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International Commodity Prices, Trade and Poverty in Uruguay

Carmen Estrades and María Inés Terra [1]

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I INTRODUCTION

During the last decade international prices of commodities rose sharply. This trend deepened between early 2007 and mid 2008. Up to that moment prices started to fall until they reached the level of end 2006. Given the current financial crisis and uncertainty, it is hard to predict the future evolution of primary prices. Nowadays, prices are still higher than in previous decades, but they could rise again or continue to fall.

These trends are a cause of both long-term and short-term factors. They are a consequence of the increase in biofuels production (Mitchell, 2008) and the rise in demand for food, as a result of world urbanization and population growth, leaded by China and India. However, changes in demand are gradual and do not explain by themselves the sharp increase in prices (FAO, 2008). The rise in speculation in agricultural market, as a consequence of a liquidity excess in financial markets, has contributed to a fluctuation of prices. Other factors such as the fall in stocks due to climate problems (FAO, 2008) or a decline in supply have also contributed to these trends.

Previous studies about the impact of changes in international prices on welfare in developing countries are not conclusive. Historically, prices of industrial goods have risen more sharply than prices of primary goods. Between 1977 and 2001, "commodity prices lost more than half of their purchasing power in terms of manufactured goods" (UNCTAD, 2002: 5). This study also highlights that this falling behind of commodity prices was in the medium term an obstacle to growth of developing countries, especially of those specialized in few agricultural goods. Paradoxically, the recent increase in food

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[1] Departamento de Economía, Facultad de Ciencias Sociales, UDELAR

prices seem to harm even more developing countries, although the net effect, according with Ivanic and Martin (2008), will depend on how much primary producers benefit and how much poorer consumers loose in each developing country. Aksoy and Isik-Dikmelik (2008) consider that the analysis is more complex, because the income of food consumers also depends on the income of food producers, so that second order effects must be taken into account.

Uruguay is a small developing country, with strong comparative advantages in agricultural goods production. It is an important exporter of agricultural goods, food and primary products processed from its natural resources, and an oil importer. In the last years, the increase in international prices of food and other primary products has contributed to a significant growth in its exports. At the same time, though, import prices have also increased as a consequence of the rise in prices of oil and other energy products. Therefore, the effect of the increase in prices on general welfare is not clear, and neither is the effect on poverty.

This paper has two objectives. The first one is to evaluate the impact of the recent increase in commodity prices on macroeconomic variables, trade, labor market, welfare, income distribution and poverty in Uruguay. The second one is to discuss some policy actions aimed to prevent the negative impact on poverty caused by soaring commodity prices.

For doing so, we apply a computable general equilibrium (CGE) model with microsimulations. This methodology is adequate for this type of analysis, because it captures the different channels through which external shocks are transmitted to domestic economy, such the labor market channel, which is explicitly modeled (Hertel and Reimer, 2005).

This article is organized in five parts. In part II we present some relevant structural characteristics of the Uruguayan economy. In part III we present the methodology while in part IV we present the simulations. In part V we discuss the results obtained and finally we draw some conclusions.

II FACTS ON URUGUAYAN ECONOMY

Four features of the Uruguayan economy should be taken into account for this analysis:

a) Uruguay has a strong specialization in agricultural exports: almost 58% of total exports are concentrated in seven groups of products. Between May 2002 and May 2008, international prices of some of these products soared, especially dairy products and some cereals like rice (table 1). Change in meat prices was quite lower, but it is still important because the relative importance of this commodity in Uruguayan exports: 20% of total exports.

Table 1. Change in International prices export-oriented agricultural products in Uruguay

	Share in total exports 2007	Percentage variation in international prices	
		May 2002- May 2008	May 2006-May 2008
Meat	**19.7**		
Bovine meta	17.8	28.7	10.4
Dairy and honey	**7.9**		
Milk	3.4	246.2	114.3
Cheese	2.5	189.9	86.9
Cereals	**7.6**		
Rice	6.2	409.0	235.0
Wheat	0.5	170.7	70.2
Barley	0.5	144.3	121.7
Corn	0.4	169.5	120.2
Leather	**6.8**	-20.1	-2.6
Wood	**5.5**	89.8	16.0
Wool	**5.2**	71.6	45.1
Seeds	**4.9**		
Soya	4.7	176.9	125.0
Total	57.6		

Source: own elaboration with data from IMF, CBU, AMD

b) Petroleum and other fuels stand for 22% of total imports. International prices of these commodities also increased significantly in the last few years. According to IMF, between May 2002 and May 2008 energy commodity prices increased 364%, leaded by a steep rise in oil prices of 378%.

As a consequence of these factors, the purchasing power of Uruguayan exports increased, but at the same time terms of trade fell, as it is shown in figure 1.

Figure 1. Uruguay: Exports purchasing power index and terms of trade index. Index 2000 = 100
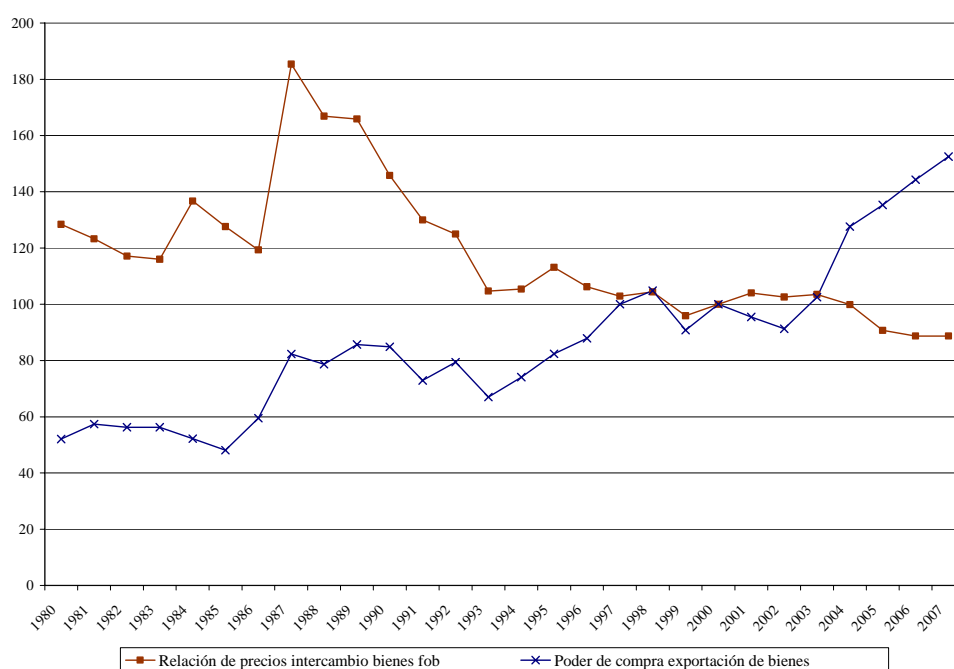
Source: own elaboration with data from ECLAC

c) As in many developing countries, the poorest households spend a higher share of their income in food and beverages. Therefore, an increase in food prices may harm mostly these households. According to the most recent Expenditure and Income Survey, carried by the National Statistics Institute, households belonging to the poorest decile of income spend almost 35% of their expenditure in food and non-alcoholic beverages, while this percentage falls to 11% for households belonging to the richest decile (NSI, 2008). In contrast, the richest deciles spend a higher share of their income in energy products. Figure 2 shows the share of food and fuels in total consumption of households, according to their decile of income. Data was taken from the Social Accounting Matrix (SAM), based on 1994 Expenditure and Income Survey. This is the SAM we used to calibrate our model.

Figure 2: Share of food and fuels in households' consumption
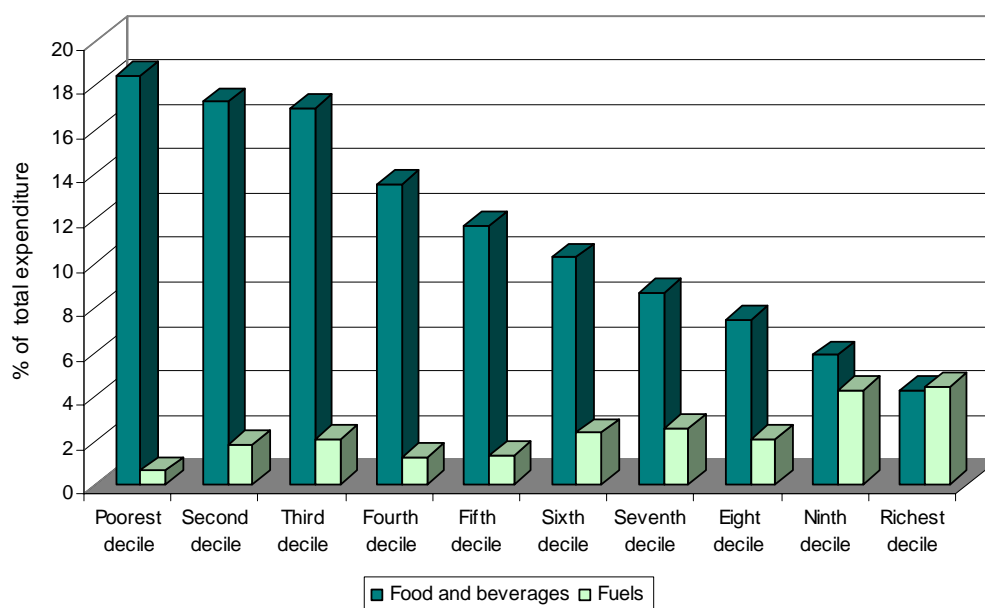
Source: Uruguay SAM, 2000

d) Lastly, sources of income also vary across households. The main sources of income for the poorest households are government transfers and unskilled and medium-skilled wages, while for the richest households are capital remuneration and skilled wages.

Figure 3: Households' income sources
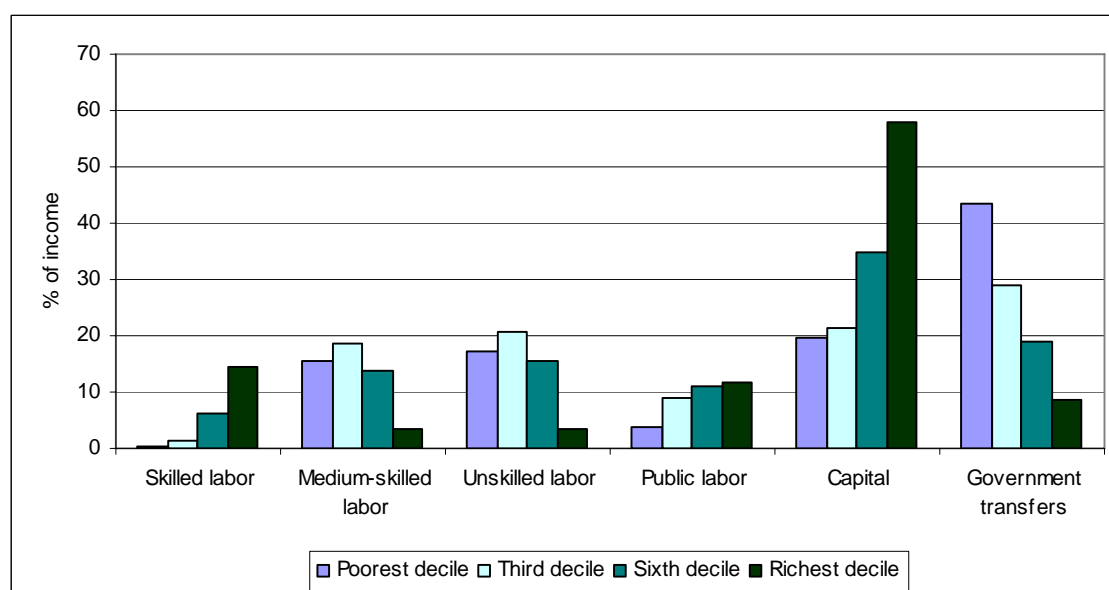
Source: SAM Uruguay, 2000

III METHODOLOGY

With the aim of analyzing the effects of price changes and discussing policies to attend the most harmed individuals, we worked with a CGE model with microsimulations.

1 Computable General Equilibrium Model for Uruguay

The CGE model is based on models by Terra et al. (2006) and Estrades and Terra (2008). It is a single country static model with perfect competition in goods and factors markets, except in the unskilled labor market, where we assume dual markets, and the public sector in which employment is fixed. We assume that Uruguay is a quasi-small economy[2] that trades with three partners: Argentina, Brazil and the rest of the world. The country faces a negatively sloped export demand; while import demand is perfectly elastic. Goods are differentiated by geographical origin, following an Armington specification.

It is a multisectoral model with ten households and four factors of production. The factors are perfectly mobile among sectors, except capital, that is specific. Sectors produce for the domestic market and for export, using intermediate inputs (domestic and imported) and value added (composite labor and capital).

We assumed that the increase in commodity prices is a short-term phenomenon that generates changes in relative payments to factors but it does not produce the productive restructure that would take place if the increase was permanent. It is an extreme assumption, because even when there are short-term factors related to the increase in prices, there are also signs that show that permanent changes in the world economy are taking place. This assumption leads to introduce Leontief production functions for those sectors where prices changed, and to consider specific capital.

For the rest of the sectors, we assumed Cobb-Douglas production functions, allowing imperfect substitution between the different inputs, and inputs and value added. However, all sectors can substitute capital and labor, and different types of labor.

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[2] Harris, 1984

We also consider an informal sector that employs informal workers. It is a non-tradable sector that does not use capital or skilled labor. The wage difference between formal and informal labor is modeled through efficiency wages, paid by formal sectors. The efficiency wage specification follows Thierfelder and Shiells (1997).

We assume that current account balance is fixed, while government and households' savings are endogenous.

2 Calibration

The model was calibrated for year 2000 using the SAM built by Barrenechea et al. (2004) and modified by Terra et al. (2006) and Estrades and Terra (2008). The SAM was aggregated in 23 sectors. Labor was disaggregated in three categories, according to years of schooling: unskilled labor (8 years or less of schooling), medium-skilled labor (between 9 and 11 years of schooling) and skilled labor (12 years or more of schooling).

3 Microsimulations

Despite the fact that income and consumption variations obtained through CGE let us draw some conclusions on how the scenarios simulated affect poverty and income distribution, the general equilibrium analysis can be complemented with microsimulations in order to analyze the effect of price shocks and policy options on households at a micro level.

We applied a top-down microsimulation strategy following Ganuza et al. (2002). Results obtain through the CGE model are introduced in microsimulations as percentage variations of the initial level of the following variables: formal employment rate, informal employment rate, wage by type of workers and average wage of the economy[3]. We used microdata from the 2001 Continuous Households Survey.

Changes in labor market variables, assigned randomly and sequentially on individuals, allow obtaining their counterfactual income in each scenario simulated, and then calculating percentage variations of head-count poverty index and extreme poverty

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[3] Our model considers fixed unemployment and does not include changes in education level of population, so microsimulations do not incorporate changes in those variables.

index, taking as reference the 2001 poverty and extreme poverty lines. The microsimulations syntax was taken from Cicowiez (2006) and is run using STATA.

The microsimulation approach is the same as in Ganuza et al (2002) but in this case we adjust poverty and extreme poverty lines according to changes in domestic prices, which are obtained through the CGE model. The extreme poverty line value is updated with a food and beverages price index, while the poverty line value is updated with the general consumption price index[4].

This methodology still has some limitations, as for example not considering changes in remuneration to other factors of production, as capital, or changes in transfer income. Therefore, when there are significant changes in returns to capital, it is not adequate to evaluate the impact of price shocks on income distribution at a micro level.

IV SIMULATION STRATEGY

We simulated price variations in four export activities (agricultural, meat processing, dairy and rice) and in two import or import substitution activities (refinery and gas), taking into account actual price changes between 2000 and 2008. We selected those activities because of their importance in Uruguayan trade and the magnitude of the price change that took place between those two years. To do so, we matched the commodities whose prices are reported by IMF with the activities of the Uruguayan SAM. In those cases where to one activity corresponded more than one commodity, we calculated the weighted average variation taking into account the share of the commodity in exports (imports) for those export (import) activities.

We defined seven scenarios of price shocks, where we simulated simultaneously an increase in import prices and in domestic prices in the partner country. We simulated an increase in prices for each activity, for all agricultural activities and for import and

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[4] This is more or less the procedure implemented by the National Statistics Institute to update poverty lines (see NSI, 2008). The food and beverage price index is estimated from changes in prices of the following sectors: agriculture, husbandry, meat processing, dairy, rice and barley, domestic market products and rest of primary products.

export activities together. Table 2 presents the simulated percentage change of export and import prices.

Table 2. Price shock scenarios

	Scenario		Product	Change in international prices (%)	
				Export	Import
1	Fuels	PPETRO	Petroleum	216	216
			Refinery		193
			Gas		82
2	Agricultural	PAGRI	Fruits and unprocessed rice	117	117
3	Meat	PFRIG	Meat	29	29
4	Dairy	PLAC	Dairy	156	156
5	Rice	PARRO	Rice and barley	153	153
6	Export commodities	PEXP	Fruits and unprocessed rice	117	117
			Meat	29	29
			Dairy	156	156
			Rice and barley	153	153
7	Import and export commodities	PCOM	Petroleum	216	216
			Refinery		193
			Gas		82
			Fruits and unprocessed rice	117	117
			Meat	29	29
			Dairy	156	156
			Rice and barley	153	153

We also designed three policy scenarios to compensate the most harmed households negatively affected by an increase in food prices:

- Elimination of value added tax (VAT) on food
- Elimination of VAT and of tariffs on food
- Increase in government transfers to the poorest households (for households in the two poorest decile an 8% increase and for the third and fourth decile households a 5% increase).

Finally, we simulated a fourth policy scenario with the purpose of lessening the impact of the increase in fuel prices: a reduction in the Internal Specific Tax (IMESI) on this commodity.

The four policy scenarios have a negative impact on government finances. The first one, the reduction of VAT, is simple and easy to apply. The second one is more complex, because Uruguay is part of a Customs Union and does not have the freedom to change tariffs unilaterally without creating a conflict within MERCOSUR. The third scenario is a focalized policy with the direct aim of compensating the most harmed households. It may be more complex to implement because it requires identifying the objective groups. Finally, the elimination of IMESI has a direct impact on fuel prices and is easy to implement.

All policy scenarios were run taking as reference the price scenario where simultaneously increase oil prices and agricultural commodities prices.

V INTERNATIONAL PRICE VARIATIONS, POLICIES AGAINST POVERTY AND WELFARE

Results obtain through the CGEM and microsimulations show that the increase in international prices of agricultural commodities has a positive impact on the economy and improves income distribution, but affects negatively the poorest households. Poverty and extreme poverty increase because food prices rise, deteriorating their purchasing power. Therefore, policies to compensate the most harmed households should be implemented. The increase in oil prices affects negatively all households, and particularly the richest households, which spend a highest proportion of their income in energy commodities. In this section we discuss these conclusions with more detail; first the price shocks scenarios and second the policy options.

1 Effects of changes in international prices of commodities

Changes in international prices of commodities affect relative prices of goods and factors generating changes in production, trade flows, factor distribution among activities and income distribution.

1.1 Impact on macroeconomic variables, prices and specialization

In the short run, resource reallocation is limited because capital and land are specific factors of production and we assumed fixed requirements of inputs and value added. If the price of a product increases, production also rises, increasing the number of workers on a fixed amount of capital, and therefore decreasing returns operate and labor productivity falls, preventing a productive restructure.

An increase in energy prices lead to a fall in GDP, consumption, investment and real imports (see table 3). There is a higher demand for foreign currency, thus local currency depreciates and exports grow. In contrast, the increase in agriculture commodities prices has a positive impact on the economy: GDP, consumption, investment and imports rise, while real exports fall, or increase at a lower rate than imports.

In contrast, when export prices increase, there is an excess of foreign currency, leading to a rise in domestic demand and a significant appreciation of the local currency, which leads to a fall in competitiveness, a decrease in exports for other exporting sectors and a reallocation of resources towards non-tradable sectors. This is in some way similar to a "Dutch disease" phenomenon: production concentrates in few sectors for which international prices increase, while production falls for the rest of the sectors. In spite of this, GDP and absorption increase.

Obviously, the strongest effect occurs when prices of the four main export activities rise simultaneously. Price changes of dairy products have a strong incidence on this result, followed by rice and barley and meat processing. The increase in meat prices, even when is lower than for other commodities, has a significant impact due to the importance of the sector in Uruguayan exports.

Table 3. Effects on macroeconomic variables. Percentage variation

	Change in international prices of:						
	Export and import commodities	Fuels	Export commodities	Rice	Dairy	Agricultural	Meat
GDP	3.2	-3.5	6.6	2.6	2.6	0.7	1.4
Absorption	1.2	-4.0	5.0	2.6	1.6	-0.2	1.4
Households' consumption	-0.8	-3.6	2.7	1.8	0.9	-0.3	0.4
Investment	14.4	-10.1	24.0	9.5	7.4	-0.2	9.4
Exports	0.7	7.7	-4.6	-6.5	-2.9	1.4	-0.2
Imports	9.2	-9.2	20.1	7.0	5.3	0.1	6.3
Real exchange rate	-6.3	0.7	-6.9	-2.1	-2.1	-0.4	-2.5

Source: own results

In spite of the rigidities assumed in the production function, relative price variation is so important that leads to a significant change in productive structure (see table 4). The four activities for which international prices increase raise their production, and so do non-tradable activities, but production falls for the rest of the activities. Production of tradable activities goes to the external sector: their exports increase and rest of exports fall.

When oil prices increase, production of refinery and gas fall (because they face higher production costs), the final price increases and their demand falls. In order to keep the external account of petroleum balanced, the local currency depreciates, improving competitiveness in export sectors, reducing non-tradable production and increasing total exports (8% at constant prices).

Table 4. Effect on production and exports. Percentage variation

	Export and import commodities	Fuels	Export commodities	Rice	Dairy	Agricultural	Meat
	Change in international prices of:						
	Production						
Agriculture	13.0	-4.6	15.7	3.1	0.9	13.4	1.0
Husbandry	4.8	0.2	4.7	-0.5	0.3	-0.2	4.4
Meat processing	13.2	1.3	11.5	-1.6	-2.2	-0.2	16.3
Dairy	13.3	-0.1	13.1	-0.1	14.0	-0.1	-2.2
Rice and barley	14.0	0.2	13.8	14.7	-0.8	-13.0	-1.1
Refinery	-8.7	-10.9	-0.2	0.0	-0.1	0.0	-0.1
Gas	-4.2	-7.3	1.7	0.9	0.7	-0.2	0.4
Non tradable	6.7	-5.0	11.2	4.4	3.4	0.4	4.0
Rest	-2.8	-0.7	-2.1	-0.5	-0.4	-0.2	-1.0
	Exports						
Agriculture	233.9	-3.1	233.5	-12.6	-5.6	317.7	-7.3
Husbandry	-97.2	27.4	-98.0	-24.8	-43.0	-3.7	-93.1
Meat processing	52.1	7.6	44.5	-7.8	-8.1	-0.6	61.6
Dairy	108.6	4.1	104.9	-3.9	112.2	-0.2	-6.6
Rice and barley	45.2	2.0	44.2	46.6	-2.3	-18.2	-2.8
Rest	-23.6	8.4	-29.0	-10.9	-8.7	-1.1	-11.5

Source: own results

Changes in resource allocation lead to changes in relative demand of factors and in their prices. The four export activities that increase their prices are intensive in natural resources, and, to a lower extent, in unskilled labor. Therefore, formal employment increases (0.7%) and so do unskilled wages (4.7%). Informality falls among this group of workers (see table 5). Medium skilled wages increase 2.8%. In contrast, demand and wages for skilled workers fall. Returns to capital increases more than proportional in agricultural export activities and falls in other sectors, except in activities that are important providers of inputs and benefit from export activities. This is the case of meat processing and rice and barley, which work with inputs from agriculture and husbandry. To sum up, commodity prices increase more than wages, and returns to specific capital fall in activities for which production falls and increase in activities that expand.

Table 5. Effects on employment, wages and returns to capital.

Percentage variation

	Change in international prices of:		
	Export and import commodities	Fuels	Export commodities
Formal employment			
Unskilled labor	0.9	0.1	0.7
Medium-skilled labor	0.1	0.1	0.0
Informal employment			
Unskilled labor	-1.5	-0.2	-1.3
Medium-skilled labor	-0.2	-0.3	0.1
Wages			
Unskilled labor	1.4	-3.4	4.7
Medium-skilled labor	-0.3	-3.2	2.8
Skilled labor	-2.6	-2.6	-0.1
Average wage	-1.6	-2.6	1.1
Returns to capital			
Agriculture	54.0	-17.2	73.5
Husbandry	15.8	-2.7	19.1
Meat processing	34.4	0.0	34.0
Dairy	293.0	-4.0	292.3
Rice and barley	529.6	-1.5	524.8
Refinery	-70.9	-77.8	-1.9
Gas	12.9	11.6	-2.0

Source: own results

On the other hand, the increase in oil prices leads to a fall in payments to all factors. There is a resource reallocation from non-tradable activities to export activities, which are intensive in unskilled and medium-skilled labor, and thus lower skilled labor employment rises and informality falls. Wages fall significantly but returns to capital fall even more (see table 5); in the case of refinery they fall 78%, while producer prices fall 35%. This happens because Uruguay does not produce petroleum, and there is a significant increase in the price of the main input of refinery sector.

1.2 Poverty and income distribution

There are several channels through which changes in international prices affect poverty. Our model considers some of them: changes in labor market, changes in domestic commodity prices, changes in payments to factors, availability of goods for consumption, and changes in government and households' income.

Variations in payments to factors have a significant impact on agents' income (table 6), as well as on informality among the poorest households. While natural resources are

owned by the richest households, unskilled labor is concentrated in the poorest households. A rise in agriculture prices leads to an increase in income of all agents while and increase in oil prices has the opposite effect. Fall in income is more pronounced for richer households, because returns to capital fall significantly[5]. Therefore, we might conclude that an increase in oil prices lead to attenuate disparities in income distribution.

Table 6. Effects on income and consumption of agents. Percentage change

	Change in international prices of:						
	Export and import commodities	Fuels	Export commodities	Rice	Dairy	Agricultural	Meat
Income							
Poorest decile	-0.7	-3.3	2.5	1.3	0.6	-0.2	0.8
Second decile	-0.6	-3.4	2.7	1.5	0.7	-0.3	0.8
Third decile	-0.6	-3.3	2.6	1.4	0.7	-0.2	0.8
Fourth decile	-0.6	-3.6	2.9	1.7	0.9	-0.3	0.7
Fifth decile	-0.6	-3.6	2.9	1.8	0.9	-0.3	0.6
Sixth decile	-0.7	-3.6	2.7	1.7	0.9	-0.3	0.5
Seventh decile	-0.9	-3.4	2.5	1.6	0.8	-0.3	0.5
Eighth decile	-1.0	-3.4	2.4	1.6	0.7	-0.3	0.4
Ninth decile	-1.0	-3.6	2.5	1.8	0.9	-0.3	0.2
Richest decile	-0.9	-4.0	2.9	2.3	1.2	-0.4	0.0
Government	0.0	-2.4	2.4	1.4	0.6	-0.1	0.6
Consumption							
Poorest decile	-3.2	-2.8	-0.6	1.1	-1.3	-0.3	0.0
Second decile	-3.0	-3.3	0.2	1.0	-0.3	-0.4	0.0
Third decile	-2.8	-3.3	0.3	1.0	0.0	-0.4	-0.2
Fourth decile	-1.5	-3.2	1.6	1.5	0.5	-0.4	0.1
Fifth decile	-0.9	-3.3	2.2	1.7	0.8	-0.4	0.2
Sixth decile	-1.0	-3.4	2.3	1.7	0.8	-0.4	0.3
Seventh decile	-0.8	-3.3	2.4	1.7	0.8	-0.3	0.4
Eighth decile	-0.4	-3.2	2.7	1.6	0.9	-0.3	0.5
Ninth decile	-0.7	-3.8	3.1	1.9	1.1	-0.3	0.5
Richest decile	-0.1	-4.2	4.0	2.4	1.6	-0.2	0.4

Source: own results

An increase in the international prices of rice and dairies leads to a higher increase in income for the richest households. Thus, inequality rises. On the contrary, an increase in the international price of meat benefits the poorest households and equity improves. This difference is explained by the magnitude of the increase in capital returns in the first two scenarios and by the increase in unskilled wages in the third scenario, because meat processing activities are more intensive in unskilled labor. Under this scenario

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[5] 58% of income of households from the tenth decile come from capital remuneration. See figure 3.

wages for unskilled and medium skilled workers have the highest increase: 2.8 and 4.7% respectively.

The simultaneous increase in prices of the four main export activities raises income for all types of households, without affecting income distribution. Lastly, when both export prices and import prices rise, the negative effects of an increase in oil prices prevail: income for all households fall, mainly for the four richest households.

However, households' welfare depends on consumption possibilities that vary with changes in income, but also with changes in prices of commodities that are part of the consumption basket. As we already mentioned (see figure 3), food represents a higher share in the poorest households' expenditure, while fuels represent a higher share in the richest households' consumption basket.

The increase in food prices reverts the positive effect of an increase in income, especially for the poorest households. When dairy prices increase, consumption for the first and second decile falls, even when their income increases (table 6). When meat prices increase, the most harmed households are the ones belonging to the third decile. It would be good to remember that under this scenario, the poorest households receive the highest increase in their income, but this is not reflected in their consumption.

The increase in oil prices reduces consumption in all types of households, but the fall is stronger for the richest households, because the share of these products in their total consumption. Finally, when both export and import prices rise, there is a fall in consumption for all types of households as well, but the effect is stronger among the poorest households.

In order to analyze the effect of these shocks on poverty, we run microsimulations. Results are significant at 95% and are presented in table 8.

When oil prices increase, poverty and extreme poverty rise. This is due to two effects operating simultaneously: an increase in poverty and extreme poverty lines values, as a consequence of the rise in living costs, and a fall in wages. This last effect has a higher incidence on the result.

Table 8. Effects on poverty. Benchmark values and percentage change

	Benchmark values (%)	Change in international prices of:		
		Export and import commodities	Fuels	Export commodities
Poverty index	17.8	0.4	3.8	-3.0
Extreme poverty index	1.5	33.7	7.9	24.9

Source: own results

An increase in agricultural commodity prices reduces poverty by 3%. Two opposite effects determine the magnitude of the fall: on the one hand labor wages increase, especially for unskilled labor, and on the other hand consumption prices increase, and real income falls. On the contrary, extreme poverty increases, because the extreme poverty line value increases more, due to the highest rise in prices of basic consumption goods (food and beverages). As we can see in table 7, under this scenario only the households in the first poorest decile reduce their consumption.

When both export and import prices increase, poverty and extreme poverty rise, because of the increase in prices of consumption goods.

2 Policies to compensate the poorest households

The policy options simulated have slight effects on macroeconomic variables. There are no significant changes of relative prices or resource allocation (see table 9). The elimination of IMESI on fuels has the highest impact, because it reduces average prices, government revenue and savings and it raises household consumption, reducing private savings and investment. Changes in relative payments to factors are also minor in the four scenarios.

The only policy that has a positive significant effect on the poorest households is the transfer policy. This policy is also the least costly to the government. On the contrary, VAT and tariff reduction policies on agriculture activities are very costly and do not improve welfare for the most damaged households. They reduce poverty, but they fail in reducing extreme poverty. This is reasonable, because the poorest households operate mainly in the informal economy. Lastly, a reduction of IMESI on fuels does not benefit

the poorest household either. It actually benefits more the richest households, because they spend a higher share of their income in fuels.

Table 9. Effects on main macroeconomic variables. Percentage variation

	Reduction in VAT on food	Reduction in VAT and tariffs on food	Transfers to poorest households	Reduction in IMESI on energy products
Nominal GDP	3.2	3.2	3.2	3.0
Real GDP	-0.4	-0.4	-0.4	-0.3
Absorption	1.2	1.2	1.2	1.2
Households' consumption	-0.4	-0.4	-0.6	-0.1
Investment	11.9	11.8	12.6	9.7
Exports	4.3	4.6	0.6	1.2
Imports	12.2	12.4	9.0	8.7
Real Exchange rate	-6.2	-6.2	-6.3	-6.1

Source: own results

The fiscal cost of these policies is uneven: government income falls in the four policy scenarios, but the fall is significantly lower in the transfer policy. When IMESI on fuels is reduced, government revenue falls by 200 million dollars, while the direct and indirect cost of reducing VAT and tariffs on food is close to 100 million dollars. On the other hand, a transfer policy represents a cost of around 2 millions to the government (see table 10).

VAT and tariff reductions (the two first scenarios) attenuate the fall in households' income and consumption but they do not prevent it (see table 10). Only households in the richest decile increase their consumption. These policies do not have a significant impact on income distribution either. On the contrary, focalized transfers to poorest households generate a significant increase in their income and consumption also increases for the households belonging to the poorest decile. In the other three deciles, increase in income does not compensate the increase in food prices and thus consumption falls. Finally, the reduction of IMESI on fuels has an equal positive effect on households' income, but benefits more the richest households by incrementing their consumption possibilities.

Table 10. Effects on income and consumption. Percentage variation

	Reduction in VAT on food	Reduction in VAT and tariffs on food	Transfers to poorest households	Reduction in IMESI on energy products
	Income			
Poorest decile	-0.3	-0.2	2.7	-0.1
Second decile	-0.2	-0.2	2.1	0.0
Third decile	-0.2	-0.2	0.8	0.0
Fourth decile	-0.1	-0.1	0.6	0.1
Fifth decile	-0.2	-0.2	-0.6	0.1
Sixth decile	-0.3	-0.3	-0.7	0.0
Seventh decile	-0.5	-0.4	-0.9	-0.2
Eighth decile	-0.6	-0.6	-1.0	-0.3
Ninth decile	-0.6	-0.6	-1.0	-0.2
Richest decile	-0.4	-0.4	-0.9	0.0
Government	-2.0	-2.1	-0.1	-3.6
	Consumption			
Poorest decile	-2.7	-2.7	0.1	-2.7
Second decile	-2.5	-2.4	-0.3	-2.4
Third decile	-2.3	-2.2	-1.5	-2.3
Fourth decile	-1.0	-1.0	-0.3	-0.9
Fifth decile	-0.5	-0.4	-1.0	-0.3
Sixth decile	-0.5	-0.5	-1.0	-0.3
Seventh decile	-0.3	-0.3	-0.8	-0.1
Eighth decile	0.0	0.0	-0.4	0.2
Ninth decile	-0.3	-0.3	-0.7	0.1
Richest decile	0.3	0.3	-0.2	0.9

Source: own results

Tax cuts are not an efficient policy to reduce poverty and extreme poverty. Poverty falls as a consequence of lower skilled wages rising, but extreme poverty increases (see table 11). These policies, meant to prevent a rise in domestic prices, have a very slight effect on them.

Table 11. Effects on poverty and income distribution. Percentage change

	Benchmark values (%)	Reduction in VAT on food	Reduction in VAT and tariffs on food	Reduction in IMESI on energy products
Poverty index	17.8	-0.2	-0.1	-0.3
Extreme poverty index	1.5	31.5	31.0	33.5

Source: own results

The effect of a transfer policy on poverty and extreme poverty is not captured by microsimulations, because they only consider changes in labor income.

VI CONCLUSIONS

There are many channels through which changes in international prices affect welfare. Thus, we should be careful in generalizing, especially when analyzing developing countries, which might differ strongly. In this paper we analyze these effects in the case of Uruguay, a small country that exports agriculture commodities and imports fuels. We adopted some assumptions regarding the nature of the change in relative prices and we examined the different channels through which they affect welfare. We find that there are many factors that operate in different directions, and thus the final result is not obvious.

In general, a change in international prices has a positive effect on the Uruguayan economy. Benefits obtained through a growth in export activities' production are partially outset by an increase in oil prices, the main component of imports. However, even under this positive scenario extreme poverty increases. This fact points out the need of policies to attenuate the negative effects of price shocks.

Agriculture activities are intensive in capital (natural resources) and to a lower extent in unskilled labor. Therefore, under this scenario the poorest households' income increases and thus poverty falls, but extreme poverty increases because their consumption basket becomes more expensive. On the contrary, a sole increase in oil prices reduces income for all types of households, increasing poverty and extreme poverty.

We assessed four policy options to compensate the poorest sectors. None of them has a significant impact on major macroeconomic variables. The three tax reduction policies (VAT, tariffs and taxes on oil) do not have a significant impact on income, consumption and households' welfare. In contrast, a focalized policy on the poorest households of income transfers has a significant positive impact on consumption and welfare in the poorest households and its fiscal cost is lower than for the other policies. Lastly, a policy of reduction of taxes on oil, even when it increases income for all types of households evenly, benefits more the richest households that spend more in fuels.

This paper shows that the recent increase in demand for food and other basic commodities may have a positive effect on growth in countries with strong competitive

advantages in those products. However, the benefits are not necessarily spilled over all sectors of society. We should evaluate carefully the effects on different groups and evaluate policy options to compensate possible losers.

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