UNIVERSITÄT BERN

CRED
CENTER FOR REGIONAL ECONOMIC DEVELOPMENT

The Effect of Outward Foreign Direct Investments on Home Employment: Evidence using Swiss Firm-Level Data

CRED Research Paper No. 28

Preetha Kalambaden
University of Bern,
CRED

Daniel Steffen
University of Bern,
CRED

August 2020

Abstract

This paper investigates the effect of outward foreign direct investments (FDI) on home employment in an understudied context - a small economy with a large relative outward FDI stock. Using Swiss firm-level data we construct a novel instrumental variable to identify a direct negative displacement effect and an indirect positive output effect. We find that FDI to high-income countries have a positive effect on domestic jobs, while FDI to lower middle-income countries are associated with a loss of domestic jobs. Further, FDI to low-income countries tend to have a positive effect on home employment. Overall, the effect of outward FDI on home employment is small and tends to create more domestic jobs than it relocates.

Key words: Foreign direct investments, home employment, multinational firms, globalization

JEL classification: F14, F16, F23, F66

CRED
Universität Bern
Schanzeneckstrasse 1
Postfach
CH-3001 Bern

Tel. +41 031 631 37 11
info@cred.unibe.ch
www.cred.unibe.ch

We are most grateful to Aymo Brunetti for his invaluable support and helpful comments. We thank all the participants of the CRED workshop (University of Bern), Brown Bag seminar (University of Bern), the Young Swiss Economists Meeting and the European Trade Study Group conference as well as Eddy Bekkers, Fabio Canetg, Ronald Davies, Maximilian von Ehrlich, Katharina Erhardt, Blaise Melly and Michael Siegenthaler for precious comments and discussions. We are grateful to David Burgherr for excellent research assistance and Melanie Moser for her support. We would like to thank the Swiss National Bank and in particular Patrick Lengg and Alexander Flühmann for providing us the data and for their valuable inputs.

1 Introduction

At present, globalization and international economic interdependence are experiencing a political setback. In many countries that were previously known for their economic openness protectionist forces have gained increasing influence. The most striking example of this turning away from globalization is the election of Donald Trump in the USA. The reason for this departure from economic openness is, among others, the fear that domestic jobs will be relocated.

Accordingly, the discussion about the effects of outward FDI on the domestic job market is reviving and the benefits of investment treaties are doubted. On the one hand, proponents of protectionism often regard outward FDI as a classic zero-sum game: The total number of jobs is fixed and every job that is built up abroad, is a job that is lost at home. This static idea of firms comes closest to the so-called *displacement effect* known in economic theory. Policy makers that support this idea strongly oppose large scale outward FDI in order to ensure home employment and production. However, this static idea of the economy does not correspond to what we observe in reality: FDI are supposed to be crucial to give firms the possibility to remain competitive and guarantee or even create additional domestic jobs in a longer term. Part of this argumentation is related to the *output effect* discussed in economic theory.

Hence, economic theory suggests two important channels through which outward FDI affect home employment: a negative and direct displacement effect channel and a positive and indirect productivity or output effect channel. Opponents of outward FDI focus rather on the displacement effect, while supporters emphasize the output effect and the importance of FDI for firms in order to remain competitive and to survive. Economic theory is not able to predict, whether the gain of domestic jobs due to output effects outweighs the initial loss due to displacement. Therefore, the currently much discussed political question about the effect of outward FDI on home employment boils down to an empirical issue.

The goal of this paper is to empirically examine this effect of outward FDI[1] on *within firm* domestic employment in the context of a small and open economy with a high relative outward FDI stock, i.e. Switzerland. In particular we aim to answer the question whether firms that engage in outward FDI increase or decrease home employment due to foreign activities. This means that we will not consider horizontal and vertical spillover effects on other firms. There is only limited evidence of these spillover effects. However, Tang and Altshuler (2015) find positive spillover effects of outward FDI on domestic suppliers, showing that at least backward linkages appear to affect home employment positively. Furthermore, we do not take into consideration that firms might have to close down their business in the longer run, if they do not have the possibility to conduct outward FDI. Hence, the overall effect on home employment is likely to be more positive

[1]Note that we are interested in operational activities of MNEs and not necessarily in financial flows. Therefore, we use foreign employment of MNEs instead of actual financial flows or stocks as measure for foreign activities. It is important to know that FDI as we use it in this paper are operational activities (foreign employment) and not bare financial flows.

than our within firm estimates suggest.

We can draw on a broad recent literature, which addresses the same empirical question. The literature can be roughly categorized into three approaches: i) papers that pursue an instrumental variable (IV) strategy, ii) papers that use matching estimators to form a counterfactual, and iii) a paper that takes a quasi-experimental approach. The first strand of literature using an IV strategy is most closely related to our method. In particular, Wright (2013) is quite closely related to this paper. We adopt the empirical strategy of this paper by estimating the displacement and the output effect in two separate steps. Wright (2013) uses sector-level data on US manufacturers and finds a positive overall effect of FDI on total employment. However, he is as well examining the effect on high- and low-skilled labor separately and finds that the total effect on low-skilled labor employment is negative. Among others, the approaches of Desai, Foley and Hines (2009) and Harrison and McMillan (2011) are as well related to our strategy. Desai, Foley and Hines (2009) show that greater foreign employment of US manufacturers is associated with greater domestic employment using firm-level data and applying as well an instrumental variable approach. Harrison and McMillan (2011) find mixed effects. They emphasize that it depends on the type and destination of FDI, whether the overall effect is positive or negative: For firms most likely to perform similar tasks in domestic and foreign affiliate, foreign and domestic employees are substitutes. However, for firms that engage in significantly different tasks at home and abroad, foreign and domestic employments are complements.[2]

The second strand of literature tries to establish a counterfactual for firms that invest abroad for the first time. This strand of literature compares national firms with firms that switch from national to multinational status using matching estimators. Debaere, Lee and Lee (2010) for example, find that South Korean multinational enterprises (MNE), which invest to countries with a lower income than South Korea face lower employment growth than comparable national firms. On the other hand, the authors find no significant difference in employment growth between firms investing in countries with higher income and comparable national firms. Barba Navaretti, Castellani and Disdier (2010) find, however, positive effects on home employment for Italian and French MNE, irrespective whether they invest in low- or high-income countries.

In a third approach, Sethupathy (2013) uses firm-level data and two events in Mexico as a natural experiment to identify the effects of a fall in the marginal cost of offshoring to Mexico. He finds no evidence of greater domestic job loss in the US due to offshoring. Finally, Crinò (2009) provides an excellent overview of the empirical literature of labor market effects of outward FDI. He finds that FDI mostly have a weak effect on home

[2]This list is obviously incomplete and there are other papers that are related to our approach. Many of them focus on the effect on wage or skill intensity. For instance, Hummels et al. (2014) are estimating the effect of offshoring wage in Denmark using an instrumental variable approach. Another prominent example are Ottaviano, Peri and Wright (2013) who apply as well an instrumental variable approach and find no negative effect of offshoring on employment level for the US. For a broader overview of offshoring and its effects on wage, skill intensity, investment as well as job loss and creation see Hummels, Munch and Xiang (2018)

employment and concludes that results tend to be very mixed depending on countries and offshoring strategy.

Hence, empirical evidence does not clearly show whether overall effects of outward FDI on home employment are positive or negative. The outcomes vary by context and might even indicate contrary effects dependent on the destination market and types of FDI. Or as Lipsey (2004, p.340) puts it in his review of home-effects of FDI: "The effect may depend on whether the foreign operations' relation to home operations is "horizontal" or "vertical," [...] the extent to which the foreign operations are in goods production or in service activities, are in developed or developing countries, or are in industries with plant-level or firm-level economies of scale." The existing literature focuses so far on big economies, while the effect on small economies is clearly less explored.

This paper contributes to the existing literature by analyzing the domestic employment effect of outward FDI for a small economy, Switzerland. Switzerland has one of the highest outward FDI stocks and flows relative to GDP in the world and is thus heavily exposed to the effects of outward FDI. Not surprisingly, some of the largest MNEs such as Nestlé, Roche or Novartis are located in Switzerland. Hence, Switzerland is not only a small economy, but, relative to its size, it engages more strongly in FDI than all other countries examined in the literature so far. Moreover, we construct a novel instrument for foreign employment and our data contains firms from the service and manufacturing sector, while the other studies often focus on the manufacturing sector.[3]

We were able to acquire unique administrative firm-level data from the surveys on cross-border capital linkages from the Swiss National Bank (SNB). We construct a novel instrument for the number of employees abroad by using different exogenous predictors of FDI to estimate the potential employment for each firm in each country in a zero-stage. The idea to estimate a firms location choices using exogenous predictors is related to the idea of di Giovanni and Levchenko (2009), who compute potential trade flows per sector adapting the classic gravity model approach. Using this novel instrument we estimate the displacement and the output effect in two different steps.

We find no evidence for the existence of a negative displacement channel and clear evidence for a positive output channel, when we are considering only FDI to high-income countries. However, the positive effect of FDI to high-income countries on home employment is rather small. In the case of FDI to lower middle-income countries, the negative displacement effect outweighs the positive output effect and, thus, the cumulative effect on home employment is negative but as well rather moderate. This negative effect is driven by China and disappears as soon as China is excluded from the estimation. Further, we find no evidence for the displacement effect and only partially significant evidence for the output effect of FDI to low-income countries. Again, this potentially

[3]For instance, Hijzen, Jean and Mayer (2011) focus as well on service and manufacturing sector of France and find a positive effect for horizontal FDI and no effect for vertical FDI. Crinò (2010) considers only the service sector in the US and finds positive employment effects for skilled workers, while less skilled workers might be displaced.

positive effect is driven by a single destination country, India. Finally, we are not able to estimate the effect of FDI to upper middle-income countries reliably. Considering all types of FDI, we find that outward FDI have no clear effect on domestic employment for Switzerland, if at all, outward FDI tend to create more domestic jobs within the investing firm than it relocates.

The remainder of this paper is structured as follows: Section 2 discusses the conceptual framework and thus, the above mentioned channels and different types of FDI in more detail. Section 3.1 presents our empirical strategy and Section 3.2 explains how the instrumental variable is constructed. The data are described in Section 4. Section 5 presents the results of the empirical application and Section 6 concludes.

2 Conceptual Framework

Economic theory distinguishes two types of FDI, vertical and horizontal FDI (see e.g. Markusen and Maskus, 2003), which affect home employment through different channels. These types are based on different motivations for an MNE to open affiliates abroad. While it was debated in the early literature which type of FDI is predominant in the world, there is now a consensus that both types of FDI coexist and are important for MNEs (Davies, 2008). Because these types of FDI affect home employment potentially differently (Lipsey, 2004), it is important to understand these diverse types and the mechanisms behind them.[4]

2.1 Vertical Foreign Direct Investments (VFDI)

Helpman (1984) and Helpman and Krugman (1985) describe VFDI in early models. The motivation behind VFDI is to exploit differences in factor prices between countries. This means that a company produces intermediate goods abroad at lower costs and thus geographically relocates part of the production chain. As a result, there are intra-firm imports of low-wage goods, which were formerly produced domestically. Therefore, in this first relocation step, foreign and home production are substitutes and VFDI are supposed to reduce the number of domestic jobs. However, after this immediate potential displacement of domestic labor, the intermediate goods produced in these foreign affiliates are complementary to the production that remained in the home country. Because factor prices are lower abroad, intermediate goods produced in the foreign affiliates are cheaper. Due to these cost savings the MNE will be able to gain market shares and, therefore, to increase production and employment at home *and* abroad. Furthermore, an expansion in production abroad leads as well to higher demand for headquarter services. Accordingly, VFDI have a negative and immediate displacement effect, as well as an opposing positive effect via competitiveness and output on domestic employment.

[4]See Barba Navaretti, Venables and Barry (2006) for a very broad overview of MNE activities and different types of FDI as well as their effects.

Because differences in factor prices are the crucial motivation for VFDI, these kind of investments flow typically from high-wage countries to low-wage countries.

2.2 Horizontal Foreign Direct Investments (HFDI)

In the case of HFDI, not only one stage but the entire production process is replicated in an affiliate abroad. I.e. the same products are manufactured in different locations. The motivation behind HFDI is the reduction of transport costs, market seeking, technology sourcing and exploitation of firm scale economies (see e.g. Markusen, 1984, for an early version of HFDI models or Markusen and Venables, 2000). Since in the case of HFDI the same products are manufactured at home and abroad, home and foreign production are substitutes. Outward HFDI thus tend to reduce domestic exports, which reduces the demand for domestic employment (Helpman, Melitz and Yeaple, 2004; Lipsey, 2004). However, HFDI allow more efficient sales in the foreign market leading to a stronger penetration of that market and accordingly, an increase in production abroad. This more complex organization and a further expansion of production due to gains in market shares lead to a higher demand for headquarter services and other complementary products, which are typically provided by the parent company (Helpman and Krugman, 1985). This gain in market share and the following rise in output increases the demand for domestic jobs. Furthermore, technology sourcing might increase home productivity, which leads as well to higher output and employment. So, there is again a negative displacement effect and a positive effect via output. The effect of HFDI on home employment strongly depends on whether a firm has exported much to a country before the foreign investment takes place. If there were only few or no exports in the forefront of the investment, there is little or no home production to be substituted and the displacement effect is negligible or even nonexistent. The more the firm exported to that country before it opened an affiliate there, the stronger is the displacement effect and it depends on the size of the output effect whether number of jobs increase or decrease at home. Because HFDI are motivated by technology sourcing or market seeking, this kind of FDI typically happens between high-income countries. Thus, according to classic theories both VFDI and HFDI have ambiguous effects on home employment: negative displacement effects as well as positive effects due to an expansion in production.

2.3 Trading Tasks

More recently Grossman and Rossi-Hansberg (2008) presented an alternative approach which examines the wage effects of offshoring. Instead of goods, tasks are traded in this new model. Wright (2013) reformulates this model in order to be able to estimate the effect on labor demand instead of wage. He, then, decomposes the effect of offshoring on labor demand in three channels: a direct *displacement effect*, an *output effect* and a *substitution effect*.[5] Wright (2013) differentiates between low- and high-skilled labor

[5]We do not discuss the substitution effect, because our data is not detailed enough to estimate this effect. However, the substitution effect is not included in the empirical literature discussed in the introduction (except in Wright, 2013, of course). Wright (2013) does not find a significant impact of this

and assumes that only low-skilled labor can be outsourced. The displacement effect negatively impacts domestic employment, because if firms move more tasks overseas, it takes less domestic tasks to produce a unit of a good. Thus, domestic labor demand falls. The output effect increases domestic labor demand by generating productivity gains via cost-savings. The substitution effect first reflects the substitution between the high-skill factor and the low-skill factor (factor substitution) and second within the low-skill factor the substitution between domestic tasks and foreign tasks (task substitution). While the factor substitution has a positive effect on domestic low-skill employment (and a negative on high skill home employment), task substitution has a negative effect on low-income employment at home. The displacement and the output effect identified by Wright (2013) are closely related to the effects described in earlier literature discussed above.

Summing up, theory comes up with different channels and opposing effects of FDI on home employment. Two channels seem to be important in all models and for both types of FDI: the direct displacement effect and the indirect output or productivity effect. These two channels have opposing effects on home employment and theory is not able to predict which will be the dominating channel. Hence, the theory does not come to a clear conclusion as to whether outward FDI lead to a loss or gain of jobs in the home country. It is important to keep in mind, that the motivation for FDI is decisive in order to investigate the effects on employment, because HFDI and VFDI do affect employment via different mechanisms. Therefore, these different investment types might have distinct effects on domestic labor demand.

3 Empirical Strategy

3.1 Baseline Specification

As outlined in the previous section two opposing channels explain the relation between domestic and foreign employment. Following Wright (2013), we estimate these two channels in two separate steps reflected in these estimation equations:

$$\ln Empl_{it}^{D} = \alpha^{D} + \beta_1^{D} \ln Empl_{it-1}^{F} + \beta_2^{D} \ln Y_{it-1} + X_{it}'\beta^{D} + \delta_t^{D} + \gamma_i^{D} + \varepsilon_{it}^{D} \quad (1)$$

$$\ln Y_{it} = \alpha^{O} + \beta_1^{O} \ln Empl_{it-1}^{F} + X_{it}'\beta^{O} + \delta_t^{O} + \gamma_i^{O} + \varepsilon_{it}^{O}, \quad (2)$$

where Equation 1 estimates the displacement effect and Equation 2 the output effect. $Empl_{it}^{D}$ is domestic labor of the MNE i and $Empl_{it}^{F}$ is the number of employees working abroad. Y_{it} is output measured in net revenue. We control for a set of additional firm specific variables X_{it} (exports, imports and capital). We do not have access to export and import data on firm level, they are constructed on industry level.[6] Moreover, we

substitution effect on employment and does not focus on this channel.

[6]Firm-fixed effects ensure that time-invariant level differences are absorbed. This means that only the change of exports and imports over time is relevant. Including exports and imports on industry-level is therefore based on the assumption that imports and exports of a MNE develop in the same way as the average of its industry.

include year (δ_t) and firm fixed effects (γ_i).

In the first step, we estimate the displacement effect, which quantifies the direct effect of offshoring, where domestic workers are replaced by foreign workers. Therefore, home employment $Empl_{it}^{D}$ is regressed on lagged foreign workers $Empl_{it-1}^{F}$ (see Equation 1). As discussed in Section 2, home employment is as well affected by foreign employment via an opposing indirect effect. This indirect channel affects home employment via firm output. In order to isolate the displacement effect in Equation 1, we have to cancel this output channel out. As Wright (2013), we are doing this by holding output fix, i.e. by controlling for output Y_{it-1}. When output is fixed, foreign and home employment are substitutes and more foreign employment means less employment at home. Consequently, we expect the displacement effect to be negative. Because the labor market is not fully flexible, it takes time until a dismissal or hiring of staff realizes. Therefore, both $Empl_{it}^{F}$ and Y_{it} are lagged by one year.

In a second step, we estimate the output effect. As discussed in Section 2, the output effect is an indirect effect which works via cost savings and an increase in production. Therefore, we need to estimate the output effect in two steps. We estimate the effect of outward FDI on total output (see Equation 2). Again, we lag $Empl_{it}^{F}$, because it takes time until the opening of a new foreign affiliate affects output. However, a significant effect of foreign employment on output in Equation 2 is not sufficient to show that the output channel exists. The output effect channel consists of two parts: The effect of foreign employment on output on the one hand and the effect of output on home employment on the other. With Equation 2, only the first part of this channel is established. Hence, in order to fully capture the output effect channel, we need to show as well that the effect of output on home employment in Equation 1 is significant (and positive). Accordingly, the indirect effect of outward FDI on home employment is only given if both – the effect of outward FDI on output and the effect of output on home employment – can be substantiated. The overall effect of FDI on domestic employment is finally identified by adding up the coefficients from estimating the displacement and the output effect.

By applying a fixed effects model, we control for time-invariant and firm-specific variation, however, there might exist time-variant firm-specific variables that are not observed. One example for time-variant unobserved variables are technology shocks which are absorbed in the error term but affect domestic and foreign employment. This could cause endogeneity issues, which we face by adopting an instrumental variable strategy.

3.2 Instrumental Variable Strategy

We are proposing a novel instrument for firm-level outward FDI. We construct the potential foreign employment for each firm using only exogenous FDI predictors. Our approach is similar to the strategy used in Desai, Foley and Hines (2009) and the gravity based technique often used in the trade literature (see e.g. Santos Silva and Tenreyro, 2006). Desai, Foley and Hines (2009) construct firm-specific weighted averages of foreign GDP growth as predictor for foreign activity of that firm. The predicted growth

rates of foreign activity are then employed to explain changes in domestic activity. The idea behind the instrument is that FDI locations differ significantly between firms and these locations are exposed to different exogenous developments (in Desai, Foley and Hines, 2009, different GDP growth rates) which affect FDI positions. Part of our argument is very similar: We know that FDI destination countries of Swiss MNEs differ significantly across firms. Given these locations, we can observe exogenous and country-specific shocks, which affect FDI choices of Swiss MNEs. Let us for example assume that one firm's investments are concentrated in Germany, while the other firm's investments are concentrated in the United Kingdom (UK). The firm which is operating in Germany is more exposed to shocks in Germany than the other firm. Hence, a positive shock in Germany is – at least in the short term – supposed to have a bigger positive impact on foreign activities of the firm with mostly German operations. As predictors of these shocks we take inward FDI stock of country c minus Swiss outward FDI stock into the same country c, the exchange rate between the US-Dollar (USD) and country $c's$ currency, as well as other variables described below which have been shown to be important exogenous predictors of FDI flows in the gravity literature (e.g. in Carr, Markusen and Maskus, 2001; Head, Mayer and Ries, 2009; Egger and Pfaffermayr, 2004). We take inward FDI stocks as predictor since Swiss MNEs are highly likely to invest in those countries, where MNEs of other countries decide to invest. The idea behind the exchange rate is the following: If there are again two firms, one with affiliates mostly in Germany and the other in the UK and the Euro depreciates, German employees become relatively cheaper and firms which have already affiliates in Germany will expand foreign activities relatively more than the firm, whose affiliates are concentrated in the UK.[7]

A challenge is that we observe all the predictors of outward FDI on country level. However, we need firm-specific predictions of foreign employment based on the exogenous predictors named above. We apply the approach of di Giovanni and Levchenko (2009) to overcome this problem. The goal is to predict firm-specific foreign employment in a zero-stage in these three steps:

$$Log\ Empl^f_{ict} = \alpha + \beta_{1i} Log\ FDI^*_{ct} + X'_{ct}\beta_i + \epsilon_{ict} \tag{3}$$

$$\widehat{Log\ Empl}^f_{ict} = \hat{\alpha} + \hat{\beta}_{1i} Log\ FDI^*_{ct} + X'_{ct}\hat{\beta}_i \tag{4}$$

$$\widehat{Empl}^f_{it} = \sum_{c=1}^{C} e^{\widehat{Log\ Empl}^f_{ict}} \tag{5}$$

$Log\ Empl^f_{ict}$ is the log of foreign employment of firm i in country c and year t. FDI^*_{ct} is total inward FDI stock of country c subtracted by the outward FDI stock of Switzerland (CH) in country c ($FDI_{ct} - FDI^{CH}_{ct}$). X_{ct} is a set of exogenous predictors of FDI as exchange rate between the USD and foreign country c's currency, population (log), capital-labor ratio, investment and trade costs (log), distance from Switzerland to

[7]We take the USD dollar as base currency, because fluctuations in the Swiss franc exchange rate of the Swiss franc are likely to be caused by events that affect the performance of Swiss firms.

c (log), dummy variable for existing investment treaties between Switzerland and c and a dummy variable for common language.[8]

The key of the approach is the first step, i.e. estimation Equation 3. Following di Giovanni and Levchenko (2009), we regress firm-level foreign employment on country-specific predictors to get firm-specific coefficients β_i, i.e. we run regression Equation 3 for each firm i. We get different firm-specific coefficients, because firms might follow different foreign investment strategies. Firm-specific investment strategies might address different host-countries, be more or less sensitive to different predictors and change over time. For example, capital-labor ratio might be more important for some firms than for others, depending on the investment strategy and the production function of the firms. In a second step, we predict potential foreign employment per country, $\widehat{Empl}^f_{ict}$, based on exogenous predictors of Estimation 3. Hence, we keep only the exogenous variation of foreign employment, while the endogenous part in the error term is left out. In a final step, we compute the total potential foreign employment per firm by summing up the exponential of the predicted log of country-specific foreign employment over all countries for each firm (see Equation 5).[9] Having predicted potential foreign employment $\widehat{Empl}^f_{it}$, we apply a 2SLS strategy to estimate Equations 1 and 2 using $\widehat{Empl}^f_{it}$ as instrument.

Since firms have affiliates and therefore positive numbers of foreign employment only in a few countries, they report a lot of zeros for most other countries. This implies that we have to deal with many zero values which would get lost when taking logs. These zero values contain important information in order to consistently estimate the coefficients in Equation 3 and allow us to consider cases were firms open up new plants in a foreign country. We face this issue by following Santos Silva and Tenreyro (2006) and use the Poisson pseudo-maximum likelihood (PPML) estimator in order to estimate Equation 3.

4 Data

The main data source on multinational activities of Swiss Firms are the surveys on cross-border capital linkages from the SNB which covers basically firms with a FDI balance sheet lager than 10 million Swiss Francs (CHF). Our data include domestic and foreign employment on a country level of Swiss multinational enterprises over the period 1994-2016. It also covers data on firm characteristics such as industry classification (3-digit NOGA code) and ownership as well as extensive information on domestic and foreign capital links of the firms. To get access to firm-level data we were obliged to obtain

[8]Note that the exogenous predictors named above should not affect home employment of a Swiss firm via any other channel than foreign employment. Therefore, it is important that we include time fixed effects: These time fixed effects absorb global shocks (e.g. a downturn in global economy) that may affect predictors (e.g. FDI^*_{ct}) as well as Swiss firms directly. Furthermore, it is important to keep in mind that we control for trade (import and export) such that predictors (e.g. distance between a country and Switzerland or population size) only affect home employment of a Swiss-based firm via FDI.

[9]In order to get the absolute total of potential foreign employment, we need to sum the exponential because the PPML estimator returns logarithmized results of potential foreign employment per firm and country.

the consent of the respective firms due to confidentiality issues and the data protection rule of the SNB. We got access to data of 139 firms. Our sample covers around 56% of all domestic employees working for Swiss MNEs. Further data on firm characteristics such as net revenues and property, plants, equipment (called capital) were extracted from Worldscope, Thomson Reuter's Datastream. The remaining missing data on firm characteristics were finally gathered through access to historical annual reports by the Swiss Economics Archive (Schweizerisches Wirtschaftsarchiv). However, we were not able to fill all the missing values for variables on firm characteristics. Exports and imports are obtained from UN Comtrade Database for trade in goods and from the SNB[10] for trade in service.

We further assemble data on FDI predictors in order to construct our instrumental variable (see Section 3.2). We obtain data on distance between Switzerland and a certain destination, population size and information on common language from the CEPII gravity database.[11] Data on investment costs (Global Competitiveness Index, GCI), exchange rates, capital-labour ratio and bilateral trade costs are retrieved from the World Bank database. Data on FDI stocks and information on bilateral investment treaties are gathered from UNCTAD and information on preferential trade arrangements between countries including WTO-investment-areas are provided by Word Bank.

Table 1 Descriptive Statistics

	Characteristics of Swiss multinationals			
	Minimum	Median	Mean	Maximum
Home Employment	109	1434	4361	53,201
Foreign Employment	9	2390	14,021	275,947
Revenue (in Mio. CHF)	43	2005	7698	95,902
Capital (in Mio. CHF)	17	409	7733	404,094
Countries per firm	1	36	45	124
Employment per Affiliate	1	94	592	56,288

Our panel is highly unbalanced with hardly any values for the years before 2002. Due to modification of the methodical concepts in 2014[12] and limited availability of other data used, we are finally left with a sample covering the period 2002-2013. The data include firms in manufacturing as well as service (including banks and insurance companies). Table 1 shows the summary statistics of the firm characteristics. The size

[10] Database can be accessed via `https://data.snb.ch/en`.

[11] Database can be accessed via `cepii.fr`.

[12] Until 2013 staff numbers included both minority and majority participations and were stated in relation to the capital participation of the investor. As of 2014 – in line with international methodology – staff numbers only include majority participations. Further, no longer proportional, but absolute numbers of staff abroad are stated.

of the MNEs vary considerably in our sample. A few firms operate mainly globally and report high values of foreign employment while others operate mainly domestically. I.e. the number of workers employed in Switzerland varies between 109 and 53,201 per firm and the number of workers abroad between 9 and 275,947. The average firm in the dataset has about 4,361 domestic employees and 14,021 employees working abroad. Furthermore, firms in our dataset have an affiliate in at least one country and on average in 46 countries. The affiliate size ranges from 1 employee to a maximum of about 56,000 employees with an average of 592 employees. The median firm has affiliates in 36 different countries with a median size of 94 employees.

Table 2 Employment by Destination

	2002	2013
Domestic employment	223,482	429,080
Total foreign employment	907,752	1,283,284
Employment in high-income countries	627,047	672,839
Share of foreign empl. in high-income	69%	52%
Employment in upper middle-income countries	71,358	130,305
Share of foreign empl. in upper middle-income	8%	10%
Employment in lower middle-income countries	166,575	368,167
Share of foreign empl. in lower middle-income	18%	29%
Employment in low-income countries	42,773	111,972
Share of foreign empl. in low-income	5%	9%

Note: Grouping into income categories according to World Bank classification in 2002.

Table 2 reports total number of domestic employment and employment in foreign countries aggregated over all firms classified in income-level aggregates. We split employment in foreign affiliates according to the country's income level in high-, upper middle-, lower middle- and low-income. The classification is done according to the World Bank income classification of 2002. While Swiss MNEs located their affiliates mostly in high-income countries in 2002 (69% of all foreign employees were engaged by then in high-income countries) lower middle-income and low-income countries have gained importance as destination market for foreign investments in the last decade. During the wave of globalization especially countries like China and India, which are classified as lower middle-income or low-income countries, became increasingly more attractive for foreign investment. These two countries are the main driver of the rise in employment in

the lower middle-income and low-income country aggregates.[13] In the period observed, foreign employment increased in high-income countries by almost 12%, while it more than doubled in lower middle- and low-income countries. These findings are well aligned with global FDI patterns: Almost all FDI in the 1990s took place between high-income countries and tended consequently to be HFDI, but VFDI have become increasingly important in recent decades (Barba Navaretti, Venables and Barry, 2006, p.32). Figure A.1 in Appendix A displays the ten most important destination countries in terms of foreign employment for Switzerland. In 2002 the US and Germany were clearly the most important destination countries followed by other major economies in Europe as the United Kingdom and France. Further behind, large emerging countries like Brazil, Russia and China were following as well as other major European economies as the UK, Italy and Spain. Over the last decade major emerging economies such as China, Brazil and India became more important countries for outward FDI. In 2013, China was as important as Germany for Swiss multinationals while the US remained the main destination of FDI in terms of employment in foreign affiliates.

We need to drop a number of firms from our sample due to several reasons. First, we drop firms which never have a non-zero observation in foreign employment (34 firms never have a non-missing or non-zero value). Second, we drop Swiss-based subsidiary companies of foreign corporations and consider only corporations headquartered in and directed from Switzerland. Thirdly, we drop firms for which the PPML-estimation does not converge, because we are not able to predict potential foreign employment reliably (8 firms). Finally, we have to drop one or two firms in each estimation, because the instrument (prediction of foreign employment) of these firms is a clear and highly influential outlier.[14]

5 Results

5.1 Benchmark Estimations

Table 3 reports the results of estimating Equation 1 quantifying the displacement effect. Models in columns 1-3 are estimated with the fixed effects estimation approach, while models in columns 4-6 show the results of the IV estimation within a 2SLS framework. The results in column 1 show that there is no significant correlation between domestic and foreign employment, when we do only control for firm and year fixed effects. Since we expect a negative displacement and a positive output effect to be at work, which might outweigh each other, this result is not meaningful. Therefore, we control for output in the regression in order to isolate the displacement channel. By doing so, the effect of

[13] India was classified as low-income country until 2009 and is, therefore, included in our low-income aggregate.

[14] These one or two outliers cause a drop of the first-stage Kleibergen-Paap F-statistic of our 2SLS prediction to below 1 from a convienent value of clearly more than the critical 10. We indicate for each estimation, how many firms had to be dropped because of outliers. Usually, a small bank with very few employees at home and abroad is dropped, as well as a firm in the energy sector. Fixed effects estimations show that estimates are otherwise not sensible to the inclusion or exclusion of these firms.

foreign employment becomes, as expected negative and significant (see columns 2-3). An increase of foreign employment of 10% would lead to a decrease of domestic within firm employment of 1%. This is in line with the theory and the underlying concept of the estimation strategy. We control for capital, exports and imports in order to capture changes in capital intensity and trade-related movements. These additional controls do not alter the coefficient of interest.

To cope with potential endogeneity issues, we instrument foreign employment as described in Section 3. The Kleibergen-Paap F-statistics of the first stage show that our instrument is relevant. Using instrumented foreign employment, the displacement effect disappears completely (columns 5-6): The coefficient of interest becomes insignificant and is close to zero. Only output seems to be relevant and is positively associated with domestic employment. However, the coefficient of output loses significance, as soon as we control for capital, exports and imports.

In a second step we estimate the output effect, which represents the indirect productivity effect from offshoring on domestic employment. We have discussed in Section 2 that we need two steps to fully substantiate the output effect: The effect of foreign employment on output and, additionally, the effect of output on home employment is expected to be positive. First, we consider the effect of foreign employment on output. In order to do that we estimate Equation 2 by using the same instrument as in Equation 1 for foreign employment. Results are reported in Table 4. We find a highly significant and

Table 3 Displacement Effect

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.01	−0.09***	−0.10***	0.22	0.06	0.04
	(0.05)	(0.03)	(0.03)	(0.21)	(0.27)	(0.29)
Lag Output (log)		0.47***	0.39***		0.35*	0.29
		(0.13)	(0.12)		(0.20)	(0.23)
Capital (log)			0.08			0.08
			(0.07)			(0.09)
Exports (log)			0.09			0.10
			(0.18)			(0.20)
Imports (log)			−0.04			−0.01
			(0.08)			(0.15)
Observations	557	557	557	557	557	557
First stage F-stat.				34.26	19.05	18.21
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 4–6. Two firms have been removed from this estimation for reasons explained in footnote 14.
* p<0.10, ** p<0.05, *** p<0.01.

Table 4 Output Effect

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.24***	0.18***	0.45***	0.38***
	(0.08)	(0.07)	(0.13)	(0.13)
Capital (log)		0.15*		0.12
		(0.08)		(0.08)
Exports (log)		0.34***		0.29**
		(0.12)		(0.11)
Imports (log)		0.01		0.06
		(0.08)		(0.11)
Observations	557	557	557	557
First stage F-stat.			34.26	29.08
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 3–4. Two firms have been removed from this estimation for reasons explained in footnote 14.
* p<0.10, ** p<0.05, *** p<0.01.

positive association between foreign employment and output. The estimate in column 4 indicates that an increase in foreign employment by 10% is associated with a rise in output of 3.8%. Hence, the first part of the output effect channel is established: Higher foreign employment is significantly and positively associated with output. Results in Table 3 show that the evidence of the second part of the output channel – whether output is positively associated with domestic employment – is less clear. Output is on the one hand positively and significantly correlated with home employment when we are not including capital and trade (column 5). But on the other hand, the IV point estimates of output become marginally smaller if we include all controls and bootstrap standard errors get inflated. Therefore, the IV estimates of the relation between output and domestic employment remain positive but turn insignificant in column 6. Hence, we do not find clear evidence of the second part of the output channel. However, results point toward the existence of such a positive output channel.

Summing up, we find that the negative displacement effect seems to be irrelevant when using the IV approach, while it depends on the model whether we find a positive output effect. Hence, outward FDI appear not to have an important effect on home employment when considering all types of FDI. As mentioned, depending on the FDI strategy of a firm different mechanisms might be at work and considering all types of FDI in one estimation might not allow to disentangle these different effects. Further, in 2002 about 70% of all Swiss outward FDI flow to other high-income countries and are therefore, mainly HFDI. Even though middle- and low-income countries gain importance over time, high-income countries remain the primary destination of outward FDI of Swiss MNEs. As discussed in Section 2, HFDI substitute domestic exports. However,

if exports to a certain country were low or zero before firms conduct HFDI in that country, there are not much exports to be substituted and thereby the displacement effect is small or nonexistent. Hence, an explanation why there seems not to exist a clear displacement effect in Switzerland, might be the investment strategy of Swiss firms seeking to open (new) markets. The small domestic market and potentially higher transport costs due to the lack of sea access, may further explain why Swiss MNEs are opening up affiliates overseas primarily in order to gain market access. In order to further investigate and disentangle the effects of different types of FDI on home employment, we need to distinguish between vertical and horizontal outward FDI. This is done in the following Section.

5.2 FDI by Destination

The distinction between VFDI and HFDI is crucial in determining the displacement and the output effect. While VFDI are motivated by making use of wage differentials and cost savings, market seeking and technology sourcing are main objectives of HFDI. Therefore, the mechanisms at work are different and effects of the respective type of outward FDI might be different.

A crude measure to differentiate between the types of FDI is by looking at destination countries and classify investments to lower-income countries as VFDI and to high-income countries as HFDI.[15] This distinction by income levels is based on the idea that wages are lower in low-income countries and therefore, they are more attractive for VFDI. Furthermore, purchasing power is below average and the market is less attractive to sell products. In high-income countries, on the other hand, purchase power is high and the technology closer to the frontier, which is important for market seeking or technology sourcing and therefore HFDI. We incorporate this distinction between VFDI and HFDI by splitting countries to high-, upper resp. lower middle- and low-income countries according to the World Bank classification in the year 2002.

5.2.1 FDI to High-Income Countries

In a first step, we focus on FDI to high-income countries. This means, we run the zero stage (Equations 3-5) as well as estimations of the displacement and output effect considering only foreign employment in high-income countries. Figure A.2 in Appendix A shows the share of employment in the 10 most important high-income destinations. In 2002 the USA was clearly the most important destination followed by Germany and further behind other major European economies as the United Kingdom, France or Italy. The most salient change in 2013 compared to 2002 is that very distant countries like Canada, Japan and Australia seem to become more important destinations. As mentioned above, we expect most of these FDI to be HFDI.

The regression results for the effect of investing to high-income countries and therefore performing HFDI are shown in Tables 5 and 6. The Kleibergen-Papp F-statistics of

[15]This link between type of FDI and destination country is, for instance, as well done in Harrison and McMillan (2011) and Debaere, Lee and Lee (2010)

Table 5 Displacement Effect for FDI into high-income countries

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.04	−0.05	−0.05	0.15	0.03	0.01
	(0.05)	(0.03)	(0.03)	(0.14)	(0.14)	(0.14)
Lag Output (log)		0.43***	0.36***		0.37***	0.31**
		(0.13)	(0.12)		(0.13)	(0.15)
Capital (log)			0.08			0.08
			(0.07)			(0.08)
Exports (log)			0.10			0.09
			(0.18)			(0.19)
Imports (log)			−0.02			−0.02
			(0.08)			(0.13)
Observations	553	553	553	553	553	553
First stage F-stat.				37.00	25.28	26.00
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 4–6. Two firms have been removed from this estimation for reasons explained in footnote 14.
* p<0.10, ** p<0.05, *** p<0.01.

the first stage of our estimations are much higher compared to the values in the baseline regressions including all types of FDI and show that our instrument is relevant. Compared to the baseline results in Table 3, the magnitude of the displacement effect in the fixed effects approach is cut in half and is not significant anymore (see columns 2-3 in Table 5). The results of the IV strategy show a similar pattern as in the baseline regression: Point estimates of foreign employment in Table 5 are close to zero and clearly not significant. Hence, we do not find any evidence of the negative displacement channel. On the other hand, foreign employment is positively and significantly associated with output (see Table 6) and output is positively and significantly associated with home employment (see Table 5). There is significant evidence of the existence of both steps of the output effect. Therefore, outward FDI to high-income countries stimulate domestic employment – even though the effect is rather small. A simple combination of both steps of the output effect as in Wright (2013) gives us the following overall effect: An increase of foreign employment by 10% is associated with an increase of home employment of about 0.9% (including all controls) to 1.3% (excluding capital and trade controls) via the output channel. Since results in this sections show that HFDI do not substitute exports (i.e. there is no displacement effect), one might conclude that the main motivation of outward FDI in Switzerland is opening new markets or technology sourcing.

Table 6 Output Effect for FDI into high-income countries

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.24***	0.16**	0.34***	0.28***
	(0.08)	(0.07)	(0.11)	(0.08)
Capital (log)		0.15*		0.12
		(0.07)		(0.08)
Exports (log)		0.32**		0.27**
		(0.12)		(0.12)
Imports (log)		−0.02		0.00
		(0.07)		(0.12)
Observations	553	553	553	553
First stage F-stat.			37.00	35.64
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 3–4. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

5.2.2 FDI to Upper Middle-Income Countries

Our instrument is not valid for this category of FDI (see Kleibergen-Papp F-statistics of the first stage in Tables B.1 and B.2). Therefore, we refrain from discussing the results. Nevertheless, the results can be found in Appendix B.

Reasons why we fail to reliably estimate the effect in this case, might be that the upper-middle income group is a relatively small group of heterogeneous countries and overall only a relatively small number of Swiss MNE employees is active in these countries. In total, Swiss MNEs in our sample are active in only 23 upper middle-income countries, which makes the upper middle-income economies the smallest category in terms of number of destinations. Figure A.3 in Appendix A shows that these are mostly Eastern European or Latin American destinations. Compared to the most important countries of other categories these are relatively small economies. With a share of 8% of total foreign employment in 2002 and no country in the top ten destinations for Swiss MNE upper middle-income countries are less important as destination for Swiss MNE than high-income or lower middle-income countries.

5.2.3 FDI to Lower Middle-Income Countries

Lower middle-income countries are with a share of 18% in 2002 and 29% in 2013 the most important destination for Swiss outward FDI after high-income countries. Figure A.4 in Appendix A shows that most important lower middle-income destination countries are big emerging markets outside of Europe as Brazil, Russia or China. These three large

Table 7 Displacement Effect for FDI into lower middle-income countries

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	−0.08*	−0.11**	−0.11**	−0.11	−0.17*	−0.16*
	(0.04)	(0.05)	(0.05)	(0.08)	(0.09)	(0.09)
Lag Output (log)		0.31***	0.28**		0.35***	0.32**
		(0.09)	(0.10)		(0.12)	(0.14)
Capital (log)			0.01			0.01
			(0.05)			(0.13)
Exports (log)			0.17			0.13
			(0.25)			(0.27)
Imports (log)			−0.07			−0.07
			(0.14)			(0.35)
Observations	386	386	386	386	386	386
First stage F-stat.				27.42	23.17	26.51
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 4–6. One firm has been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

emerging markets also belong to the most important destinations for Switzerland when considering all destinations. Due to the high wage level in Switzerland, lower-middle-income countries might mainly be of interest for VFDI for Swiss MNE. However, some of these countries such as China, Brazil and Russia might be as well interesting for HFDI, because of their market size and increasing purchase power (at least during the period observed).

Tables 7 and 8 show the results of FDI to lower middle-income countries. In contrast to our findings of overall FDI and FDI to high-income countries, we find evidence of a negative displacement effect in the IV model (columns 5 and 6 in Table 7). IV estimates show that an increase of foreign employment in lower middle-income countries by 10% is associated with a significant decrease of employment at home by 1.6%. Furthermore, there is evidence for the positive output effect: Foreign employment is positively and significantly associated with output (see Table 8), while output is positively associated with home employment (see Table 7). When we are combining the effects as it is done in Wright (2013), we find that overall an increase in foreign employment in lower middle-income countries by 10% is associated with a decrease of home employment by about 1.1%. Hence, the negative displacement effect outweighs the positive output effect in this case.

So, while overall FDI and in particular FDI to high-income countries tend to have a positive effect on home employment, FDI to lower middle-income countries seem to decrease home employment in the short-run. Hence, the different mechanics behind

Table 8 Output Effect for FDI into lower middle-income countries

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.13**	0.11**	0.16**	0.17**
	(0.05)	(0.05)	(0.08)	(0.07)
Capital (log)		0.13		0.12
		(0.11)		(0.15)
Exports (log)		0.41**		0.44*
		(0.17)		(0.23)
Imports (log)		0.01		0.01
		(0.20)		(0.36)
Observations	386	386	386	386
First stage F-stat.			27.42	30.19
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1-2 and bootstrap std. err. (10,000 iterations) for columns 3–4. One firm has been removed from this estimation for reasons explained in footnote 14.
* p<0.10, ** p<0.05, *** p<0.01.

HFDI and VFDI actually do affect home employment differently: While the positive output effect dominates for HFDI, the negative output effect is dominating for VFDI to lower middle-income countries.

5.2.4 FDI to Low-Income Countries

Ultimately, we look at FDI to low-income countries. Figure A.5 in Appendix A shows that almost 40% of foreign employees in low-income countries are located in India. Other important low-income destination countries are Zambia, Indonesia or Pakistan. Due to the low purchase power, most of these countries do not seem to be interesting for HFDI.[16] Moreover, low-income countries are generally not at the technological frontier and therefore, technology sourcing is as well unlikely to be the motivation behind FDI to these countries. Wage differentials seem to be the main motivation behind FDI in these countries. Furthermore, countries with unstable political institutions and very low purchase power but rich in natural resources as the Democratic Republic of Congo seem to be attractive destinations because of their natural resources and not because of low wages and cost-savings in production. Hence, it is not likely that production stages from Switzerland will be shifted to countries with very low incomes but rich in natural resources. The goal behind FDI to these countries is rather natural resource sourcing than a substitution of Swiss production. Thus, FDI to low-income countries

[16]Countries like India or Indonesia could of course be as well interesting for HFDI because of their market size and rapidly growing middle-class. However, HFDI are overall rather the exception, while VFDI are the prevailing FDI type flowing to these type of countries.

Table 9 Displacement Effect for FDI into low-income countries

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	−0.09	−0.12*	−0.09	0.02	−0.05	0.03
	(0.06)	(0.07)	(0.06)	(0.13)	(0.11)	(0.21)
Lag Output (log)		0.27**	0.21*		0.24**	0.12
		(0.11)	(0.11)		(0.10)	(0.15)
Capital (log)			−0.04			−0.02
			(0.03)			(0.15)
Exports (log)			0.58***			0.73**
			(0.20)			(0.37)
Imports (log)			0.00			0.06
			(0.10)			(0.34)
Observations	250	250	250	250	250	250
First stage F-stat.				88.46	93.86	49.20
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 4–6.
* p<0.10, ** p<0.05, *** p<0.01.

appear to be heterogeneous and it is not clear what the prevailing motivation behind FDI to low-income countries is. Further, it is important to know, that only very few Swiss firms open up relatively large affiliates in these countries. In 2013 only 54 firms of 103 in the data have affiliates in low-income countries, while 100 of 103 firms in the data have affiliates in high-income countries.

Tables 9 and 10 present the results of the estimations considering only FDI to low-income countries. The results might be compared to the results found in the benchmark estimations in Table 3 and 4: The displacement effect disappears completely as soon as we instrument foreign employment. The point estimate is again close to zero and clearly not significant (see Table 9). On the other hand, we find a positive association between foreign employment and output for the fixed effects approach and for the IV approach (see Table 10). Output tends to be positively associated with domestic employment, although the positive association is not significant when including all control variables (see column 6 in Table 9). So, in the case of FDI to low-income countries we do not find evidence of a negative displacement effect and we find only weak evidence of a positive output effect. Similarly as for the estimation with upper middle-income countries, this lack of significance might be attributed to the limited number of observations, but also to the heterogeneity of countries in our low-income sample. On the one hand the data covers foreign employment in countries with large market size such as India and Indonesia which are interesting for VFDI (and HFDI), on the other hand it also includes countries rich in natural resources (e.g. Democratic Republic of Congo, Zambia, etc.), which are

Table 10 Output Effect for FDI into low-income countries

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.14**	0.16**	0.27*	0.30**
	(0.06)	(0.06)	(0.15)	(0.13)
Capital (log)		0.14		0.16
		(0.13)		(0.23)
Exports (log)		0.76**		0.87*
		(0.37)		(0.51)
Imports (log)		0.10		0.18
		(0.13)		(0.42)
Observations	250	250	250	250
First stage F-stat.			88.46	62.10
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 3–4.
* p<0.10, ** p<0.05, *** p<0.01.

rather interesting for resource sourcing instead of production for MNEs.

5.3 Robustness Checks

In Section 5.2 we have grouped the countries into different income categories according to the World Bank definition from 2002. We have used this classification as a rough measure to classify the FDI into HFDI and VFDI. However, results discussed before could be driven by large destination countries or particularities of the classification itself. Therefore, we run two different robustness checks for each destination category, except for the upper middle-income group, where we were not able to estimate benchmark results reliably with the data at hand.

First, we exclude dominant countries that might drive the results. In the case of FDI to high-income countries we exclude the US with a share of almost 30% of the foreign employees in high-income countries. In the case of lower-middle income countries we exclude China with a share of 35% in 2013 and in the case of low-income countries we drop India with a share of almost 40% in 2013.

Second, we re-run the whole estimation by destination group using the classification of the World Bank in the year 2013 instead of 2002. Many countries changed the income group until 2013 (see Table D.1 in Appendix D for an overview) and therefore, this robustness check allows us to test whether results found in Section 5.2 stem from particularities of the classification.

5.3.1 Robustness Check: Drop Dominant Destinations

In a first robustness check we drop the US as dominant destination in the high-income group. Results in Tables C.1 and C.2 in Appendix C.1 show that the exclusion of the USA does not importantly change the results: We still do not find any evidence of the displacement effect when instrumenting for foreign employment (columns 5 and 6 in Table C.1), but – as in the benchmark results – we find evidence for both steps of the positive output effect.

In a second robustness check we drop China as the dominant destination in the lower middle-income group (see Tables C.5 and C.6 in Appendix C.3). Dropping China alters the results completely. The negative displacement effect disappears: Points estimates are small and insignificant. While there is still significant evidence for the first step of the output effect (Table C.6), there is no evidence for the second step anymore: Point estimates of the second step are cut in half and not significant anymore (Table C.5 columns 5 and 6). So, it appears that the negative overall effect of FDI to lower-middle income countries found in the benchmark estimations is driven by China and disappears completely as soon as China is excluded.

In a third robustness check India as the dominant destination of the low-income group is dropped. Tables C.9 and C.5 in Appendix C.5 show that the results found in the benchmark estimation for low-income countries heavily depend on India: Not only does the instrument lose its relevance (Kleibergen-Papp F-statistics of the first stage are consistently below the value of 5), but we do not find any evidence for the displacement or output effect anymore.

In conclusion, results for lower middle- and low-income destination are driven by single dominant countries and not robust when these countries are dropped. However, the positive effect of FDI to high-income destination is robust when dropping the US as dominant destination.

5.3.2 Robustness Check: Income Classification of 2013

In this section we re-estimate the regressions by income level classification of 2013 instead of 2002. Table D.1 in Appendix D shows to which income group countries belonged in 2002 and 2013. Tables C.3 and C.4 in Appendix C.2 show the effect of FDI to high-income countries according to the classification of 2013. Point estimates remain very similar to the benchmark estimation. The only remarkable difference to the benchmark results is that the second part of the output effect loses significance when all controls are included (see Table C.3 column 6).

Considering the robustness check of the lower middle-income category, it is important to know that seven of the ten most important lower middle-income countries in 2002 were classified either as upper middle- or high-income countries in 2012. Most importantly, China - which is driving the results in the benchmark estimation - as well as Brazil and Russia switched from being classified as lower-middle income countries in 2002 to upper-middle income countries in 2013. On the other hand, many important low-income destinations are classified as lower middle-income countries in 2013. In particular,

India is classified as a lower-middle income country since 2009. Tables C.7 and C.8 in Appendix C.4 present the results using the 2013 classification. We find no evidence for the negative displacement effect. Results show further that foreign employment is positively associated with output (see Table C.8 columns 3 and 4). Hence, we find evidence for the first part of the output effect. Finally, it depends on the specification whether we find evidence for the second part of the output effect (see Table C.7): We only find a positive and significant association between output and home employment in columns 5 but not when we include all covariates in column 6. Hence, as soon as we are considering the classification of 2013 the effect of FDI to lower middle-income countries changes from negative to (tendentiously) positive. This is no surprise, since most important lower middle-income destinations of 2002 became upper middle-income countries, while most important low-income destinations moved up to the lower middle-income category. So, the results we are finding in this robustness check is very similar to the results of the benchmark estimation of the low-income category. However, this robustness check shows that results are sensitive to the classification of countries.

In the case of low-income countries, many important countries moved up to the lower middle-income group. Most importantly India, that was driving the results in the benchmark estimations, but in total eight of the ten most important destinations in 2002 were classified as lower middle-income countries in 2013. Consequently, observations drop to 100 and it is not surprising that we do not find any significant results (see Tables C.11 and C.12 in Appendix C.6).

In conclusion, robustness tests show that the positive effect found for high-income countries is fairly robust: Results do not change much if the dominant country is dropped nor if the income classification of 2013 is used. However, effects found for all other income levels do not seem to be robust and heavily depend on single dominant countries or the year of the classification. In particular, it becomes apparent that the negative effect found for lower middle-income countries is only driven by China (which is comparable to the finding of Debaere, Lee and Lee (2010) for South Korea).

6 Conclusion

Economic theory suggests that there are negative as well as positive effects of offshoring on domestic labor demand. However, theory is not able to predict clearly, whether positive effects are able to offset negative effects. Empirical work does not come to a clear conclusion either: Results depend on the context of the country observed and on the type and destination of FDI. We use firm-level data containing firms of the manufacturing and the service sector in order to examine the effect of offshoring on home employment in the case of Switzerland, a small economy with relatively high outward FDI stock.

We find that it is crucial to distinguish between different types of FDI. Using fixed effects and an instrumental variable approach we find no evidence of the negative displacement effect, but a positive and significant output effect of FDI to high-income countries (i.e. mainly HFDI). On the other hand we find a significant and negative displacement effect which outweighs the positive output effect in the case of FDI to lower

middle-income countries (i.e. mainly VFDI). However, while the positive effect found for FDI to high-income countries is robust, the effect of FDI to lower-middle income countries is driven by China and disappears as soon as China is excluded. Further, it is important to keep in mind that these positive short-run effects of HFDI and negative effects of VFDI are rather moderate. We find no evidence of a negative displacement effect when we are considering the IV results of FDI to all countries and only to low-income countries. For both – FDI to all countries and only to low-income countries – results point toward to a positive output and, hence, overall effect. However, the effect of FDI to low-income countries is driven by single dominating destinations and not robust to changes in the income classification definitions.

Summing up, Swiss outward FDI stock and flows are tremendous in relative size, but do barely affect total domestic jobs within firms. If so, there seems to be rather a positive effect than a negative. It is important to keep in mind that the goal of this paper is to estimate the overall effect of outward FDI on home employment and that effects might be very different between low- and high-skilled labor (see e.g. Wright, 2013).

A reason why the displacement effect does not seem to exist in Switzerland might be, that Swiss MNEs follow a HFDI strategy and primarily invest in other high-income countries. HFDI seem to stimulate total domestic jobs, although the magnitude of the effect is rather small. So, we are concluding that outward FDI do not endanger the total number of domestic jobs in the case of Switzerland – on the contrary they seem to create jobs, especially if the MNE is investing into another high-income country. Although there is a trend to more outward FDI into upper middle- but more importantly lower middle- and low-income countries, the majority of Swiss outward FDI still flows into other high-income countries.

There are limitations in comparing our results with other existing evidence given the different estimation strategy and underlying data. Our approach is most related to Desai, Foley and Hines (2009), who find positive effects of foreign activity of US MNEs on domestic employment. Harrison and McMillan (2011) present evidence of different effects given the destination country and the tasks performed abroad, where investments to low-income country is associated with lower domestic employment, while they find positive effects of FDI into high-income countries. Wright (2013) finds as well a slightly positive overall effect. However, he examines as well the effect on low skilled labor, where he finds a negative effect. Hijzen, Jean and Mayer (2011) and Debaere, Lee and Lee (2010) pursue a different empirical approach but find similar effects. Hijzen, Jean and Mayer (2011) find positive effects of HFDI and no effects of VFDI in France, while Debaere, Lee and Lee (2010) find negative effects of FDI in lower-income countries and positive effects on employment of FDI to higher-income countries for South Korea.

Finally, it is important to stress that our estimation approach and the underlying data do not take into consideration that firms might have to close down their business in the longer run, if they do not have the possibility to engage in outward FDI. Furthermore, we do not consider backward or forward spillovers on other firms.[17] These points indicate that the long-run positive effect of outward FDI on home employment might even be

[17]E.g. Tang and Altshuler (2015) find positive spillover effects of outward FDI on domestic suppliers.

more pronounced than our findings suggest.

References

Barba Navaretti, Giorgio, Davide Castellani and Anne-Célia Disdier. 2010. "How Does Investing in Cheap Labour Countries Affect Performance at Home? Firm-Level Evidence from France and Italy." *Oxford Economic Papers* 62(2):234–260.

Barba Navaretti, Giorgo, Anthony Venables and Frank Barry. 2006. *Mulitnational Firms in the World Economy*. Princeton: Princeton University Press.

Carr, David, James Markusen and Keith Maskus. 2001. "Estimating the Knowledge-Capital Model of the Multinational Enterprise." *American Economic Review* 91(3):693–708.

Crinò, Rosario. 2009. "Offshoring, Multinationals and Labour Market: A Review of the Empirical Literature." *Journal of Economic Surveys* 23(2):197–249.

Crinò, Rosario. 2010. "Service Offshoring and White-Collar Employment." *Review of Economic Studies* 77(2):595–632.

Davies, Ronald. 2008. "Hunting High and Low for Vertical FDI." *Review of International Economics* 16(2):250–267.

Debaere, Peter, Hongshik Lee and Joonhyung Lee. 2010. "It Matters Where You Go: Outward Foreign Direct Investment and Multinational Employment Growth at Home." *Journal of Development Economics* 91(2):301–309.

Desai, Mihir, Fritz Foley and James Hines. 2009. "Domestic Effects of the Foreign Activities of US Multinationals." *American Economic Journal: Economic Policy* 1(1):181–203.

di Giovanni, Julian and Andrei Levchenko. 2009. "Trade Openness and Volatility." *Review of Economics and Statistics* 91(3):558–585.

Egger, Peter and Michael Pfaffermayr. 2004. "Distance, Trade and FDI: a Hausman–Taylor SUR Approach." *Journal of Applied Econometrics* 19(2):227–246.

Grossman, Gene and Esteban Rossi-Hansberg. 2008. "Trading Tasks: A Simple Theory of Offshoring." *American Economic Review* 98(5):1978–1997.

Harrison, Ann and Margaret McMillan. 2011. "Offshoring Jobs? Multinationals and U.S. Manufacturing Employment." *Review of Economics and Statistics* 93(3):857–875.

Head, Keith, Thierry Mayer and John Ries. 2009. "How Remote Is the Offshoring Threat?" *European Economic Review* 53(4):429–444.

Helpman, Elhanan. 1984. "A Simple Theory of International Trade with Multinational Corporations." *Journal of Political Economy* 92(3):451–471.

Helpman, Elhanan, Marc Melitz and Stephen Yeaple. 2004. "Export Versus FDI with Heterogeneous Firms." *American Economic Review* 94(1):300–316.

Helpman, Elhanan and Paul Krugman. 1985. *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy.* Cambridge: MIT Press.

Hijzen, Alexander, Sébastien Jean and Thierry Mayer. 2011. "The Effects at Home of Initiating Production Abroad: Evidence from Matched French Firms." *Review of World Economics* 147(3):457–483.

Hummels, David, Jakob Munch and Chong Xiang. 2018. "Offshoring and Labor Markets." *Journal of Economic Literature* 56(3):981–1028.

Hummels, David, Rasmus Jørgensen, Jakob Munch and Chong Xiang. 2014. "The Wage Effects of Offshoring: Evidence from Danish Matched Worker-Firm Data." *American Economic Review* 104(6):1597–1629.

Lipsey, Robert. 2004. Home- and Host-Country Effects of Foreign Direct Investment. In *Challenges to Globalization: Analyzing the Economics*, ed. Robert Baldwin and Alan Winters. Chicago: University of Chicago Press pp. 333–382.

Markusen, James and Anthony Venables. 2000. "The Theory of Endowment, Intra-Industry and Multinational Trade." *Journal of International Economics* 52(2):209–234.

Markusen, James and Keith Maskus. 2003. General-Equilibrium Approaches to the Multinational Enterprise: A Review of Theory and Evidence. In *Handbook of International Trade*, ed. Kwan Choi and James Harrigan. Malden: Blackwell Publishing pp. 320–352.

Markusen, James R. 1984. "Mulitnationals, Mutli-Plant Economies and the Gains from Trade." *Journal of International Economics* 16(3–4):205–226.

Ottaviano, Gianmarco, Giovanni Peri and Greg Wright. 2013. "Immigration, Offshoring, and American Jobs." *American Economic Review* 103(5):1925–1959.

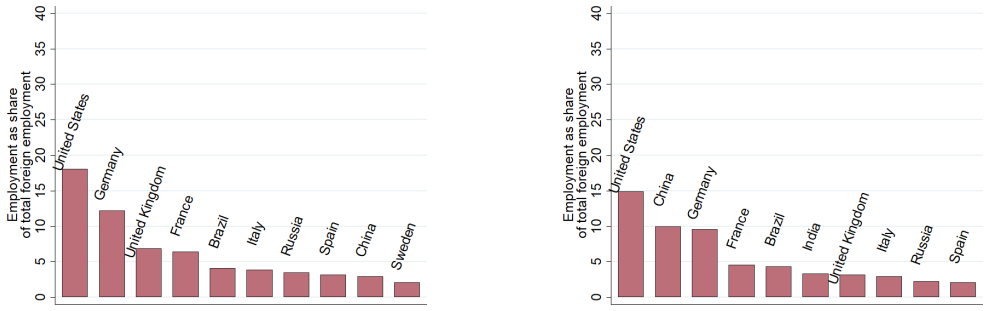
Santos Silva, João and Silvana Tenreyro. 2006. "The Log of Gravity." *Review of Economics and Statistics* 88(4):641–658.

Sethupathy, Guru. 2013. "Offshoring, Wages, and Employment: Theory and Evidence." *European Economic Review* 62:73–97.

Tang, Jitao and Rosanne Altshuler. 2015. "The Spillover Effects of Outward Foreign Direct Investment on Home Countries: Evidence from the United States." Working Paper 1503, Oxford University Centre for Business Taxation. URL: `www.sbs.ox.ac.uk/` (last access: 15.03.2020).

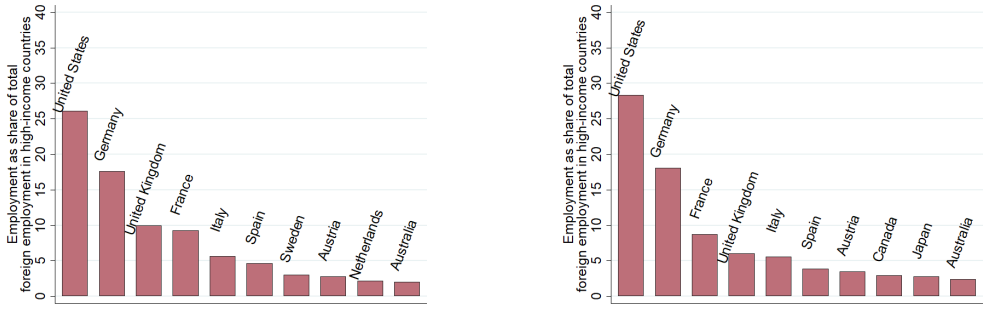
Wright, Greg. 2013. "Revisiting the Employment Impact of Offshoring." *European Economic Review* 66:63–83.

A Appendix: Foreign Employment by Destination



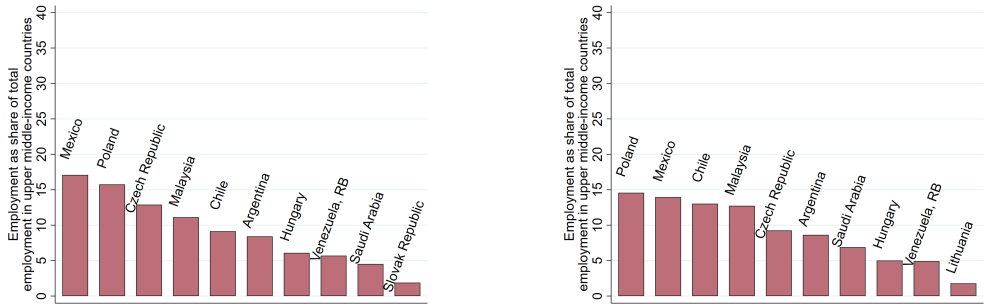
(a) 2002 (N=78) **(b)** 2013 (N=103)

Fig. A.1 Share of total foreign employment by destination
Notes: Number of firms N in parentheses.



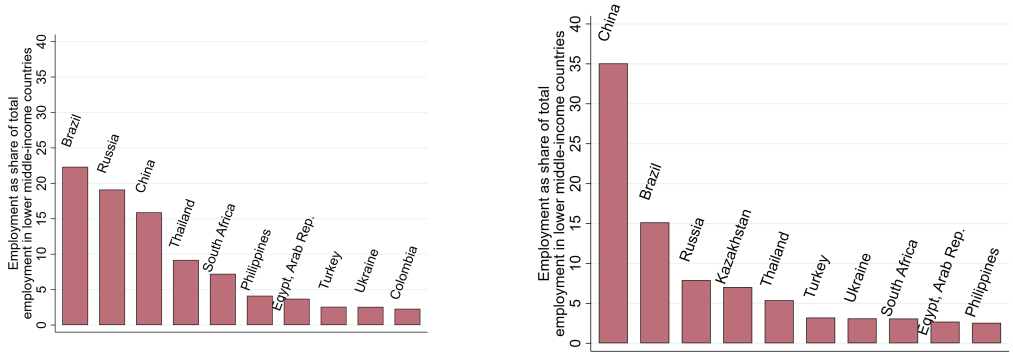
(a) 2002 (N=78) **(b)** 2013 (N=100)

Fig. A.2 Share of total foreign employment in high-income countries by destination
Notes: Number of firms N in parentheses.



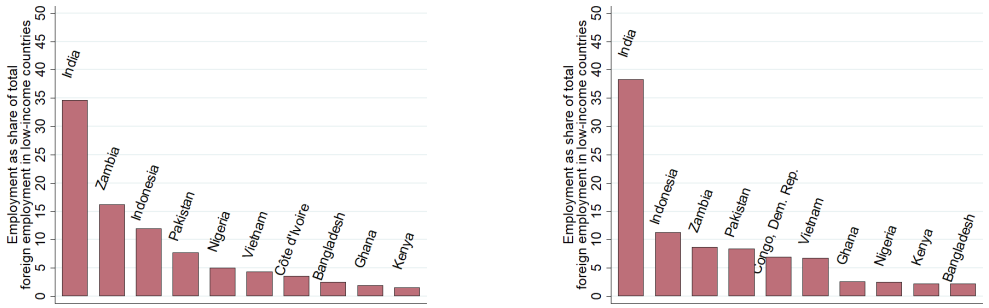
(a) 2002 (N=46) **(b)** 2013 (N=74)

Fig. A.3 Share of total foreign employment in upper middle-income countries by destination
Notes: Number of firms N in parentheses.



(a) 2002 (N=45) **(b)** 2013 (N=73)

Fig. A.4 Share of total foreign employment in lower middle-income countries by destination
Notes: Number of firms N in parentheses.



(a) 2002 (N=32) **(b)** 2013 (N=54)

Fig. A.5 Share of total foreign employment in low-income countries by destination
Notes: Number of firms N in parentheses.

B Appendix: FDI to upper middle-income countries

Table B.1 Displacement Effect for FDI into upper middle-income countries

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.01	−0.02	−0.01	0.09	0.07	0.01
	(0.04)	(0.03)	(0.03)	(0.28)	(1.91)	(1.20)
Lag Output (log)		0.36**	0.21*		0.32	0.20
		(0.16)	(0.12)		(1.77)	(0.76)
Capital (log)			0.01			0.01
			(0.06)			(0.21)
Exports (log)			0.66***			0.66
			(0.18)			(1.72)
Imports (log)			0.08			0.08
			(0.09)			(0.46)
Observations	369	369	369	369	369	369
First stage F-stat.				2.80	2.81	2.93
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 4–6. Five firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

Table B.2 Output Effect for FDI into upper middle-income countries

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.13*	0.07	0.06	−0.02
	(0.07)	(0.05)	(0.48)	(0.45)
Capital (log)		0.17		0.19
		(0.13)		(0.27)
Exports (log)		0.54**		0.54
		(0.22)		(0.41)
Imports (log)		0.11		0.10
		(0.21)		(0.44)
Observations	369	369	369	369
First stage F-stat.			2.80	2.79
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. (10,000 iterations) for columns 3–4. Five firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

C Appendix: Robustness Checks

C.1 High-Income Countries: Drop USA

Table C.1 Displacement effect for FDI into high income countries: Drop USA

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.03	−0.04	−0.04	0.05	−0.04	−0.04
	(0.06)	(0.04)	(0.04)	(0.15)	(0.13)	(0.12)
Lag Output (log)		0.42***	0.34***		0.42***	0.34**
		(0.13)	(0.12)		(0.13)	(0.14)
Capital (log)			0.08			0.08
			(0.07)			(0.09)
Exports (log)			0.11			0.11
			(0.19)			(0.19)
Imports (log)			−0.02			−0.02
			(0.08)			(0.12)
Observations	545	545	545	545	545	545
First stage F-stat.				60.63	33.00	32.34
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 4–6. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

Table C.2 Output effect for FDI into high-income countries: Drop USA

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.21***	0.14**	0.21*	0.18**
	(0.08)	(0.06)	(0.13)	(0.09)
Capital (log)		0.16*		0.16*
		(0.08)		(0.09)
Exports (log)		0.33**		0.31**
		(0.13)		(0.14)
Imports (log)		−0.02		−0.01
		(0.08)		(0.13)
Observations	545	545	545	545
First stage F-stat.			60.63	51.44
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 3–4. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

C.2 High-Income Countries: Income Classification of 2013

Table C.3 Displacement effect for high-income countries: Income class. 2013

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.04	−0.05	−0.06*	0.20	0.11	0.10
	(0.05)	(0.03)	(0.03)	(0.15)	(0.17)	(0.17)
Lag Output (log)		0.43***	0.36***		0.31*	0.24
		(0.13)	(0.12)		(0.16)	(0.17)
Capital (log)			0.08			0.07
			(0.07)			(0.08)
Exports (log)			0.10			0.08
			(0.18)			(0.20)
Imports (log)			−0.03			−0.01
			(0.08)			(0.13)
Observations	553	553	553	553	553	553
First stage F-stat.				32.60	23.63	24.03
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 4–6. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

Table C.4 Output effect for high-income countries: Income class. 2013

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.25***	0.17**	0.31***	0.26***
	(0.08)	(0.07)	(0.10)	(0.08)
Capital (log)		0.15*		0.13
		(0.08)		(0.08)
Exports (log)		0.31**		0.27**
		(0.12)		(0.12)
Imports (log)		−0.02		0.00
		(0.07)		(0.12)
Observations	553	553	553	553
First stage F-stat.			32.60	31.97
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 3–4. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

C.3 Lower-Middle Income Countries: Drop China

Table C.5 Displacement effect for FDI into lower-middle income countries: Drop China

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.00	−0.03	−0.02	0.08	0.05	0.04
	(0.02)	(0.03)	(0.03)	(0.10)	(0.11)	(0.11)
Lag Output (log)		0.24***	0.21**		0.17	0.14
		(0.09)	(0.10)		(0.12)	(0.15)
Capital (log)			0.01			0.00
			(0.05)			(0.12)
Exports (log)			0.13			0.17
			(0.24)			(0.29)
Imports (log)			−0.03			−0.05
			(0.11)			(0.28)
Observations	370	370	370	370	370	370
First stage F-stat.				18.74	18.68	17.61
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 4–6. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

Table C.6 Output effect for FDI into lower-middle income countries: Drop China

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.13***	0.10**	0.18**	0.14*
	(0.05)	(0.04)	(0.08)	(0.07)
Capital (log)		0.13		0.12
		(0.10)		(0.15)
Exports (log)		0.37**		0.38*
		(0.17)		(0.23)
Imports (log)		−0.01		−0.02
		(0.20)		(0.38)
Observations	370	370	370	370
First stage F-stat.			18.74	18.72
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 3–4. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

C.4 Lower Middle-Income Countries: Income Classification of 2013

Table C.7 Displacement effect for lower middle-income countries: Income class. 2013

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	−0.12**	−0.16**	−0.13**	−0.03	−0.10	−0.03
	(0.06)	(0.06)	(0.06)	(0.09)	(0.09)	(0.12)
Lag Output (log)		0.31***	0.26**		0.28***	0.18
		(0.11)	(0.11)		(0.11)	(0.14)
Capital (log)			−0.05			−0.03
			(0.03)			(0.12)
Exports (log)			0.48***			0.64**
			(0.17)			(0.32)
Imports (log)			0.02			0.04
			(0.08)			(0.27)
Observations	267	267	267	267	267	267
First stage F-stat.				66.65	61.76	47.39
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 4–6. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

Table C.8 Output effect for lower-middle income countries: Income class. 2013

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.16***	0.18***	0.25***	0.31***
	(0.04)	(0.05)	(0.07)	(0.06)
Capital (log)		0.14		0.14
		(0.12)		(0.21)
Exports (log)		0.77**		0.93**
		(0.34)		(0.45)
Imports (log)		0.04		0.06
		(0.15)		(0.37)
Observations	267	267	267	267
First stage F-stat.			66.65	56.63
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 3–4. Two firms have been removed from this estimation for reasons explained in footnote 14. * p<0.10, ** p<0.05, *** p<0.01.

C.5 Low-Income Countries: Drop India

Table C.9 Displacement effect for FDI into low-income countries: Drop India

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.14*	0.12	0.07	0.26	0.09	0.08
	(0.07)	(0.08)	(0.09)	(0.70)	(0.52)	(2.63)
Lag Output (log)		0.22*	0.20		0.23	0.20
		(0.11)	(0.11)		(0.19)	(0.35)
Capital (log)			−0.04			−0.04
			(0.03)			(0.68)
Exports (log)			0.33			0.33
			(0.24)			(3.21)
Imports (log)			−0.04			−0.04
			(0.09)			(0.75)
Observations	156	156	156	156	156	156
First stage F-stat.				4.12	3.82	4.25
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 4–6. * p<0.10, ** p<0.05, *** p<0.01.

Table C.10 Output effect for FDI into low-income countries: Drop India

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.12	0.10	0.78	0.73
	(0.11)	(0.12)	(5.05)	(12.47)
Capital (log)		0.10		0.19
		(0.11)		(1.60)
Exports (log)		0.67		0.13
		(0.62)		(11.63)
Imports (log)		0.07		0.24
		(0.26)		(3.75)
Observations	156	156	156	156
First stage F-stat.			4.12	4.13
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 3–4. * p<0.10, ** p<0.05, *** p<0.01.

C.6 Low-Income Countries: Income Classification of 2013

Table C.11 Displacement effect for low income countries: Income class. 2013

Dep. Var.:	Not instrumented			Instrumented		
Log of Home Empl.	(1)	(2)	(3)	(4)	(5)	(6)
Lag For. Empl. (log)	0.06	0.04	0.01	−0.01	−0.21	0.00
	(0.07)	(0.06)	(0.06)	(1.25)	(5.20)	(6.32)
Lag Output (log)		0.16	0.59*		0.31	0.59
		(0.28)	(0.32)		(4.98)	(6.91)
Capital (log)			−0.34*			−0.35
			(0.17)			(3.02)
Exports (log)			0.46			0.48
			(0.34)			(6.68)
Imports (log)			−0.34			−0.35
			(0.53)			(4.72)
Observations	100	100	100	100	100	100
First stage F-stat.				7.29	14.55	11.54
Firm & Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 4–6. * p<0.10, ** p<0.05, *** p<0.01.

Table C.12 Output effect for low-income countries: Income class. 2013

Dep. Var.:	Not instrumented		Instrumented	
Log of Output	(1)	(2)	(3)	(4)
Lag For. Empl. (log)	0.08	0.05	0.63	0.04
	(0.06)	(0.03)	(2.29)	(0.23)
Capital (log)		0.40***		0.40**
		(0.08)		(0.19)
Exports (log)		−0.56***		−0.54
		(0.11)		(0.81)
Imports (log)		1.34***		1.35**
		(0.38)		(0.69)
Observations	100	100	100	100
First stage F-stat.			7.29	9.65
Firm & Year FE	Yes	Yes	Yes	Yes

Notes: Clustered std. err. in parentheses for columns 1–2 and bootstrap std. err. for columns 3–4. * p<0.10, ** p<0.05, *** p<0.01.

D List of Countries and Income Classification

Table D.1 Income Classification

Country Names	2002	2013
Antigua and Barbuda	H	H
Aruba	H	H
Australia	H	H
Austria	H	H
Bahamas, The	H	H
Bahrain	H	H
Barbados	H	H
Belgium	H	H
Bermuda	H	H
Brunei Darussalam	H	H
Canada	H	H
Cayman Islands	H	H
Cyprus	H	H
Denmark	H	H
Finland	H	H
France	H	H
Germany	H	H
Greece	H	H
Hong Kong SAR, China	H	H
Iceland	H	H
Ireland	H	H
Isle of Man	H	H
Israel	H	H
Italy	H	H
Japan	H	H
Korea, Rep.	H	H
Kuwait	H	H
Luxembourg	H	H
Macao SAR, China	H	H
Malta	H	H
Netherlands	H	H
New Zealand	H	H
Norway	H	H
Portugal	H	H
Qatar	H	H
Singapore	H	H
Slovenia	H	H
Spain	H	H
Sweden	H	H
Taiwan, China	H	H
United Arab Emirates	H	H
United Kingdom	H	H
United States	H	H
Virgin Islands (U.S.)	H	H
Argentina	UM	UM
Belize	UM	UM
Botswana	UM	UM
Chile	UM	H
Costa Rica	UM	UM
Croatia	UM	H
Czech Republic	UM	H
Dominica	UM	UM
Estonia	UM	H
Gabon	UM	UM
Grenada	UM	UM
Hungary	UM	UM
Latvia	UM	H
Lebanon	UM	UM
Libya	UM	UM
Lithuania	UM	H
Malaysia	UM	UM
Mauritius	UM	UM
Mexico	UM	UM
Oman	UM	H
Panama	UM	UM
Poland	UM	H
Saudi Arabia	UM	H
Slovak Republic	UM	H
St. Kitts and Nevis	UM	H
St. Lucia	UM	UM
Trinidad and Tobago	UM	H
Uruguay	UM	H
Venezuela, RB	UM	UM
Albania	LM	UM
Algeria	LM	UM
Armenia	LM	LM
Belarus	LM	UM
Bolivia	LM	LM
Bosnia and Herzegovina	LM	UM
Brazil	LM	UM
Bulgaria	LM	UM
China	LM	UM
Colombia	LM	UM
Cuba	LM	UM

Country Names	2002	2013
Dominican Republic	LM	UM
Ecuador	LM	UM
Egypt, Arab Rep.	LM	LM
El Salvador	LM	LM
Guatemala	LM	LM
Honduras	LM	LM
Iran, Islamic Rep.	LM	UM
Iraq	LM	UM
Jamaica	LM	UM
Jordan	LM	UM
Kazakhstan	LM	UM
Macedonia, FYR	LM	UM
Morocco	LM	LM
Namibia	LM	UM
Paraguay	LM	LM
Peru	LM	UM
Philippines	LM	LM
Romania	LM	UM
Russian Federation	LM	H
South Africa	LM	UM
Sri Lanka	LM	LM
Syrian Arab Republic	LM	LM
Thailand	LM	UM
Tunisia	LM	UM
Turkey	LM	UM
Turkmenistan	LM	UM
Ukraine	LM	LM
West Bank and Gaza	LM	LM
Afghanistan	L	L
Angola	L	UM
Azerbaijan	L	UM
Bangladesh	L	L
Benin	L	L
Burkina Faso	L	L
Burundi	L	L
Cambodia	L	L
Cameroon	L	LM
Central African Republic	L	L
Chad	L	L
Congo, Dem. Rep.	L	L
Congo, Rep.	L	LM
Côte d'Ivoire	L	LM
Ethiopia	L	L
Georgia	L	LM
Ghana	L	LM
Guinea	L	L
Haiti	L	L

Country Names	2002	2013
India	L	LM
Indonesia	L	LM
Kenya	L	L
Kyrgyz Republic	L	LM
Lao PDR	L	LM
Liberia	L	L
Madagascar	L	L
Malawi	L	L
Mali	L	L
Mauritania	L	LM
Moldova	L	LM
Mongolia	L	LM
Mozambique	L	L
Myanmar	L	L
Nepal	L	L
Nicaragua	L	LM
Niger	L	L
Nigeria	L	LM
Pakistan	L	LM
Papua New Guinea	L	LM
Rwanda	L	L
Senegal	L	LM
Sierra Leone	L	L
Sudan	L	LM
Tajikistan	L	L
Tanzania	L	L
Timor-Leste	L	LM
Togo	L	L
Uganda	L	L
Uzbekistan	L	LM
Vietnam	L	LM
Yemen, Rep.	L	LM
Zambia	L	LM
Zimbabwe	L	L

Center for Regional Economic Development (CRED)

University of Bern

Schanzeneckstrasse 1

P.O.Box

CH-3001 Bern

Telephone: +41 31 631 37 11

E-Mail: info@cred.unibe.ch

Website: http://www.cred.unibe.ch

The Center for Regional Economic Development (CRED) is an interdisciplinary hub for the scientific analysis of questions of regional economic development. The Center encompasses an association of scientists dedicated to examining regional development from an economic, geographic and business perspective.

Contact of the authors:

Preetha Kalambaden

University of Bern

Schanzeneckstrasse 1

P.O.Box

CH-3001 Bern

Telephone: +41 (0)31 631 33 84

Email: preetha.kalambaden@vwi.unibe.ch

Daniel Steffen

University of Bern

Schanzeneckstrasse 1

P.O.Box

CH-3001 Bern

Telephone: +41 (0)31 631 33 84

Email: daniel.steffen@vwi.unibe.ch

This paper can be downloaded at:

https://www.cred.unibe.ch/forschung/publikationen/cred_research_papers/index_ger.html