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Distributional Effects of FDI: How the Interaction of FDI and Economic Policy Affects Poor Households in Bolivia

by

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Abstract

This paper provides a computable general equilibrium analysis of the medium to long-run impact of FDI inflows on poverty and income distribution in Bolivia. The simulation results suggest that FDI inflows enhance economic growth and reduce poverty. However, the income distribution typically becomes more unequal. In particular, FDI widens income disparities between urban and rural areas. The Bolivian government may promote growth-enhancing and poverty-alleviating effects of FDI by overcoming labour market segmentation and providing complementary public investment in infrastructure. Yet, simulated policy reforms or alternative productivity scenarios are hardly effective in reducing the divide between urban and rural areas.

I.   Introduction

Critics of globalization, including representatives of trade unions in industrial countries, often blame multinational corporations for paying sub-standard wages to workers in developing host countries and forcing them to work under "sweatshop conditions". This seems to imply that foreign direct investment (FDI) in developing countries is adding to, rather than reducing poverty. By contrast, many economists argue that FDI improves the welfare of workers in developing countries by increasing the demand for labour and by paying higher wages than prevail locally (e.g., Graham 2000). Heads of State and Government have endorsed the optimistic view at the UN Conference on Financing for Development in Monterrey, Mexico, in 2002: According to the Monterrey Consensus, FDI "is especially important for its potential to … ultimately eradicate poverty through economic growth and development."

High expectations attached to FDI in developing countries may be questioned for two reasons (Nunnenkamp 2004). First, the empirical literature on the economic growth effects of FDI is far from conclusive. Several studies suggest that host countries must have reached a certain stage of economic and institutional development before they can benefit from FDI.[1] Second, the poverty-alleviating effects of FDI may be limited because FDI benefits more skilled workers in the formal sector, but may worsen the relative income position of the poor. We address the latter proposition in this paper by performing a computable general equilibrium (CGE) analysis for the case of Bolivia.

Bolivia represents a most interesting case to assess the distributional effects of FDI inflows. On the one hand, economic stabilization and structural reforms, initiated in the late 1980s and early 1990s, resulted in steeply increasing FDI stocks in Bolivia. On the other hand, the poverty situation as well as income equality has taken a turn to the worse in recent years. Even though the erosion of previous improvements may be due, at least partly, to external shocks (Klasen et al. 2004), the coincidence of booming FDI and deteriorating poverty and inequality indicators is striking and calls for a careful analysis of causal links.

We address this issue by performing an incidence analysis of FDI inflows in Bolivia. We apply a modified version of the General Equilibrium Model for Poverty Impact Analysis,

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[1]   According to Lipsey (2003: 297), it is "safe to conclude that there is no universal relationship between the ratio of inward FDI flows to GDP and the rate of growth of a country."

GEM-PIA (Wiebelt 2004). The base scenario with constant FDI inflows is compared with alternative scenarios, which have in common that FDI inflows are assumed to increase by 10 percent per annum over a period of 10 years. Poverty and distributional effects of FDI are considered in terms of per-capita incomes of several segments of the workforce as well as national and regional Gini coefficients, poverty headcounts and poverty gaps.

The structure of the paper is as follows. Section II offers some stylized facts on FDI inflows in Bolivia as well as post-reform trends in poverty and income distribution. Section III reviews the relevant literature with regard to the distributional effects of FDI in developing host countries. In Section IV, we shortly describe major features of the CGE model, focusing on transmission channels through which FDI affects the Bolivian economy. Section V presents the simulation results. Section VI summarizes and outlines future research options.

II.   Stylized Facts for Bolivia

FDI had played a minor role in Bolivia until the country started to implement the *Nueva Politica Economica* in the late 1980s, thereby replacing the previous state-led import substitution regime. Inward FDI stocks surpassed one billion US$ only in 1990 (UNCTAD online data). Related to population, Bolivia hosted FDI stocks of just slightly above US$ 100 at the end of the 1980s, compared with about US$ 380 in neighbouring Chile and US$ 240 in all developing economies of Latin America.

The growth of FDI stocks continued to be moderate in the first half of the 1990s, i.e., shortly after Bolivia had embarked on major structural reforms, including capital market deregulation and liberalization of the FDI regime.[2] However, FDI stocks boomed in the aftermath of second generation reforms, notably the restructuring and so-called capitalization of state-owned enterprises. The notion of capitalization means that major stakes (50 percent) of state-owned enterprises were sold by international tender to strategic investors. The scheme required the successful bidder to fund a pre-specified investment program. In other words, the proceeds from privatization remained in the acquired company. According to Flexner (2000), FDI inflows resulting from the capitalization scheme accounted for 43 percent of total inflows in 1995–1998.

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[2] According to Lora (2001) and Rodrik (2003), Bolivia stands out as having undertaken deeper structural reforms in line with the so-called Washington Consensus than most developing countries.

Privatization-related FDI had two major implications. First, the contribution of FDI inflows to gross fixed capital formation soared from about 10 percent in 1987–1989 to 55 percent in 2000–2002 (UNCTAD online data). The ratio of inward FDI stocks to Bolivia's GDP increased tenfold since the early 1980s to 87 percent in 2003. Second, the sectoral composition of FDI changed significantly (Table 1). While the manufacturing sector accounted for most of the (still small) FDI inflows in 1990–1992, FDI inflows were heavily concentrated in hydrocarbons ("petroleum" in UNCTAD's classification) and the services sector in 2000-2002. This is because major sales under the capitalization scheme involved companies operating in these two sectors (Flexner 2000: Table 3).

The effects of booming FDI on poverty and income inequality in Bolivia are open to question. National poverty data were lacking in Bolivia until recently. However, Klasen et al. (2004) have created a new time series of data for the period 1989–2002, by combining information from income and expenditure surveys available for urban households as well as nationally representative demographic and health surveys. Major findings are summarized in Table 2. [3] The results of these authors point to a break in poverty and inequality trends in the late 1990s. For example, income inequality declined in 1994–1999, but the Gini coefficient almost returned to its pre-reform level in 2002. As concerns absolute poverty, Klasen et al. (2004) corroborate findings from earlier studies, according to which poverty in capital cities declined in the aftermath of the reform program of 1989, but took an upturn again in the late 1990s.

Previous studies have stressed the role of external shocks such as terms-of-trade losses, *El Nino* and declining *overall* capital inflows as factors explaining the recent deterioration of poverty indicators and income inequality in Bolivia (e.g., Lay et al. 2007). Yet, it is striking that previous achievements in alleviating poverty and reducing income inequality were eroded shortly after FDI inflows had gathered momentum. In contrast to other types of capital inflows, FDI inflows continued to be high until 2002. Additional reason to evaluate the possible contribution of FDI to rising income inequality in Bolivia comes from studies performed for other developing countries. The review in the subsequent section suggests that FDI may have adverse effects on the relative income position of the poor.

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[3] For a detailed account of poverty and inequality trends in the post-reform period and for the methods applied to generate time-series data, see Klasen et al. (2004).

III. Previous Studies on Distributional Effects of FDI

There is no direct link between FDI and poverty reduction, but FDI may indirectly benefit the poor by creating better employment and earnings opportunities to unskilled workers in developing host countries (Overseas Development Institute 2002). Traditional trade theory predicts that FDI draws on unskilled labour in developing countries. Hence, FDI would provide a means to specialize according to comparative advantages. In unskilled labour abundant host countries, it would raise the relative demand for unskilled labour and, thus, reduce wage inequality between skilled and unskilled labour (Rama 2003: 7). However, Easterly (2004) shows that theoretical predictions turn ambiguous once it is taken into account that trade and factor flows may be driven by productivity differences between countries. Likewise, Brown et al. (2003) argue that available theories on how FDI might affect income and wages in the host countries yield ambiguous predictions. Empirical testing is required because there are many, and possibly opposing effects (Te Velde 2003: 16).

The empirical literature has approached the question of whether FDI reduces or increases inequality within host countries in different ways.[4] A first strand performs cross-section analyses. According to Rama (2003), FDI does not have a significant impact on wage inequality across occupations. The fixed effect regressions presented by Easterly (2004) reveal that FDI increases inequality in the rich countries, whereas the impact on inequality in the poor countries is not significantly different from zero. By contrast, Bussmann et al. (2002) claim that income inequality in both developing and developed countries is unaffected by the presence of foreign direct investors. The cross-section analyses of Tsai (1995) and Sylvester (2005) are restricted to developing host countries. Both authors include regional dummies. Tsai (1995: 479), whose analysis is restricted to the 1970s, concludes that the positive correlation between FDI and inequality obtained in earlier studies "is more likely to reflect the geographical difference in inequality than the perverse impact of FDI."[5] Sylvester reports similar findings for the period 1970-1989. In contrast to these studies, Basu and Guariglia (2006) find that FDI exacerbated income inequality in developing host countries. Opposing results may be due to sample selection: While the samples of Tsai and Sylvester comprise 33

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[4] For a more detailed discussion of empirical studies, see the working paper version of this article (http://www.ifw-kiel.de/pub/kap/2006/kap1281.htm).

[5] However, the results of Tsai do provide evidence for a positive correlation between FDI and inequality in East and Southeast Asian host countries during the 1970s.

and 29 developing countries, respectively, Basu and Guariglia cover 119 developing countries over the period 1970–1999.[6]

Country-specific studies represent another strand of the literature on the distributional effects of FDI. As concerns developing host countries, almost all of the available evidence shows that FDI is associated with higher wages for all types of workers.[7] At the same time, skilled workers tend to benefit more from FDI than less skilled workers (Overseas Development Institute 2002). This refers to various developing countries in different regions. For example, FDI contributed to rising wage inequality in five Sub-Saharan African countries (Te Velde and Morrissey 2001) and in Thailand (Te Velde and Morrissey 2002).[8] According to Matsuoka (2001), segmented labour markets had the effect that the wage premium paid by foreign-owned firms in Thai manufacturing was higher for (more skilled) non-production workers than for (less skilled) production workers. Likewise, Zhao (2001) argues for the case of China that high costs of labour mobility and segmented labour markets have increased the skill premium so-called foreign-invested enterprises are prepared to pay. Using establishment data for the manufacturing sector in Indonesia, Lipsey and Sjöholm (2004a) show that wages in foreign-owned plants were about 12 and 20 percent higher than in private domestic plants for blue-collar workers and white-collar workers, respectively. In another paper on Indonesia, Lipsey and Sjöholm (2004b) find that white-collar workers gained more from FDI-induced wage spillovers than blue-collar workers.

In Latin America, Mexico received particular attention in the literature on the distributional effects of FDI. Feenstra and Hanson (1997) link rising wage inequality to FDI inflows. FDI growth induced a shift of relative labour demand towards skilled workers. Aitken et al. (1996) report a significantly positive effect of foreign ownership on average industry wages in Mexico and Venezuela; the effect was stronger for skilled workers than for unskilled workers. The more recent study of Te Velde (2003) covers Bolivia, Chile, Colombia, and Costa Rica and includes the stock of FDI, relative to GDP, as a determinant of skill-specific wages. Most strikingly, it turns out that wage inequality in Bolivia increased in 1987–1997 because

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[6] Another reason may be that Basu and Guariglia take unobserved country-specific heterogeneity into account by applying a fixed effects specification of the estimation equation.

[7] The evidence for developed countries, not considered here, is summarized in Lipsey (2002).

[8] The effects of FDI on wage inequality turned out to be less clear or insignificant in four other East Asian host countries (Hong Kong, Korea, the Philippines, and Singapore).

negative wage effects of FDI were more pronounced for less-skilled workers than for skilled workers. This is in sharp contrast with the positive wage effects typically found for other developing host countries. Te Velde's finding is also difficult to reconcile with Flexner (2000), according to whom FDI inflows had a significantly positive impact on per-capita income growth in Bolivia in the period 1990–1998. However, both studies have in common that they cover just the beginning of the recent FDI boom in Bolivia. They may thus fail to capture fully the effects of structural reforms.

The distributional effects of Bolivia's structural reforms are discussed analytically in Spatz and Steiner (2002) as well as Spatz (2006). These authors present a rent-based dual-economy model and assess the impact of structural reform measures on model parameters. It is argued that skilled workers as well as unskilled workers previously employed in the informal sector should have benefited from structural reforms in Bolivia, by improving their income position relative to unskilled workers in the formal sector. Overall wage inequality rises if the effect on the relative wage of skilled workers dominates. Even though Spatz and Steiner (2002) as well as Spatz (2006) regard FDI liberalization and privatization as important reform measures, their analysis provides only limited insights for the purpose of the present paper. The analysis is confined to *wage* inequality in *urban* Bolivia. FDI and trade liberalization are considered jointly, whereas privatization is discussed as a separate reform measure. As shown in Section II, however, booming FDI in Bolivia was largely because of privatization-related FDI so that the distributional effects of FDI may well differ from those of trade liberalization. Finally, as the authors admit, the effects on wage equality are theoretically ambiguous for both related and the liberalization of trade and FDI.

In summary, important gaps remain when it comes to the distributional effects of FDI in developing countries in general, and Bolivia in particular. It may be for different reasons that FDI does not appear to have had the inequality-reducing effects that conventional trade theory predicts for developing host countries. Rather than locating in unskilled labour intensive industries, in which developing countries may have comparative advantages, FDI is often concentrated in skill intensive industries.[9] Moreover, foreign companies may apply more skill intensive technologies than domestic companies in the same industry, and they may induce

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[9] See Te Velde and Morrissey (2002) for the case of East Asian host countries; see also Braunstein (2006: 10).

skill-biased technological change.[10] FDI may increase inequality even if it does not lead to skill-biased technological change, namely when it locates in host countries characterized by labour market segmentation and impediments to labour mobility (Matsuoka 2001; Zhao 2001). As we argue below, this is highly relevant for the case of Bolivia. Country-specific labour market conditions may also account for the fact that there is no consistent relationship between FDI and wage inequality, even when the same test format is applied for several countries in the same region (as in Te Velde and Morrissey 2002, and Te Velde 2003).

Furthermore, most of the studies mentioned above are restricted to wage inequality, as reflected in relative wages of production and non-production workers, in the manufacturing sector. This implies various limitations:

- Wage earners may be regarded as a "privileged elite in most developing countries, where farmers and the self-employed account for most of the labour force" (Rama 2003: 1). In the case of Bolivia, wage earners (agricultural workers, non-agricultural workers and employees) accounted for just 28 percent of the total workforce in 1999 (Table 4). Hence, higher wage inequality does not necessarily imply that national income inequality increases (Overseas Development Institute 2002). Non-wage income may have an important say on the overall distribution of income.

- The crude distinction between production and non-production workers, enforced by data constraints, fails to capture finer divisions according to skills and education.[11] It also ignores that FDI may have different effects on earnings in rural and urban areas. Rural labour markets play an important role in Bolivia. Taken together, rural smallholders and agricultural workers represented more than 40 percent of the workforce (Table 4).

- The typical focus on the manufacturing sector neglects that services play an increasingly important role, in terms of production and exports (Braunstein 2006) and in terms of FDI inflows (UNCTAD 2004); formal and informal services, as given in Table 3, absorbed about 40 percent of the workforce in Bolivia. At the same time, FDI may affect the

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[10] For instance, Tan (2000) finds that foreign companies applied new information and communication technologies more intensively than local firms in the manufacturing sector of Malaysia.

[11] As noted by Lipsey and Sjöholm (2005: 25), "in almost all the wage studies….the only measure of skill is a division between production and non-production workers or blue-collar and white-collar workers."

distribution of income through its impact on the workforce in the informal sector (Carr and Chen 2002); in Bolivia, the informal sector represented almost 50 percent of the urban workforce. This implies that, despite higher wage inequality in manufacturing, FDI may help alleviate poverty by offering formal employment opportunities to unskilled workers.

- Finally, FDI may have important indirect effects on the distribution of income, e.g., through its impact on fiscal revenues and expenditures (Te Velde 2003: 16).

Consequently, it may be premature to conclude that the "evidence shows that, at a minimum, FDI is likely to perpetuate inequalities" (Te Velde 2003: 4). This applies especially to Bolivia where non-wage income seems to have an important say on overall inequality. As noted in Section II, income inequality and poverty declined until the late 1990s, while wage inequality in Bolivia "increased during most of the 1990s" (Te Velde 2003: 9). Hence, the fact that we consider various income items, formal and informal sectors, and urban and rural areas in the subsequent analysis is supposed to offer a major improvement over the existing literature.

IV. FDI-related Transmission Mechanisms in a Simulation Model for Bolivia

To capture the links between FDI inflows and income distribution and poverty, we use a modified version of the General Equilibrium Model for Poverty Impact Analysis in Bolivia (Wiebelt 2004).[12] This model allows us to simulate the impact of a positive FDI shock on the Bolivian economy. Using a single-country model has the advantage that it allows for a detailed account of important structural and institutional characteristics of the Bolivian economy, including the segmentation of labour and capital markets, which should have a major say on the distributional effects of FDI. All simulations reported below have in common that FDI flows are assumed to increase by 10 percent annually over ten years.

Given the structure of the Bolivian economy, the increase in FDI is supposed to add to domestic fixed capital formation in the formal sector only, whereas we realistically assume that the informal sector does not attract FDI so that poor informal workers do not benefit directly from FDI (see below for indirect effects). This assumption also implies that the direct effects of FDI are concentrated in urban areas since informal activities dominate in rural areas.

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[12] Major features of this model are summarized in the Box below.

As concerns the allocation of FDI within the formal sector, we assume that it is driven by relative returns to capital. This essentially means that foreign investors behave like local investors, e.g., in that they take advantage of lower production costs, rather than primarily targeting specific sectors such as gas extraction or privatized services. Consequently, our model clearly fails to replicate the actual distribution of FDI within Bolivia's formal sector, which was outlined in Section II above. Arguably, econometric approaches estimating a single FDI equation are superior to CGE analyses in this respect as they capture the sectoral distribution of FDI in the past at least implicitly.[13] Yet, the assumed allocation mechanism seems appropriate for assessing the growth and distributional effects of FDI. By allowing for capital mobility across formal sectors and considering foreign and local capital to be equally productive in most of our simulations, we avoid adding structural features to the model which would almost automatically result in positive FDI effects on growth from which the poor could hardly benefit.[14]

The aforementioned qualification notwithstanding, the subsequent CGE analysis has some clear advantages over reduced form models. Most importantly, we model structural features of the Bolivian economy which both multi-country and econometric approaches fail to capture. These structural features are particularly relevant to assess the indirect effects of FDI. The CGE model explicitly considers informal activities, i.e., traditional agriculture and urban informal services, where most of Bolivia's poor earn their living (Table 3). The strong differentiation in production allows us to capture the impact FDI inflows may have on the employment and earnings opportunities of different households. Finally, we account for segmented labour and capital markets, credit-constrained informal producers, and absorptive capacity constraints, all of which may compromise FDI effects on growth, income distribution and poverty reduction. Major transmission mechanisms related to FDI are summarized in the following.[15]

Most obviously, FDI is a source of additional investment. As mentioned before, FDI adds to domestic fixed capital formation in the formal sector which, *ceteris paribus*, feeds into higher

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[13] It should be noted, however, that the considerable shifts in the sectoral distribution of FDI in recent years (Section II) involve major problems for econometric tests, too.

[14] Arguably, positive growth effects and negative distributional effects of FDI would be built into the model if capital was assumed to be sector-specific and FDI was assumed to be more productive than local capital.

[15] For a full description of the model and transmission mechanisms, see Wiebelt (2004); a non-technical summary is included in the working paper version of this article (http://www.ifw-kiel.de/pub/kap/2006/kap1281.htm)

economic growth. By applying a dynamic CGE model, we assure that FDI affects the capital stock not only directly but also indirectly through its impact on income and savings (Baldwin 1989). However, this channel does not necessarily imply positive effects of FDI on *overall* private investment (which includes investment by producers in the informal sector), growth and poverty alleviation. Adverse effects on domestic private investment may result from (i) absorptive capacity constraints of the Bolivian economy due to insufficient public investment in (complementary) infrastructure and (ii) FDI-induced price increases for investment goods. The former effect limits growth and earnings possibilities in all sectors. Strongly increasing FDI over time (as experienced in Bolivia) involves the risk of decreasing returns to capital if public infrastructure is lagging behind, thereby causing higher production costs. The latter effect primarily hurts investors in the informal sector who do not attract FDI, while being negatively affected by higher prices for investment goods. Investment by smallholders and urban informals is also constrained by their limited access to credits from commercial banks. Hence, there is the possibility of crowding out in the informal sector which may not only result in lower overall private investment, but may also compromise the effects of FDI on growth, income distribution and poverty alleviation.

On the other hand, the FDI-induced demand for investment goods benefits suppliers of capital goods and construction services, which represent the most important investment goods. Local production of capital goods is extremely limited in Bolivia and imported capital goods can hardly be substituted by local goods. Hence, FDI leads to higher imports, rather than stimulating local production of capital goods. By contrast, FDI may have important effects on poverty and income distribution through higher demand for construction services that are non-tradable. FDI-induced demand pressure raises local prices for construction. This benefits urban unskilled workers who are intensively employed in construction. It also benefits urban informals who invest in this sector. Moreover, sectors with strong forward linkages to construction tend to benefit, while those with strong backward linkages tend to suffer. Positive production stimuli are strongest for intermediate goods demanded by construction firms, thereby raising the incomes of urban unskilled and skilled workers employed in the production of intermediate goods.

Taken together, the direct and indirect effects of FDI-induced demand for investment goods work in favour of urban households, both workers and owners of unincorporated capital, whereas rural households tend to be affected negatively. Rural households suffer from missing linkages to the urban sector, while their real investment is eroded by higher domestic prices for investment goods.

In addition to its effects on private investment in Bolivia, FDI inflows have indirect effects on public investment which, in turn, may have growth and poverty implications. The government invests in infrastructure by drawing on public savings. FDI may help improve public infrastructure by relaxing the budget constraint of the government. Given that government consumption and public transfers are determined exogenously in the model and that government borrowing is assumed to be constant, tax revenues are the binding constraint for public infrastructure. Consequently, public infrastructure improves to the extent that FDI leads to additional tax revenues. In this way, FDI may provide an indirect growth stimulus as public infrastructure enters the production function together with labour and private capital. This complementarity applies to both formal and informal sectors so that FDI effects working through public investment do not have obviously adverse distributional consequences, but may rather help alleviate poverty. However, higher FDI inflows do not necessarily result in additional tax revenues. Tax revenues may even fall if FDI inflows, by raising the supply of capital, strongly depress the returns to capital. In this case, deficient infrastructure limits the absorptive capacity of the economy, with negative consequences for growth and poverty alleviation.

Further indirect effects on growth, poverty and income distribution result from FDI-induced changes in the real exchange rate. Higher FDI inflows cause a real appreciation by raising the prices of non-tradables and weakly substitutable domestically produced goods, while the prices of tradables are determined at the world market, thereby changing the domestic terms of trade. Beneficiaries (losers) of the real appreciation are those households that earn their living in non-tradable (tradable) sectors while consuming tradable (non-tradable) goods. Given the sectoral trade orientation in Bolivia and the consumption patterns of different households, households engaged in agriculture (i.e., smallholders and rural workers) are likely to be hurt by the real appreciation. Urban households, in general, tend to benefit, but the final impact on the real income position of specific groups of urban households (skilled and unskilled workers, informals, and employers) depends on whether increases in factor remuneration are large enough to overcompensate rising consumer prices.

Finally, at given growth rates of labour supply (for rural workers, skilled and unskilled urban workers, and urban informals), additional FDI flows change the factor endowment of the Bolivian economy. The increase in the wage-rental rate has a differential impact across sectors, depending on the degree of labour market rigidities as well as differences in relative factor intensities and factor substitution possibilities. Wage increases are more pronounced in urban areas, due to FDI-induced changes in the structure of the Bolivian economy. The

expanding manufacturing and services sectors use urban unskilled workers and informals intensively so that the remuneration of these household groups raises the most.

Box: Major Characteristics of the CGE Model

GEM-PIA: single-country, recursive-dynamic, real-financial, applied **G**eneral **E**quilibrium **M**odel for **P**overty **I**mpact **A**nalysis.

Production sectors: *2 informal sectors* (traditional agriculture, informal services), *9 formal sectors* (modern agriculture, oil and gas, mining, consumer goods, intermediate goods, capital goods, utilities, construction, formal services), and *public services*.

Production factors: *4 labour categories* (smallholders, rural unskilled labour, urban unskilled labour, skilled labour), largely segmented labour markets with limited mobility over time; *3 capital categories* (unincorporated capital, corporate capital, public infrastructure capital); corporate (unincorporated) capital is invested exclusively in formal (informal) production sectors; public infrastructure capital is a non-rival factor, provided costless to all production sectors and has a crowding-in effect.

Economic agents: *6 types of households* (smallholders, rural workers, urban workers, employees, informals, employers), 4 of which are poor (smallholders, rural workers, urban workers, informals), and 3 of which own unincorporated capital (smallholders, informals, employers); smallholders invest exclusively in traditional agriculture; informals invest in informal services, construction and consumer goods; employers invest in all formal sectors except utilities; *corporate enterprises* own corporate capital and invest in all formal sectors; the *government* invests in infrastructure; the *central bank* fulfils its customary functions as lender of last resort to the financial system; *commercial banks* supply loans on the basis of available resources, which are determined by deposits plus advances from the central bank; the "*rest of the world*" imports and exports goods from and to Bolivia, undertakes direct and portfolio investment in the country, and provides development aid and loans to the government, commercial banks and the central bank.

Solving the model: sequence of static equilibria connected through endogenous capital accumulation and migration; dynamics based on exogenous growth rates for labour, government expenditure and FDI inflows; simulation results linked to household survey information to yield detailed distributional and poverty results.

In summary, the impact of a positive FDI shock on growth, income distribution and poverty is transmitted through various channels captured in the CGE model applied in this paper. We run several simulations on the basis of this model. The first scenario ("FDI") is meant to reveal the effects on growth, income distribution and poverty resulting exclusively from higher FDI inflows. This scenario does not consider any (complementary) reform measure by the Bolivian government. The assumed increase in FDI by 10 percent annually over a period of ten years is equivalent to about 5 percent of baseline GDP and, thus, roughly equivalent to the increase in FDI that Bolivia actually experienced in the 1990s.

In additional simulations, we maintain the assumption concerning the increase in FDI and evaluate how the basic results of scenario "FDI" are affected once higher FDI inflows are considered in combination with potential reform measures, or once specific model assumptions are changed. In particular, we are interested to assess whether complementary policy reforms or FDI-related productivity dynamics counteract the adverse effects that FDI may have on income distribution in Bolivia.

We consider two complementary policy reforms:

- Scenario "FDI+tax" encompasses a tax reform which equalizes the tax rates on private income and on profits of enterprises. We model a government-revenue neutral change in direct tax rates. Given the prevailing structure of direct taxation in Bolivia, this implies lower corporate taxes and higher personal income taxes for those households earning income in the formal sector.

- Scenario "FDI+lab" combines additional FDI flows with a labour market reform enabling urban informals to enter the formal labour market for unskilled labour. This policy change is modelled by raising the migration elasticity parameter, which determines the migration response to a gap between the average income of informals and the wages of unskilled workers.

As concerns FDI-related productivity dynamics, the relevant literature has remained ambiguous. While FDI inflows are often considered an important means to benefit from technology transfers, it is open to debate to which extent and under which circumstances technology spills over to local firms and, thus, boosts the productivity of firms in the host country.[16] Given this uncertainty, we consider foreign and local capital to be equally productive in the first three simulations while we apply alternative assumptions on FDI-related productivity effects in two additional simulations:

- Scenario "FDI+prod" allows for productivity effects *only in those sectors that attract FDI*. FDI inflows are assumed to induce a uniform increase in total factor productivity of about 9 percent in these sectors. This assumption is based on the actual share of FDI in corporate investment in Bolivia and a (calibrated) elasticity of 5 percent of TFP with respect to the FDI share.

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[16] Blomström and Kokko (2002) summarize the literature as follows: "There is strong evidence pointing to the potential for significant spillover benefits from FDI, but also ample evidence indicating that spillovers do not occur automatically."

- Scenario "FDI+AK" allows for productivity effects *in all sectors*. This scenario is based on a modified model with regard to the impact of infrastructure. We implement an AK-type model in which private and public capital together have constant returns to scale. This implies that productivity increases are endogenous in the simulation and that FDI, by leading to increased government revenue and investment, may have an effect on the productivity of private factors of production in all sectors.

V. Simulation Results

The macroeconomic results of the different scenarios after ten periods are summarized in Table 5. Increased FDI inflows add almost eight percentage points to Bolivia's investment ratio. Moreover, in all simulations except "FDI+lab", FDI seems to have a crowding-in effect on domestic (private plus public) investment, as indicated by a somewhat higher increase in the INV/GDP ratio than in the FDI/GDP ratio. However, there is some crowding out of *private* domestic investment in all scenarios, except for the AK model which considers an endogenous increase in productivity. The latter finding is in line with Agosin and Mayer (2000), according to whom FDI tends to crowd out domestic investment in Latin American host countries. As another downside of higher FDI inflows, Bolivia's export orientation weakens. This is due to (slightly) higher rates of inflation which translate into a real appreciation.

Given the substantial increase in FDI inflows, economic growth effects appear to be modest, ranging from 0.5 to 0.8 percentage points depending on the scenario considered. Yet, this impact is far from being economically insignificant. Moreover, it contradicts the sceptical view that FDI is unlikely to have any positive growth impact in lower-income developing countries, especially when they depend heavily on primary commodities (Nunnenkamp 2004). Rather, our findings support Flexner (2000) who reports positive growth effects of FDI in Bolivia. The impact of FDI on growth turns out to be slightly higher if labour market reforms allow for higher mobility in urban labour markets ("FDI+lab"), and if FDI is assumed to stimulate total factor productivity in sectors receiving FDI ("FDI+prod"). Growth effects are highest in the model with endogenous productivity increases ("FDI+AK"), and lowest if additional FDI inflows are combined with a tax reform ("FDI+tax"). In the former case, FDI inflows lower production costs and enhance the absorption capacity of the economy by giving rise to government revenues and infrastructure investment. Higher private and public

investment both have a positive impact on growth.[17] By contrast, in the latter scenario, the equalization of corporate and personal tax rates is assumed to leave government revenues unchanged compared to scenario "FDI". Hence, infrastructure investment, too, remains unchanged which increases production costs and hampers overall growth.[18]

Turning to the principal focus of our analysis, i.e., the effects of FDI on poverty and income distribution, Table 6 reveals that higher FDI inflows may indeed help alleviate poverty, as declared in the Monterrey Consensus reached at the UN Conference on Financing for Development. This applies even when FDI inflows are assessed in isolation and complementary reform measures are ignored (scenario "FDI"). Both poverty indicators, the headcount measure and the poverty gap, improve at the national level, though only after some periods (not shown in the table). At the same time, our simulation results are in line with Te Velde's (2003: 4) statement that FDI is likely to perpetuate inequalities. According to the Gini coefficients shown in Table 6, higher FDI goes along with increasing income inequality in Bolivia.

Yet, the distributional effects of scenario "FDI" support the reasoning in Section III that it is crucially important to differentiate between urban and rural areas, formal and informal workers as well as manufacturing and other sectors. Table 6 reveals the urban-rural divide: The rising Gini coefficient at the national level is because the urban-rural income gap widens considerably. While the urban income distribution improves somewhat (not least because of the pronounced increase in informal income; see below), the Gini coefficient for rural households rises by 0.7 percentage points over the entire simulation period. Moreover, the poverty-alleviating effects of FDI are restricted to urban households. Despite higher GDP growth, the poverty gap of rural households widens by more than 0.5 percentage points in scenario "FDI".

In the short run, the urban-rural income gap widens for the following reasons: The FDI-induced demand for investment goods leads to immediate income gains in urban construction activities in the first place. By contrast, traditional agriculture does not benefit in the short run

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[17] As noted by an anonymous referee, the higher growth impact of FDI in scenario "FDI+AK" is not surprising, given the underlying assumptions outlined in Section IV. However, the distributional consequences which are the focus of this paper are far less obvious (see below).

[18] Note that the increase in the INVG/GDP ratio reported for scenario "FDI+tax" in Table 5 results from lower GDP growth, rather than higher public investment.

as this sector does not produce investment goods and its forward linkages to investment goods industries are extremely weak. Modern agriculture benefits slightly from the expansion of investment demand (for seedlings, cattle, etc.), but is negatively affected by the real appreciation that results from additional FDI inflows. Overall, the domestic agricultural terms of trade deteriorate, which negatively affects the real income position of both smallholders and agricultural workers (Table 7).

In the longer run, agriculture and the real income position of rural households continue to be negatively affected. Nominal income gains of rural households, resulting from the expansion of domestic demand for agricultural goods, are overcompensated by higher prices for consumer goods. In contrast to smallholders and agricultural workers, all urban household groups benefit from higher physical investment of private and public enterprises and higher growth in manufacturing and formal services. Longer-run income gains are largest for poor urban households, i.e., unskilled workers and informals.[19] The reason is that the sectoral allocation of FDI is determined by the relative profitability of formal capital across sectors.[20] Sectors which attract FDI inflows use unskilled labour relatively intensively. Urban informals benefit in two ways: First, they receive additional income from expanding construction where they are involved in maintenance activities. Second, higher overall income is partly spent on informal services, which leads to higher prices and higher earnings in this sector.

Comparing the distributional effects of FDI in scenario "FDI" with the reasoning and findings of related studies (see Section III), several points need to be emphasized. First of all, FDI widens income disparities between urban and rural areas by adversely affecting smallholders and agricultural workers, i.e., household groups outside the realm of most other studies. Second, our findings support the reasoning of Spatz and Steiner (2002) and Spatz (2006), according to whom unskilled workers previously employed in the urban informal sector should benefit over-proportionally from structural reforms, including FDI liberalization. Third, however, the simulation results of scenario "FDI" contradict the view that unskilled workers in urban formal sectors will suffer from higher FDI. As we show further below, this

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[19] This result appears to be in contrast with Te Velde's (2003) findings according to which FDI increased wage inequality in Bolivia. However, it is for several reasons that our results are not strictly comparable. First of all, we perform simulations rather than regression analysis. Furthermore, Te Velde derives the distributional effects of FDI from the wages of skilled and unskilled workers. By contrast, our results are largely driven by the earnings of informals as well as by the differentiation between urban and rural areas.

[20] See Section IV for a discussion of this assumption.

is largely because we suppose FDI to operate in highly segmented Bolivian labour markets, unless labour market reforms are implemented in combination with FDI liberalization.

The next question is whether complementary economic reforms may reduce the divide between urban and rural areas and the bias against smallholders and agricultural workers that higher FDI inflows cause in scenario "FDI". Overall, the results achieved for scenarios "FDI+lab" and "FDI+tax" are rather disappointing with respect to rural poverty and rural income disparity. Both reform scenarios alter the distributional impact of higher FDI inflows only marginally, as reflected in the Gini coefficient for rural households (Table 6). Essentially the same applies to the incidence of absolute poverty and the poverty gap in rural areas. However, by changing labour market conditions or the absorptive capacity of the Bolivian economy, complementary reforms may cause significant changes in the impact of additional FDI inflows on urban poverty.

In scenario "FDI+lab", the government renders it easier for urban informals to be employed as non-agricultural workers in the formal labour market, e.g., by lowering the costs of dismissal or by granting more opportunity for temporary work. The most obvious effect is that average real earnings for urban informals go up by much more than in scenario "FDI" (Table 7). At the same time, average real wages for urban unskilled workers decline, once complementary labour market reforms are taken into consideration. This contrasts with rising wages for this household group under scenario "FDI" and, thus, underscores the crucial importance of labour market conditions with regard to the distributional consequences of FDI. More precisely, it is only with a certain degree of labour mobility that our simulation results are in line with the proposition of Spatz and Steiner (2002) and Spatz (2006) that the relative income position of unskilled workers in the formal sector should deteriorate.

On balance, higher incomes for informals and lower incomes for unskilled workers result in less income disparity in urban areas (Table 6). The wage differential between informal labour and unskilled workers in the formal economy is roughly halved. The considerable decline in urban poverty is helped by the somewhat higher macroeconomic growth effects of FDI once labour market segmentation is reduced, although this effect takes some periods to materialize. Better earning opportunities in the urban informal sector, in turn, induce rural-urban migration on a significant scale. Nevertheless, the incomes of smallholders and rural workers continue to decline and this decline is only moderately less than in the scenario without labour market reform. As a consequence, the rural income distribution changes just slightly in favour of poor

households. A more significant decline in rural poverty is also prevented by the minor effect of FDI on rural GDP growth.

The poverty-alleviating effects of FDI in combination with tax reform are even less favourable. The government-revenue neutral equalization of direct tax rates in scenario "FDI+tax" lowers the tax burden of enterprises at the cost of higher taxation of household income. The immediate impact is a restructuring of domestic final demand away from private consumption towards private investment, while government consumption and investment are unaffected in the short term. However, the higher investment ratio does not translate into higher income growth compared to scenario "FDI". The rise in formal capital (resulting from additional FDI inflows) in combination with an insufficient absorptive capacity (due to lower disposable private income) leads to decreasing returns to capital which outweigh the quantity effect of FDI inflows. Thus, this scenario highlights the importance of complementary public investment in infrastructure for improving the absorptive capacity of the Bolivian economy.

When comparing "FDI+tax" and "FDI" in Table 7, employers represent the only household group which benefits from the restructuring of the tax schedule. By contrast, agricultural workers do not benefit from additional investment of corporations in the formal sector and are negatively affected by the reduction of domestic private consumption. Overall, a tax reform that increases the tax burden of private households, while lowering taxes on corporate income, slightly increases both urban and rural poverty.

The simulation results with respect to potential productivity effects of FDI are not encouraging either. Productivity gains in sectors receiving FDI (scenario "FDI+prod") lower both the incidence and the depth of urban poverty compared to scenario "FDI". However, the rural poverty headcount is hardly affected and the rural poverty gap is reduced only slightly. As in the case of labour market reform, urban informals are the primary beneficiaries of higher factor productivity in sectors receiving FDI. On the supply side, urban informals benefit from higher wages paid in expanding sectors. Urban informals also benefit from increasing demand for non-tradables that results from higher overall income.

The distributional implications of FDI inflows are less favourable to urban households when assuming endogenous productivity gains in all sectors due to higher public investment in infrastructure ("FDI+AK"). In particular, urban informals do not gain as much as in scenario "FDI+prod". At the same time, the loss of factor income of rural unskilled workers is considerably lower than in all other scenarios. But urban sectors still gain at the expense of

rural sectors, even though "FDI+AK" is based on fairly optimistic assumptions concerning FDI-related productivity effects and, accordingly, delivers relatively strong growth effects.

VI. Summary and Conclusions

We assessed the impact of FDI inflows on growth, poverty and income distribution by applying a computable general equilibrium model for Bolivia. The CGE analysis complements econometric studies on FDI effects in that we account for major transmission mechanisms through which FDI inflows affect the real income of specific groups of households. The model considers labour market segmentation and public investment in infrastructure to be important factors that may shape the distributional effects of FDI in developing host countries such as Bolivia. Specifically, the CGE analysis addresses several limitations of the existing literature by (i) investigating the impact of FDI inflows on incomes of urban and rural households; (ii) taking into account informal activities which represent the major income source of poor households in Bolivia; and (iii) differentiating between various segments of the urban workforce.

The simulation results suggest that FDI inflows add to Bolivia's investment ratio, enhance economic growth, and reduce poverty. This is even though we avoid adding structural features to the CGE model that would almost automatically result in positive growth effects. In particular, we consider foreign and local capital to be equally productive in most of our simulations.

Our results point to two levers through which the government may promote growth-enhancing and poverty-alleviating effects of FDI. First, it seems important to overcome labour market segmentation. Labour market reforms to be considered in this context include lowering the cost of dismissal and granting better opportunities for temporary work in the formal sector. In this way, the government could enhance labour mobility both within urban areas and from rural to urban areas. Urban informal workers would have better chances to enter the formal workforce, while poor rural smallholders would have stronger incentives to migrate to urban areas. Second, the growth and poverty effects of FDI tend to be limited unless the government strengthens the capacity of the Bolivian economy to productively absorb higher FDI inflows. Public investment plays an important role in overcoming bottlenecks in infrastructure. By contrast, if such bottlenecks persist, there is the danger that higher FDI inflows depress the returns to capital. As a consequence, an insufficient absorptive capacity tends to impair employment and income possibilities for the poor.

As regards the distributional consequences of FDI, the simulation results suggest that FDI generally widens income disparities between urban and rural areas. FDI leads to more employment and higher factor remuneration in urban activities. In particular, FDI improves the relative income position of unskilled workers previously employed in the informal sector. Moreover, unskilled workers in urban areas benefit more than skilled workers, at least under conditions of segmented labour markets. On the other hand, rural activities benefit only marginally on the supply side, while smallholders and agricultural workers tend to be negatively affected by higher consumer prices.

Complementary policy reforms or alternative productivity scenarios help little in reducing the divide between urban and rural areas. In general, the scenarios considered in this paper do not significantly alter the distributional impact of FDI. Labour market reforms are an exception in that they lower barriers for informal workers to enter the market for unskilled labour, and lead to a considerable decline in urban poverty. In future research, it might be assessed if the government has other instruments at its disposal to increase the benefits the rural poor may derive from higher FDI inflows. For example, government spending may be directed increasingly to educating poor rural households, which may help them becoming employed in the formal sector and/ or in urban areas. However, the important role of bottlenecks in infrastructure for enhancing the absorptive capacity of the Bolivian economy implies that the government faces critical choices when it comes to spending priorities with regard to additional FDI-induced revenues.

Two further avenues of future research should be explored. As concerns Bolivia, the discretionary investment decisions of multinational corporations may be modelled in more detail. As noted in Section II, FDI flows to Bolivia were concentrated in hydrocarbons and the services sector. It seems likely that the effects of FDI on poverty and income distribution differ between various types of FDI as well as the sectors in which it takes place. For example, resource-seeking FDI in the primary sector tends to have weak linkages with the local economy of the host country, which may seriously constrain poverty-alleviating effects. Hence, a more accurate picture of the distributional effects of FDI flows to Bolivia may be achieved by accounting for changes in the composition of FDI.

Furthermore, the effects of FDI on poverty and income distribution are likely to depend on the economic structure and institutional features in particular host countries. The degree of labour market segmentation is a case in point. Consequently, it seems necessary to apply the CGE approach to other developing countries. This would not only serve comparing our results on

Bolivia with other developing countries; incorporating explicitly the transmission mechanisms through which FDI inflows affect poverty and income distribution would also help assess the – often ambiguous – results obtained from reduced form models.

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Table 1 — Sectoral Composition of FDI Flows to Bolivia, 1990–1992 versus 2000–2002[a]
       (percent of total inflows)

Sectors	1990–1992	2000–2002
Primary	6.8	50.7
thereof:		
Petroleum	n.a.	47.9
Secondary	74.2	10.0
Tertiary	19.0	39.4
memorandum: Total inflows (US$ mill.)	95.0	903
[a] Annual average.		

Source: UNCTAD online data based on Banco Central de Bolivia.

Table 2 — Estimated Poverty and Inequality Trends in Bolivia[a], 1989–2002

	1989	1994	1999	2002
Poverty headcount	76.9	72.4	65.2 (60.3)	67.2
Poverty gap	45.5	41.9	32.5 (30.1)	32.9
Gini coefficient	0.555	0.555	0.525 (0.531)	0.551

[a] Simulated figures for 1989 and 1994; simulated figures for 1999 in parentheses; actually observed figures for 1999 and 2002. The poverty headcount expresses the share of the population whose income is below the poverty line, while the poverty gap measures how far off households are from the poverty line. The Gini coefficient measures income inequality; the coefficient varies between 0 (complete equality) and 1 (complete inequality).

Source: Klasen et al. (2004: 8).

Table 3 — Employment and Income in Bolivia 1999, by Sector and Skill Category

Production sectors	Skilled workers		Unskilled workers	
	Employment (persons)	Income (Bs./month)	Employment (persons)	Income (Bs./month)
Informal sectors				
Traditional agriculture	—	—	1,409,313	244
Informal services	—	—	878,203	415
Formal sectors				
Modern agriculture	6,353	1,902	66,672	725
Crude oil & natural gas	8,096	2,866	9,322	1,268
Mining	3,668	1,856	21,362	1,053
Consumer goods	25,268	1,451	80,522	646
Intermediate goods	11,885	1,451	35,773	648
Capital goods	828	1,451	2,930	642
Electricity, gas & water	7,481	2,534	3,548	823
Construction	16,921	1,092	79,987	324
Formal services	364,119	779	36,441	490
Public sector	181,749	1,945	26,566	1,339
Total	626,368		2,650,639	

Source: Thiele and Piazolo (2003).

Table 4 — Employment and Income in Bolivia 1999, by Household Group

	Employment (no. of persons)	Employment (%)	Average monthly income (Bs.)
Rural smallholders (unskilled)	1,409,313	39.5	244
Agricultural workers (unskilled)	66,672	1.8	725
Non-agricultural workers (unskilled)	296,451	8.3	651
Urban informals (unskilled)	878,203	24.6	415
Employees (skilled)	626,368	17.5	1,240
Employers (self-employed)	292,734	8.2	2,683
Total economically active population	3,569,741	100.0	704

Source: Thiele and Piazolo (2003).

Table 5 — Macro Results for Base Run and Alternative FDI-Inflow Scenarios (after 10 periods)

	GDP	INV/GDP	FDI/GDP	INVG/GDP	INVP/GDP	EXP/GDP	INFL
Base run	4.00	24.11	5.98	4.97	13.16	21.32	-0.03
Change compared to base run							
FDI	0.62	7.87	7.78	0.62	-0.53	-3.60	0.98
FDI+tax	0.49	8.49	7.87	1.19	-0.57	-3.61	1.09
FDI+lab	0.71	7.62	7.75	0.79	-0.92	-3.45	0.86
FDI+prod	0.66	8.04	7.69	0.83	-0.48	-3.44	0.96
FDI+AK	0.79	10.16	7.63	0.46	2.07	-1.75	0.47

Note:
GDP = Real gross domestic product; INV/GDP = Share of total investment in GDP; FDI/GDP = Share of FDI in GDP; INVG/GDP = Share of public investment in GDP; INVP/GDP = Share of private domestic investment in GDP; EXP/GDP = Export share; INFL = Inflation rate.

Table 6 — Distributional and Poverty Measures: Results for Alternative Scenarios
(after 10 periods)

Indicator[a]	FDI	FDI+lab	FDI+tax	FDI+prod	FDI+AK
Gini coefficient					
All	0.3	0.4	0.3	0.2	0.3
Urban	-0.3	-0.4	-0.3	-0.4	-0.2
Rural	0.7	0.8	0.8	0.7	0.7
Poverty headcount					
All	-1.9	-3.2	-1.5	-2.4	-1.4
Urban	-3.1	-5.2	-2.8	-3.8	-2.3
Rural	0.1	0.0	0.4	-0.1	0.0
Poverty gap					
All	-0.9	-1.7	-0.7	-1.3	-0.6
Urban	-1.7	-2.8	-1.5	-2.1	-1.3
Rural	0.6	0.3	0.9	0.3	0.5

[a] Deviation from base run in percentage points.

Table 7 — Real Per-Capita Factor Income: Results for Alternative Scenarios
(after 10 periods)

Household[a]	FDI	FDI+lab	FDI+tax	FDI+prod	FDI+AK
Smallholders	-7.4	-7.0	-8.5	-6.5	-7.2
Agricultural workers	-10.9	-9.5	-15.3	-7.7	-2.5
Unskilled workers	8.3	-3.9	7.8	9.6	8.3
Urban informals	12.8	34.0	11.2	16.6	7.6
Employers	1.9	0.8	5.2	2.3	3.2
Skilled workers	4.4	2.8	3.5	4.9	4.3

[a] Deviation from base run in percentage points.