-owned nonbank foreign affiliates, expressed in millions of employees, from the Bureau of Economic Analysis; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US FDIL and net FDI; an interaction term between US FDIL and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US FDIL and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database. The set of controls includes: country-year and sector fixed effects; US foreign direct investments in labor; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The sample is split along three dimensions of country popularity from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998): a country's institutional framework (columns 1 and 2), defined as a dummy that takes on value one if the country has British legal origin; quality of institutions (columns 3 and 4), defined as the International Country Risk guide's assessment of the corruption in a country's government; and democratic score (columns 5 and 6), defined as the Data Sharing for Demographic Research Polity III index. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US foreign direct investments in labor however is only available as of 1998.

	(1) British legal origin	(2) Non-British legal origin	(3) High Quality	(4) Low Quality	(5) High Dem. Score	(6) Low Dem. Score
US Sentiment (-1)	0.0570**	-0.0102	0.0072	-0.0083	0.0157	-0.0209
	(1.99)	(-0.37)	(0.48)	(-0.13)	(1.16)	(-0.30)
US Sentiment (-1)	0.0854***	-0.0856	0.0607**	0.3110	0.0710*	-0.0618
x US FDIL (-1)	(2.65)	(-0.84)	(2.02)	(0.97)	(1.88)	(-0.12)
US Sentiment (-1)	3.92e-13	1.23e-12	1.66e-14	-2.06e-12	-7.09e-14	-4.18e-12
x Net FDI (-1)	(0.61)	(1.43)	(0.09)	(-0.50)	(-0.36)	(-0.83)
US FDIL (-1)	-3.74e-12	-3.43e-12*	-1.29e-12**	-2.60e-10	-1.09e-12	2.17e-10
x Net FDI (-1)	(-1.09)	(-1.69)	(-2.14)	(-1.36)	(-1.60)	(0.83)
US FDIL (-1)	0.5090	-0.116	-0.0047	150.7000	-0.0588	-0.1370
x FD	(0.91)	(-0.08)	(-0.01)	(1.58)	(-0.15)	(-0.04)
US FDIL (-1)	0.0309	0.0097	0.0083	0.0120	0.0161	0.0214
x ED	(1.56)	(0.26)	(0.40)	(0.24)	(0.80)	(0.30)
Observations	1423	2789	2481	1731	2990	1222
R-squared	0.1130	0.0713	0.1410	0.0751	0.1010	0.0729

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9. Investor sentiment and growth during crises

Panel regression of employment growth (column 1), real value added growth (column 2), labor productivity (column 3), and real wages growth (column 4) on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators and normalized to have zero mean and unit variance; an interaction term between US investor sentiment and US foreign direct investments (US FDI), defined as the US direct investment position abroad on a historical-cost basis, expressed in USD billions, from the Bureau of Economic Analysis; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US FDI and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US FDI and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database; an interaction term between US investor sentiment, US foreign direct investments and a crisis dummy, defined as the list of country-level banking crises from Laeven and Valencia (2010); interaction term between financial development, external dependence and a crisis dummy; an interaction term between external dependence and the crisis dummy. The set of controls includes: country-year and sector fixed effects; US foreign direct investments; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US foreign direct investments however is only available as of 1983.

	(1) Employment Growth	(2) Value Added Growth	(3) Labor Productivity	(4) Real Wages Growth
US Sentiment (-1)	0.0038	-0.0687***	-0.0333*	-0.0396
	(0.25)	(-3.52)	(-1.77)	(-1.61)
US Sentiment (-1)	0.0006***	0.0002	-0.0004	-0.0003
x US FDI (-1)	(4.28)	(0.82)	(-1.34)	(-0.92)
US Sentiment (-1)	-5.61e-13***	-2.80e-13	4.27e-13	1.11e-13
x Net FDI (-1)	(-3.36)	(-0.71)	(0.93)	(0.22)
US Sentiment (-1)	-0.0008***	-0.0018***	-0.0010*	-0.0010**
x US FDI (-1) x Crisis	(-2.82)	(-2.87)	(-1.72)	(-2.46)
FD x ED x Crisis	-0.0202	-0.1070	-0.0807	-0.0299
	(-0.50)	(-0.88)	(-0.87)	(-0.97)
ED x Crisis	0.0104	0.0443	0.0310	0.0157
	(0.47)	(0.73)	(0.68)	(1.28)
US FDI (-1)	-1.29e-14***	5.45e-15	2.03e-14**	1.91e-14*
x Net FDI (-1)	(-3.11)	(0.72)	(2.16)	(1.87)
US FDI (-1)	0.0004	-0.0013	-0.0018	-0.0017
x FD	(0.62)	(-1.10)	(-1.06)	(-0.97)
US FDI (-1)	0.0003***	0.0001	-0.0001**	-0.0001
x ED	(3.44)	(1.39)	(-2.00)	(-0.69)
Observations	22165	22312	22165	21719
R-squared	0.0325	0.0450	0.0379	0.0742

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10. Employment growth, US foreign direct investments and country popularity during crises

Panel regression of employment growth (column 1), real value added growth (column 2), labor productivity (column 3), and real wages growth (column 4) on lagged US investor sentiment, defined as Baker and Wurgler's (2006) index orthogonalized to US business cycle indicators and normalized to have zero mean and unit variance; an interaction term between US investor sentiment and US foreign direct investments (US FDI), defined as the US direct investment position abroad on a historical-cost basis, expressed in USD billions, from the Bureau of Economic Analysis; an interaction term between US investor sentiment and a country's net foreign direct investments (net FDI), defined as the difference between FDI made abroad by a given country and FDI received from foreign countries, expressed in USD billions, from the International Monetary Fund's Balance of Payments database, supplemented by data from the United Nations Conference on Trade and Development and official national sources; an interaction term between US FDI and financial development (FD), defined as stock market capitalization over GDP (1980-95 average); an interaction term between US FDI and external dependence (ED), defined as in Rajan and Zingales (1998) as the reliance on external finance of US listed firms in the Compustat database; an interaction term between US investor sentiment, US foreign direct investments and a crisis dummy, defined as the list of country-level banking crises from Laeven and Valencia (2010); interaction term between financial development, external dependence and a crisis dummy; an interaction term between external dependence and the crisis dummy. The set of controls includes: country-year and sector fixed effects; US foreign direct investments; a country's net foreign direct investments; a country's financial development; an industry's external dependence; an interaction term between financial development and external dependence; the industry's share of the dependent variable in the manufacturing sector in the previous year. Standard errors are clustered by country. The sample is split along three dimensions of country popularity from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998): a country's institutional framework (columns 1 and 2), defined as a dummy that takes on value one if the country has British legal origin; quality of institutions (columns 3 and 4), defined as the International Country Risk guide's assessment of the corruption in a country's government; and democratic score (columns 5 and 6), defined as the Data Sharing for Demographic Research Polity III index. The dataset includes three-digit industries for 113 countries for the period 1970-2003 from the Unido Indstat-3 (United Nations Industrial Development Organization, Industrial Statistics) 2006 database. The dataset for US foreign direct investments however is only available as of 1983.

	(1) British legal origin	(2) Non-British legal origin	(3) High Quality	(4) Low Quality	(5) High Dem. Score	(6) Low Dem. Score
US Sentiment (-1)	0.0149	-0.0031	0.0159	-0.0194	0.0118	-0.0105
	(0.46)	(-0.13)	(1.59)	(-0.39)	(1.24)	(-0.13)
US Sentiment (-1)	0.0007***	-0.0006	0.0005***	-0.0018	0.0004***	-0.0017
x US FDI (-1)	(3.75)	(-0.98)	(4.79)	(-0.49)	(2.72)	(-0.57)
US Sentiment (-1)	-5.97e-13	3.57e-13	-4.40e-13***	1.14e-11*	-2.57e-13	6.83e-12
x Net FDI (-1)	(-1.32)	(0.76)	(-2.69)	(1.75)	(-1.53)	(0.98)
US Sentiment (-1)	-0.0276**	-0.0000	-0.0006***	0.0031	-0.0005**	0.0028
x US FDI (-1) x Crisis	(-2.02)	(-0.00)	(-2.77)	(0.65)	(-1.96)	(0.46)
FD x ED x Crisis	-0.0252	-0.0310	0.0026	-0.1130	0.0012	-0.1290
	(-0.35)	(-0.74)	(0.15)	(-0.82)	(0.05)	(-0.79)
ED x Crisis	0.0201	0.0066	-0.0070	0.0288	-0.0067	0.0362
	(0.31)	(0.35)	(-0.57)	(0.80)	(-0.51)	(0.68)
US FDI (-1)	-1.17e-14***	-5.29e-14***	-8.77e-15**	1.55e-13	-5.30e-15	1.47e-13
x Net FDI (-1)	(-3.20)	(-3.40)	(-2.57)	(0.84)	(-1.53)	(0.68)
US FDI (-1)	0.0008	-0.0018	-0.0003	-0.0109	-0.0012	-0.0005
x FD	(1.45)	(-1.01)	(-0.42)	(-0.67)	(-1.36)	(-0.27)
US FDI (-1)	0.0003***	0.0007	0.0001	0.0044	0.0002***	0.0024
x ED	(2.87)	(1.38)	(1.62)	(1.45)	(2.87)	(0.95)
Observations	8057	14108	12205	9960	14677	7488
R-squared	0.0385	0.0350	0.0504	0.0380	0.0381	0.0412

t statistics in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$