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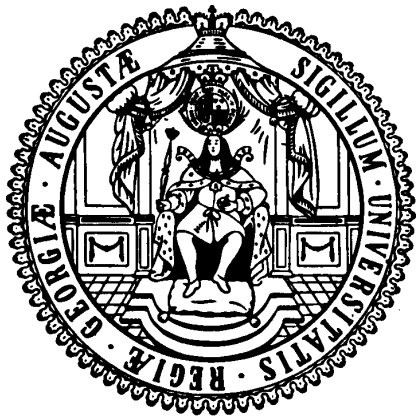

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Financial Globalization and the Labor Share in Developing Countries: The Type of Capital Matters

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Financial Globalization and the Labor Share in Developing Countries: The Type of Capital Matters

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Abstract

In this paper, we investigate how de facto financial globalization has influenced the labor share in developing countries. Our main argument is the need to distinguish between different types of capital in this context, as different forms of foreign investment have different fixed costs and impacts on the host countries' production process and vary concerning their bargaining power vis-à-vis labor. Assuming an aggregate elasticity of substitution between capital and labor would thus be misleading.

Our econometric analysis of the impact of foreign direct vs. portfolio investment in a sample of about 40 developing and transition countries after 1992 supports this claim. Using different panel data techniques to address potential endogeneity problems, we find that FDI has a positive effect on the labor share in developing countries, while the impact of portfolio investment is significantly smaller, and potentially negative. Our results also highlight that de facto foreign investment cannot explain the decline of the labor share in developing countries over the investigated period.

Keywords: Labor Share, Globalization, Income Distribution, International Capital Flows, FDI, Wage Bargaining

JEL classification: C23, E25, F21, O15

1 Introduction

The post-1990 wave of globalization generated a vivid dispute about its distributional consequences among researchers, policymakers, and the public. The "anti-globalization" movement of the late 1990s and the current backlash against globalization in the US and Europe, a broad literature on distributional effects of globalization in developing and advanced economies (see e.g. Goldberg and Pavcnik, 2007; Slaughter, 2001; Bourguignon, 2015) and the recent debate around Piketty (2014) demonstrate the wide interest in this issue.

International capital flows have been a characteristic feature of this globalization process and their effects on developing countries and distributional aspects have attracted the attention of previous research, as we review in more detail below. 'Capital' has mostly been considered as a pretty homogenous concept in this specific context.[1] This aggregate view is sometimes helpful, as it keeps the exposition clear. However, it can be misleading in cases where very different modes of production are associated with specific capital flows.

The effect of foreign investment on developing countries' functional income distribution is such a case. While certain types of these investments (most notably portfolio investment) might represent capital in a general sense, foreign direct investment is further associated with transferring certain production technologies, management techniques, and other features that by themselves will alter factor demand and associated income shares in host developing countries.[2] This leads us to the hypothesis that foreign portfolio investment (FPI) will have a different impact on developing countries' labor

[1] An example is the debate between Piketty (2014) and Summers (2014) about the elasticity of substition between capital and labor. Kanbur and Stiglitz (2015) have recently emphasized the difference between wealth and capital in this context, an argument loosely related to our argument of heterogeneous types of (foreign) capital. For completeness, we mention that a strand in the literature has focused specifically on the social effects of FDI but—to our knowledge—has not paid attention to its differing impact compared to other capital flows.

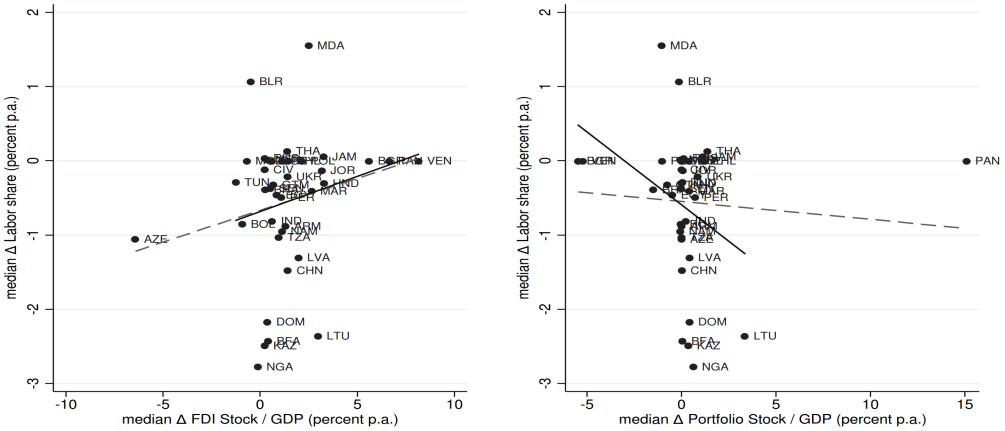
[2] While this is generally true for advanced host economies as well, the technology distance and its associated effects are expected to be larger for developing countries (see the knowledge-capital model of FDI, e.g. Markusen et al., 1996, for the impact of skill and related factor differences on FDI).

share than foreign direct investment (FDI). Taking a first descriptive glance at the data that we are going to present and analyze in this paper supports the reasonability of this hypothesis: Figure 1 shows the unconditional correlations between mean annual changes of foreign investment and of the labor share (taken from PWT) in our sample of developing and transition countries after 1992 for FDI (left panel) and FPI (right panel). Without claiming any causation at that stage, three observations are worth noticing: First, there have been substantial changes in the labor share over the last two decades in several developing countries, mostly to the downside.[3] Second, de facto financial globalization is an unlikely candidate to explain the main part of this dynamics. This can be inferred from the low correlation, especially for portfolio investment (suggesting that other factors have been more relevant) and from the fact that the more relevant correlation between FDI and the labor share seems to be positive (suggesting that it cannot explain the delining labor share). This is not to say that foreign capital is unlikely to matter. On the contrary, FDI might have been an important force moderating the decline in the labor share. Additionally, figure 1 does not preclude the possibility that partial effects of foreign portfolio investment are potentially large. And third, correlations with the labor share seem to be quite different for FDI and portfolio investment: by and large, the correlation of FDI with the labor share seems to be positive while, if anything, it is rather negative for portfolio investment, although the latter does not seem to explain much cross-country difference and is much more susceptible to the potential outlier of Panama in this unconditional, descriptive setting.

In this paper, we empirically elaborate on the impact of those two key types of foreign investment on the labor share in developing countries and substantiate their heterogeneous effects. Our empirical analysis relies on the recently published PWT labor share data and additionally on a new data set on labor shares in approximately 40 developing and transition countries that we constructed in the context of this study. To estimate the impact of foreign investment, we rely on several panel data techniques, including a distributed lag first-difference model and a novel IV identification strategy that explores the interaction of global financial conditions and distance from the world's financial centers and is based on the more general idea of Nunn

[3]The only countries with notable increases, Bulgaria and Moldova, are economies recovering from the post-transition shock.

Figure 1: Correlations Between Foreign Investment and Labor Share



Note: dashed lines include the potential outliers Azerbaijan and Panama, respectively, solid lines do not.

and Qian (2014). While this provides us with an identification strategy that credibly meets the exogeneity and exclusion restriction despite controling for unobserved cross-country heterogeneity, we have to rely on weak instrument techniques to draw conservative inference.

Across the board, our results confirm the different impact of FDI compared to FPI. More precisely, we find a positive impact of FDI on developing countries' labor share, while the impact of FPI tends to be negative but is often not statistically different from 0. This general result is robust to various estimation techniques and data set variations. Quantitatively, our results over the period 1992 to 2009 show that an increase of the FDI stock (as a percentage of GDP) by 10 % points increases the labor share by about 2 %. An increase of FPI of the same size would result in a decline of the labor share by a similar magnitude (but less statistical reliability). Economically, this is a relevant magnitude, leading us to the conclusion that foreign capital matters for developing countries' labor share. Furthermore, we find some evidence that this effect depends on a country's capital-to-labor ratio. However, despite the economically significant effects of foreign capital on developing countries' labor share, other factors were more important for it's dynamics: as the increase of FPI was rather modest compared to FDI, one can conclude

that de facto financial globalization by itself cannot explain the decline of the labor share in developing countries over the last decades. Our results suggest that especially trade might be a potential candidate.

Our results provide a number of broader relevant insights and contributions. First and foremost, we contribute to a larger debate and literature on the overall distributional consequences of globalization in developing countries (e.g. Prasad et al., 2003; Dollar and Kraay, 2004; Verhoogen, 2008), showing that the popular view that increasing capital mobility came at the expense of labor income in these countries is generally not defensible, at least for de facto capital mobility. This has several policy implications for developing countries integrating into the world economy. Second, and relatedly, we add to a more focused debate about global developments of the labor share and its macroeconomic determinants and consequences (e.g. Karabarbounis and Neiman, 2013; Harrison, 2005; Hutchinson and Persyn, 2012).[4] Third, we add to a literature that emphasizes the differences between types of international capital flows, their determinants, and effects (e.g. Daude and Fratzscher, 2008). This also relates to the debate about the elasticity of substitution between capital and labor and raises the question to what extent an abstract notion of 'capital' will provide us deep insights into distributional effects on the global level. Last not least, we provide some methodological innovations by proposing a new identification strategy for the effects of foreign investment in developing countries and providing a new data set on labor shares in developing countries that covers the whole economy (as opposed to only the manufacturing sector) and uses country-specific information to correct for self-employment.

Our paper is structured as follows: Section 2 provides the economic motivation for our analysis and reviews the relevant literature related to our study. We present the data and estimation methodology in section 3 and the empirical results in section 4. Section 5 demonstrates the robustness of our results and provides some additional findings. Section 6 concludes.

[4]Maarek and Decreuse (2015) provide an analysis focusing exclusively on FDI and its effect on developing countries' labor share. We discuss our relation to this study in subsection 2.3. For studies focusing on OECD countries, see Bentolila and Saint-Pau (2003); Guscina (2006); Hutchinson and Persyn (2012); Jaumotte and Tytell (2007); Richardson and Khripounova (1998).

2 Theoretical motivation and related literature

In this section we discuss why it is important to distinguish foreign direct investment (FDI) from foreign portfolio investment (FPI) in assessing the impact of capital flows on developing countries' labor share. We start with a standard neoclassical argument why 'capital' in the common sense will have largely neutral effects on developing countries' labor share. However, we also point out that this argument rests on the assumed elasticity of substitution between capital and labor beeing close to 1. We provide some arguments why this elasticity might tend to be above 1 for FPI (mostly based on bargaining power considerations), while it is most likely to be lower than 1 for FDI, as the latter requires complementary domestic factor inputs (especially skilled labor) and does not enjoy the same bargaining power as FPI due to fixed costs and hold up problems in complex production networks. This leads us to our hypothesis that FDI and FPI will exercise different impacts on developing countries' labor shares.

2.1 A standard neoclassical interpretation

By definition, the labor share LS is the part of national income Y that is not acquired by capital ($LS := Y - \alpha Y$), which allows us to focus on our research question from the viewpoint of capital K. Following Piketty (2014), and based on Harrod and Domar, the capital share of income, α, will in the long run be determined by the return on capital, r, and the capital-to-income ratio:

$$\alpha = r \times K/Y, \tag{1}$$

with the latter adjusting in the long run to the ratio of the savings rate, s, to the growth rate, g.

From a standard neoclassical viewpoint with perfect competition, factor remuneration by its marginal product, and a Cobb-Douglas elasticity of substition between capital and labor equal 1, one would expect a broadly neutral effect of capital flows on the labor share in the host economy: on the one hand, openness would reduce the return on capital in developing

countries ($r \downarrow$) while increasing the return on the more abundant factor labor (i.e. wages). This is the rationale of standard trade models based on the factor-proportion approach (Heckscher-Ohlin-Stolper-Samuelson) and can be extended to financial globalization to the extent capital mobility acts as a substitute for trade (Mundell, 1957; Ethier and Svensson, 1986). On the other hand, however, the positive impact on wages and the decline in the return on capital would be 1:1 outweighed in the capital share as the K/L ratio would increase by the same amount, due to the elasticity of 1; in terms of equation (1): $r \downarrow = K/Y \uparrow \rightarrow \alpha = \alpha'$, which is also the rationale of the long-assumed stability of the labor share in neoclassical economics.

2.2 Moving beyond a substitution elasticity of 1

Recent contributions such as Karabarbounis and Neiman (2013) and Piketty (2014, 220) challenged this unity-elasticity arguing for an elasticity greater than 1, kicking off a fierce debate on that matter (see e.g. Summers, 2014; Rognlie, 2015; Kanbur and Stiglitz, 2015). A substition elasticity above one means that there are many different uses of capital in the long run and that the marginal productivity of capital (and labor) is the more independent of the available quantity of capital and labor the higher the elasticity. Intuitively, fixed capital could then smoothly replace workers in the production process.

The view of an elasticity greater than one is also consistent with the view that the increased mobility of capital due to globalization increased its bargaining power vis-à-vis labor, whose de-facto mobility remained virtually unaltered (e.g. Rodrik, 1997; Harrison, 2005; Jayadev, 2007). According to this argument, threatening to offshore jobs, either by outsourcing or FDI, puts tight discipline on workers' wage claims.[5] As Arseneau and Leduc (2011) show, equilibrium effects of such outside options for entrepreneurs can be substantial in size.[6]

On the other hand, one may argue that human capital has become an

[5] Outsourcing/offshoring and investing abroad differ from each other in the aspect that the latter constitutes ownership while the former establishes an arms-length relationship.

[6] Similarly, since attracting foreign investment - especially FDI - has become a policy goal in itself in many developing countries, labor relations may have been characterized by wage restraints in an act of anticipatory obedience.

ever increasing input factor in modern production that cannot easily be substituted away by physical capital and give more power to skilled laborers, resulting in a decline in the substition elasticity.

After all, different forces influence the elasticity of substition and their relative importance can differ over time, between countries, and between different types of capital. In the following subsection, we discuss the main considerations influencing the elasticities for two main types of investment in developing countries: FPI and FDI. How large and relevant these factors are in practice remains an empirical question, thus motivating our empirical analysis of the impact of foreign investment on the labor share in developing countries.

2.3 Factors that affect the substitution elasticity of foreign investment in developing countries

Foreign investment in developing countries mostly comes in the form of FDI, which is broadly speaking investment by multinational firms. FPI has historically been less relevant (see Figure 2) but is recently gaining importance in many developing, especially emerging economies. These foreign capital flows are distinguished by the fact that FDI implies some degree of control or influence in the host firm (see IMF, 2009, §§6.8-6.24).[7] One feature of this influence often is the direct takeover of management. FDI of multinational firms thus often has considerable influence on the production process in the host firm and economy, while FPI should rather be interpretated as providing additional capital to domestic (host) firms. In our view, this constitutes a major difference between the two forms of foreign investment that is likely to result in different returns to capital (r) and substitution elasticities and, ultimately, different impacts on developing countries' labor share.

Let us start with the claim that globalization has improved the bargaining power of capital vis-à-vis labor, which is likely to exercise a negative impact on the labor share (and a positive impact on the substitution elasticity). The associated threat to withdraw capital is less credible when that capital is fixed, or capital relocation is costly.

[7]Statistically, the distinction consists of FDI needing an ownership share of at least 10 % in the foreign affiliate.

For FPI—which, by definition, only constitutes a very small share of the host firm's capital structure—withdrawal of capital is relatively easy, especially in developed and liquid capital markets. For example, it should not be difficult to sell a 0.2 % share of a company on the stock exchange, so that this threat is largely credible.[8] On the other hand, selling a share of over 10 % (and often much more), as it would be the case for foreign direct investors, is less of an option in most cases as it would require considerably more time. Besides from difficulties of placing such a large share in the host financial market, divestment might be costly because the host firm is often integrated in a multinational production network (e.g. Yeaple, 2003; Blonigen et al., 2007; Badinger and Egger, 2010; Alfaro and Chen, 2014). Detaching a single plant from this network might thus disrupt the whole multinational production process and create severe holdup problems.[9] There is a large literature theoretically investigating and empirically confirming these higher fixed setup costs of FDI and associated higher sensitivity to uncertainty, informational frictions, and risk.[10] These considerations lead us to the hypothesis that FPI is in a stronger bargaining position vis-à-vis developing country laborers than FDI and will thus tend to have a more negative effect on labor shares.

Our other key argument relates to the influence FPI and FDI have on the production process and associated substitution elasticities between capital and labor. As FPI takes smaller stakes in host firms, it can be seen as 'investment at the margin' that will potentially be used to conduct pending firm investments in fixed capital. In that sense, it helps substituting capital for labor, pushing the elasticity of substitution upward. FDI to developing countries, on the other hand, often revolutionizes the whole production process and produces at higher segments of the value chain (Harding and Javorcik, 2012). This often requires relatively high-skilled workers so that capital and

[8]FPI can also come in the form of debt flows. In this case, foreign investors might care less about host firm developments because their capital is preferential to equity. However, it might still be possible to sell the debt in local financial markets.

[9]Furthermore, multinationals often transfer technology to host firms. In case they sell their stake, the technology is appropriated by the host firm or another investor, so the foreign direct investor has a higher incentive to maintain ownership and control.

[10]Examples include Razin et al. (1998); Albuquerque (2003); Daude and Fratzscher (2008); Javorcik and Wei (2009); van Nieuwerburgh and Veldkamp (2009); Kesternich and Schnitzer (2010); Wei (2000); Davies and Kristjánsdóttir (2010); Hashimoto and Wacker (2016). See also Helpman et al. (2004) for fixed costs of horizontal FDI.

labor complement each other considerably more than for FPI, thus potentially lowering the substitution elasticity. Furthermore, finding workers with required levels of human capital can often be difficult in developing countries and as multinationals also fear transfer of their technology through labor market churning (Görg and Strobl, 2005), they often pay higher wages (see e.g. Lipsey, 2002; Hijzen et al., 2013) which constitutes a further argument against FDI lowering the labor share in developing countries.

A related rationale is also explored by Maarek and Decreuse (2015) who argue (based on a search-theoretical model with firm heterogeneity and labor market frictions) that in a developing country with few foreign firms, FDI would lower the labor share via technology effects but as the proportion of foreign enterprises passes a certain threshold, FDI starts exercising a positive impact on the labor share because of competition for laborers between firms. They find some evidence of the associated U-shaped pattern in 98 developing countries over the period 1980 to 2000, although the large majority of countries lies in the part where a negative relationship is present since the estimated threshold of over 150 % (of FDI stock to GDP) is very high. While related to our paper, their study differs from ours in several aspects. First, we focus on different types of foreign investment in a broader perspective, instead of only looking at FDI. Second, we use country-wide labor shares instead of only focusing on manufacturing labor shares. While Maarek and Decreuse (2015) argue that FDI in developing countries is most relevant in the manufacturing sector, it is also well-known that FDI induces considerable vertical spillovers (e.g. Havranek and Irsova, 2011). Furthermore, although labor markets in developing countries are far from perfect, it is unlikely that wage developments in the manufacturing sector have no effects on wages in services, agriculture, and primaries. In that sense, our approach is more appropriate to capture general equilibrium effects.[11]

2.4 Empirical implication and hypothesis

Our discussion highlights that there are several reasons to assume that FDI and FPI have different elasticities of substitution between capital and labor,

[11]Moreover, the key point of a U-shaped relationship in the Maarek and Decreuse (2015) paper is suspicious of suffering from a spurious regression problem of interaction terms in fixed effect models (see Balli and Sorensen, 2013). This might also explain why their quadratic term is unidentified in the IV regressions.

bargaining positions, and hence also different effects on the labor share in developing countries. Which factors prevail and whether they are large enough to produce a substitution elasticity significantly different from 1 and associated effects on the labor share remains an empirical question motivating our analysis. From the above discussion, it seems reasonable to assume that FPI might see a substitution elasticity close to 1 and have no strong effect on the labor share, although the discussed bargaining and substitution effects might tend to exercise a negative impact on the labor share. Whether the effect of FDI on developing countries' labor share is positive or not remains to be seen but from the above discussion we have strong reasons to assume that the impact, denoted β, will be more positive (less negative) for FDI than for FPI. Our most important hypothesis can thus formally be denoted as testing $H_0 : \beta_{FDI} = \beta_{FPI}$ vs. the alternative $H_1 : \beta_{FDI} \neq \beta_{FPI}$ (see subsection 3.2.1).

3 Data, inference, and identification

In this section, we first describe our data set — most notably which measures we use for the labor share and how we obtain foreign investment data — and show simple correlations in the data, including fixed effect (FE) and random effects (RE) regressions. We then present our econometric model, including the relevant testing hypothesis and identification strategy.

3.1 Data

We focus on the labor share as our dependent variable because of its macroeconomic and political economy relevance (see Karabarbounis and Neiman, 2013; Atkinson, 2009) and because most standard trade and open economy models suggest distributional effects of openness for production *factors*. Accordingly, we look at the functional income distribution which is distinct from (but related to) other studies that look at the personal income distribution or poverty effects of globalization (e.g. Arestis and Caner, 2010; Dollar and Kraay, 2004).[12]

[12]However, the functional income distribution generally allows making a link between personal income distribution on the micro level and a macroeconomic national accounts perspective (Ray, 1998; Glyn, 2009; Daudey and Garcia-Penalosa, 2007; Checchi and Garcia-Penalosa, 2010). This is particularly true in developing countries where most

3.1.1 Labor share

Simply speaking, the labor share is the fraction of an economy's income that accrues to labor (as opposed to capital). Recently, Inklaar and Timmer (2013) provided estimates of the labor share for up to 127 countries in the Penn World Tables (PWT) 8.0, which we take as the dependent variable for our baseline estimates.

A relevant contribution of our study, which initiated before the PWT 8.0 data were released, is that we develop an alternative measure for the labor share in developing countries. Trapp (2015) provides a detailed discussion of our method and the differences to the PWT data but the key difference concerns the adjustment for labor income of the self-employed.[13] Our approach mainly relies on Gollin's (2002) third suggestion which assumes that the self-employed earn the same wage as employees and corrects for the fact that this tends to overestimate the labor share in the more backward economies (where many of the self-employed engage in low-productive subsistence farming).[14] By contrast, the PWT data in almost equal parts are based on Gollin's second suggestion, which assumes that the labor share of self-employed income is the same as for the rest of the economy, and Gollin's first adjustment, which adds self-employed income (proxied by total agricultural value added) to the labor income of employees.[15] Furthermore, our data use more micro-

people (especially poor households) only have their labor to earn a living and do not have relevant capital income, so the labor share directly relates to the personal income distribution (Ray, 1998, 171).

[13] One may argue that correcting for self-employment is not important altogether, as the self-employed are usually not working for foreign companies. This neglects that especially FDI can set in motion social mobility towards the formal sector which increases labor compensation and thus the (unadjusted) labor share, even though labor income has effectively changed little.

[14] As data on the share of self-employment in total employment is rare, we use the agricultural employment share as a proxy. Where data on self-employed income is available, the first and second adjustment suggestions of Gollin (2002) serves as upper and lower bounds, respectively. No further adjustment is undertaken in countries that seemingly already accounted for self-employed labor income.

[15] In the PWT data, no further adjustment is undertaken in countries where the naive labor share exceeds 0.7. Gollin's third adjustment using the self-employment share in total employment is used when employment data are available and the resulting labor share is lower than that resulting from Gollin's first adjustment using agricultural value added as a proxy.

founded information (e.g. from Social Accounting Matrices) about trends in self-employment in developing countries to substantiate the assumptions made. We thus think our data provide a more accurate measure of the labor share for the specific sample of low and middle income countries because it incorporates more country-specific information about self-employment and does not build on as many assumptions as the PWT (interpolation, constant labor shares at start and end points). However, to refuse any concerns our labor share measure was constructed in a way to support our hypothesis, we rely on the PWT data for our baseline estimates and use the measure of Trapp (2015) only to check for robustness.

Compared to previous studies about the effect of globalization in developing countries, it is finally worth highlighting that both our labor share measures adjust for the problem of labor income of the self-employed (as opposed to Karabarbounis and Neiman, 2013; Harrison, 2005; Jayadev, 2007; Diwan, 2001) and cover the whole economy, instead of only relying on the manufacturing or corporate sector (such as Maarek and Decreuse, 2015; Karabarbounis and Neiman, 2013, respectively).

The measures for the labor share in our relevant sample range from 21.2 % in Azerbaijan (2008) to 78.1 % in Armenia (1998) for the PWT series, and from 18.7 % in Azerbaijan (2008) to 64.3 % in Bolivia (2000) for our newly constructed measure. For the econometric estimation, we log-transform the data. To avoid potential spurious regression problems to inference that can also arise in standard panel data models if series are integrated of order one (Kao, 1999), we test for unit roots using Fisher-type panel data tests based on Phillips and Perron and augmented Dickey-Fuller tests, including also drifts and trends up to three lags. Of the 15 different tests conducted, 14 (13, 12) allow to reject the null hypothesis of a unit root in our newly constructed log labor share on the 10 (5, 1)% level of statistical significance, while the same is only true for 5 (5, 5) of the PWT data.[16] Because this casts some doubt on the PWT series, we emphasize that our key results are also robust for our newly constructed labor share data which are less suspicious to suffer from unit-root-induced inference issues. Results are available upon request.

[16]This might partly be due to the PWT method of filling missing values with interpolation and keeping labor shares constant.

3.1.2 Foreign investment

Our main explanatory variables of interest are foreign direct investment (FDI) and foreign portfolio investment (FPI), both measured in stocks (taken from the International Investment Position, IIP, of the IMF's International Financial Statistics, IFS) relative to GDP (as reported by the UN SNA) in order to arrive at a good measure of the relative importance of foreign investment in the host economy (see IMF, 2009, and Wacker, 2013, for more information on these measures). Along the lines of our discussion in section 2.3, the key distinction between these two types of foreign investment in the IIP is their degree of ownership which is reflected in different equity stakes in the host enterprises.

Note that this is a *de facto* measure of capital stocks or financial globalization (cf. Edinson et al., 2002). De jure measures, which are based on legal restrictions on international capital flows, may have some advantages but they do not always indicate the actual degree of investors presence in the country (see e.g. Kose et al., 2009b, who use an equivalent benchmark measure for de facto financial openness). For example, many countries in Sub-Saharan Africa have loosened their capital controls but are only experiencing small inflows of foreign investment. Furthermore, actual legislation does not tell much about the investment that has accumulated in the past and hence currently exercises economic effects in the sense of section 2.3 in the host economy, which is captured more appropriately by our stock measures. Finally, we are mainly interested in the heterogenous effects of different types of capital flows which would be hard to compile from de jure data.

The according measures for FDI and FPI in our sample range from 0 (Côte d'Ivoire, 1994-1997) to 132.3 % (Azerbaijan, 2004) and from -0.04 (Tanzania, 2008) to 65.2 % of GDP (Jordan, 2005), respectively.

3.1.3 Control variables

To obtain the ceteris paribus effect of FDI and FPI stocks on the labor share, we control for a set of variables that have been found to influence the labor share in previous research and which are also likely to correlate with capital stocks, so that parameter estimates would be biased when omitting these variables. In the baseline regressions, we limit the control variables to those

we consider most relevant and which still allow us to rely on a comprehensive sample. In section 5, we will demonstrate that our results are also robust to the inclusion of additional control variables.

To accommodate the possibility that the labor share is systematically different at higher development levels, we control for *GDP p.c.*, transformed into logs. Note that most of our panel estimations remove unobserved cross-country heterogeneity, so this variable will to some extent also capture cyclical effects. As an even more cyclical variable that is easily available, we control for the *inflation rate* which might influence the labor share in the short run since wages react to price fluctuations with some delay, as pointed out by Marterbauer and Walterskirchen (2003). To control for the fact that countries that produce more capital intensive should earn more interests and hence experience a lower labor share, we include the *capital-to-labor (K/L) ratio* (with labor taken from WDI and capital stocks estimated from PWT 7.0 with the perpetual inventory method).

Furthermore, we control for *government consumption/GDP*, taken from PWT 7.0, since Harrison (2005) and Jayadev (2007) find that government inference positively influences the labor share. The reason is that governments in general pursue redistribution policies in favor of labor. Government policies, however, change with the opening up of capital markets and the resulting 'discipline effect' (Prasad et al., 2003, 2), leaving it a priori unclear whether government consumption correlates positively or negatively with the labor share. National governments in open economies may be prompted to adopt policies that disproportionally serve the interests of capital (Stiglitz, 2000).

Another standard control variable, especially with regard to developing countries, is *institutional quality*. We hence experiment with a composite risk rating and an index for financial risk from the International Country Risk Guide (ICRG), where higher values indicate lower risk. The baseline results will focus on the composite risk rating.

Furthermore, *trade/GDP* is a control variable of particular interest to us because standard models predict that trade increases the labor share of developing countries. Our arguments instead suggest that trade may negatively influence the labor share because the bargaining power of labor can

be weakened with increased international competition as labor at home indirectly competes with labor abroad (cf. Dube and Reddy, 2014; Ortega and Rodriguez, 2002). In any case, it is important to control for trade in our setting, as it might not only influence the labor share but also be correlated with foreign investment.

Finally, to control for the important effect of education, we use an *education* index compiled by the United Nations Development Program (UNDP) as our last baseline control variable. It combines mean years of schooling with expected years of schooling and has the advantage of wide availability. Again, this is a potentially important control variable in our setting, as a more educated labor force may acquire a higher labor share while at the same time influencing foreign investment (as e.g. the knowledge-capital model for FDI points out; cf. Blonigen et al., 2003).

As a mere statistical control, we further include an (unreported) dummy variable SNA which indicates if a country's system of national accounts follows the 1993 convention (or the 1968 convention otherwise).

In section 5, we demonstrate the robustness of our results to including additional/alternative control variables that we do not include in the baseline regression (mostly due to data availability and according sampling issues). Including gross fixed *capital formation* (GFCF/GDP) helps taking into account different aggregate production technologies. For a similar reason, we also control for *labor productivity*, defined as GDP per worker from PWT 7.0, although it is highly correlated with GDP. Furthermore, we control for *crisis* periods, identified by swift changes in the nominal exchange rate, which also tend to depress the labor share (cf. Diwan, 2001; Onaran, 2009; Harrison, 2005; Jayadev, 2007; Arseneau and Leduc, 2011). Theoretical considerations further suggest to also control for the *real interest rate* (WDI) because the government may be encouraged to pursue a high interest rate policy once the capital markets have been liberalized in order to attract foreign investors. This, however, can depress domestic investment and may have a negative effect on the labor share. We also consider the PPP-implied *exchange rate* (IMF WEO) because appreciations may adversely affect employment in the export sector and hence the labor share and because the exchange rate can also be considered as a proxy for the fixed costs for capital of relocating abroad (Harrison, 2005), with an appreciation decreasing the costs of relo-

cating.[17] Finally, we also test for robustness to including an *employment vulerability* measure: the fraction of paid family workers and own-account workers (as a percentage of total employment, from WDI).

3.1.4 Descriptive statistics and correlations

Table 6 in Appendix A provides summary statistics of each variable used (based on the sample for our baseline model (2) in table 1). The same Appendix also provides a list of included countries.

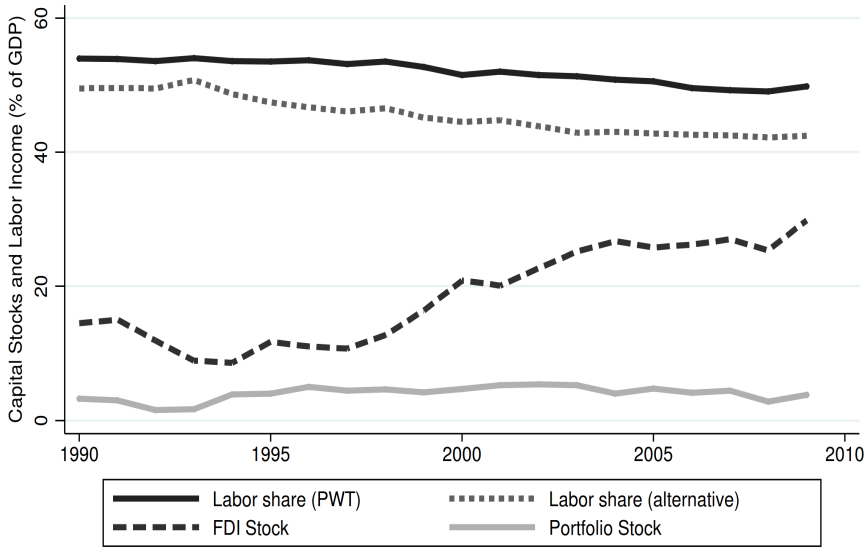
Figure 2 shows the developments of our key variables of interest over time. As one can see, the labor share shows a significant downturn since the early 1990s, a trend which prevails in most developing regions. Regressing the log labor share on time (using fixed effects and limited to observations in the baseline sample) shows a negative trend of -0.008*** and -0.009** for the PWT and our newly constructed series, respectively. The figure further shows that FDI plays a much more important role than FPI in developing countries and saw a much more dynamic development through the sample period.

Table 7 in Appendix A provides pairwise variable correlations. Three observations seem worth highlighting. First, pairwise correlations in our baseline variables seem small, so multicollinearity is unlikely to be an issue. Second, the low correlation between our two labor share measures is remarkable and possibly highlights the degree to which the different adjustment methods suggested by Gollin (2002) might matter. Third, for both labor share measures, the (unconditional) correlation with portfolio stocks is more negative than with FDI stocks.

Conditional correlations can be inferred from table 1 that provides simple panel data results from fixed effect (FE) and random effect (RE) estimation. For both estimation techniques, correlations of the labor share with FDI stocks are positive, while those with portfolio stocks are negative. While they are individually insignificantly different from 0 without controling for other factors, their difference is statistically significant once one controls for other macroeconomic variables (at the 5 % level, at least), as indicated by

[17] Since we note price notation, an appreciation of the currency is associated with a decrease in the exchange rate.

Figure 2: Labor Shares and Capital Stocks in Developing Countries



the test statistic in the last line (and discussed in more detail in subsection 3.2.1). With those baseline controls, the positive correlation of the labor share with FDI itself also turns statistically significant, while the negative correlation with the portfolio stock is only signifcant in the FE estimation.

3.2 Econometric model and inference

While those first results are already indicative of our key hypothesis, they are potentially prone to several sources of endogeneity bias. We thus move to a more causal identification concerning the effect of foreign capital investments on the labor share in developing countries. As in the simple FE and RE results above, we start by modelling our labor share variable, $\ln(LS)$, as a log-linear function of the foreign capital stock variables (FDI, FPI) conditional on a set of control variables, Ψ (some of which are log-transformed as well):

$$\ln(LS)_{it} = \beta_{FDI}\frac{FDI_{it}}{GDP_{it}} + \beta_{FPI}\frac{FPI_{it}}{GDP_{it}} + \Psi_{it}\theta + u_{it}, \tag{2}$$

where $u_{it} := \alpha_i + \gamma_t + \varepsilon_{it}$ with α_i being country dummy variables, γ_t representing year dummy variables[18] and ε_{it} is an error term with $\mathbb{E}(\varepsilon_{it}) = 0$ and existing second moment. As discussed below, this model is estimated in first differences and using instrumental variable techniques, respectively.[19] With respect to statistical inference, all estimated standard errors of these models are robust to any pattern of heteroskedasticity and autocorrelation within countries.

3.2.1 Inference and null hypothesis

At this point, it is important to stress that our main argument (see subsection 2.3) and related null hypothesis is not about a parameter being statistically indifferent from zero, as in most empirical studies. As discussed in subsection 2.1, a parameter estimate of zero would even be a resonable a priori expectation under most conventional neoclassical assumptions. It would not be conflicting with our hypothesis when both forms of foreign investment have an impact on the labor share that is statistically not different from zero, as our main hypothesis is that $\beta_{FDI} > \beta_{FPI}$.

We therefore test for equality of parameters in our null hypothesis

$$H_0 : \beta_{FDI} = \beta_{FPI} \tag{3}$$

[18] Note that the included time dummies also nest a time trend, even with a structural break and that they also account for any 'global' factors and shocks (such as oil prices).

[19] For the RE model presented above, it is assumed that $\alpha_i \stackrel{!}{=} \alpha \; \forall \; i$ and parameters are estimated via generalized least squares in this case.

against the alternative

$$H_1 : \beta_{FDI} \neq \beta_{FPI}. \tag{4}$$

Although we assume $\beta_{FDI} > \beta_{FPI}$, we still test against a two-sided alternative given the absence of a formal model deriving this (alternative) hypothesis. Our inference is hence rather conservative. Under the null hypothesis and conventional least squares estimation (especially first differences and FE), the according test statistic $t := \frac{\hat{\beta}_{FDI} - \hat{\beta}_{FPI}}{\hat{se}(\hat{\beta}_{FDI})}$ follows a t-distribution with $k-1$ degrees of freedom, where k is the number of estimated parameters.[20]

When using instrumental variable methods, we have to rely on other test statistics that are robust to weak instruments. In that case, the distribution of the IV estimator and according test statistics are not well-approximated by standard asymptotic limits. Therefore, we rely on the conditional likelihood ratio (CLR) test proposed by Moreira (2003) and on the Anderson and Rubin (1949) AR test, both of which are robust to weak instruments and can also be inverted to produce a confidence region for our parameters of interest. This allows a visual inspection to infer where the true parameter is likely to lie. Moreover, the AR test includes a test for the exogeneity condition $\mathbb{E}(Zu) = 0$. That is, the null is also rejected if exogeneity is not supported by the correlation of residuals with the instrument(s). Conversely, the CLR test assumes the exogeneity condition to be satisfied. While it has more power than the AR test, it can only accommodate a single endogenous regressor.

3.2.2 Identification

Against the background of our relevant hypothesis, a discussion of potential problems that may cause a bias to our parameters of interest, β_{FDI} and β_{FPI}, seems at order. It is important to stress that, given our hypothesis, the relevant problem we should be concerned about is a potential endogeneity problem that causes an upward bias in β_{FDI} relative to β_{FPI}. Conversely, anything that will bias β_{FDI} and β_{FPI} upward (or downward) at the same order is unfortunate for the precision of our point estimates (which we still care about) but does not affect inference concerning our relevant null hypothesis.

[20] In case of GLS estimation in the RE model presented above, the distribution follows a χ^2 distribution with one d.o.f., i.e. the distribution of a simple normal deviate squared.

In our view, there is only one relevant economic problem that might cause such a bias, which is reverse causality from wages (which proxy for workers' skill) to types of foreign investment. It is widely accepted that multinational firms tend to pay higher wages and hire more skilled workers (e.g. Hijzen et al., 2013). To the extent that wages reflect skills, a higher labor share might attract mulitinationals' FDI, which is also less sensitive to a higher wage bill than FPI, and bias our estimated effect for the causal effect of FDI on the labor share upward relative to the effect of FPI.

Our distributed lag first-difference strategy takes care of this (and any other potential) source of reverse causality. The model can be written as

$$\Delta \ln(LS)_{it} = \beta_{FDI}^{FD} \Delta\Big(\frac{FDI_{i,t-1}}{GDP_{i,t-1}}\Big) + \beta_{FPI}^{FD} \Delta\Big(\frac{FPI_{i,t-1}}{GDP_{i,t-1}}\Big) + \Delta\Psi_{it}\theta^{FD} + \gamma_t^{FD} + \varepsilon_{it}^{FD}, \tag{5}$$

where Δ is the first-difference operator, i.e. $\Delta x_t = x_t - x_{t-1}$ (and $\Delta\Psi$ might also include lagged differences). Note that this transformation cancels out the (time-invariant) country fixed effects while still accounting for unobserved cross-country heterogeneity.

To see why this approach resolves reverse causality issues, first note that the model relates innovations in the labor share in year t to changes in foreign capital stocks in $t-1$. Hence, reverse causality could only be an issue if foreign investors in t (differently) react to changes in wages or, precisely, the labor share in $t+1$. This is very unlikely, especially since we look at capital stocks, not flows, which to a large extent reflect past investment (and its revaluations).[21] An issue could only arise with high persistence of the (first differenced) series, i.e. if wage (or labor share) developments in $t+1$ are largely echoing those in t. However, this is not the case as the correlations between current and lagged first differences of our labor share measures are only 0.05 (for the PWT series) and -0.07 (for our newly constructed series), and in neither case significant at the 10 % level. Furthermore, first-order autoregressions of these (differenced) series produce an (insignificant) AR(1) parameter estimate of 0.003 and -0.021, respectively, indicating that persis-

[21] Note in this context that capital flows are *not* simply the first difference of capital stocks. See Wacker (2016).

tence in differences of the labor share is not an issue.

However, the sceptical reader might come up with other sources for an endogeneity bias. Therefore, we propose a novel strategy to identify the effect of international capital flows using instrumental variables based on global financial conditions that credibly meet the exogeneity and exclusion restrictions, though suffer from a weak-instruments problem, for which we account in our inference techniques. In our view, this identification approach is an innovation to the literature that has to date failed to provide a time-varying instrument for international capital that is not only credibly exogenous but also convincingly meets the exclusion restriction.

Our instrumental variable identification strategy is based on the well-established fact that capital flows to emerging and developing countries can at least partially be driven by push factors in industrialized economies, most notably monetary and financial conditions (e.g. Calvo et al., 1993; Fernandez-Arias, 1996; di Giovanni, 2005; Dabla-Norris et al., 2010; Fratzscher, 2011; Rey, 2013). To gauge those financial conditions, we use the US financial conditions index (FCI) developed by Wacker et al. (2014). This measure is credibly exogenous as US financial conditions and monetary policy are not influenced by events in developing countries in general and the labor share in particular. Furthermore, it meets the exclusion restriction as the FCI is constructed to be conditional on the US business cycle, i.e. it captures developments in financial conditions that are exogenous to most important real developments. This avoids that latter aspects in the FCI exercise a relevant impact on developing countries' labor share through other channels than foreign investment, especially since we control for time dummies in the second stage regression. While the US are by far the most important foreign investor in developing countries, we certainly also want to gauge financial conditions in Japan and the European Union (EU) to improve identification in the first-stage regression. Unfortunately, elaborated FCIs with the required time range are not available for these economies, so we construct proxy measures that are basically an average of equity prices, bond interest rates and the spread between long term and short term bond rates.[22] These

[22]We take OECD data for long-term interest rates, a spread between short-term and long-term rates, and a share price index. These three series are smoothed with a Hodrick-Prescott filter, Pearson transformed, and the first two are inverted so that a rise in each variable indicates finance becoming more easily available. For the EU, we take an average

measures should matter for capital flows to developing countries as they are crucial for the (re-)financing conditions of most relevant investors. The wave of capital flows to emerging economies in the aftermath of the US Fed easing after the financial crisis and its reversal amid the 'Taper tandrum' are obvious examples. To make these ('global') measures country-specific, we interact them with the distance of the capital of the respective host country to Washington DC, Brussels, and Tokio, respectively, using CEPII's GeoDist database (Mayer and Zignago, 2011). Economically, this captures the idea that US financial conditions might matter more for geographically close countries (e.g. in Latin America) than for Eastern European economies, where EU financial conditions might matter more. Statistically, our identification strategy essentially builds on the idea of Nunn and Qian (2014) that only the interaction term of both variables needs to be exogenous (conditional on the baseline controls). To see a discussion of the correlation between our newly proposed instruments and foreign investment, including first-stage regression results, see online appendix B.1.

4 Estimation Results

In this section, we report our baseline results of the first-difference and the IV model. In the following section 5, we provide some residual diagnostics and show that our results are robust to alternative sets of control variables and to the changes in the sample that they induce. In addition, we provide results from using an alternative measure for the labor share as the dependent variable and on the marginal effect of foreign investment in dependence of the domestic capital stock.

4.1 First-difference results

Table 2 starts with the first-difference results. The unconditional model in column (1) already confirms our basic intuition of opposing effects of FDI and FPI on the labor share in developing countries even though only the (positive) FDI variable is significant in a statistical sense, while the difference to FPI, our key statistic of interest is slightly insignificant at the 10 % level if no control variables are included (as indicated in the last column of the table). However, the opposing effects of FDI and FPI on the labor share

of the largest FDI economies, i.e. UK, Germany, France, and Belgium.

in developing countries, with FDI exercising a positive effect, is clearly supported by our baseline model reported in the second column of table 2. The results suggest that a 10 % point increase in the FDI stock relative to GDP will increase the labor share by slightly more than 1 %, with a negative effect of similar magnitude for FPI. Both parameter estimates are statistically significant (at the 5 and 10 % level, respectively), with their difference being significant at the 5 % level. Interestingly, the only other two variables that exercise a statistically significant influence on the labor share in this specification are the capital-to-labor (K/L) ratio and trade intensity. As expected, but at odds with standard neoclassical theory, a higher capital-to-labor ratio tends to lower the labor share, while the negative effect of trade supports the notion that globalization is indeed an important factor influencing the labor share in developing countries.[23]

In column (3), we check that the lag structure of our key explanatory variables is well-defined. Allowing for an additional lag of the differenced foreign investment stocks does not alter our main results and the additional lags are individually and jointly insignificant.[24] Column (4) shows different lags for the control variables, again with our main results concerning the opposing effect of FDI and FPI on the labor share in developing countries unchanged.[25]

4.2 IV results

As an alternative identification strategy, we rely on the instrumental variable approach discussed above to estimate our baseline model, with second-stage results presented in table 3. As already indicated, first-stage identification is weak (a presentation and discussion is provided in Appendix B.1), so while the exogeneity assumption of our approach is economically credible, statisti-

[23]The estimated magnitude is of similar order as for our capital flow variables. Given that trade/GDP increased by a considerable magnitude in those countries over the last decades, this might add up to a relevant decline in the labor share.

[24]The p-value of the F-statistics of the second lags of FDI and FPI is 0.78 and hence does not allow us to reject the null of joint insignificance.

[25]We decided to lag the differences of the more structural (as opposed to cyclical) variables education and capital-labor ratio by one year as we assume that they might take more time to materialize, whereas we allow for the contemporaneous and one-year lagged difference of short-term variables (such as inflation), which might affect the labor share quickly.

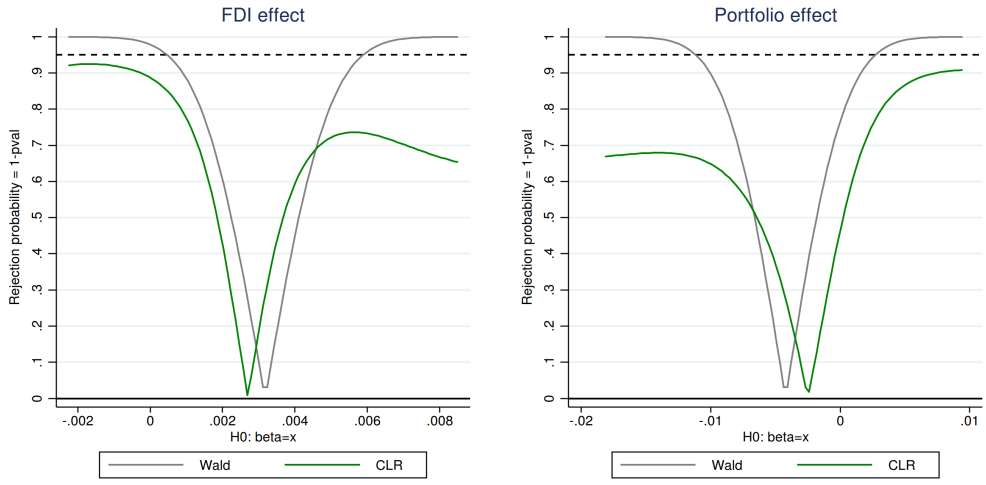
cally we have to rely on weak-identification techniques.

In the first and second column of table 3, FDI and FPI are only individually instrumented, respectively. For both cases, the respective CLR statistics of the relevant parameters are depicted in figure 3 (together with the Wald statistics that are not robust to weak instruments). The vertical axes of the graphs show a statistical rejection probability for the null hypothesis that the true parameter is equal to the corresponding value on the horizontal axes. For example, from the left panel we can infer that one can reject that the true FDI parameter equals -0.002 at a 90 % (but not a 95 %) statistical significance level, as the depicted CLR function exceeds the 0.9 (but not the 0.95) threshold. More generally, despite weak identification, we can reject a negative value of the FDI parameter at the 90 % level of statistical significance. Accordingly, we can reject (at the 10 % level at least) the hypothesis that the true FDI parameter is equal to the point estimate of the FPI parameter in colunn 1 (not instrumented) or 2 (instrumented). This is also visible from the CLR statistic in the last line of column (1). Conversely, an according statement cannot be made for the FPI parameter estimate from IV identification (depicted in column 2 of table 3 and in the right panel of figure 3). While the results suggest that a negative effect of FPI on the labor share in developing countries is more likely, weak identification only allows us to reject a parameter of rather high size (approximately above 0.01) which is clearly above the estimated FDI effect (of 0.002). However, it is worth emphasizing that rejection of a larger FPI parameter is much more probable than of a more negative one, while the opposite is true (with more confidence) for the FDI parameter.[26]

For a joint IV assessment of both our parameter estimates of interest, we also instrument them simultaneously, with results provided in column (3) of table 3. The point estimates are close to those obtained from individual IV estimates in the first two columns. For inference with respect to our key hypothesis, we work with the AR statistic, which is available for the case of 2 potentially endogenous regressors, and can reject (on a 10 % level) the joint hypothesis that the true parameter values are equal to their

[26]Careful observers might have noticed that the point estimates in table 3 are not equal to the parameter values where the CLR function reaches its minimum in figure 3. By construction, this does not need to be the case. Rather, the fact that both are quite close suggests that the model is supported by the data.

Figure 3: IV results (1 endogenous variable): CLR confidence area

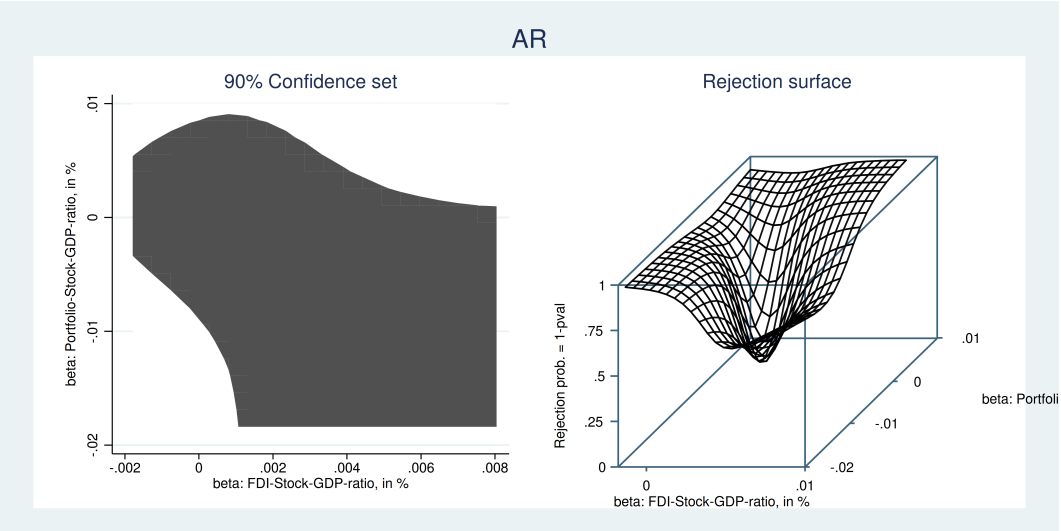


respective other foreign capital estimates. That is, we can reject the null $H_0 : \beta_{FDI} = \hat{\beta}_{FPI} \wedge \beta_{FPI} = \hat{\beta}_{FDI}$ in favor of the alternative that both parameters are unequal. Figure 4 plots a 90 % confidence set and a more detailled rejection surface of parameter combinations. The latter is a 3-dimensional extension of the previous CLR confidence area, reflecting that there are now 2 instead of 1 endogenous regressors. Since visual inspection is difficult, the left panel displays the area of parameter combinations where the surface in the right panel does not surpass the 90 % rejection probability.

Looking at the left panel, one could imagine a line where $\beta_{FDI} = \beta_{FPI}$, that would cross the 90 % confidence set, thus not allowing us to reject our relevant null hypothesis at those specific points. However, as is clearly visible, the confidence set is not symetrically distributed around these parameter combinations of equality but extends much more to the lower right into the area where the effect of FDI on the labor share is positive, while the effect of FPI is negative, in line with our discussion and previous results.

It is interesting to note that IV estimates suggest a larger effect (in absolute terms) of both foreign investment parameters than the first difference

Figure 4: IV results (2 endogenous variables): Rejection area



results. For the most part, however, this does not seem to be driven by an estimation bias but by the difference between estimation in levels and first differences[27], with the former possibly capturing more long-run effects.

Looking at other control variables, we can confirm the previous result that trade and a higher K/L ratio negatively correlate with the labor share. The positive correlation of the education index with the labor share turns statistically significant in the second column, with reasonable standard errors in the other two specifications. The negative correlation with GDP turns significant and government consumption also exhibits a negative effect. Taken at face value, both latter results are somewhat surprising and at odds with most findings in previous studies. However, a negative effect of GDP p.c. on the labor share was also found in Harrison (2005) and the conventional rationale that higher GDP (growth) leads to more scope for trade unions to redistribute to workers seems problematic in the context of developing countries that are often characterized by surplus labor, leaving little bargaining

[27]This can be seen when comparing the FD results with level results in table 1. Additionally, non-instrumented foreign capital variables in IV table 3 are still larger (in absolute size) than the FD results.

power to unions (at least in the broad economy). The negative correlation of the labor share with government expenses is an artefact of the PWT data and not robust to our alternative labor share measure, as demonstrated in the next section.[28]

The relative economic relevance of different explanatory variables can be inferred from the standardized beta coefficients in table 4. As one can see, foreign investment (and also trade) does matter for the labor share in developing countries from an economic perspective, although FDI and FPI seem to cancel each other out for the most part. No clear picture that is robust across specifications emerges for the other variables, though the more structural (as opposed to cyclical) variables — education, K/L ratio, and development level — seem to matter in the IV regression, which captures more long-run effects (with the education effect being potentially economically relevant but insignificant from a statistical perspective).

5 Robustness and further results

In this section, we provide several specification and robustness checks as well as some further results.

5.1 Diagnostic checks

We start with a diagnostic check on the functional (linear) form of the first-difference model.[29] The upper panel of figure 5 therefore provides a plot of the model residuals against fitted values and a leverage-to-residual plot. As one can see, the only truly worrisome residuals concern Azerbaijan (2006) and Moldova (1999). Column (5) of table 5 thus re-estimates our model without these two observations. This somewhat lowers (in absolute terms) the point estimates of our two foreign investment variables of interest, without changing the qualitative implications of our results (as both individually

[28] A negative correlation could also arise if governments increasingly moved away from public job-creating investment programs to social benefits. In this likely case, social benefits would no longer be reflected in wages.

[29] An indirect assessment of the functional specification of the IV model can be inferred from the fact that the point estimate is close to the minimum of the rejection probability function of the CLR and AR tests.

and their difference remain statistically significant).

The lower panel of figure 5 provides a component-plus-residual plot for the FDI and FPI variable, respectively. One can see that there is no reason to believe that the linear functional relationship would be inappropriate.

5.2 Alternative specifications and labor share measure

Column (1) of table 5 adds a crisis dummy and gross fixed capital formation (GFCF) as additional controls to the baseline first-difference model. Column (2) further adds labor productivity and the interest rate. Note that this also leads to a relevant decrease in the sample size. However, in neither of the two alternative specifications our key result is affected: Our foreign capital stock variables are both individually significantly different from zero and significantly different from each other (in a statistical sense). The same is true for the point estimates of the IV model when adding the crisis dummy and GFCF (column 6), although weak-instrument robust inference does not allow us to reject parameter equality at the margin (p-value 0.108). Notably, our results with respect to the K/L ratio and the negative effect of trade remain robust to the inclusion of further controls.

We also add an index for employment vulerability, the implied PPP exchange rate, and mean years of schooling (as an alternative education measure) as control variables, respectively.[30] Neither of those variables turn out significant. With respect to our key hypothesis, results remain unaffected in the first-difference model, with parameter equality rejected at the 5 % level in all three cases and individual FDI (and FPI) parameters being positive (negative) and statistically significant at least at the 5 (10) % level in all cases. For the IV model, our key result does no longer hold when including the employment vulnerability index, which most likely is driven by the enormous decline in sample size to 170 observations. Key results hold, however, when including the exchange rate or years of schooling.

[30] Results not reported but available upon request.

VARIABLES	(1) $\ln(LS_{PWT})$	(2) $\ln(LS_{PWT})$	(3) $\ln(LS_{PWT})$	(4) $\ln(LS_{PWT})$
FDI stock/GDP	0.00167	0.00178***	0.00148	0.00170**
	[0.00122]	[0.000419]	[0.00106]	[0.000789]
Portfolio stock/GDP	-0.00145	-0.00234***	-0.00166	-0.00177
	[0.00146]	[0.000789]	[0.00126]	[0.00112]
ln(GDP p.c.)		-0.359***		-0.280***
		[0.0465]		[0.0687]
ln(inflation)		0.000225		-0.000633
(-1)		[0.00504]		[0.00524]
risk		0.00174		0.00104
		[0.00130]		[0.00168]
ln(government share)		-0.0655***		-0.0490
		[0.0173]		[0.0329]
Education Index		0.887***		1.210***
		[0.268]		[0.191]
K/L		-3.03e-06***		-7.30e-07
		[9.58e-07]		[1.15e-06]
trade		-0.00153***		-0.00127**
		[0.000391]		[0.000580]
Observations	433	309	433	309
Number of countries	51	38	51	38
R-squared (within)	0.27	0.57	0.27	0.55
Estimation	FE	FE	RE	RE
test statistic	1.84	16.55***	2.55	5.79**

Cluster-robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1
time dummies, constant, SNA not reported

Table 1: Panel correlations (FE and RE)

VARIABLES	(1) $\Delta\ln(LS_{PWT})$	(2) $\Delta\ln(LS_{PWT})$	(3) $\Delta\ln(LS_{PWT})$	(4) $\Delta\ln(LS_{PWT})$
ΔFDI stock/GDP	0.00100*	0.00119**	0.00118**	0.00105**
(-1)	[0.000541]	[0.000490]	[0.000554]	[0.000475]
ΔFDI stock/GDP			-0.000288	
(-2)			[0.000418]	
ΔPortfolio stock/GDP	-0.000191	-0.00108*	-0.000907	-0.000866*
(-1)	[0.000636]	[0.000554]	[0.000759]	[0.000509]
ΔPortfolio stock/GDP			0.000523	
(-2)			[0.00144]	
Δln(GDP p.c.)		-0.185	-0.183	
		[0.154]	[0.158]	
Δln(inflation)		-0.00178	-0.00118	-0.000203
(-1)		[0.00337]	[0.00368]	[0.00244]
Δrisk		0.00276	0.00238	0.00237
		[0.00167]	[0.00188]	[0.00181]
Δln(government share)		0.0373	0.0401	0.0462
		[0.0745]	[0.0770]	[0.0734]
ΔEducation Index		0.0851	0.143	
		[0.651]	[0.698]	
ΔK/L		-3.26e-06*	-2.99e-06*	
		[1.83e-06]	[1.68e-06]	
Δtrade		-0.000958**	-0.00101**	-0.000830**
		[0.000424]	[0.000482]	[0.000408]
Δln(GDP p.c.)				-0.170*
(-1)				[0.0908]
Δln(government share)				0.0285
(-1)				[0.0253]
ΔEducation Index				0.403
(-1)				[0.523]
ΔK/L				-4.03e-06*
(-1)				[2.20e-06]
Δtrade				-0.000257
(-1)				[0.000495]
Observations	361	245	220	244
Number of countries	47	35	33	34
R-squared	0.134	0.263	0.248	0.269
t-statistic	1.94	6.31**	-	5.72**

Cluster-robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
SNA and time dummies not reported

Table 2: FD results

VARIABLES	(1) $\ln(LS_{PWT})$	(2) $\ln(LS_{PWT})$	(3) $\ln(LS_{PWT})$
FDI stock/GDP	0.00318**	0.00188***	0.00312**
	[0.00138]	[0.000639]	[0.00125]
Portfolio stock/GDP	-0.00263**	-0.00422	-0.00419
	[0.00111]	[0.00354]	[0.00362]
ln(GDP p.c.)	-0.333***	-0.360***	-0.336***
	[0.0613]	[0.0747]	[0.0614]
ln(inflation)	0.00201	0.00103	0.00252
(-1)	[0.00528]	[0.00455]	[0.00541]
risk	0.00173	0.00205	0.00202
	[0.00160]	[0.00168]	[0.00170]
ln(government share)	-0.0765***	-0.0685***	-0.0782***
	[0.0202]	[0.0222]	[0.0219]
trade	-0.00186***	-0.00140***	-0.00169***
	[0.000555]	[0.000519]	[0.000474]
Education Index	0.655	0.896**	0.676
	[0.586]	[0.400]	[0.557]
K/L	-2.67e-06**	-3.56e-06**	-3.17e-06*
	[1.33e-06]	[1.69e-06]	[1.63e-06]
Instrumented	FDI	FPI	FDI & FPI
Observations	308	308	308
Number of countries	37	37	37
R-squared	0.406	0.433	0.399
CLR / AR χ^2_4	6.63*	1.85	8.18*

Cluster-robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1
Time dummies partialled out, SNA not reported
CLR test for single parameter equality in columns 1 & 2,
AR test for joint equality of both endogenous regressors in column 3.

Table 3: IV results

	(1) difference model	(2) IV model
FDI Stock GDP	0.207**	0.357**
	(2.43)	(2.49)
Portfolio stock/GDP	-0.096*	-0.199
	(-1.94)	(-1.16)
ln(GDP p.c.)	-0.196	-1.336***
	(-1.20)	(-5.47)
ln(inflation)	-0.033	0.018
(-1)	(-0.53)	(0.47)
risk	0.160	0.062
	(1.65)	(1.19)
ln(government share)	0.080	-0.169***
	(0.50)	(-3.57)
Education Index	0.008	0.566
	(0.13)	(1.21)
K/L	-0.086*	-0.451*
	(-1.78)	(-1.94)
trade	-0.167**	-0.298***
	(-2.26)	(-3.56)
N	245	308

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

Results correspond to column (2) of table 2 and (3) of table 3, respectively.

Table 4: Standardized beta coefficients

VARIABLES	(1) $\Delta\ln(LS_{PWT})$	(2) $\Delta\ln(LS_{PWT})$	(3) $\Delta\ln(LS_{Trapp})$	(4) $\Delta\ln(LS_{Trapp})$	(5) $\Delta\ln(LS_{PWT})$	(6) $\ln(LS_{PWT})$	(7) $\ln(LS_{Trapp})$	(8) $\Delta\ln(LS_{PWT})$
FDI stock/GDP	0.00130**	0.00141***	0.00242**	0.00305**	0.000817***	0.00365***	0.00307**	0.00209***
	[0.000479]	[0.000425]	[0.00114]	[0.00122]	[0.000299]	[0.00125]	[0.00146]	[0.000663]
Portfolio stock/GDP	-0.00135**	-0.00144*	-0.00201*	-0.00279***	-0.000937*	-0.00678**	-0.00736	-0.00186*
	[0.000503]	[0.000719]	[0.00112]	[0.000971]	[0.000511]	[0.00333]	[0.00599]	[0.00102]
FDI Stock × K/L								-3.34e-08**
								[1.55e-08]
Portfolio Stock × K/L								2.94e-08*
								[1.69e-08]
ln(GDP p.c.)	-0.318***	-0.375*	-0.240*	-0.350***	-0.162*	-0.275***	0.00530	-0.171
	[0.107]	[0.186]	[0.133]	[0.123]	[0.0869]	[0.0590]	[0.0984]	[0.152]
ln(inflation)	-0.00767**	-0.00726**	0.00703	0.00245	-0.000848	0.00236	0.0117	-0.00177
(-1)	[0.00313]	[0.00344]	[0.00508]	[0.00525]	[0.00303]	[0.00648]	[0.00795]	[0.00326]
risk	-0.000442	0.00120	0.00558***	0.00428*	0.00168	0.000826	0.00607**	0.00259
	[0.00140]	[0.00128]	[0.00191]	[0.00227]	[0.00145]	[0.00183]	[0.00263]	[0.00168]
ln(government share)	-0.0432	-0.0256	0.0916	0.0196	-0.0189	-0.0871***	0.232***	0.0393
	[0.0387]	[0.0365]	[0.0737]	[0.0419]	[0.0332]	[0.0168]	[0.0450]	[0.0757]
Education Index	0.606	1.229*	0.821	1.889**	-0.174	0.614	1.069	0.00689
	[0.563]	[0.686]	[0.964]	[0.915]	[0.614]	[0.645]	[0.783]	[0.675]
K/L	-5.80e-06***	-5.72e-06***	-8.36e-07	5.15e-07	-3.53e-06*	-5.08e-06***	-3.07e-06	-3.93e-06*
	[1.95e-06]	[1.75e-06]	[1.68e-06]	[2.60e-06]	[2.00e-06]	[1.93e-06]	[1.92e-06]	[2.29e-06]
trade	-0.00102**	-0.000998**	-0.000943*	-0.00106*	-0.000933**	-0.00112***	-0.000884	-0.000983**
	[0.000454]	[0.000459]	[0.000498]	[0.000607]	[0.000444]	[0.000389]	[0.000574]	[0.000415]
crisis	-0.0353**	-0.0336		-0.107*		-0.00883		
	[0.0153]	[0.0219]		[0.0635]		[0.0537]		
FCF/GDP	-0.000594	-0.000560		-0.00233*		-0.00134		
	[0.000639]	[0.000505]		[0.00116]		[0.000988]		
labor productivity		-2.78e-06						
		[1.13e-05]						
interest rate		0.000296						
		[0.000478]						
Observations	197	144	251	203	243	261	316	245
Number of countries	34	27	37	36	35	35	39	35
R-squared	0.406	0.551	0.221	0.289	0.235	0.459	0.342	0.275
Estimation	FD	FD	FD	FD	FD	IV	IV	FD
test statistic	8.52***	7.45**	5.14**	8.24***	6.30**	7.59 (AR)	7.62 (AR)	N/A

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1
Differences and lag structures not indicated in explanatory variables. IV instruments for both types of foreign investment.

Table 5: Robustness checks

Columns 3 and 7 of table 5 use the alternative labor share measure calculated by Trapp (2015) as the dependent variable in our baseline first-difference and IV model, respectively. Even with this alternative labor share measure, which differs considerably from the PWT measure (as demonstrated in the correlation matrix of appendix table 7), our qualitative results remain unaffected. If anything, the (absolute) magnitude of the effects increase (especially in the first-difference model). Column 4 further adds the crisis dummy and GFCF to the first-difference model using the alternative labor share measure by Trapp (2015), with results still remaining robust.

5.3 Additional results: marginal elasticity of substitution

We further experimented with different interaction terms. Column 8 of table 5 shows the results of the first-difference model when our two key foreign investment variables are interacted with the capital-to-labor ratio. Note that we principally estimate the model in first differences to control for unobserved heterogeneity, but interact the (first-differenced) foreign investment stocks with the *level* of the K/L ratio to obtain marginal effects of foreign investment on the labor share conditional on differences in the K/L ratio *across* (and not within) countries.

This provides an interesting result as the interaction has a different prefix for FDI as opposed to FPI, meaning that an increasing K/L ratio shrinks the effect of foreign investment towards 0, and eventually leads to a change in the prefix (though the latter is not significant).[31] Without over-emphasizing the robustness of these results, they have a relevant economic implication that could be explored further in future research: As we argued, 'classical' foreign capital in the form of FPI might possess some bargaining power, in tendency increasing the elasticity of substitution. However, this effect will be the more important, the more capital-scarce a country is, e.g. the lower the K/L ratio, consistent with our results. Conversely, our argument for the lower substitution elasticity of FDI essentially results from a capital market

[31] For both effects, the threshold is slightly above a K/L ratio of 60,000, which is only the case for 5 countries in the sample. Also, the (interactive) effect does not turn significant at such high levels of the K/L ratio within the sample range. Plots of the marginal conditional effects are available upon request.

friction: Foreign direct investors (in developing countries) cannot easily withdraw their establishment. This constraint will become less binding, however, as capital markets deepen. The latter makes it easier to sell FDI assets to local investors and allow multinationals to become increasingly 'footlose'.

Consistent with this result, we also find squared terms of FDI and FPI to be negative (and significant) and positive (but insignificant), respectively. The former is at odds with the findings of Maarek and Decreuse (2015), who find a negative FDI effect but a positive squared term, with the labor share only covering the manufacturing sector. Quantitatively, the effect of our squared FDI term is negligible: it only leads to a negative effect on developing countries' labor share if the first-differenced FDI stock reaches more than 40 % of GDP, which is only true for one observation in the sample. Interacting the FDI stock with the FPI stock leads to a positive (and significant) interaction term. Most importantly, in all those specifications, our main conclusions about the opposing effect of FDI and FPI on developing countries' labor share hold (for the main part of the sample). Furthermore, trade and the K/L ratio remain negative and significant (at the 1% level) in all of those specifications.

6 Discussion and Conclusion

Our analysis has shown that de facto financial globalization in the form of foreign direct and portfolio investment cannot account for the decline in the labor share that has been observed in developing countries over the last two decades. This does not mean that foreign capital does not matter for the labor share in those countries. Rather, FDI and FPI have relevant but opposing effects in line with our key argument that only portfolio investors are globally flexible enough to exercise a relevant bargaining power, while FDI is more bound to the host market than often assumed and tends to pay a wage premium to attract well-educated and reliable employees to protect multinational firms' proprietary asset.

In practice, since FDI is much more important than FPI, the effect of those two aspects of financial de facto globalization on developing countries' labor share is positive. Quantitatively, the FDI stock (relative to GDP) in the sample developing countries increased from 16 to about 35 % over the

last two decades, while FPI only rose from about 4.2 to 5.5 % of GDP. Meanwhile, the log of the labor share fell from 3.77 to 3.72. This implies that FPI can explain very little of the labor share decline (about 5 % of the overall decline) while the actually observed increase of FDI countered the labor share decline by about three quarters.[32] By and large, the effects of FDI are thus not only statistically significant but also economically very relevant, while the potential negative effects of FPI (if any) are relatively modest.

Our results contribute to a wider debate concerning the macroeconomic determinants and implications of the labor share (e.g. Karabarbounis and Neiman, 2013) and the role and effects of financial globalization in developing countries (e.g. Prasad et al., 2003; Kose et al., 2009a; Jeanne et al., 2012). They do not preclude the possibility that financial liberalization policies have a relevant detrimental effect on the labor share, as de-jure financial openness also gives foreign direct inverstors that have not yet realized their project an outside option that increases their bargaining power and could hence lead to a 'race to the bottom' in wages. On the other hand, evidence by Görg et al. (2009) for OECD countries indicates that multinationals might favor redistributive welfare states for stability considerations, creating an argument against unbounded wage competition. While it is too demanding to explicitly model all those effects econometrically, theoretical work by Arseneau and Leduc (2011) suggests that the effect of such outside options is potentially large. Moreover, our results about the functional income distribution between capital and labor do not preclude the possibility that financial defacto globalization has contributed importantly to the increase in inequality between households (that is, within labor) in developing countries.

It is also worth mentioning that our estimations show a robust negative labor-share effect of the capital-to-labor ratio, at odds with conventional neoclassical theory, and of trade. While being beyond the scope of this paper, we think a more detailed analysis of the latter effect using more disaggregated data that has become available recently is a promising and relevant area for future research, especially since the effect is potentially large in economic magnitue.[33] Similarly, the fact that different forms of FDI potentially lead

[32] We assume parameters of -0.002 (FPI) and 0.002 (FDI). The contributions are then calculated as $(\Delta FI \times \beta)/-0.05$, where ΔFI is the change in foreign investment, β is the respective parameter, and -0.05 is the change in the log of the labor share.

[33] Assuming a parameter of -0.0015, as suggested by several of our results, a 12 percentage

to different modes of world market integration with differing socio-economic effects (see e.g. Wacker et al., 2016) calls for a more disaggregated analysis of the potentially heterogeneous FDI effects. Finally, it seems important to gauge to what extent different forms of financial de-jure liberalization can account for the observed decline of the labor share in developing countries.

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point increase in the trade/GDP ratio, as roughly observed in our sample between the pre-2000 and post-2000 period, is associated with a decline of the labor share of 1.8 percent.

A Appendix

Variable	Mean	(Std. Dev.)	N	Source
$\ln(LS_{PWT})$	3.883	(0.197)	309	PWT 8.0
$\ln(LS_{Trapp})$	3.756	(0.241)	307	own calculation
FDI stock/GDP	26.376	(22.488)	309	IFS, UN SNA
Portfolio stock/GDP	6.4	(9.351)	309	IFS, UN SNA
ln(GDP p.c.)	8.129	(0.783)	309	PWT 7.0
ln(inflation) (-1)	1.948	(1.371)	309	WDI
risk	66.52	(6.076)	309	ICRG
ln(government share)	2.035	(0.425)	309	PWT 7.0
Education Index	0.526	(0.165)	309	UNDP
K/L	30,504	(28,043)	309	own calculation
trade	77.471	(34.781)	309	PWT 7.0
crisis	0.03	(0.172)	263	own calculation
GFCF/GDP	21.226	(7.411)	309	WEO, UN SNA

Table 6: Summary statistics

Countries included (in baseline estimation of table 1), incl. no. of observations: Armenia (11), Azerbaijan (8), Belarus (9), Bolivia (13), Brazil (3), Bulgaria (8), Burkina Faso (6), China (5), Colombia (17), Cote d'Ivoire (7), Dominican Republic (4), Egypt (6), Guatemala (5), Honduras (6), India (14), Jamaica (2), Jordan (10), Kazakhstan (8), Latvia (3), Lithuania (2), Moldova (12), Morocco (8), Mozambique (6), Namibia (3), Niger (11), Nigeria (5), Panama (3), Paraguay (15), Peru (18), Philippines (1), Poland (2), Russian Federation (9), Senegal (12), Tanzania (16), Thailand (15), Tunisia (15), Ukraine (9), Venezuela (2).

	$\ln(LS_{PWT})$	$\ln(LS_{Trapp})$	FDI	FPI	ln(GDP)	inflation	risk	ln(G/GDP)	Educ	K/L	trade
$\ln(LS_{PWT})$	1										
$\ln(LS_{Trapp})$	0.462	1									
FDI stock/GDP	-0.149	0.0558	1								
Portfolio stock/GDP	-0.198	-0.198	0.193	1							
ln(GDP p.c.)	-0.141	-0.0273	0.222	0.369	1						
ln(inflation) (-1)	0.159	0.119	-0.309	-0.0768	0.140	1					
risk	-0.221	-0.0854	0.373	0.273	0.446	-0.356	1				
ln(government share)	0.241	0.0764	-0.151	0.0379	-0.121	0.0216	-0.0861	1			
Education Index	0.0523	0.0724	0.403	0.330	0.805	0.191	0.303	-0.149	1		
K/L	0.0520	-0.000133	0.178	0.417	0.595	0.141	0.314	-0.0326	0.524	1	
trade	0.0609	0.168	0.431	0.244	0.311	-0.116	0.293	-0.0117	0.430	0.349	1
N	309										

Table 7: Variable correlation matrix

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B Online Appendix

B.1 First-stage results

Table 8 provides the first-stage results of our model, that is the equation explaining foreign investment by financial conditions in the financial centers and the distance therefrom. It should be noted that the model includes country and year fixed effects. The negative coefficient on the US FCI is hence not worrisome and should not be interpreted because it is only identified because of some year fixed effects dropping out. The measure of relevance is the (mostly positive) interaction of the respective FCIs with distance. This suggests that in times where it is easy for investors to attain access to finance, they are more likely to invest in more distant countries than otherwise. This is consistent with theory and can be compared to investors moving towards the long end of the yield curve (with more risky assets) if financial conditions are easy (and hence risk-taking increases).

	(1)	(2)
VARIABLES	FDI/GDP	FPI/GDP
US FCI	-33.843**	-5.9290
	(14.428)	(5.2580)
US FCI x Dist(USA)	0.00020	0.00022**
	(0.00015)	(0.00009)
Euro FCI x Dist(BEL)	-0.00057	0.00059***
	(0.00057)	(0.00021)
Japan FCI x Dist(JPN)	0.00021	-0.00016
	(0.00054)	(0.00030)
included instruments: ln(GDP) ln(inflation)(-1), ICRG risk, ln(govt share), educ index, K/L, trade		
observations (clusters)	308 (37)	308 (37)
F-stat: overall / excluded IV	6.38 / 1.66	5.44 / 5.11
Kleibergen-Papp underidentification	p-value: 0.1226	
Hansen J overidentification	p-value: 0.4570	

Table 8: First-stage results

The Hansen J statistic does not allow to reject the null hypothesis of

joint validity of instruments and overidentifying restrictions (suggesting that the set of instruments are coherent in the sense that they identify the same vector of parameters). Identification, however, is weak, as suggested by the Kleibergen-Papp statistic, meaning that the excluded FCI × distance instruments are correlated with the potentially endogenous foreign investment regressors, but only weakly. We hence control for this weak identification in the inference of our main model by using the CLR and AR tests.

B.2 Residual diagnostics

Figure 5: Diagnostic checks (first difference model)