Documentos de Trabajo

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Abstract

Commodity prices have risen sharply since 2006. This may benefit developing countries specialized on primary exports, but poverty may increase. Uruguay is a net exporter of primary products and a net importer of oil. With the aim of analyzing the impact of soaring commodity prices and policy options, we apply a CGE model and microsimulations. A rise in food prices has a positive impact on the Uruguayan economy that is partially offset by the increase in oil prices. Even when poorest households' income rises, their welfare falls because their consumption basket becomes more expensive. Poverty falls but extreme poverty increases. A policy of transfers to the poorest households seems to be the most efficient policy option to compensate poor households.

Keywords: International commodity prices, poverty policies, labor issues, international trade, computable general equilibrium model

JEL classification: F11, F14, F16, Q17

Resumen

Los precios de los *commodities* han aumentado fuertemente desde 2006. Si bien esto puede beneficiar a los países en desarrollo especializados en la exportación de productos primarios, la pobreza podría aumentar. Uruguay es un exportador neto de productos primarios y un importador neto de petróleo. Con el propósito de analizar el impacto de los precios en alza de los *commodities* y de opciones de política, aplicamos un modelo de EGC y microsimulaciones. Un incremento en el precio de los alimentos tiene un efecto positivo sobre la economía uruguaya que es compensado parcialmente por el aumento del precio del petróleo. A pesar de que el ingreso de los hogares más pobres aumenta, su bienestar disminuye debido al encarecimiento de su canasta de consumo. La pobreza se reduce pero la pobreza extrema aumenta. Una política de transferencias hacia los hogares más pobres parece ser la opción de política más eficiente para compensar a los hogares pobres.

Palabras clave: precios internacionales bienes primarios, políticas de pobreza, mercado de trabajo, comercio internacional, equilibrio general computable

I. INTRODUCTION

In the last few years international prices of commodities have shown strong fluctuations. After an unprecedented increase between July 2004 and July 2008, international commodity prices suffered a 55 percent fall, only to start a new increasing trend from February 2009 onwards.

There are a series of factors behind this recent increase in commodity prices. The most important general factor, according to Headey and Fan (2008) and Mitchell (2008) is the increase in demand for some crops used in production of biofuels. This is caused by the increase in oil prices, which has also a direct impact on food prices by increasing agricultural costs. The authors also find crop-specific factors which explain the rise in prices, and disregard other possible causes, such as the increase in demand for food leaded by China and India or the rise in speculation in agricultural markets. According to a FAO report, the first one is mostly gradual and does not explain for itself a sharp increase in prices, and the second one has contributed mainly to a fluctuation in prices (FAO, 2008).

Previous studies about the impact of changes in international prices on welfare in developing countries are not conclusive. Between 1977 and 2001, commodity prices lost purchasing power with respect to manufacture prices (UNCTAD, 2002). This was seen in the medium term as an obstacle to growth in developing countries, especially of those specialized in few agricultural goods, through a fall of terms of trade and welfare (Ocampo and Parra, 2003). Paradoxically, the recent increase in food 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 specialized in exports 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 resulting in a fall of terms of trade. Therefore, the effect of the increase in prices on general welfare is not straightforward, 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. Results show that a rise in food prices has a positive impact on the Uruguayan economy that is partially offset by the increase in oil prices. Even when poorest households' income rises, their welfare falls because their consumption basket becomes more expensive. Poverty falls but extreme poverty increases. In this context, a policy of transfers to the poorest households seems to be the most efficient policy option to compensate poor households.

This article is organized in six 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. SOME FEATURES OF URUGUAYAN ECONOMY

Five 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 meat	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 stood for 22% of total imports in 2007. 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 two factors, in the last 15 years 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
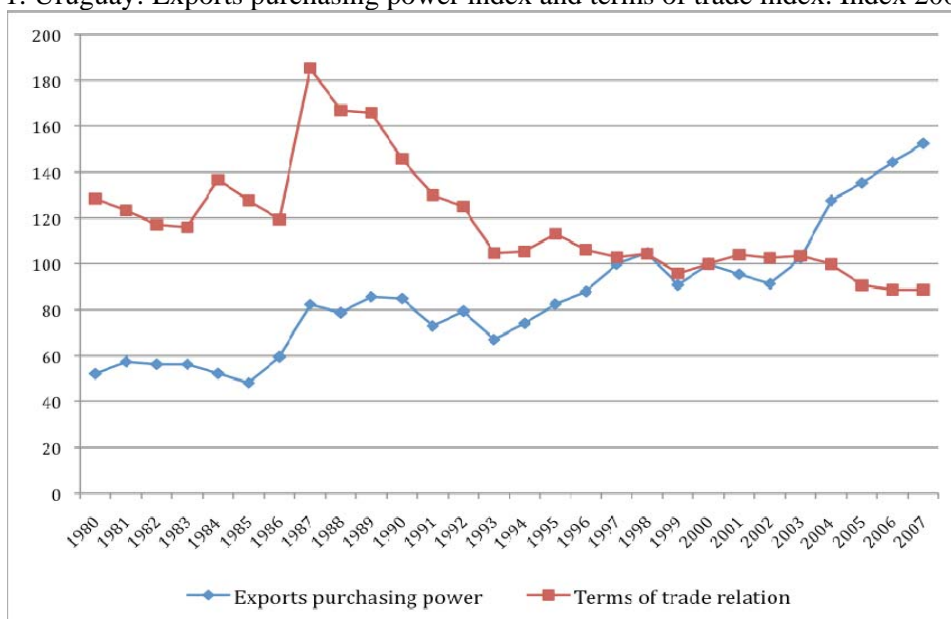
Source: own elaboration with data from ECLAC

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 Households' Expenditure and Income Survey (EIGH), carried by the National Statistics Institute (INE), households belonging to the poorest decile of income spend more than 40% of their total expenditure in food and non-alcoholic beverages, while this percentage falls to 8.5% for households belonging to the richest decile. In contrast, the richest deciles spend a higher share of their income in energy products, as shown in figure 2.

Figure 2: Share of food and fuels in households' consumption
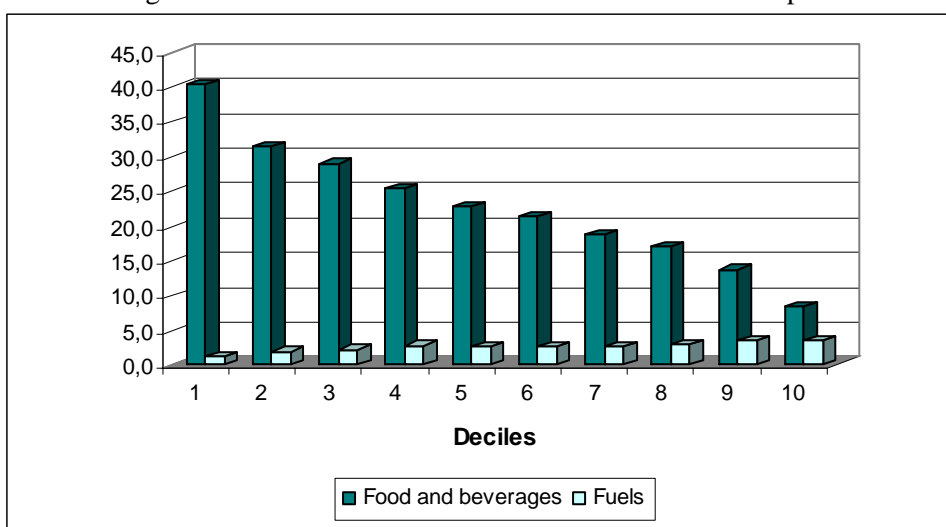
Source: Own elaboration using data from EIGH, 2005-2006

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

Figure 3: Households' income sources
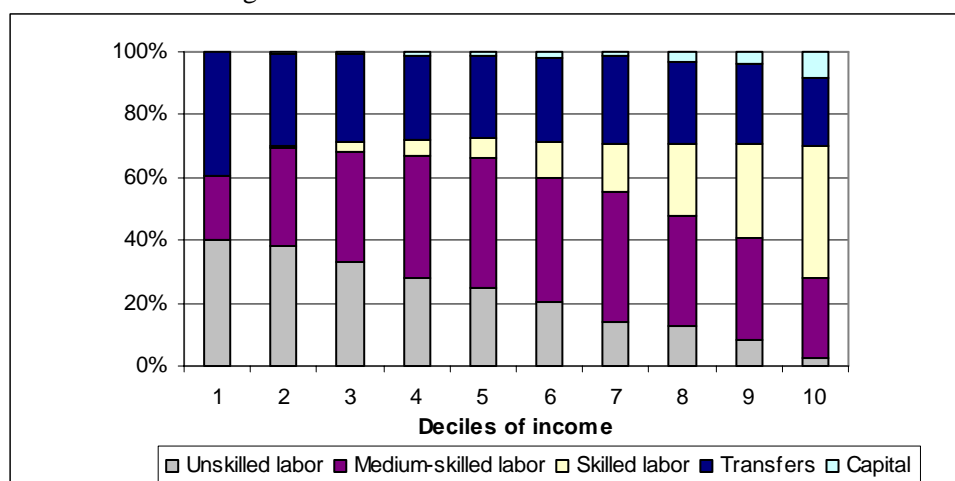
Source: Own elaboration using data from EIGH, 2005-2006

e) Poverty in Uruguay affects around a third of its population and is mainly an urban problem. Even though the poverty headcount is higher in rural areas, rural population in Uruguay is only 6% of total population. Thus, poverty and extreme poverty are mainly urban. Besides, agricultural production for own-consumption is not significant. Agriculture production is concentrated in export leading sectors which are intensive in land and capital, so population is concentrated in urban areas mainly in the capital area (Montevideo), which accounts for almost 40 percent of total population.

Table 2. Poverty and extreme poverty headcount. Percentage of population, 2007

	Total	Urban Areas	Rural Areas
Extreme Poverty	3.4	3.7	1.9
Poverty	32.8	32.2	36.6

Source: INE (2008)

III. METHODOLOGY

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

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 and medium skilled 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]. The country faces a negatively sloped export demand and a perfectly elastic import supply. Both final and intermediate goods are differentiated by geographical origin, following an Armington specification.

It is a multisectoral model with ten households and four factors of production: three types of labor, which are mobile among sectors and capital, which is specific. Factor supply is assumed as exogenous. Sectors produce for the domestic market and for export, combining intermediate inputs and value added through a Leontief production function with fixed coefficients.

Value added is obtained through a nested CES function that combines capital and composite labor at the upper level and labor by skills at the lower level.

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). Laid off workers from the formal sectors go to this sector where wages adjust according to demand and supply variations.

Government income and expenditure are endogenous. It collects taxes, pays transfers to households and consumes final goods. We assume that current account balance is fixed,

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[2] Harris, 1984

while government and households' savings are endogenous. Investment adjusts to savings according to classical closure.

2. Calibration

The model was calibrated for year 2000 using the Social Accounting Matrix (SAM) built by Barrenechea et al. (2004) and modified by Terra et al. (2006) and Estrades and Terra (2008). The SAM is aggregated in 23 sectors. Labor is 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). Capital includes land and other natural resources.

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, average wage of the economy and average rate of return to capital[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, extreme poverty index and Gini coefficient, taking as reference the 2001 poverty and extreme poverty lines[4].

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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.
[4] 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 extreme poverty line according to changes in food and beverages price index, which are obtained through the CGE model[5].

This methodology still has some limitations, as for example not considering changes in transfer income. Besides, we consider the weighted average rate of return to capital and not the sectoral rates, which would be more appropriate in a model in which we assume specific capital by sectors.

IV. SIMULATION STRATEGY

We defined three scenarios of price shocks, where we simulated simultaneously an increase in import and in domestic prices in the partner country. The first one simulates an increase in prices of fuels, the second one export agriculture commodity prices and finally the two combined. Table 3 presents the simulated percentage change of export and import prices. We also simulated an increase in prices for each agriculture activity separately; the results are presented in the Annex.

We considered price variations in four export activities (agricultural, meat processing, dairy and rice) and in two import 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.

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[5] This is more or less the procedure implemented by the National Statistics Institute to update poverty lines (see INE, 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. Poverty lines are not updated in this model because the average price index is the numaraire of the model.

Table 3. Price shock scenarios

	Scenario	Product	Percentage change in international prices	
			Export prices	Import prices
1	Fuel prices	Petroleum	216	216
		Refinery		193
		Gas		82
2	Export commodity prices	Fruits and unprocessed rice	117	117
		Meat	29	29
		Dairy	156	156
		Rice and barley	153	153
3	Commodity prices	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 four policy scenarios to attenuate the negative impacts of the global price shock. Three of them seek to compensate the most harmed households negatively affected by an increase in food prices, while a fourth scenario has the purpose of lessening the impact of the increase in fuel prices.

Table 4. Policy scenarios

	Scenario	Parameter	Sectors	Change
1	Value Added Tax	VAT	Agricultural sectors	Elimination
2	Value Added Tax and Tariffs	VAT+TAR	Agricultural sectors	Elimination
3	Transfers to poorest households	TRAN	First and second deciles	25%
			Third and fourth deciles	10%
4	Internal Sales Tax	TEX	Refinery	-84%

All scenarios have the same impact on fiscal deficit and are relatively easy to implement. In the case of a cash transfer program, it is a policy easy to implement in Uruguay, because it is a small country with a reduced population and has already developed a social development program that includes a food card program. In order to implement these

programs the Social Development Ministry has identified the poorest households and has developed an institutional setting that consists, among other things, in a network of social assistances working for the program and a magnetic card for each target household that can be charged with any amount the government decides. This allows an easily implementation of the program whenever food prices go up again.

The four policy scenarios were run taking as reference the scenario where there is a simultaneously increase of oil prices and agricultural commodities prices.

V. INTERNATIONAL PRICE VARIATIONS, POLICIES AGAINST POVERTY AND WELFARE

In this section we discuss first the impact of changes in international prices of commodities on macroeconomic variables, prices, specialization, income distribution and poverty and second, the impact of compensatory policies.

1. Effects of changes in international prices of commodities

The global impact of the increase in international prices of commodities on Uruguayan economy is positive but it is the net effect from the positive shock of an increase in agriculture commodities prices and the negative impact of an increase in energy prices. Consequently, we analyze the results of each shock separately in order to understand deeply how they affect the Uruguayan economy.

1.1 Impact on macroeconomic variables, prices and specialization

Table 5 shows changes in macroeconomics variables in the three scenarios. An increase in fuel prices affects negatively the economy: it leads to a fall in GDP, consumption, investment and real imports. In contrast, value of imports increase significantly, raising demand for foreign currency, and depreciating local currency. The competitiveness of export sectors improve, increasing total exports and reducing non-tradable production. Government income also falls sharply because production of refinery and gas fall and these sectors are strongly taxed. As a consequence, public savings and public investment go down.

Table 5. Effects on macroeconomic variables. Percentage variation

	Commodity prices	Fuel prices	Export commodity prices
GDP	3.1	-3.5	6.5
Absorption	0.8	-4.0	4.7
Households' consumption	0.2	-4.5	4.6
Investment	4.9	-5.3	10.2
Real Exports	-0.9	14.0	-11.0
Real Imports	4.3	-6.3	13.1
Real exchange rate	-6.3	1.0	-7.8
Terms of trade	21.6	-11.4	38.5

Source: own results

There is a resource reallocation from non-tradable activities to export activities (see table 6). Export activities are intensive in unskilled and medium-skilled labor, and thus lower skilled labor employment rises and informality falls. However, this does not prevent relative payments to all factors from falling. Non skilled labor is also harmed by the fall in public investment which affects negatively unskilled labor intensive sectors as construction.

Wages fall significantly but returns to capital fall even more (see table 7). In the case of refinery returns to capital 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.

Table 6. Effect on production and exports. Percentage variation

	Commodity prices	Fuel prices	Export commodity prices
		Production	
Agriculture	13.1	-4.1	15.4
Meat processing	12.4	1.9	9.9
Dairy	13.2	0.0	12.8
Rice and barley	13.9	0.4	13.6
Refinery	-3.8	-5.7	-0.2
Gas	-4.8	-7.4	0.0
Non tradable	0.9	-1.4	2.0
Rest	-1.4	0.0	-1.4
		Exports	
Agriculture	219.7	-4.7	219.5
Meat processing	46.8	10.2	35.6
Dairy	104.7	5.5	99.5
Rice and barley	43.0	2.7	41.5
Rest	-24.1	16.4	-35.3

Source: own results

Table 7. Effects on employment, wages and returns to capital.
Percentage variation

	Commodity prices	Fuel prices	Export commodity prices
Formal employment			
Unskilled labor	0.7	0.2	0.5
Medium-skilled labor	0.0	0.2	-0.1
Informal employment			
Unskilled labor	-1.2	-0.3	-0.9
Medium-skilled labor	-0.1	-0.4	0.3
Wages			
Unskilled labor	2.8	-5.2	7.7
Medium-skilled labor	1.4	-5.0	5.9
Skilled labor	-0.6	-4.5	3.7
Returns to capital			
Agriculture	57.2	-17.4	77.8
Husbandry	16.8	-2.7	19.9
Meat processing	34.6	-0.3	33.6
Dairy	296.2	-4.9	292.5
Rice and barley	526.7	-1.7	515.2
Refinery	-45.3	-59.6	0.6
Gas	-15.6	-27.6	5.6

Source: own results

In contrast, the increase in agriculture commodities prices has an overall positive impact on the economy: GDP, consumption, investment and imports rise, while real exports fall. Under this scenario, 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.

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 (see table A2 in Annex).

Resource reallocation is limited in this model, because capital and land are specific by activity and we assumed fixed requirements of inputs and value added. If the price of a product increases, production rises, increasing the number of workers on a fixed amount of capital, and therefore decreasing returns operate and labor productivity falls, limiting productive restructure.

Despite this, relative price variation is so important that leads to a significant change in productive structure (see table 6). The four activities for which international prices increase raise their production, and so do non-tradable activities, while production falls for the rest of the activities. Exports increase for these four activities and fall for the rest.

Changes in resource allocation lead to changes in relative demand for 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 7). Medium skilled wages increase 2.8%. In contrast, demand and wages for skilled workers fall. Capital returns increase more than proportional in agricultural export activities and fall 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,

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commodity prices increase more than wages, and returns to specific capital fall in activities for which production falls and increase in activities that expand.

The net effect of the two shocks on macroeconomic variables is positive. Relative wages of unskilled labor increase reducing the wage gap between skilled and unskilled labor. It should be noticed that these results depends on the relative variation of prices of fuels and agriculture commodities.

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, variation 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 8). A rise in oil prices leads to a fall in income of all agents, and does not seem to change income distribution. Richest households' income falls because capital returns plummet[6] while poorest households' income falls because wages go down. While natural resources are owned by the richest households, unskilled labor is concentrated in the poorest households.

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.

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[6] 58% of income of households from the tenth decile come from capital remuneration. See figure 3.

Table 8. Effects on income and consumption of agents. Percentage change

	Commodity prices	Fuel prices	Export commodity prices
	Income		
Poorest decile	0.5	-4.5	4.8
Second decile	0.5	-4.5	4.9
Third decile	0.5	-4.5	4.8
Fourth decile	0.5	-4.6	4.9
Fifth decile	0.5	-4.6	4.9
Sixth decile	0.4	-4.5	4.7
Seventh decile	0.2	-4.4	4.4
Eighth decile	0.1	-4.4	4.3
Ninth decile	0.0	-4.4	4.3
Richest decile	0.1	-4.6	4.5
Government	1.4	-1.2	2.7
	Consumption		
Poorest decile	-1.9	-4.0	1.8
Second decile	-1.8	-4.4	2.4
Third decile	-1.7	-4.4	2.5
Fourth decile	-0.3	-4.2	3.6
Fifth decile	0.2	-4.2	4.2
Sixth decile	0.1	-4.4	4.3
Seventh decile	0.3	-4.2	4.3
Eighth decile	0.8	-4.2	4.8
Ninth decile	0.2	-4.7	4.8
Richest decile	0.9	-5.0	5.6

Source: own results

The simultaneous increase in prices of the four main export activities raises income for all types of households, especially for poorest households. Therefore, we might conclude that an increase in main agriculture export sector prices attenuates disparities in income distribution. In this case, the positive impact on wages, especially unskilled wages, is higher than on capital. However, we should take into account that returns to capital increase significantly for a small group of land owners and fall for the rest. By aggregating households in deciles we miss this result.

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.

The increase in food prices partially reverts the positive effect of an increase in income, especially for the poorest households (table 8). 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. Welfare increases more the richer the household.

Finally, under the global scenario, the positive effect prevails: income for all households increases, mainly for the five poorest households. 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 9.

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

Table 9. Effects on poverty. Benchmark values and percentage change

	Benchmark values (%)	Commodity prices	Fuel prices	Export commodity prices
Poverty index	17.8	-1.4	4.7	-5.9
Extreme poverty index	1.5	28.7	9.0	10.8
Gini Index	0.4426	-0.4	0.2	-0.6

Source: own results

An increase in agricultural commodity prices reduces poverty by almost 6% mainly due to an increase in labor wages, especially for unskilled labor. 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 8, under this scenario the households in the first poorest decile increase their consumption at lower rate than the rest. In this case, income distribution improves. This is consistent with the income variations reported in table 8 but this index does not take into account consumption possibilities and welfare changes.

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In the global scenario, poverty falls, extreme poverty rises and income distribution improves slightly.

2.   Policies to compensate the poorest households

Results obtain through the CGEM and microsimulations show that the increase in international prices of fuels and agricultural commodities has a positive impact on the economy and improves income distribution, but affects negatively the poorest households. Extreme poverty increases because food prices rise, deteriorating their purchasing power. Even though poverty falls, the poorest households are the least beneficiated for the same reason. Therefore, policies to compensate the most harmed households should be implemented. In this section we discuss the impact of four policy options.

The policy options simulated have slight effects on macroeconomic variables (see table 10). There are no significant changes of relative prices or resource allocation. However, compared to the global scenario there is a significant increase in consumption and a fall in investment. These results can be explained by two main reasons. First, these policies are aimed to poor households whose saving propensity is low. Second, the increase in public deficit has a negative impact on public saving and investment.

Table 10. Effects on main macroeconomic variables. Percentage variation

	Commodity prices	Value Added Tax	Value Added Tax and Tariffs	Internal Sales Tax	Transfers to poorest households
GDP	3.1	2.9	2.9	2.7	2.8
Absorption	0.8	0.8	0.8	0.7	0.7
Households' consumption	0.2	0.8	0.8	0.7	0.8
Investment	4.9	1.5	1.4	1.6	1.0
Exports	-0.9	1.9	2.1	-1.0	-1.3
Imports	4.3	6.7	6.9	4.0	3.9
Real Exchange rate	-6.3	-6.4	-6.3	-6.3	-6.4
Terms of trade	21.6	38.5	20.8	21.4	21.6

Source: own results

The three tax reduction scenarios improve evenly households' income and attenuate the fall in poorest households' consumption but they do not prevent it (see table 11). These policies do not have a significant impact on income distribution either except in the case of

reduction on fuels tax, which is a regressive policy. On the contrary, focalized transfers to poorest households generate a significant increase in their income and consumption.

Table 11. Effects on income and consumption. Percentage variation

	Commodity prices	Value Added Tax	Value Added Tax and Tariffs	Internal Sales Tax	Transfers to poorest households
			Income		
Poorest decile	0.5	1.0	1.0	0,9	11,0
Second decile	0.5	1.1	1.1	0,9	8,8
Third decile	0.5	1.0	1.0	0,9	3,1
Fourth decile	0.5	1.1	1.1	1,0	2,6
Fifth decile	0.5	1.0	1.0	0,9	0,2
Sixth decile	0.4	0.9	0.9	0,8	0,1
Seventh decile	0.2	0.7	0.7	0,6	-0,1
Eighth decile	0.1	0.6	0.6	0,5	-0,2
Ninth decile	0.0	0.6	0.6	0,5	-0,2
Richest decile	0.1	0.7	0.7	0,7	-0,1
Government	1.4	-0.9	-1.0	-1,4	1,3
			Consumption		
Poorest decile	-1.9	-1.3	-1.3	-1,7	8,3
Second decile	-1.8	-1.2	-1.2	-1,5	6,3
Third decile	-1.7	-1.0	-1.0	-1,4	0,8
Fourth decile	-0.3	0.3	0.3	0,0	1,8
Fifth decile	0.2	0.8	0.9	0,6	0,0
Sixth decile	0.1	0.7	0.7	0,5	-0,2
Seventh decile	0.3	0.8	0.8	0,7	0,0
Eighth decile	0.8	1.3	1.3	1,2	0,5
Ninth decile	0.2	0.7	0.7	0,8	0,0
Richest decile	0.9	1.4	1.4	1,5	0,7

Source: own results

The effect of a transfer policy on poverty and extreme poverty is not captured by microsimulations, because they do not consider changes in income from transfers. Tax cuts do not seems to be efficient policies to reduce poverty and extreme poverty (see table 12). However, when government reduces indirect taxes on food, poverty falls more and extreme poverty increases less than under commodity prices scenario. Reducing sales tax on fuels has no impact on poverty and extreme poverty.

Table 12. Effects on poverty and income distribution. Percentage change

	Benchmark values (%)	Commodity prices	Value Added Tax	Value Added Tax and Tariffs	Internal Sales Tax
Poverty index	17.8	-1.4	-2.0	-2.0	-1.6
Extreme poverty index	1.5	28.7	23.8	23.5	28.4
Gini coefficient	0.4426	-0.4	-0.5	-0.5	-0.4

Source: own results

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 most macroeconomic variables but they raise consumption and reduce investment The three tax reduction policies (VAT, tariffs and internal 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. 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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ANNEX

Table A1

	Rice prices	Dairy prices	Agricultural prices	Meat prices
GDP	2.7	2.6	0.6	1.3
Absorption	2.4	1.5	-0.3	1.3
Households' consumption	2.3	1.4	-0.2	1.3
Investment	6.2	4.2	-0.9	2.4
Exports	-8.9	-4.9	1.3	-2.8
Imports	4.6	3.3	-0.1	3.6
Real exchange rate	-2.2	-2.2	-0.4	-2.7
Terms of trade	15.3	15.2	2.8	6.6

Table A2

	Rice prices	Dairy prices	Agricultural prices	Meat prices
			Production	
Agriculture	3.0	0.6	14.2	0.2
Meat processing	-1.9	-2.4	-0.2	15.4
Dairy	-0.2	14.0	0.0	-2.4
Rice and barley	14.7	-0.9	-13.7	-1.3
Refinery	0.0	-0.1	0.1	-0.2
Gas	0.3	0.2	-0.1	-0.1
Non tradable	1.4	0.9	-0.1	0.3
Rest	-0.4	-0.3	-0.1	-0.7
			Exports	
Agriculture	-13.2	-5.6	304.7	-6.6
Meat processing	-9.0	-9.3	-0.7	55.9
Dairy	-4.5	108.9	-0.2	-8.0
Rice and barley	44.5	-2.6	-19.1	-3.5
Rest	-13.6	-11.0	-0.9	-13.9

Table A3

	Rice prices	Dairy prices	Agricultural prices	Meat prices
			Income	
Poorest decile	1.8	1.1	-0.1	2.1
Second decile	1.9	1.2	-0.2	2.0
Third decile	1.8	1.2	-0.2	2.0
Fourth decile	2.1	1.3	-0.2	1.7
Fifth decile	2.2	1.4	-0.2	1.6
Sixth decile	2.1	1.3	-0.2	1.6
Seventh decile	2.0	1.2	-0.2	1.5
Eighth decile	2.0	1.2	-0.2	1.4
Ninth decile	2.2	1.3	-0.2	1.1
Richest decile	2.7	1.6	-0.2	0.8
Government	1.4	0.6	0.0	0.8
			Consumption	
Poorest decile	1.7	-0.8	-0.2	1.2
Second decile	1.5	0.1	-0.4	1.2
Third decile	1.4	0.5	-0.3	1.0
Fourth decile	2.0	1.0	-0.3	1.1
Fifth decile	2.2	1.2	-0.3	1.3
Sixth decile	2.1	1.2	-0.3	1.3
Seventh decile	2.1	1.2	-0.2	1.4
Eighth decile	2.1	1.4	-0.2	1.6
Ninth decile	2.2	1.5	-0.2	1.4
Richest decile	2.8	2.0	-0.1	1.2