The End of Cheap Labor: Are Foreign Investors Leaving China?*

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Abstract
China's government has been promoting the shift toward a consumption-based economy in the past few years to arrive at a path of sustainable and socially inclusive growth. In this context, the explicit goal to significantly raise the percentage of wages in the national household income was an integral part of the 12th Five-Year Plan (2011–15). These changes in economic strategy are likely to affect the attractiveness of the country to foreign investors. In this paper, we raise the hypothesis that soaring relative wages negatively affect foreign direct investment (FDI) inflows to China, and alter their distribution within China. In addition, low-wage countries in the Asian region might benefit from the changed direction of FDI inflows. We utilize fixed-effects panel models with spatial spillovers for Chinese provinces and developing ASEAN countries to provide strong and robust evidence that wage increases change the allocation of FDI within China. In addition, we show that the changes in China's economic strategy improve the chances of its low-income neighbors to attract FDI.

1. Introduction

Thanks to China's rapid economic ascendance and its increasing integration into the world economy, the country has become a primary destination for foreign direct investment (FDI). According to the UNCTAD FDI database, China was the world's largest recipient of foreign investment in 2014.

During the early stages of China's economic development, a major aspect of the government's strategy was to attract export-oriented manufacturing FDI. In this context, its huge market size, improving infrastructure, and relatively low labor costs were the main pull

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factors for foreign investors. With the development of the economy and the emergence of a considerable middle class in recent years, however, China's government is increasingly stimulating the shift toward a consumption-based economy to ensure a more sustainable and socially inclusive path of economic growth. In fact, the explicit goal to significantly raise the percentage of wages in the national household income was part of the country's 12th Five-Year Plan (2011–15).[1] In 2013, average monthly wages in China amounted to about US$ 600. According to the International Labor Organization, this implies that Chinese wages are currently around three times higher than wages in Indonesia or Vietnam. Although other types of investment costs are also on the rise (e.g., resulting from environmental regulations and increasing land prices), labor is the biggest factor in most sectors.

These changes in economic conditions are likely to affect China's attractiveness to foreign investors. As wages have increased more rapidly than productivity for a number of years now, unit labor costs in China are rising. This may undermine the country's competitiveness in labor-intensive sectors (e.g., garments, shoes, and toy manufacturing) and prompt many low-cost manufacturers to shift their production to other locations in emerging Asia such as Cambodia, Indonesia, Thailand, or Vietnam.[2] In contrast, the government strategy to promote FDI in high-tech sectors is less affected by the increase in wages, as in these sectors the proportion of high-skilled labor costs in total costs is usually not very large. Hence, soaring wages can change the pattern of FDI inflows, and can also affect the distribution of FDI across regions or countries.

Despite the considerable amount of literature on the effects of China's inward FDI on other countries' attractiveness to foreign investors, the literature suffers from several limitations. First, little attention has been paid to the evolution of FDI determinants in China and their subsequent impact on the local distribution of FDI. Second, regional dependencies and spillovers are typically ignored. Their exclusion might lead to an omitted variable bias and can blur the regression results. Cross-sectional correlation might arise because of common shocks or regional competition, among others. If these regional dependencies are neglected, policy recommendations may be invalid.

To overcome these deficits, we estimate panel models incorporating spatial effects at the level of Chinese provinces and ASEAN economies. Regional dependencies are explicitly

1 See Athukorala and Wei's (2018) discussion of the labor market implications of China's economic transformation.

2 Two recent examples illustrate this development: In 2014, Microsoft decided to relocate large parts of its mobile phone production from southern China to Vietnam, not least because of rising labor costs in China (see https://asia.nikkei.com/Business/Companies/Microsoft-closing-2-handset-plants-in-China; last accessed September 2017). In a similar vein, Samsung Electronics has announced plans to gradually shift its production bases from China to Vietnam to preserve profits (see http://www.bbc.com/news/technology-29985467; last accessed September 2017).

embedded in these settings. We find strong and robust evidence that increasing wages change the distribution of FDI within China. In addition, the changes in China's economic policy increase the chances of its low-income neighbors to attract foreign investment.

The rest of the paper is structured as follows. In Section 2, we review the potential determinants of FDI, where special emphasis is given to the role of labor costs. Methodology and measurement issues are discussed in Section 3. Section 4 presents the results for Chinese provinces and ASEAN economies. Finally, Section 5 concludes with policy recommendations.

2. Labor costs and FDI

From the variety of determinants potentially affecting FDI, the market size effect seems to be the most robust—namely, larger countries receive higher FDI (Chakrabarti 2001; Blonigen 2005). The role of labor costs for FDI is ambivalent. On one hand, lower labor costs can attract investments seeking higher efficiency. Production could be realized at lower costs (i.e., the effect of labor costs on FDI should be negative). On the other hand, however, higher wages might also reflect strong labor productivity. Hence, the impact of wages on FDI might be positive, especially when foreign investors demand high-skilled workers. The former effect likely dominates in a low-wage country. In fact, most of the literature on the determinants of FDI inflows to China has found a negative wage elasticity (see, e.g., Cheng and Kwan 2000; Coughlin and Segev 2000; Sun, Tong, and Yu 2002; Chen 2011). Higher Chinese wages, by reducing the country's attractiveness to foreign investors, are also likely to change the distribution of FDI in developing Asia. Low-wage neighboring economies such as Indonesia or Vietnam might benefit from increased FDI inflows, as their cost competitiveness improves relative to China.

There are a number of empirical studies on the effects of China's inward FDI on other countries' FDI inflows. All of them are motivated by the assumption that a growing China might crowd out FDI inflows from its neighbors or other regions (see, e.g., Abe 2003; Yusof 2003). Contrary to what one might expect, however, most authors find complementarities rather than substitution effects on other Asian countries' FDI inflows (e.g., Chantasasawat et al. 2004, 2010; Eichengreen and Tong 2006a; Resmini and Siedschlag 2013). The increased fragmentation of production activities in international production chains has played a major role in this regard. In contrast, Mercereau (2005) reports negative effects for Asian economies. Eichengreen and Tong (2006b) find negative effects for countries that compete with China for horizontal FDI and positive effects for those competing for vertical FDI. García-Herrero and Santabárbara (2007) focus on the emergence of China as a large host country of FDI and its consequences for Latin American economies. Although they do not find an effect for Latin America as a region, they report negative effects for individual countries in the most recent past.

3. Econometric methodology and data issues

There are several reasons why geo-referenced variables can be spatially autocorrelated. For example, it can be expected that political decisions in one region or country can be affected by corresponding decisions in neighboring areas. Additionally, spatial autocorrelation can arise from common shocks that impact the spatial units in similar ways. If not appropriately modeled, regional spillovers introduce correlations over the cross sections and can blur the regression results (e.g., Anselin 1988).

To capture the potential impact of both economic variables and regional dependencies, FDI inflows are explained in a spatial panel Durbin framework:

$$FDI_{it} = \alpha_i + \delta t + \beta_1 wages_{it-1} + \beta_2 X_{it-1} + pWFDI_{jt} + \sum_{j=1}^{k} \beta_j X_{jt-1} + \sum_{j=1}^{k} \gamma_j W X_{jt-1} + \varepsilon_{it} \quad (1)$$

The index i refers to the cross section (regions or countries), and t denotes time. *FDI* is measured as FDI inflows in percent of GDP and is taken in log.[3] The vector X_{it} represents a set of economic controls, and ε_{ti} denotes the error term with white noise properties. Fixed effects are included for both the cross-section and time series dimensions. Controls include factors that are common in the FDI literature (see, e.g., Blonigen and Piger 2014) and that have been found to be relevant for China (e.g., Sun, Ton, and Yu 2002; Chen 2011; Yin, Ye, and Xu 2014). They are lagged one period to reduce simultaneity bias.

The wage variable is of particular interest. It is defined as the log of the monthly real minimum wage, where nominal minimum wages have been deflated by the regional consumer price index. The choice of minimum wages is due to the fact that, unlike nominal or real wages, the variable is available for all cross sections in the analysis. An increase in minimum wages over time can be interpreted as an indication of a general rise in the wage level.[4] This would be the case if the wage distribution within a country or region remains more or less unchanged. Differentials between average wages and minimum wages might be explained by skill premia, among other factors. Because the skill premia are rather

3 FDI stocks might be preferred over FDI flows, as stocks are typically less volatile on an annual basis. However, stock data are not available at the level of Chinese provinces.

4 Increasing wages in China are likely to differ in their impact on different types of FDI. Higher wages can be expected to affect mostly efficiency-seeking FDI (or vertical FDI, which is mainly driven by differences in international factor prices). Horizontal or market-seeking FDI, in contrast, should be less affected, as its main objective is to gain access to foreign markets and to avoid transport costs. The existing FDI data for China do not allow a disaggregated analysis for diverging FDI motives.

constant, at least over short periods of time, minimum wages and average wage levels should be closely connected (see, e.g., Ma 2016).[5]

There is a further argument for why minimum wages are the appropriate choice: The cost motive is much less relevant for market-seeking investors than it is for efficiency-seeking investors. The latter are typically focused on cheap-labor industries, where minimum wages are particularly relevant. To capture a possible cross-section correlation pattern, the model includes spatial lags in the dependent and independent variables. Specifically, W is a spatial or contiguity matrix with information on the regional pattern. The elements of the matrix are equal to 1 or 0, depending on whether two regions (or countries) share a common border or not. In this framework, direct and indirect effects of the explanatory variables can be distinguished. Direct effects correspond to the partial derivatives of the endogenous variable with respect to exogenous variables in the same spatial unit, and indirect effects arise as a result of impacts on the endogenous variable passing through neighborhood regions and back to the region itself. The total impact of a regressor is calculated as the sum of its direct and indirect components.

Equation (1) is estimated for panels of 29 Chinese provinces and six ASEAN economies (Indonesia, Cambodia, Laos, the Philippines, Thailand, and Vietnam). The selection of these countries is mainly motivated by data availability. Annual series refer to the 2005–13 period and are reported by the *China Statistical Yearbook* and the World Development Indicators (WDIs) of the World Bank.[6] See Tables A1 and A2 for the summary statistics.

3.1 Controls in the panel of Chinese provinces

In the analysis, the control variables include the log of GDP and GDP per capita as well as the GDP growth of the host province. These variables proxy for the effects of market size, the level of development, and the business cycle, respectively. Because a well-developed and adequate infrastructure is widely believed to improve the chances for attracting foreign investors (see, e.g., Donaubauer, Meyer, and Nunnenkamp 2016a), the length of highways relative to the provincial area is used. To capture the impact of a better-educated workforce (i.e., the availability of human capital at the destination), the share of people with a college degree or better in the overall population is chosen. Further controls include the size of the private sector, the extent of urban concentration, and the industry value-added relative to GDP. The strength of the private sector refers to business opportunities, proxied by the share of employees in privately owned companies in overall regional

5 Empirical studies based on Mincerian wage regressions usually report constant wage elasticities, as they are mostly based on a cross-section. The correlation of (absolute) minimum and overall wages is not perfect, but rather strong (about 0.6 in our ASEAN sample).

6 Data from the *China Statistical Yearbook* are available at http://www.stats.gov.cn/english/statisticaldata/AnnualData. World Bank's WDIs can be found at http://data.worldbank.org/products/wdi (last accessed June 2016).

employment. According to the new Five-Year plan of the Chinese government, urbanization is a catalyst for higher economic growth. The urbanization ratio is defined as the share of the population living in urban areas in overall population. Larger private sectors and urbanization ratios should stimulate FDI activities, as both variables reflect market potential.

3.2 Controls in the panel of ASEAN countries

To capture the effect of wage increases in China on the regional distribution of FDI, the focus of this paper is on ASEAN members. Because of their geographic proximity, FDI inflows into these countries might also increase inflows into the Chinese market—namely, the market-seeking motive (see Chia 2005). The countries included in our sample are Indonesia, Cambodia, Laos, the Philippines, Thailand, and Vietnam. Wages are defined in relative terms (i.e., they refer to the real minimum wage relative to Chinese minimum wages). Further controls include GDP, GDP growth, and GDP per capita and the share of the population living in urban areas. To proxy business conditions, a country's institutional framework is embedded via the Heritage Foundation's investment freedom index.[7] The latter reflects the restrictions on investment in the host country, where higher values indicate fewer restrictions.[8]

4. Results

4.1 FDI determinants within China

Although Chinese provinces are relatively large territorial entities, spatial relationships between provinces are a widespread phenomenon in the country (e.g., Dreger, Kosfeld, and Zhang 2016). To determine whether FDI, wages, and the other variables in our model have a geographical dimension, we conduct the Moran's I test on spatial autocorrelation (Anselin 1988). Positive values point to regional clustering and negative values to regional dispersion. Table A3 presents the Moran coefficients for all the variables in the model. The null hypothesis of no spatial autocorrelation can be rejected at the 1 percent level for wages, GDP per capita, infrastructure, the size of the private sector, and urban concentration. Results are less clear for the other variables. FDI, education, and GDP exhibit a weaker spatial autocorrelation pattern (though still significant at the 1 percent level for most years in

7 Wage data are based on International Labor Organization data from the Global Wage Database 2014–15, available at http://www.ilo.org/travail/areasofwork/wages-and-income/WCMS_142568/lang–en/index.htm. Data on investment freedom are available at http://www.heritage.org/index/download (last accessed June 2016).

8 Unfortunately, data availability restricts the specification, especially in the ASEAN model, as further control variables are reported only for shorter times. We used two strategies to tackle this issue: First, we included a lagged dependent variable that captures the influence of potentially omitted regressors to some extent. Second, we included further controls in a shorter sample—for instance, infrastructure (using data from Donaubauer, Meyer, and Nunnenkamp 2016b) or education (with data on average years of schooling from the WDI). Detailed results can be obtained from the authors upon request.

the sample period). Regional spillovers appear to be much weaker for GDP growth and industry value-added. Despite the differences in individual variables, we find strong evidence for the existence of regional clusters. Hence, we estimate the determinants of FDI to Chinese provinces in the framework of a spatial panel model. Columns (1)–(3) of Table 1 present the results of equation (1).

The findings for the control variables are in line with the existing literature and largely as expected. At the level of Chinese provinces, especially urban concentration, the size of the private sector, GDP per capita, and the GDP growth rate seem to attract FDI, whereas the level of education or infrastructure are less relevant. The key finding is that higher wages appear to discourage foreign investors. This is consistent with the view that lower labor costs attract investments seeking efficiency rather than reflecting higher skill levels. The coefficient on the direct effect of wages proves to be statistically significant at the 5 percent level. In terms of the quantitative impact, an increase of minimum wages by 1 percent decreases the FDI inflows-to-GDP ratio in the same province by roughly 0.6 percent. When looking at indirect effects of higher wages, we find that higher wages in neighboring provinces tend to have positive effects on FDI inflows to a particular province. The nonsignificance of the total wage impact reflects the opposing direct and indirect effects.

In the following, a variety of robustness tests is performed. For a start, we use different measures for the dependent FDI variable. Instead of our preferred measure (FDI as percent of the host province's GDP), in columns (4)–(6) of Table 1 we consider (logged) FDI in absolute terms and FDI in per capita terms (logged) in columns (7)–(9). As can be seen, the evidence on the relevance of wages for foreign investors is qualitatively as before.

As a further robustness check, for all three alternative definitions of the FDI variable we estimate a standard panel model without spatial lags. Although the model is likely misspecified because of the omission of the spatial regressors, it nonetheless provides a useful reference for comparison. Results are presented in Table 2. Even though the findings differ somewhat in terms of the statistical significance and the magnitude of the effects of the control variables, our major findings carry over: Wages have a strong and negative effect on the allocation of FDI between Chinese provinces.[9]

4.2 Chinese wages and FDI to neighboring countries

In this section, we first test for global spatial autocorrelation in the sample of developing ASEAN economies and then replicate the estimations of equation (1) for the country sample. Table A4 shows the Moran coefficients for all the variables in the model. Although the

9 Our findings also hold when using nominal instead of real minimum wages. We are most grateful to an anonymous reviewer for suggesting this robustness test. Detailed results are available upon request.

Table 1. Regression results for Chinese provinces (spatial Durbin model)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Dependent variable								
	(FDI/GDP) (log)			FDI (log)			FDI_pc (log)		
Variables	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Wages (log)	−0.567**	0.818*	0.251	−0.611**	0.800*	0.190	−0.624**	0.845*	0.221
	(0.268)	(0.454)	(0.491)	(0.265)	(0.447)	(0.483)	(0.263)	(0.442)	(0.475)
GDP_pc (log)	1.741**	−2.001	−0.260	1.876**	−2.200	−0.324	2.679***	−2.277	0.401
	(0.791)	(1.505)	(1.572)	(0.781)	(1.481)	(1.545)	(0.778)	(1.464)	(1.520)
GDP (log)	−2.576***	1.249	−1.328	−2.026**	1.312	−0.714	−2.847***	1.442	−1.405
	(0.828)	(1.404)	(1.496)	(0.817)	(1.384)	(1.474)	(0.814)	(1.366)	(1.449)
GDP growth	0.0404**	−0.0655**	−0.0250	0.0476***	−0.0664**	−0.0188	0.0477***	−0.0673**	−0.0196
	(0.0160)	(0.0274)	(0.0307)	(0.0158)	(0.0270)	(0.0301)	(0.0157)	(0.0267)	(0.0297)
Infrastructure	0.229	0.317	0.546	0.184	0.333	0.516	0.168	0.311	0.479
	(0.187)	(0.390)	(0.367)	(0.185)	(0.385)	(0.361)	(0.185)	(0.381)	(0.355)
Education	−1.392	−0.0188	−1.411	−1.279	0.0700	−1.209	−1.451	0.00934	−1.441
	(1.803)	(2.790)	(2.876)	(1.779)	(2.750)	(2.834)	(1.775)	(2.721)	(2.789)
Industry	−0.00552	−0.00267	−0.00819	−0.00425	−0.00212	−0.00637	−0.00423	−0.00191	−0.00615
	(0.0117)	(0.0198)	(0.0201)	(0.0116)	(0.0195)	(0.0198)	(0.0116)	(0.0193)	(0.0195)
Private sector	1.380*	4.184**	5.564***	1.337*	3.997**	5.334***	1.225*	3.899**	5.124***
	(0.728)	(1.810)	(1.883)	(0.719)	(1.783)	(1.854)	(0.716)	(1.762)	(1.825)
Pop_urban	0.0427***	0.0962***	0.139***	0.0411***	0.0931***	0.134***	0.0414***	0.0923***	0.134***
	(0.0125)	(0.0246)	(0.0282)	(0.0124)	(0.0242)	(0.0278)	(0.0123)	(0.0239)	(0.0273)
Observations	261	261	261	261	261	261	261	261	261
R^2	0.002	0.002	0.002	0.071	0.071	0.071	0.012	0.012	0.012
Number of provinces	29	29	29	29	29	29	29	29	29

Note: *Standard errors in parentheses.* ***Statistically significant at the 1 percent level;* **statistically significant at the 5 percent level;* *statistically significant at the 10 percent level. All equations include province and year fixed effects (not reported). All explanatory variables are lagged by one year.*

Table 2. Regression results for Chinese provinces (panel fixed effects model)

	(1)	(2)	(3)
	Dependent variable		
Variables	**(FDI/GDP) (log)**	**FDI (log)**	**FDI_pc (log)**
Wages (log)	−0.693**	−0.731**	−0.744**
	(0.310)	(0.306)	(0.306)
GDP_pc (log)	1.582*	1.763**	2.592***
	(0.843)	(0.832)	(0.830)
GDP (log)	−2.359***	−1.849**	−2.699***
	(0.882)	(0.870)	(0.869)
GDP growth	0.0415**	0.0493***	0.0490***
	(0.0169)	(0.0166)	(0.0166)
Infrastructure	0.259	0.217	0.201
	(0.218)	(0.216)	(0.215)
Education	−1.319	−1.209	−1.389
	(2.345)	(2.314)	(2.310)
Industry	−0.00446	−0.00276	−0.00260
	(0.0119)	(0.0117)	(0.0117)
Private sector	0.642	0.653	0.570
	(0.917)	(0.905)	(0.903)
Pop_urban	0.0187	0.0181	0.0186
	(0.0163)	(0.0160)	(0.0160)
Observations	261	261	261
R^2	0.190	0.491	0.475
Number of provinces	29	29	29

Note: *Standard errors in parentheses.* *********Statistically significant at the 1 percent level;* ********statistically significant at the 5 percent level;* *******statistically significant at the 10 percent level. All equations include province and year fixed effects. All explanatory variables are lagged by one year.*

ASEAN economies are often smaller than some Chinese provinces, regional spillovers do not play a major role in the country sample. For all the control variables, the evidence for spatial correlation is also rather weak. Nevertheless, we find some evidence that FDI activities exhibit positive spatial autocorrelation. Therefore, estimation results are presented with spatial lags (Table 3).

Except for GDP growth, which is found to negatively influence FDI, the effects of the control variables are largely as expected, although only investment freedom and urban population are statistically significant. Turning to the relative wage variable, we find strong and significant negative effects: The lower wages are relative to China, the more FDI is attracted to countries in China's geographical neighborhood. The quantitative impact is considerable: If relative wages fall by 1 percent, the FDI-to-GDP ratio will increase by 0.5 percent. Using alternative measures of the dependent variable corroborates this finding (see columns (4)–(9) in Table 3). If we include the lagged dependent variable to reduce the risk of omitted variables (see columns (10)–(12)), the real wage variable remains significant.

As the evidence for the existence of regional dependencies in the country sample is rather weak, we additionally provide the results of fixed effects panel estimations in Table 4.

Table 3. Regression results for ASEAN countries (spatial Durbin model)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Dependent variable											
	(FDI/GDP) (log)			FDI (log)			FDI_pc (log)			FDI/GDP (log)		
Variables	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
Relative wages (log)	−0.251**	−0.248*	−0.500***	−0.273**	−0.0593	−0.332***	−0.273**	−0.0602	−0.333***	−0.141	−0.196	−0.336***
	(0.121)	(0.143)	(0.0982)	(0.118)	(0.151)	(0.118)	(0.118)	(0.151)	(0.117)	(0.0892)	(0.165)	(0.127)
GDP_pc (log)	2.482	−3.903	−1.420	−7.169	0.464	−6.704	−6.120	0.527	−5.594	−0.478	−0.588	−1.067
	(4.315)	(3.581)	(4.200)	(4.641)	(3.734)	(5.027)	(4.620)	(3.724)	(4.990)	(4.179)	(3.053)	(5.091)
GDP (log)	−1.104	2.819	1.715	8.019**	−0.188	7.831	6.968*	−0.246	6.723	0.938	0.226	1.164
	(3.764)	(3.123)	(4.191)	(4.091)	(3.339)	(5.016)	(4.072)	(3.334)	(4.980)	(3.683)	(2.706)	(4.889)
GDP growth	−0.0139**	0.00441	−0.00947	−0.00767	0.00237	−0.00529	−0.00760	0.00248	−0.00513	−0.0108*	−0.0110	−0.0218**
	(0.00701)	(0.0118)	(0.00961)	(0.00689)	(0.0126)	(0.0117)	(0.00685)	(0.0125)	(0.0116)	(0.00566)	(0.0106)	(0.0105)
Investment freedom	0.00737***	−0.00148	0.00589	0.00628**	0.00332	0.00960	0.00613**	0.00334	0.00947	0.00368	0.0130**	0.0167***
	(0.00263)	(0.00617)	(0.00549)	(0.00253)	(0.00675)	(0.00665)	(0.00253)	(0.00671)	(0.00659)	(0.00240)	(0.00554)	(0.00558)
Pop_urban	0.0397**	−0.00386	0.0358	0.0813***	0.0716***	0.00965	0.0812***	0.0720***	0.00924	0.00826	0.00777	0.0160
	(0.0194)	(0.0237)	(0.0220)	(0.0214)	(0.0254)	(0.0263)	(0.0213)	(0.0252)	(0.0261)	(0.0187)	(0.0242)	(0.0236)
Lagged dep. variable										0.245***	−0.436***	−0.191**
										(0.0898)	(0.122)	(0.0951)
Observations	54	54	54	54	54	54	54	54	54	54	54	54
R^2	0.663	0.663	0.663	0.900	0.900	0.900	0.216	0.216	0.216	0.097	0.097	0.097
Number of countries	6	6	6	6	6	6	6	6	6	6	6	6

Note: *Standard errors in parentheses.* ***Statistically significant at the 1 percent level;* **statistically significant at the 5 percent level;* *statistically significant at the 10 percent level. All equations include country and year fixed effects (not reported). All explanatory variables are lagged by one year.*

Table 4. Regression results for ASEAN countries (panel fixed effects model)

	(1)	(2)	(3)
	Dependent variable		
Variables	(FDI/GDP) (log)	FDI (log)	FDI_pc (log)
Relative wages (log)	−0.381***	−0.388**	−0.390**
	(0.108)	(0.144)	(0.143)
GDP_pc (log)	−0.670	−6.138*	−5.160
	(2.526)	(3.365)	(3.357)
GDP (log)	1.449	6.870**	5.884**
	(2.147)	(2.860)	(2.853)
GDP growth	−0.00416	0.00745	0.00748
	(0.00806)	(0.0107)	(0.0107)
Investment freedom	0.00562**	0.00237	0.00226
	(0.00243)	(0.00323)	(0.00323)
Pop_urban	0.0574***	0.0916***	0.0918***
	(0.0179)	(0.0239)	(0.0238)
Observations	54	54	54
R-squared	0.739	0.951	0.943
Number of countries	6	6	6

Note: *Standard errors in parentheses.* *** *Statistically significant at the 1 percent level;* ** *statistically significant at the 5 percent level;* * *statistically significant at the 10 percent level. All equations include country and year fixed effects (not reported). All explanatory variables are lagged by one year.*

Irrespective of the definition of the FDI variable, we again find robust evidence that higher wages in China improve the chances of its low-income neighbors to attract FDI.

5. Summary and conclusion

The adjustment of the economic strategy toward a larger role of private consumption in China has led to a significant rise in wages in recent years. The resulting increase in labor costs has changed the attractiveness of the country foreign investors. While China is still attractive with respect to its huge market potential, the country lost competitiveness as a destination for FDI driven by low-cost motives in labor-intensive industries. Countries in the geographical surrounding benefit from this development.

Our empirical findings based on panel models with fixed effects and spatial spillovers for Chinese provinces and developing ASEAN economies are largely consistent with this view. We provide strong and robust evidence that the Chinese wage evolution changed the distribution of FDI both within China and Eastern Asia, as it improves the chances of the low-income neighbors (provinces or countries with lower minimum wages) to attract FDI. China is expected to receive less FDI in labor-intensive industries, with adverse effects on industrial growth and subsequent employment losses. On the other hand, the regional environment in Asia benefits from the development in terms of higher FDI and economic growth. In this sense, the Chinese economic transformation makes higher growth in the Asian region possible.

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Appendix A. Additional tables

Table A1. Summary statistics for Chinese provinces

Variable	Observations	Mean	Std. dev.	Min	Max
(FDI/GDP) (log)	261	2.490	1.944	0.068	8.192
Wages (log)	261	6.156	0.309	5.449	7.035
GDP_pc (log)	261	9.915	0.544	8.525	11.215
GDP (log)	261	6.577	0.942	3.893	8.460
GDP growth	261	12.493	2.263	5.400	23.800
Infrastructure	261	0.739	0.417	0.041	1.601
Education	261	0.084	0.054	0.025	0.393
Industry	261	48.399	7.777	21.700	61.500
Private sector	261	0.444	0.150	0.154	0.805
Pop_urban	261	49.307	12.568	26.870	86.300

Table A2. Summary statistics for ASEAN countries

Variable	Observations	Mean	Std. dev.	Min	Max
(FDI/GDP) (log)	54	−10.457	0.509	−11.385	−9.693
Relative wages (log)	54	−0.491	0.752	−2.087	0.796
GDP_pc (log)	54	7.015	0.591	6.158	8.136
GDP (log)	54	24.683	1.693	21.730	26.831
GDP growth	54	6.106	2.484	−0.738	13.250
Investment freedom	54	35.000	10.989	15.000	60.000
Pop_urban	54	36.475	10.551	19.174	52.252

Table A3. Moran coefficient for the variables in the model (Chinese provinces sample)

Year	(FDI/GDP) (log)	Wages (log)	GDP_pc (log)	GDP (log)	GDP growth
2005	0.370 (0.001)	0.436 (0.000)	0.423 (0.000)	0.139 (0.078)	−0.104 (0.220)
2006	0.349 (0.001)	0.301 (0.003)	0.411 (0.000)	0.129 (0.089)	−0.031 (0.483)
2007	0.308 (0.003)	0.265 (0.007)	0.407 (0.000)	0.134 (0.083)	−0.161 (0.144)
2008	0.249 (0.011)	0.310 (0.002)	0.391 (0.000)	0.135 (0.082)	−0.086 (0.343)
2009	0.144 (0.065)	0.314 (0.002)	0.389 (0.000)	0.142 (0.073)	−0.105 (0.282)
2010	0.089 (0.145)	0.416 (0.000)	0.384 (0.000)	0.145 (0.070)	−0.210 (0.080)
2011	0.026 (0.302)	0.260 (0.007)	0.376 (0.000)	0.143 (0.072)	0.044 (0.259)
2012	0.070 (0.182)	0.427 (0.000)	0.366 (0.001)	0.147 (0.067)	0.174 (0.047)
2013	0.076 (0.169)	0.371 (0.000)	0.348 (0.001)	0.147 (0.067)	0.172 (0.048)
Year	**Infrastructure**	**Education**	**Industry**	**Private sector**	**Pop_urban**
2005	0.603 (0.000)	0.328 (0.000)	−0.056 (0.434)	0.257 (0.009)	0.377 (0.000)
2006	0.609 (0.000)	0.240 (0.001)	−0.068 (0.396)	0.305 (0.003)	0.376 (0.000)
2007	0.603 (0.000)	0.233 (0.001)	−0.037 (0.495)	0.275 (0.006)	0.383 (0.000)
2008	0.607 (0.000)	0.246 (0.001)	−0.031 (0.484)	0.294 (0.004)	0.392 (0.000)
2009	0.610 (0.000)	0.287 (0.000)	0.008 (0.352)	0.302 (0.003)	0.410 (0.000)
2010	0.600 (0.000)	0.277 (0.000)	0.028 (0.284)	0.342 (0.001)	0.364 (0.000)
2011	0.602 (0.000)	0.172 (0.013)	0.050 (0.223)	0.398 (0.000)	0.351 (0.001)
2012	0.619 (0.000)	0.192 (0.010)	0.028 (0.288)	0.445 (0.000)	0.340 (0.001)
2013	0.626 (0.000)	0.221 (0.003)	0.009 (0.345)	0.473 (0.000)	0.342 (0.001)

Note: *p-values in parentheses.*

Table A4. Moran coefficient for the main variables in the model (ASEAN sample)

Year	(FDI/GDP) (log)	Relative wages (log)	GDP_pc (log)	GDP (log)	GDP growth	Investment freedom	Pop_urban
2005	0.148 (0.111)	−0.207 (0.489)	−0.311 (0.331)	−0.032 (0.268)	−0.209 (0.480)	−0.217 (0.403)	0.182 (0.085)
2006	0.201 (0.079)	−0.193 (0.490)	−0.316 (0.323)	−0.032 (0.268)	−0.094 (0.336)	−0.217 (0.403)	0.150 (0.103)
2007	0.182 (0.078)	−0.181 (0.472)	−0.318 (0.319)	−0.030 (0.265)	−0.284 (0.330)	−0.217 (0.403)	0.116 (0.124)
2008	0.174 (0.091)	−0.202 (0.497)	−0.318 (0.319)	−0.025 (0.259)	−0.414 (0.176)	−0.217 (0.403)	0.080 (0.150)
2009	0.093 (0.136)	−0.200 (0.500)	−0.318 (0.320)	−0.015 (0.248)	−0.273 (0.397)	−0.417 (0.160)	0.044 (0.180)
2010	0.035 (0.187)	−0.175 (0.465)	−0.321 (0.315)	−0.016 (0.249)	−0.287 (0.373)	−0.294 (0.341)	0.007 (0.215)
2011	0.062 (0.152)	−0.157 (0.439)	−0.320 (0.318)	−0.007 (0.238)	−0.377 (0.224)	−0.295 (0.341)	−0.029 (0.254)
2012	0.065 (0.144)	−0.220 (0.471)	−0.320 (0.317)	−0.006 (0.238)	0.133 (0.096)	−0.295 (0.341)	−0.062 (0.294)
2013	−0.008 (0.221)	−0.224 (0.466)	−0.315 (0.324)	0.002 (0.229)	−0.518 (0.088)	−0.380 (0.234)	−0.093 (0.335)

Note: *p-values in parentheses.*