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Kiel Working Paper No. 1281

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

by

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June 2006

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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 CGE analysis addresses several important transmission channels which have been neglected in the empirical literature by (i) investigating the impact of FDI inflows on incomes of urban and rural households; (ii) taking into account informal activities; and (iii) differentiating between various segments of the urban workforce, whereas previous studies are typically confined to the dichotomy between white-collar and blue-collar workers in manufacturing industries. The simulation results suggest that FDI inflows add to Bolivia's investment ratio, 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 Our results point to two levers through which the Bolivian government may promote growth-enhancing and poverty-alleviating effects of FDI. First, it seems important to overcome labor market segmentation. Second, complementary public investment in infrastructure may help remove bottlenecks in the absorptive capacity of the economy that tend to limit productive employment of the poor. Yet, simulated policy reforms or alternative productivity scenarios are hardly effective in reducing the divide between urban and rural areas.

Keywords: Foreign direct investment, poverty and income distribution, Bolivia, computable general equilibrium analysis

JEL-Code: C68, D3, F21, O5

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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 labor 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 have 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 recursive-dynamic real-financial (CGE) model GEM-PIA

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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.”

(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 Sections IV and V, we provide a description of major features of the CGE model applied and present 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 (Figure 1). 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 neighboring Chile and US$ 240 in all developing economies of Latin America (UNCTAD online data).

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 (Figure 1). 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. 2004). 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

According to the Overseas Development Institute (2002), there is no direct link between FDI and poverty reduction. However, FDI may indirectly benefit the poor by creating better employment and earnings opportunities to unskilled workers in developing host countries. Traditional trade theory predicts that FDI draws on unskilled labor in developing countries. Hence, FDI would provide a means to specialize according to comparative advantages. In unskilled labor abundant host countries, it would raise the relative demand for unskilled labor and, thus, reduce wage inequality between skilled and unskilled labor (Rama 2003: 7).

Easterly (2004) concedes that models of trade and factor flows based on international differences in factor endowments offer clear predictions as to how FDI affects inequality: FDI should reduce inequality in poor countries, while increasing inequality in rich countries. Yet, as Easterly shows, 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. A first strand performs (pooled) cross-section analyses. Rama (2003) focuses on wage inequality across *occupations*. While the ratio of FDI to GDP does not have a significant impact on this variable, Rama admits that the apparent neutrality of FDI may hide distributional effects with respect to the *education* of workers. Easterly (2004) considers the change in the (log of the) Gini coefficient as a function of FDI flows to developed and developing host countries. Fixed effect regressions 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. This conclusion is derived from estimations that include an interaction term between FDI and the per-capita income of host countries. However, the interaction term is considered only in OLS regressions with regional dummies. Fixed effect regressions, run as robustness tests for the overall panel of developing and developed countries by Bussmann et al., rather suggest that a higher FDI to GDP ratio went along with a somewhat higher Gini coefficient and a lower income share of the poorest quintile of the population.

The cross-section analyses of Tsai (1995) and Sylvester (2005) are restricted to developing host countries. Both authors include regional dummies. Tsai (1995: 479) 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."[4] While Tsai's analysis is restricted to the 1970s, Sylvester reports similar findings for the period 1970-1989. The conclusion of Sylvester that FDI did not increase income inequality is based on OLS regressions as well as 3SLS estimations which treat FDI, economic growth and the change in the Gini coefficient as endogenous variables. 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 and 29 developing countries, respectively, Basu and Guariglia cover 119 developing countries over the period 1970-1999.[5] 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.[6]

Country-specific studies represent another strand of the literature on the distributional effects of FDI. As concerns developing host countries, the evidence on the relationship between FDI and income and wage inequality at the macro level is still limited.[7] However, almost all of the available evidence shows that FDI is associated with higher wages for all types of workers in developing countries. 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, Te Velde and Morrissey (2001) find that foreign-owned establishments paid higher wages in five Sub-Saharan African countries, but more so for skilled workers, thereby increasing wage inequality. The same authors report similar

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4 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.

5 The large difference in sample size is quite surprising since Basu and Guariglia (2006) refer to the same data on income inequality (Deininger and Squire 1996) as Sylvester (2005) and Bussmann et al. (2002).

6 Basu and Guariglia (2006) also control for possible endogeneity of the regressors. However, results are hardly affected.

7 The evidence for developed countries, not considered here, is summarized in Lipsey (2002). With respect to new EU member countries, Bruno et al. (2004) show that FDI exerted a positive direct impact on the skill premium in the Czech Republic and Hungary, whereas FDI did not worsen wage inequality by shifting the labor demand towards skilled workers.

results for Thailand (Te Velde and Morrissey 2002).[8] Also according to Matsuoka (2001), 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. Matsuoka attributes this finding to labor market imperfections in Thailand, where foreign firms dominated segmented markets for particular skills. Likewise, Zhao (2001) argues for the case of China that high costs of labor mobility and segmented labor markets have increased the skill premium so-called foreign-invested enterprises are prepared to pay. Finally, among Asian host countries, Indonesia has received particular attention. Using establishment data for the manufacturing sector and controlling for various plant characteristics and the level of education of workers, 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. From another paper on FDI-induced wage spillovers in Indonesian manufacturing, the same authors conclude that FDI has raised the general wage level in industries and provinces in which foreign presence is large (Lipsey and Sjöholm 2004b); while both white-collar and blue-collar workers benefited from wage spillovers, the former tended to gain more.

In Latin America, Mexico received most of the 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 labor demand towards skilled workers. In regions where the *maquiladora* production by foreign companies was concentrated, FDI accounted for about half of the increase in the wage share of skilled workers that occurred in the late 1980s. 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) performs OLS regressions based on an unbalanced panel of annual data for four Latin American countries (Bolivia, Chile, Colombia, and Costa Rica). The stock of FDI, relative to GDP, is included as a determinant of skill-specific wages. Country-specific results reported in this study indicate that, with the possible exception of Colombia, FDI did not have an inequality-reducing effect. Most strikingly, it turns out that wage inequality in Bolivia increased in 1987-1997 because *negative* wage effects of FDI were more pronounced for less-skilled workers than for skilled

[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).

workers. This is in sharp contrast with the positive wage effects typically found for other developing host countries.

Te Velde's finding of negative wage effects of FDI in Bolivia is also difficult to reconcile with Flexner (2000), according to whom FDI inflows (measured as real FDI to real GDP on a quarterly basis) had a significantly positive impact on per-capita income growth in Bolivia in the period 1990-1998.[9] 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.[10] 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. This is for several reasons. First, due to data constraints, the analysis is confined to *wage* inequality in *urban* Bolivia. Second, 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

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[9] Te Velde himself considers his results to be tentative. As stated by the author, estimated coefficients may suffer from an endogeneity bias. Te Velde does not run IV estimates because of the small number of observations. However, the robustness of Flexner's results is open to question, too. The treatment of privatization-related FDI inflows by "substituting the capitalization dummy variable for FDI" does not account for potentially different growth effects of different types of FDI. Moreover, his OLS regressions, too, are subject to possible endogeneity of FDI inflows.

[10] In addition, unskilled workers previously employed in the informal sector are supposed to benefit from a rising employment share of unskilled workers in the formal sector.

liberalization. Third, as the authors admit, the effects on wage equality are theoretically ambiguous for both privatization and the liberalization of trade and FDI.[11]

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 labor intensive industries, in which developing countries may have comparative advantages, FDI is often concentrated in skill intensive industries.[12] Moreover, foreign companies may apply more skill intensive technologies than domestic companies in the same industry, and they may induce skill-biased technological change.[13] As shown by Matsuoka (2001) and Zhao (2001), FDI may increase inequality even if it does not lead to skill-biased technological change, namely when it locates in host countries characterized by labor market segmentation and impediments to labor mobility. As we argue below, this is highly relevant for the case of Bolivia. Country-specific labor 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 suffer from several shortcomings. Micro studies focusing on wage comparisons between foreign and local firms may be best suited to isolate the effect of FDI on wages at the firm level, but tell little about the economy-wide distributional effects of FDI. Even so-called macro studies[14] typically provide only limited insights in the latter regard. Most research is restricted to wage inequality, as reflected in relative wages of production and non-production workers, in the manufacturing sector. This implies various limitations:

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[11] Effects on wage inequality are more straightforward when it comes to product market deregulation and labor market deregulation.

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

[13] 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.

[14] See Overseas Development Institute (2002) on the differentiation between micro and macro studies with regard to the distributional effects of FDI.

- As noted by Rama (2003: 1), wage earners may be regarded as a "privileged elite in most developing countries, where farmers and the self-employed account for most of the labor force." In the case of Bolivia, wage earners (agricultural workers, non-agricultural workers and employees in Table 5) accounted for just 28 percent of the total workforce in 1999. 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.[15] It also ignores that FDI may have different effects on earnings in rural and urban areas. Rural labor markets play an important role in Bolivia. Taken together, rural smallholders and agricultural workers represented more than 40 percent of the workforce.

- 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 4, absorbed about 40 percent of the workforce in Bolivia. At the same time, FDI may affect the 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. Despite higher wage inequality in the manufacturing sector, FDI may help alleviate poverty by offering formal employment opportunities to unskilled workers. However, FDI may also add to absolute poverty in the informal sector if foreign investors acquire local firms and shed unskilled labor as a consequence of labor-saving technological progress (Nunnenkamp 2004: 667).

- 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).

Hence, it may be premature to conclude that the "micro and macro evidence shows that, at a minimum, FDI is likely to perpetuate inequalities" (Te Velde 2003: 4). This applies especially to Bolivia where almost all of the above qualifications are likely to matter. The only empirical

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[15] 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 nonproduction workers or blue-collar and white-collar workers."

study including the case of Bolivia (Te Velde 2003) resembles most of the literature on the distributional effects of FDI in that non-wage inequality is not taken into account. However, non-wage income seems to have an important say on overall inequality in Bolivia. 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. A Simulation Model for Bolivia

To capture the major links between FDI inflows and income distribution and poverty along the lines discussed above, we use a modified version of the real-financial CGE model GEM-PIA (General Equilibrium Model for Poverty Impact Analysis). The model combines neoclassical and structural characteristics, but does not account for Keynesian multiplier effects so that the simulation results have to be interpreted as medium to long term. The production structure and goods market conditions correspond with the standard neoclassical specification (e.g., Dervis et al. 1982). However, the model takes into account the segmentation of labor markets in Bolivia (Lay and Wiebelt 2001). The savings and investment behavior of different agents (including foreign investors) is modeled explicitly, following the structuralist view on economic adjustment of other models for Bolivia (e.g., Jemio 2001, Jemio and Wiebelt 2003, Thiele and Wiebelt 2004). In particular, the model takes into account that the ability to acquire domestic and foreign capital differs across sectors and agents.

In the following, the major components of the modeling framework are described in a non-technical manner. A full mathematical documentation can be found in Wiebelt (2004).

Production: The model distinguishes 12 sectors (see Table 3) which produce a characteristic, though not necessarily homogenous good. As concerns exporting sectors, it is assumed that, e.g. due to quality differences, domestically sold and exported goods are not identical. This is modeled by means of a Constant Elasticity of Transformation (CET) function. Mining and oil & gas provide exceptions: Bolivia's exports in these sectors are exogenously determined by world market conditions or, at least until recent nationalization, by long-term contracts as in the case of gas exports to Brazil. Domestically produced and imported goods of the same category are also treated as different, which is modeled by means of a Constant Elasticity of Substitution (CES) function (Armington assumption). Finally, some sectors (utilities,

construction, public services) produce pure non-tradables. This rather strong differentiation in production allows us to capture in a realistic way the impact FDI inflows may have on the earning opportunities of different households.

A distinctive feature of the model is the explicit treatment of informal production sectors, i.e., traditional agriculture and (urban) informal services, where most of Bolivia's poor earn their living (Table 4). Informal sectors are not directly affected by FDI inflows. Workers in these sectors are considered self-employed; for the most part, they rely on their own labor inputs and use only small amounts of capital. This implies that, over one year, supply is almost constant for a given number of workers and given factor productivities; and if demand changes, adjustment will mainly run through changes in prices, which directly affect incomes of those employed in informal sectors. By contrast, formal sectors tend to produce with modern, more capital-intensive techniques; these sectors are able to attract FDI, and, like the government, they hire skilled and unskilled workers. Throughout the formal economy, primary factors are combined via CES production functions, whereas production technology of the two informal sectors is represented by a Cobb-Douglas function to account for the fact that labor can fairly easily substitute for the very basic capital goods used in these sectors. Both formal and informal sectors use intermediate inputs in fixed proportions to production.

Factor markets: The model assumes a high degree of labor market segmentation in order to reflect reality in Bolivia and to keep track in a detailed manner of the poor's main income flows. In addition to self-employed labor of smallholders and urban informals, we consider two types of unskilled labor (agricultural and non-agricultural) as well as skilled labor (Table 3). Labor markets are linked via rural-rural and rural-urban migration. While the former involves smallholders becoming hired workers in modern agriculture, the latter involves the absorption of smallholders by the urban informal sector. Along the lines of the Harris-Todaro model, the decision to migrate depends on wage differentials. As concerns the urban labor market, the limited possibilities of urban informal workers to enter the formal workforce are taken into account by a Harris-Todaro model that links self-employment of informal workers to the market for (unskilled) non-agricultural labor. The informal sector absorbs all those failing to obtain formal employment at the prevailing wage. The model does allow for underemployment in the sense that people are stuck in low-paid informal sector jobs, but not for open unemployment of unskilled labor. This appears to be an accurate characterization of the Bolivian labor market, except for recession years when rates of open unemployment tend to rise to non-negligible levels. Wage adjustments also ensure that all other labor markets clear.

The model also assumes segmented capital markets, with a distinction made between unincorporated and corporate capital. Three household groups (smallholders, urban informals, and employers) own unincorporated capital. Smallholders and urban informals invest almost exclusively in traditional agriculture and informal services, respectively; employers receive capital income from all formal sectors with the exception of utilities. Corporate capital, by contrast, is owned by (domestic and foreign) private and public enterprises, which invest in all formal sectors and retain the respective factor income. Finally, the model separates public infrastructure capital, which is assumed to affect the level of sectoral production. This is specified by means of a CES function in which public capital and aggregate private value added enter as arguments. Thus, by determining where to invest public infrastructure capital, the government can influence the income generation possibilities in different sectors and regions.

Income and expenditures: The model identifies six representative groups of private households, which are characterized by their distinct factor endowments (Table 3). This is justified because factor income is the single-most important income source in Bolivia given the low degree of redistribution. In addition, workers and the self-employed are disaggregated regionally as their earning possibilities and consumption patterns tend to vary in urban and rural areas. Four of the six household groups (smallholders, urban informals, agricultural workers and non-agricultural workers) can be considered poor (Table 5). Depending on factor endowments, households receive labor or capital income as well as (net) interest payments on financial assets. Moreover, they receive transfer income from the state and from relatives living abroad. Households use gross income to pay for taxes and consumption as well as to save. The allocation of private consumption expenditures on different goods is modeled employing a Linear Expenditure System (LES), according to which poorer households devote a larger budget share to price-inelastic subsistence consumption than do richer households.

The government finances its current and capital expenditures out of direct and indirect tax revenues, operating surpluses of public enterprises, and capital inflows from abroad. Private and public enterprises receive capital income, subsidies and net interest payments on financial assets; their income is used to pay corporate taxes and to save in the form of retained earnings. Since financial institutions are assumed to act as mere intermediaries, their current transactions (interest payments) are also allocated to private and public enterprises. Finally, 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.

Financial markets: The specification of the model's financial sector is based on Tobin's portfolio-theoretic framework, in which the interaction of stocks and flows plays a decisive role. Starting from the beginning-of-period stocks of assets and liabilities, financial markets match the savings and investment decisions of all economic agents over the period, comprising the accumulation of both physical and financial assets and liabilities. The financial markets handle simultaneously the flows arising from savings and financial accumulation, and those arising from the reshuffling of existing portfolios due to changes in asset returns. For the latter, it is assumed that individual agents have only limited possibilities to substitute among different assets, which is captured by CES functions. A further characteristic of the financial sector is that specific economic agents, e.g. smallholders, may be constrained in their access to credit, which is clearly the case for most of Bolivia's informal producers. This is modeled by determining bank credit to credit-constrained agents residually after all other agents' credit demand is satisfied.

Dynamics: An important feature of the model is its recursive-dynamic nature. The model is solved for a sequence of static equilibria connected through capital accumulation and labor force growth. The dynamics of the model are based on assumptions concerning exogenous growth rates for different variables such as labor supply, government expenditure, and FDI inflows. A general advantage of the dynamic specification is the possibility to generate a medium to long-run growth path. Moreover, the model allows us to analyze structural changes over time and their impact on income distribution and poverty in Bolivia.

Implementation of the model: In using the model for policy simulations, 1997 was chosen as the base year for two reasons. First, crucial data, in particular an Input-Output Table, are available for that year. Second, 1997 appears to be a fairly "normal" year for the Bolivian economy in the sense that no major shocks occurred, rendering it an appropriate benchmark against which to evaluate counterfactual simulations with regard to FDI inflows.

In order to specify the model numerically, the (real and financial) transactions between the sectors, production factors and economic agents identified in Table 3 had to be compiled in a Social Accounting Matrix (SAM) for 1997 (see Thiele and Piazolo 2003). The SAM provides the statistical backbone for the calibration of the model. From the information given in the SAM, various parameters such as tax and subsidy rates can readily be calculated. Other parameters such as trade elasticities and income elasticities of private demand have to be taken from external sources. The choice of these parameters is based on stylized facts presented in the empirical literature and on what is known about Bolivia's economic structure.

Armington elasticities, for instance, are assumed to be considerably higher for agriculture than for intermediate and capital goods. This is because import substitution of intermediate and capital goods is possible to a limited extent only, considering the minor local production of these goods in Bolivia and its low sophistication compared to the relevant import substitutes. In a final step, the calibrated model was updated so as to generate a fairly smooth growth path over ten years.

Linking the model with household data: The CGE model is linked to household survey data in order to obtain detailed results on the poverty and distributional impact of the simulated policies. The starting point for this exercise is household income, split up into (1) individual factor incomes, (2) net interest income and transfers from abroad, and (3) public transfers including pensions. These components of household income can be identified in the CGE model (see above) as well as in the household survey.[16]

Households receive factor income from different sources, i.e., individual household members may earn different factor incomes. The household head may be self-employed (e.g., urban informal in the CGE model) and his/her spouse may be employed as a worker (e.g., unskilled worker in the CGE model). The link between the CGE model and the survey is simply sequential: Each individual factor income in the household survey is scaled up or down according to the CGE results for the eight production factors owned by households (Table 3). This is how changes in real factor prices in the CGE model affect the distribution of income.

The remaining two components of household income and the changes therein are given by household group in the CGE model. These changes from the CGE model are applied to the survey information at the household level. The household types in the survey are classified according to the occupation of the household head, in line with the classification used in the CGE model.

V. Simulation Results

The model is used to simulate alternative scenarios. All scenarios have in common that FDI inflows are assumed to increase by 10 percent annually over a period of 10 years. The first scenario ("FDI") does not consider any other reform measure by the Bolivian government and, thus, reveals the effects on income distribution and poverty resulting exclusively from

[16] The household survey used is the 1999 MECOVI. This survey is to be preferred over the 1997 employment survey as it contains more detailed and more reliable information on household incomes.

higher FDI inflows. Additional simulations reveal how these basic results are affected once higher FDI inflows are considered in combination with potential reform measures, or once model assumptions are changed. In particular, we are interested to assess whether complementary policy reforms or alternative productivity developments counteract the adverse effects that FDI may have on income distribution in Bolivia:

- Scenario “FDI+tax” encompasses a tax reform which equalizes the tax rates on income. This implies lower corporate taxes and higher personal income taxes for those earning income in the formal sectors.

- Scenario “FDI+lab” combines additional FDI with a labor market reform enabling urban informals to enter the formal labor market for unskilled labor.

- Scenario “FDI+prod” considers the case of FDI inflows leading to an increase in total factor productivity in sectors receiving FDI.

- Scenario “FDI+AK” 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, leading to increased government revenues and investment, may have an effect on the productivity of private factors of production.

In all simulations, we assume that the Bolivian government does not borrow from the Central Bank and from commercial banks and that external borrowing is constant. The government’s budget constraint is exclusively determined by total tax revenues, including those resulting from additional FDI inflows. Furthermore we assume government consumption to increase at a constant rate, and government transfers to stay constant in real terms. This implies that additional government revenues due to FDI inflows are channeled to public investment in infrastructure. Finally, in all simulations except “FDI+AK”, infrastructure is supposed to have a crowding-in effect because it enters the sectors’ production functions together with private factors (labor and private capital).

The macroeconomic results of the different scenarios after ten periods are summarized in Table 6. 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 economically insignificant. Moreover, it contradicts the skeptical 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 for FDI in Bolivia. The impact of FDI on GDP growth turns out to be slightly higher if labor markets reforms allow for higher mobility in urban labor markets ("FDI+lab"), and if FDI is assumed to stimulate total factor productivity in sectors receiving FDI ("FDI+prod"). Growth effects turn out to be 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 increase the absorption capacity of the economy; thereby, FDI leads to higher returns on capital, rising government revenues and infrastructure investment. Higher private and public investment both have a positive impact on growth. 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" (tax substitution). Hence, infrastructure investment, too, remains unchanged which increases production costs and hampers overall growth.[17]

Turning to the principal focus of our analysis, i.e., the effects of FDI on poverty and income distribution, Figure 2 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 additional reform measures are ignored (scenario "FDI"). Both poverty indicators, the headcount

[17] Note that the increase in the INVG/GDP ratio under scenario "FDI+tax" in Table 6 results from lower GDP growth, rather than higher public investment.

measure and the poverty gap, improve at the national level, though only after some periods. 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 Figure 2, 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 – all issues which are hardly addressed in the earlier literature. Figure 2 focuses on the urban-rural divide. It is shown that 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 up to 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”. Short-run and longer-run transmission mechanisms underlying these findings are as follows:

- Higher FDI inflows directly add to the resources available to enterprises in the formal sector for (physical and financial) investments. Rising demand for investment goods leads to income gains in capital goods industries and construction activities in the first place.

- By contrast, traditional agriculture does not benefit in the short run 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 (Figure 3).

- Agriculture and the real income position of rural households continue to be negatively affected in the longer run. 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 in the longer run from higher physical investment of private and public enterprises and higher growth in manufacturing and formal services. The income gains are largest for poor urban households, i.e., unskilled workers and informals.[18] The reason is that the sector allocation of FDI is determined by the relative profitability of formal capital across sectors. Sectors which benefit most from FDI inflows use unskilled labor relatively intensively. Urban informals benefit in two ways from increasing FDI inflows. First, they receive additional income from the expanding capital goods industry and from 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 is largely because we suppose FDI to operate in highly segmented Bolivian labor markets, unless labor 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". As mentioned before, we run two simulations

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[18] 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.

with complementary reforms: (i) labor market legislation encouraging labor mobility and (ii) tax reform reducing corporate tax rates. Overall, the results achieved for scenarios “FDI+labor” and “FDI+tax” are rather disappointing with respect to rural poverty and rural income disparity. As Figure 2 reveals, both reform scenarios alter the distributional impact of higher FDI inflows, as reflected in the Gini coefficient for rural households, only marginally. Essentially the same applies to the incidence of absolute poverty and the poverty gap in rural areas. However, by changing labor 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+labor”, the government renders it easier for urban informals to be employed as non-agricultural workers in the formal labor 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” (Figure 3). At the same time, average real wages for urban unskilled workers decline, once complementary labor 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 labor market conditions with regard to the distributional consequences of FDI. More precisely, it is only with a certain degree of labor 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 (Figure 2). The wage differential between informal labor 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 labor market segmentation is reduced (see Table 6), 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 under the scenario without labor market reform. As a consequence, the rural income distribution changes just slightly in favor of poor household groups. 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 favorable. Given the initial structure of direct taxation in Bolivia, “FDI+tax” models a government

revenue-neutral equalization of direct tax rates which lowers the tax burden of private and public 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 formal 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 Figure 3, 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 und rural poverty.

The simulation results with respect to potential productivity effects of FDI inflows are not encouraging either. Scenario “FDI+prod” assumes that FDI inflows are accompanied by a one-time increase of total factor productivity of about 9 percent in sectors receiving FDI. This lowers 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 compared to “FDI”. As in the case of labor market reform, urban informals are the primary beneficiaries of higher factor productivity. On the supply side, urban informals directly 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 favorable to urban households when assuming that public investment in infrastructure positively influences total productivity of private factors of production (“FDI+AK”). In particular, urban informals do not gain as much as under scenario “FDI+prod”. At the same time, the loss of factor income of rural unskilled workers is considerably lower than in all other scenarios.

All in all, neither complementary policy reforms nor alternative productivity scenarios alter the negative effect of FDI inflows on the overall income distribution in Bolivia. Under all

scenarios, urban sectors gain at the expense of rural sectors, though this effect is somewhat moderated when modeling endogenous productivity increases due to higher public investment in infrastructure. The most significant reduction in the poverty headcount and the poverty gap is achieved when higher FDI inflows are accompanied by labor market reforms allowing for greater mobility of labor. An FDI-induced increase in productivity in urban sectors significantly improves the earnings possibilities of urban informals. By contrast, smallholders as well as rural workers in agriculture stand to lose in relative and absolute terms even when higher FDI inflows are considered in combination with policy reforms and alternative productivity scenarios.

VI. Summary and Conclusions

In this paper, we assessed the impact of FDI inflows on poverty and income distribution, with the focus on distributional dimensions that are relevant in a developing-country context while having received little attention in the literature. We applied a computable general equilibrium model for Bolivia to analyze numerically the medium to long-run impact of increasing FDI inflows on poverty and income distribution. The model accounts for major transmission mechanisms through which FDI inflows affect real income of specific groups of households. It captures microeconomic determinants of income distribution such as the occupational composition of household groups, as well as macroeconomic and sectoral determinants such as relative factor and consumer prices, labor market segmentation, government revenues and public investment in infrastructure. 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 developing countries such as Bolivia; and (iii) differentiating between various segments of the urban workforce, whereas previous studies are typically confined to the dichotomy between white-collar and blue-collar workers.

The simulation results suggest that FDI inflows add to Bolivia’s investment ratio, enhance economic growth, and reduce poverty. They contradict the skeptical view that FDI is unlikely to have any positive impact in lower-income developing countries. 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 labor market segmentation. Labor 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 labor 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 in infrastructure plays an important role in this respect. Complementary public investment may enhance the increase in productivity. By contrast, if bottlenecks in infrastructure persist, there is the danger that higher FDI inflows depress the returns to capital. As a consequence, an insufficient absorptive capacity tends to result in less 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 labor 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. Labor market reforms are an exception in that they lower barriers for informal workers to enter the market for unskilled labor, 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 modeled 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 labor 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.

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

Table 3 — Classification of the CGE Model

Sectors/ Goods and Services	Production Factors	Economic Agents
Informal Sectors – Traditional agriculture – Informal services *Formal Sectors* – Modern agriculture – Oil&gas – Mining – Consumer goods – Intermediate goods – Capital goods – Utilities – Construction – Formal services – Public services	*Labor* – Skilled labor – Agricultural unskilled labor – Non-agricultural unskilled labor – Smallholder labor – Urban informal labor *Physical Capital* – Corporate (formal) capital, incl. FDI – Employers' capital – Urban informals' capital – Smallholders' capital – Public (infrastructure) capital	*Households* – Smallholders – Agricultural workers – Non-agricultural workers – Employees – Urban informals – Employers *Enterprises* – State enterprises – Private enterprises *Government* *Rest of the world* *Financial institutions* – Commercial banks – Central Bank

Table 4 — Employment and Income in Bolivia 1999, by Sector and Skill Category

	Skilled workers		Unskilled workers	
	Employment (persons)	Income (Bs./month)	Employment (persons)	Income (Bs./month)
Traditional agriculture	—	—	1,409,313	244
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
Informal services	—	—	878,203	415
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 5 — 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

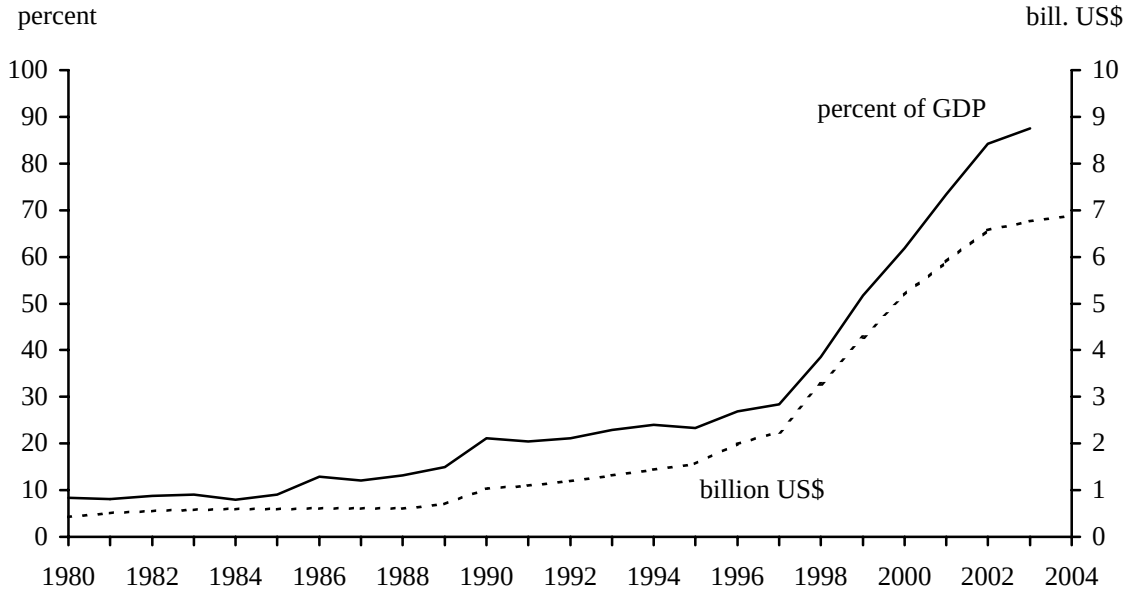
Source: Thiele and Piazolo (2003).

Table 6 — 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.

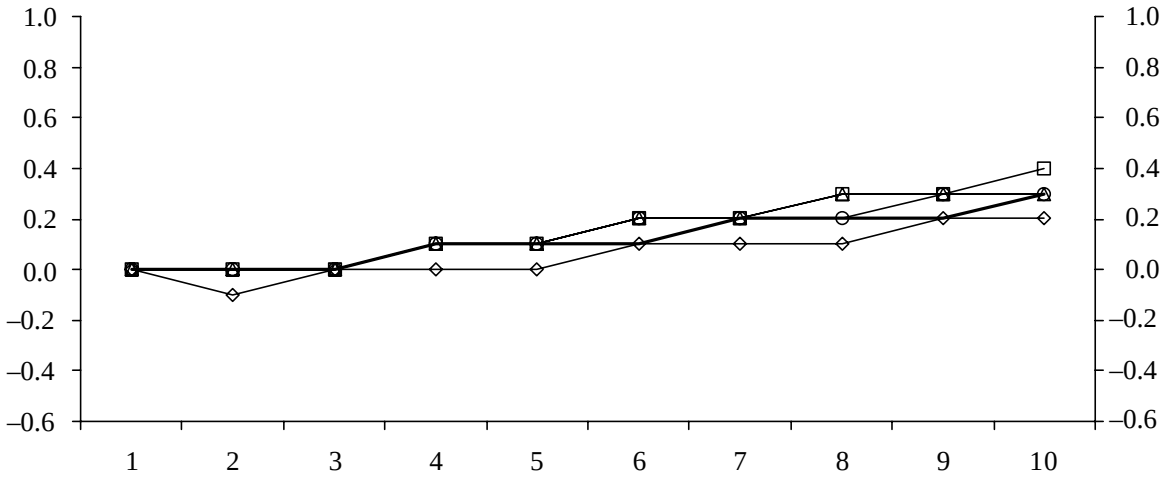
Figure 1 — FDI Stocks in Bolivia, 1980–2004



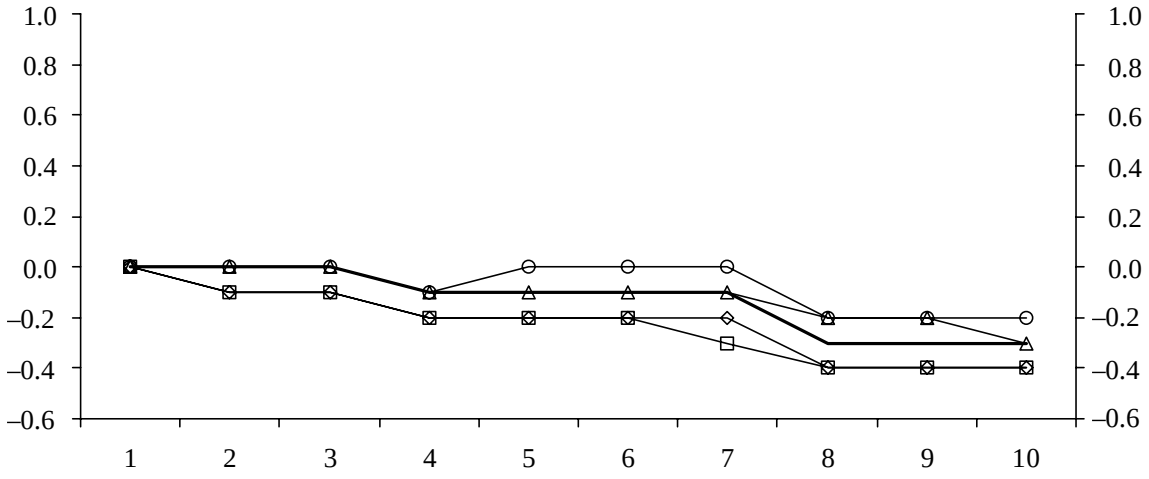
Source: UNCTAD online data.

Figure 2 — Distributional and Poverty Results

Gini coefficients, All households



Gini coefficients, Urban households



Gini coefficients, Rural households

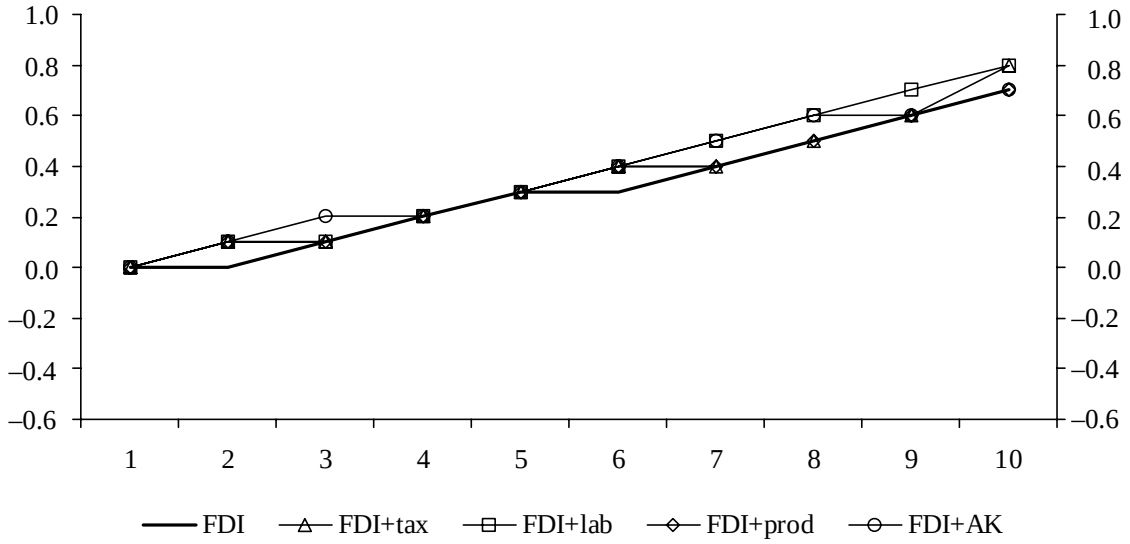
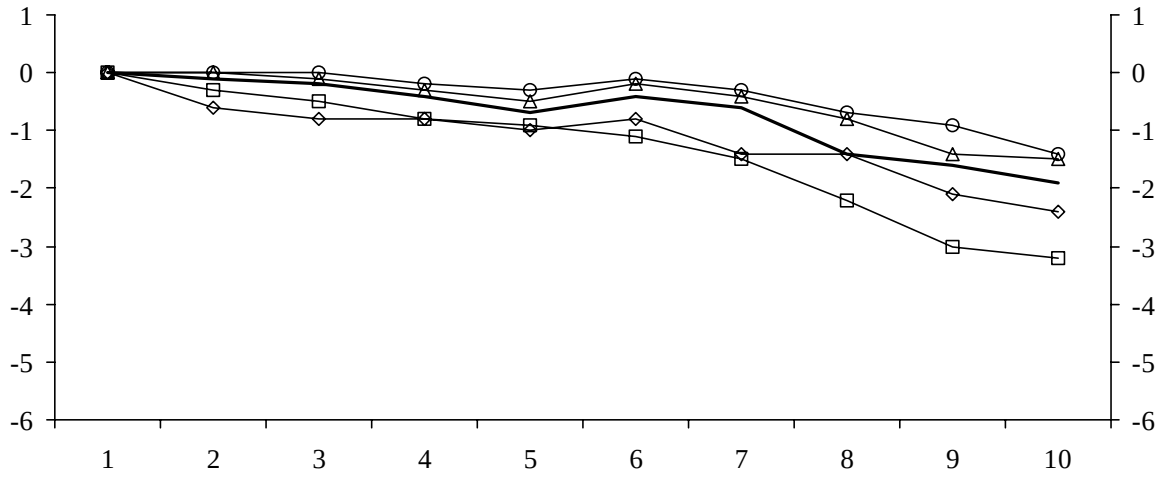
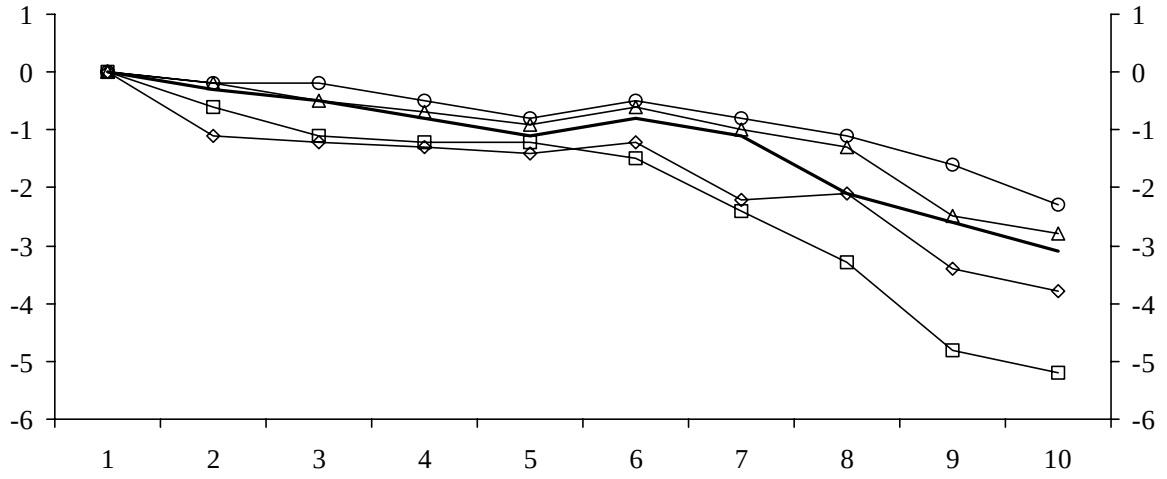


Figure 2 — cont.

Headcount, All households



Headcount, Urban households



Headcount, Rural households

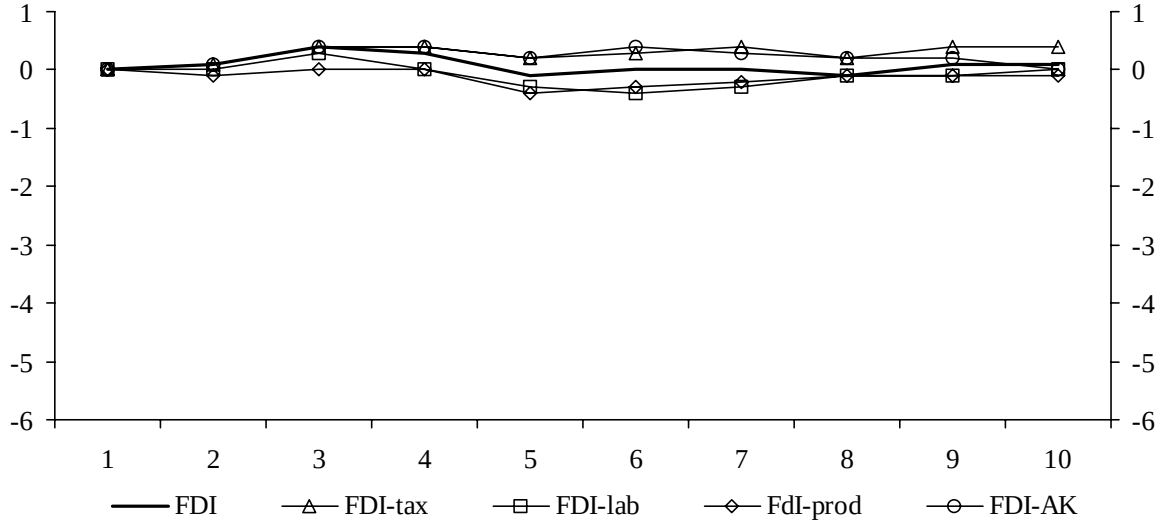
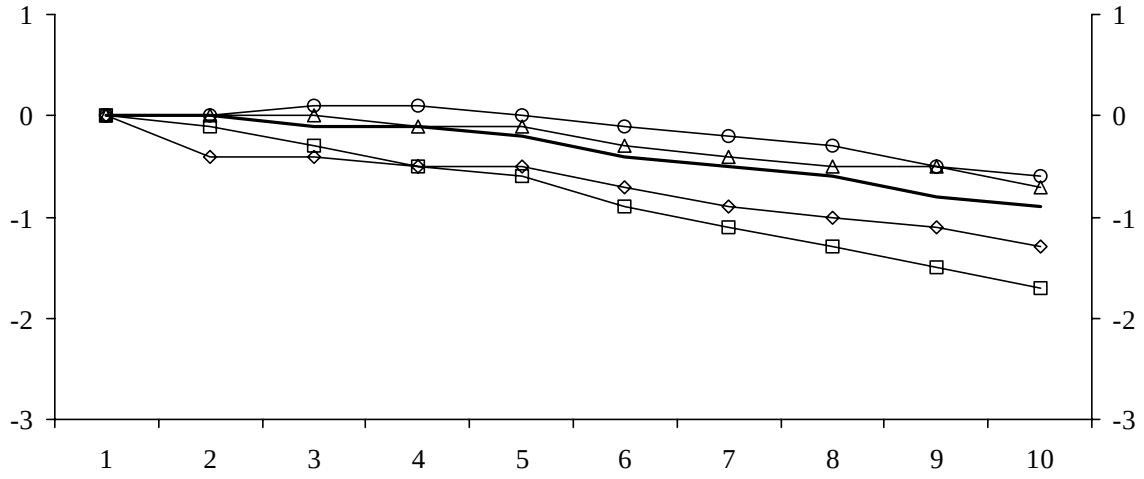
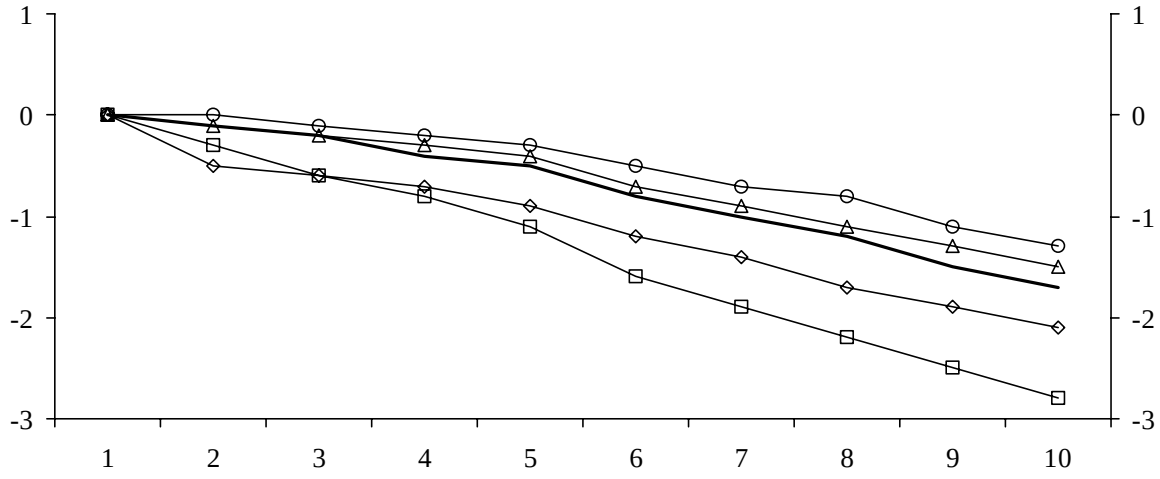


Figure 2 — cont.

Poverty gap, All households



Poverty gap, Urban households



Poverty gap, Rural households

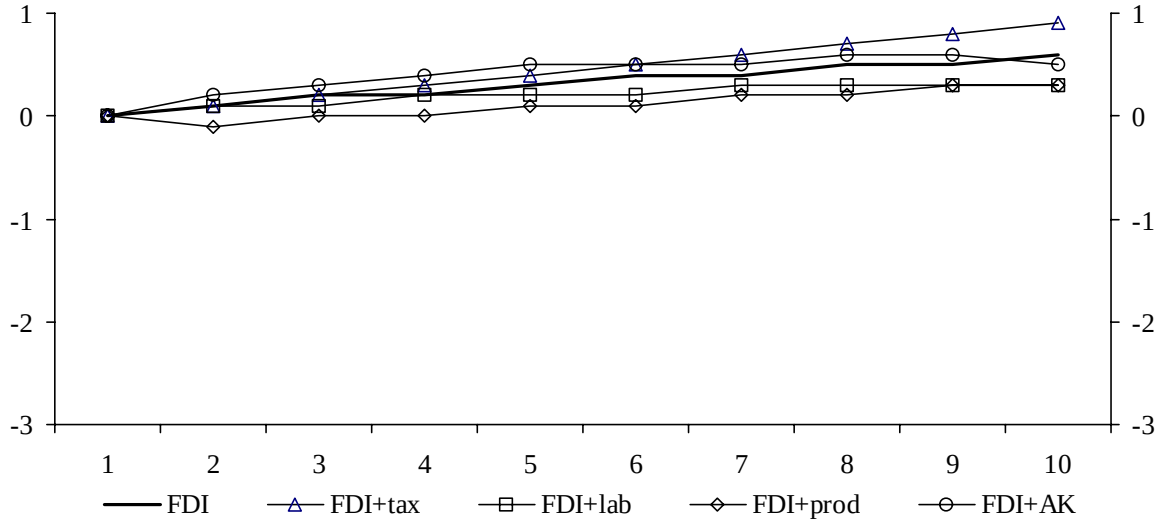
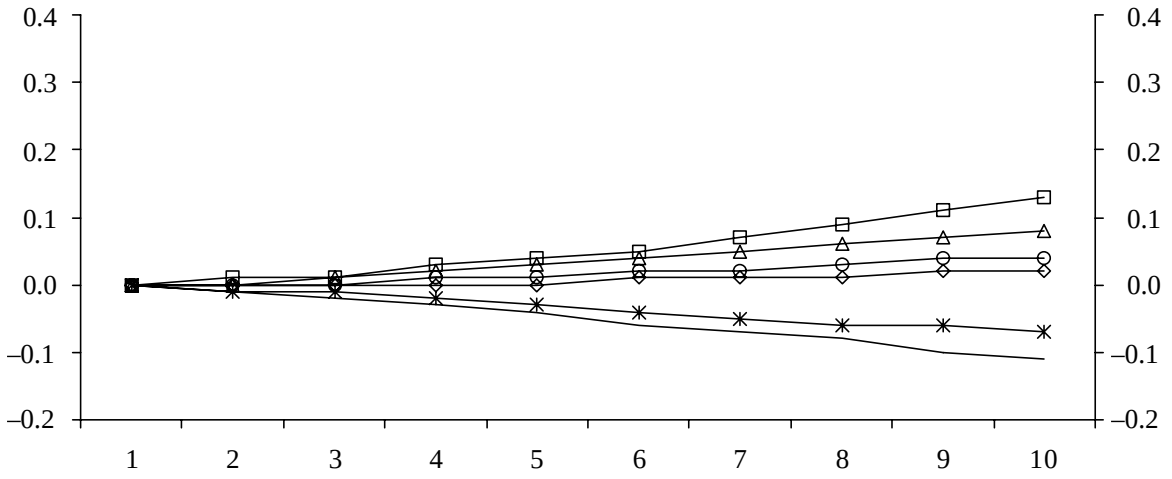
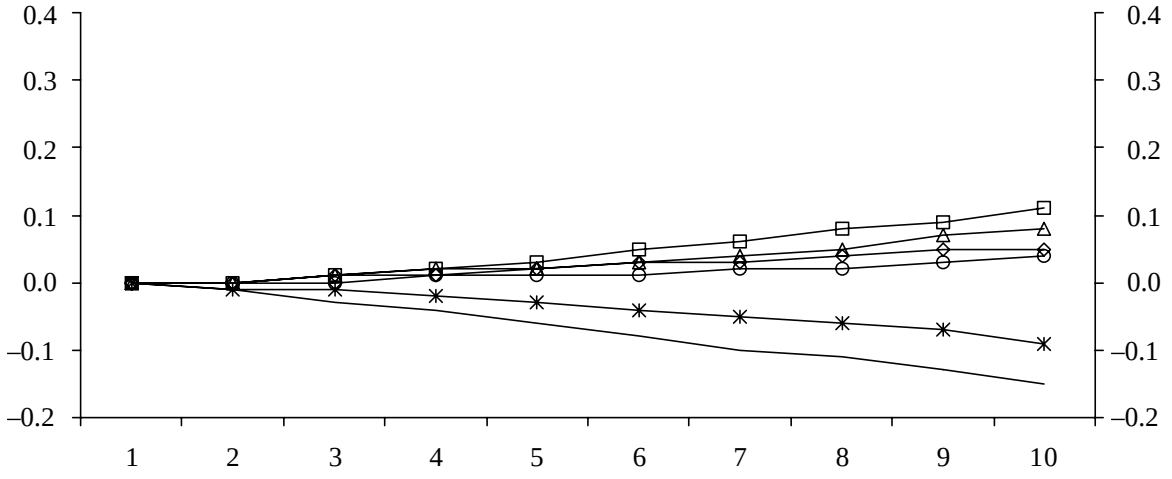


Figure 3 — Real Per-Capita Income

FDI



FDI+tax



FDI+lab

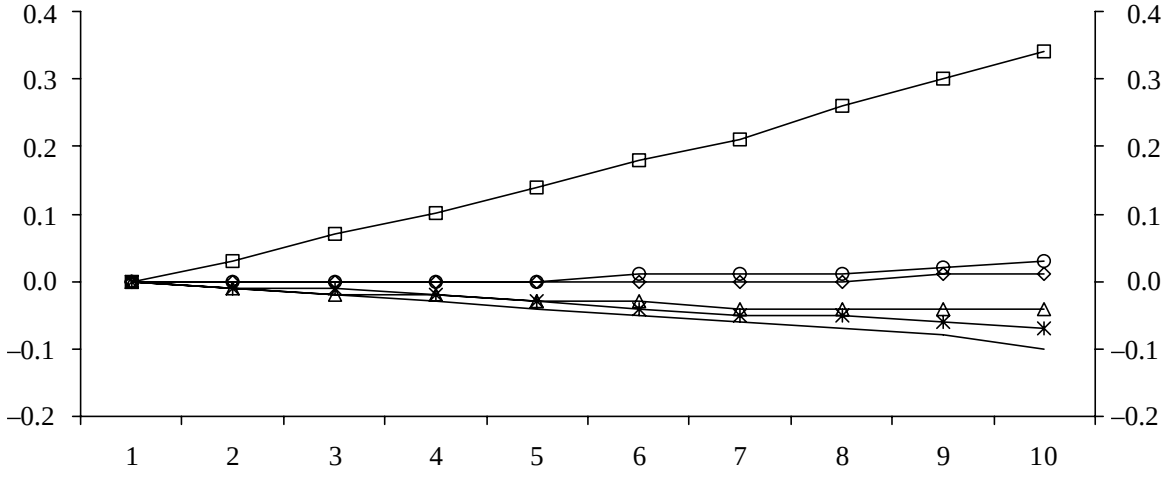
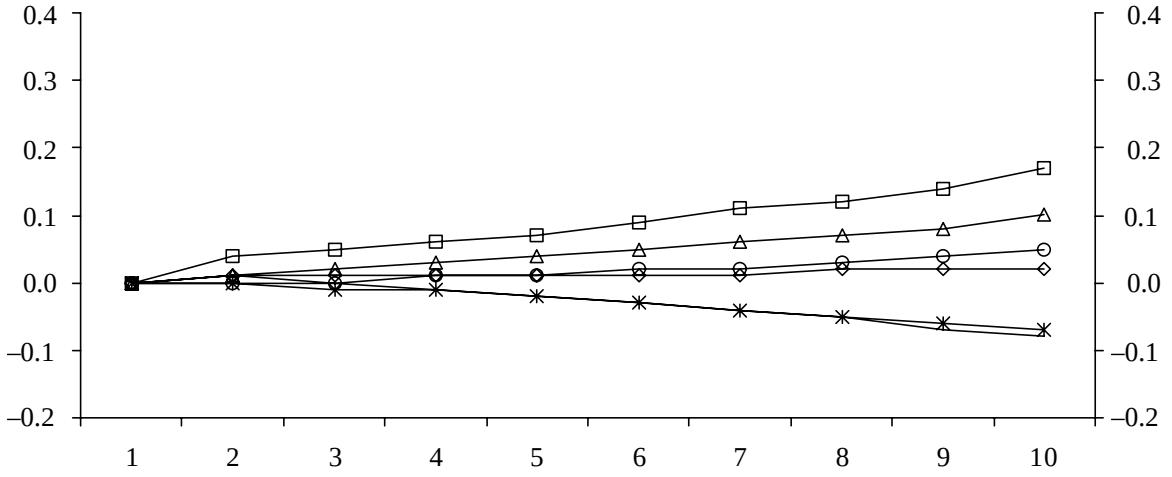


Figure 3 — cont.

FDI+prod



FDI+AK