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## **The Impact of the International Economic Crisis in South Africa**

Margaret Chitiga

Ramos Mabugu

Hélène Maisonnave

Véronique Robichaud

Bernard Decaluwé

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Chitiga: Department of Economics, University of Pretoria

Mabugu: Financial and Fiscal Commission, South Africa

Maisonnave: Corresponding author. Financial and Fiscal Commission, South Africa

[helenem@ffc.co.za](mailto:helenem@ffc.co.za)

Robichaud: CIRPÉE, Université Laval

Decaluwé: Université Laval, PEP network and CIRPÉE

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**Abstract:**

A dynamic computable general equilibrium model based on the PEP standard model developed by Decaluwé *et al.* (2009) is used to evaluate the impacts of the international crisis on the South African economy. However, we have changed some assumptions in order to better represent South African specificities. A major innovation in this regard is the modelling of unemployment and the influence of labour unions on the labour market. Two scenarios encompassing a severe and moderate recession are run. The effects of the crisis on the economy are really quite harsh, even in the moderate recession scenario, both in the short run and the long run. Indeed, the decrease of world prices combined with the drop of world demand lead to a decrease in production for many sectors with consequent laying off of workers. The impact on institutions is also worrying: agents see their income as well as their savings decreasing. The huge drop in firms' savings has a dire impact on total investment while the huge negative impact on government accounts of protracted slow global growth imply tight public budgets for some time to come. Thus, some gains made by the government prior to the crisis may have been reversed by the economic crisis. It is apparent from the results that the impact of the crisis will drag into the long run with the situation still below what it would have been in the absence of a crisis until 2015.

**Keywords:** Dynamic Computable General Equilibrium, Economic crisis, South Africa

**JEL Classification:** D58, O55, F47

## **1. Introduction**

The United States of America subprime mortgage crisis which began in August 2007 degenerated into a full-scale global financial crisis between August and October. Commentators have referred to this crisis as the worst the world has witnessed in the last 80 years<sup>8</sup>. The crisis has resulted in significant asset depreciation, closures of companies, rising unemployment and a sharp slowing down of economic growth, with most highly industrialised countries entering a recession.

After a lag, the crisis has now begun to be felt by South Africa. The country has especially been affected by the sharp fall in demand for its export products, the fall in prices of key export commodities and falling foreign investment. The economy has recently been plunged into a recession for the first time in 17 years and its macroeconomic forecasts have had to be revised downwards substantially. The declining growth has potentially negative implications for incomes, employment, and investment; and on social programmes partly through the slowdown's effect on tax revenues for government. This document uses a dynamic computable general equilibrium model (CGEM) to analyse the impact of the financial and economic crisis on South Africa.

The remainder of the document is divided into six sections. Section 2 describes the general impacts of the crisis in South Africa while section 3 discusses the scenarios and likely impacts for South Africa as well as recent macroeconomic policy responses to the crisis. Section 4 describes the data used for the model while section 5 discusses the model. Section 6 reports and discusses results of various simulations and section 7 concludes.

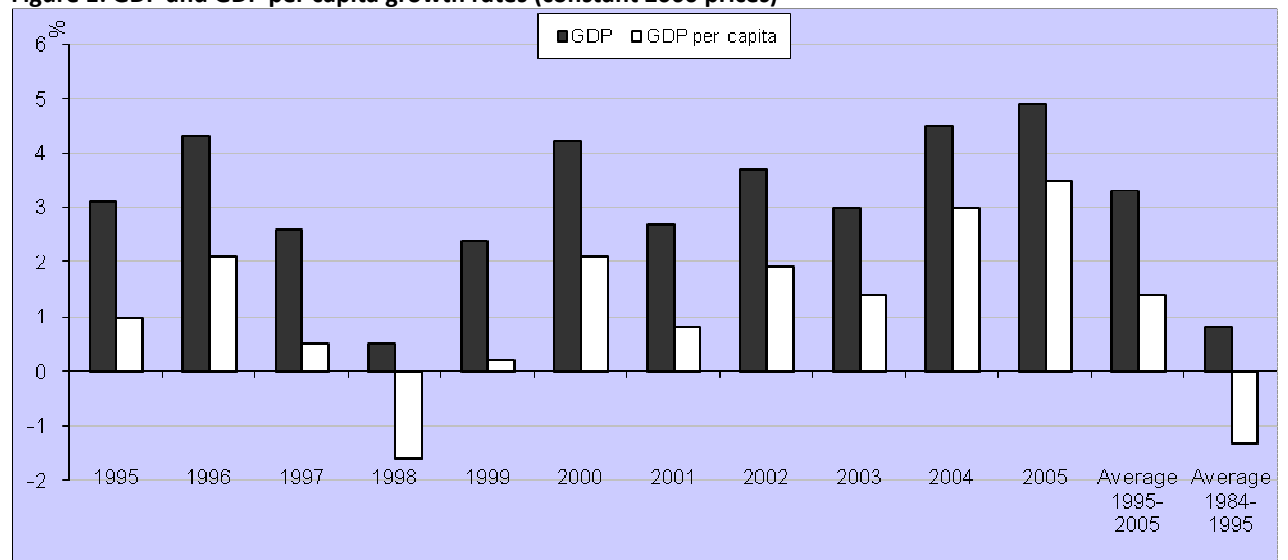
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<sup>8</sup> See for example, IMF 2008

## 2. Impacts on the economy

Until recently, the economic performance of post apartheid South Africa has been relatively impressive, averaging 3.3% growth rate for real gross domestic product (GDP) and 1.4% in per capita terms for the period 1995 to 2005. This growth trend was an improvement, if one compares with the rates of the 1985 to 1994 period, where the respective average rates were 0.8 and -1.3% (Figure 1).

**Figure 1: GDP and GDP per capita growth rates (constant 2000 prices)**



Source: South African Reserve Bank (SARB) database ([www.reservebank.co.za](http://www.reservebank.co.za)).

The International Monetary Fund (IMF) had to downgrade its forecasts for economic growth in advanced economies quite dramatically. Whereas previously, consensus forecasts had been looking towards growth in GDP for 2009 and 2010 in the United States, Eurozone and Japan of around 1.5%, new forecasts by the IMF see growth in the United States falling from 1.6% in 2009 to just 0.1% in 2010. Similarly, a decline from 1.3% in 2009 to just 0.2% in 2010 is forecast in the Eurozone and in Japan down from 0.7% in 2009 to 0.5% in 2010. To the extent that South Africa's historical economic growth rate has been very closely linked to that of the world economy since 1993/94, such downward revisions in the forecasts of these major economies imply that one must similarly look for reduced domestic growth in the economy. Indeed, South Africa's economic growth rate has recently fallen to its lowest level in five years in terms of year on year basis and in 10 years on quarter on quarter annualised

basis in the first quarter of 2009. Bearing in mind the closeness of the correlation between domestic economic growth and that of the global economy, this slowdown in economic growth should come as no surprise.

A visible effect of the crisis has been declines in several commodity prices since their peaks around July 2008. Most dramatic of all have been the decline, of around 60%, in the prices of platinum group metals (PGMs) as shown in Table 1.

**Table 1: Commodity prices per Oz/per bbl**

	2007		2008 (YTD)		Current (May 2009)	
	\$ price	Rand Price	\$ price	Rand Price	\$ price	Rand Price
<b>Gold</b>	697	4900	895	6918	916	8519
<b>Platinum</b>	1304	9167	1772	13698	998	9281
<b>Palladium</b>	353	2482	393	3038	196	1823
<b>Rhodium</b>	6113	42974	7550	58362	3250	30225
<b>Oil</b>	72.7	511	111.2	860	78.3	728

Source: Econometrix (2008)

Table 2 illustrates the magnitude of the decline in exports of precious metals and the decline in the value of oil imports on an annualised basis. It can be seen that there has been a decline in exports of precious metals of some R13.0bn compared with 2007 and by R37.4bn compared with the average export revenue achieved in the year to date in 2008.

**Table 2: Value of Annualised Mineral Imports/Exports (R'bn)**

	2007	Annualised 2008 (YTD)	Annualised Current
<b>Gold</b>	39.9	46.9	48

<b>Platinum</b>	46.2	58.6	39.7
<b>Palladium</b>	6.9	7.2	4.3
<b>Rhodium</b>	26.9	34.6	17.9
<b>PGMs</b>	83	100.4	61.9
<b>Oil</b>	109.8	153	129.5

Source: Econometrix (2008)

**Table 3: Change in Annualised Mineral/Exports (R'bn)**

<b>Exports</b>	<b>Current vs 2007 Avg</b>	<b>Current vs 2008 Avg</b>
Gold	+8.1	+1.1
Platinum	-6.5	-18.9
Palladium	-2.6	-2.9
Rhodium	-12	-16.7
PGMs	-21.1	-38.5
Oil	-13	-37.4
<b>Imports</b>		
Oil	-19.7	-23.5
<b>Balance</b>	+6.7	-13.9

Source: Econometrix (2008)

One needs to also take into account declines in export values of minerals other than precious metals. In particular, coal prices have declined by some 30% in recent months, not to mention the 50% decline in the price of copper from its peak in July. One could therefore be looking at a further R10bn decline in the value of mineral exports in relation to the average for this year as a whole. The net effect at present, of lower commodity prices, would be to contribute to the widening of South Africa's trade deficit by around R15bn to R25bn on an annualised basis compared with the situation which prevailed when commodity prices were at their peaks in July 2008. This is not a dramatic deterioration in the trade account

and is relatively small in relation to the services account of the current account of the balance of payments.

South Africa has a current account of the balance of payments (exports minus imports of goods and services as well as transfers) deficit equal to between 7.5% and 9% of GDP. The country does not have substantial foreign exchange reserves to finance that deficit, and therefore relies on capital inflows. But if these turn to outflows as a result of the financial crisis, the Rand will be under enormous pressure, and will lose value rapidly in world markets. This will mean that, the world financial crisis will likely impact more heavily on South Africa in terms of its wide economic effects than it will via the exposure of its financial markets to the melting fortunes of foreign financial firms.

Since the onset of the steep decline in global and domestic economic growth, one has been wary of the possibility of a huge shortfall in government revenue and an associated substantial expansion in the fiscal deficit. In the month of April 2009 specifically, which represents the first month of the 2009/10 fiscal year, such fears were amplified as shown in Table 4. Year on year growth in government revenue was heavily negative at -10.6%, whilst conversely, growth in government expenditure soared to 50.2%. The resultant fiscal deficit for April of -R37.4bn, was much greater than the corresponding -R13.9bn deficit recorded in April of 2008. Extrapolation of April's growth in government revenue and expenditure to an entire fiscal year would lead to revenue of just R543.9bn, but expenditure of R954.7bn, leaving a phenomenal fiscal deficit for the full year of -R410.9bn or 16.6% of GDP. It is insightful to note that whereas the growth in direct tax revenues (personal tax and company tax) in April held up quite well compared with the full-year budget, growth in revenue from indirect taxes such as VAT, excise duties, the fuel levy and international trade, was dramatically down on the full-year budget. Since these are indicators of expenditure patterns, this is an indication of the depth of the economic downturn in respect of spending patterns.

**Table 4 : Government finances: Growth in Revenue and Expenditure (%change)  
April 2009**

	<b>2007/08</b>	<b>2008/09</b>	<b>2008/09</b>	<b>2009/10</b>
	<b>Actual</b>	<b>Budget</b>	<b>Actual</b>	<b>Budget</b>
Personal Tax	21.7	19.9	15.6	4.2
Companies	24.6	18.8	18.0	-1.2
STC	27.2	32.1	-2.8	-5.0
Property Tax	n/a	22.7	-20.3	7.3
VAT	11.2	9.3	2.3	9.0
Excise Duties	12.3	11.1	7.0	9.9
Fuel Levy	8.0	9.9	4.8	22.9
International Trade	11.6	12.5	-14.6	3.8
<b>Revenue</b>	<b>16.8</b>	<b>12.8</b>	<b>8.7</b>	<b>5.0</b>
<b>Expenditure</b>	<b>14.0</b>	<b>11.4</b>	<b>17.4</b>	<b>15.7</b>
<b>Fiscal Surplus/(Deficit) Rbn</b>	<b>19.5</b>	<b>14.3</b>	<b>(27.3)</b>	<b>(94.0)</b>
<b>Borrowing Requirement Rbn</b>	<b>20.6</b>	<b>15.1</b>	<b>(23.4)</b>	<b>(90.4)</b>

Source: Econometrix (2009)

### **3. Scenarios for South Africa and likely impacts**

When attempting to estimate the likely impact on specific segments of the population of South Africa, one needs to generate scenarios based on the anticipated level of severity of the global downturn, as well as its duration. Two such scenarios, namely a severe recession scenario and a medium recession scenario are sketched here to act as a guideline in thinking about the impact that the crisis may have on the economy.



In the severe recession scenario, G7 economies see the liquidity crisis spill over from their financial sectors as a result of their consumers suffering from a negative wealth effect brought about by falling asset prices (equities, homes, etc.). The loss of previously imagined wealth, including the impacts that those now falling asset prices might have on pension funds, could cause consumers in the G7 countries to cut back heavily on their demands for both goods and credit. This would lead to both lower demand for domestically produced goods in those economies, and for imported goods produced by other economies both within the G7 group, and within developing nations supplying raw materials and intermediate goods. This kind of development could become a downward spiral for both demand and supply, as lower demand for goods would lead to the supply side cutting back on its resource requirements, with job losses. The potential depth of the ensuing recession, or even depression if prices in those economies as well as outputs begin to drop beyond the initial asset categories affected so far, is likely to be proportionally linked to the length of time that the recession/depression would last. The deeper the production loss at any point in time, the longer the recession could be expected to remain in place. If the loss of production is severe, as imagined in this scenario, it could last for years, rather than quarters of a year.

The medium recession scenario sees the loss of asset values being constrained to a level perhaps 10% to 20% below where they stood on 10<sup>th</sup> October 2007. While this will have a sufficiently large effect on G7 economies to be very noticeable in terms of negative growth on both the demand and supply sides of their economies, growth for the group as a whole would remain in a band between 0% and -1% during 2009, after which it could be expected to slowly and gently recover. Inflation is likely to be higher in this than the severe recession scenario, because more liquidity would surely have to be injected into those economies to soften the scale and duration of the downturn.

Now what would be the likely impact of severe G7 recession scenario on South Africa? For the financial side of the South African economy, this scenario could be devastating. Foreigners would be forced to withdraw huge amounts of capital currently residing in the SA financial economy, resulting in sales of equities, property, government and parastatal bonds, and a simultaneous weakening of the exchange rate as the funds are expatriated to the

home economies of the sellers, where they would be needed to increase liquidity. The Rand would tumble sharply on world forex markets, leading to a rapid and very sharp and sustained weakening of the exchange rate. Eventually, this would redress the current account imbalance through lower imports, but it could also kill off the recently rapidly escalating fixed investment plans of government and parastatals, forcing them to cancel currently intended capacity expansion projects (eg. Eskom, Transnet). These projects are mainly responsible for the growth rate of production in the South African economy having remained firmly positive so far during 2008 and if they are threatened during and beyond 2009, domestic production growth in South Africa could crumble, detracting from employment and earning prospects in this country. Even the possibility of falling prices in G7 countries would probably not be sufficient to bring down the prices of imported goods, because of the severe weakness of the Rand in this scenario. The only ray of light would then be the continuing positive growth in commodity demand from China and India, remembering that commodities do dominate South Africa's export basket.

Finally, what about the impact of medium G7 recession scenario on the South African economy? Obviously, the impacts of a less severe G7 downturn, which would also not last for several years as is imagined in the severe scenario, would be less harsh for the South African economy. The Rand would not fall to the same extent, or for as extended a period, but there certainly would be damage to the economy from more expensive imported materials, many of which are required for the infrastructural expansion programs recently begun. Inflation would remain high for longer than it would have if the G7 had not entered recessionary conditions, mainly because of the weakness of the Rand exchange rate. This will dissipate real spending power within South Africa, depleting the real level of demand for goods and services even if the economy does not enter a period of negative employment and production growth. As above, the China and India demand factor could assist South Africa as a major commodity producer and a lack of capital in global markets could act to prevent other commodity producers in Africa and the rest of the world from developing the necessary infrastructure to get commodities to distant ports in order to export them to China and India. Nevertheless, South Africa's higher value added (i.e. manufactured) exports, mainly destined for the weak G7 economies, would doubtlessly suffer more than the dominant commodity exports, and the loss of export value and GDP could be disproportional to the loss of export volumes.

Neither of the above scenarios is particularly favourable for the South African economy, because of its exposure to global market conditions. It might be protected or insulated in certain aspects, and for various lengths of time under differing global shrinkage scenarios. The national response to the global crisis has come in 5 different forms (see Nedlac/Presidency (2009)). First the government has announced a major public investments programme of approximately R787bn over the three financial years to March 2012. This public investment programme will include expanding and improving the road and rail networks, public transport, and port operations, dams, water and sanitation infrastructure, housing construction including low-income housing and publicly owned rental stock, information and communications technology and energy generation capacity as well as education and health infrastructure. Related to this, South Africa is set to host the 2010 Soccer World Cup. The build up to this event has already initiated a multitude of fixed investment projects, including the building of new stadia, massive improvements to the country's airport facilities, and the upgrading of the country's transport and road network, urgency in the drive to increase electricity generating capacity, further investments in telecommunications, rail and harbor facilities. These investment projects will have some way to go, with knock-on benefits in terms of generating additional business opportunities for the private sector. Even though funding of such huge projects is likely to prove a constraint of sorts, the economy finds itself in a healthy fiscal situation in being able to countenance running into a significant fiscal deficit seeing that the fiscal balance has been in surplus for a number of years and the public debt has declined to below 25% of GDP. However, the principal constraint lies not so much with government borrowing but with access to foreign borrowings and foreign exchange in order to fund the high level of imports of capital equipment.

Second, the macroeconomic policy response to the crisis has come in the form of counter-cyclical (expansionary) fiscal policy, reduction in nominal interest rates, and competitive exchange rates. Third, industrial and trade policy response has come in the form of rescue packages for vulnerable sectors (clothing, textile). There has also been support for small and medium enterprises in crisis as well as tightening of import controls. Fourth, employment measures have included the expanded public works programme and training and skills

development. Fifth, social measures include industrial level social plans, improved unemployment insurance fund benefits, emergency food relief, access to free basic services, social grants and support for community food production.

#### 4. Data description

- **SAM:**

The Social Accounting Matrix (SAM) is based on the 2005 Supply and Use (SU) tables obtained from Stats SA and other national data sets from various sources such as the Reserve Bank. The SAM we are using has 54 activities and 54 commodities; two broad factors, labour and capital; 4 institutional sector accounts (households, enterprises, government and the rest of world); and 2 saving and investment accounts (change in inventories and GDFI).

For the trade parameters, we use Gibson (2003), for the low-bound export supply while demand elasticities are obtained from Behar and Edwards (2004). To our knowledge, estimates for parameters in industries' production and households' demand are not available for South Africa. Therefore, our study borrows these values from the literature surveyed by Annabi et al. (2006). Finally, unemployment rates are drawn from the labour force survey report by Statistics South Africa (2005).

Given our specific study, we present in Table 5 trade relations between South Africa and the rest of the world in 2005. It specifies the import penetration rate as well as the sectoral share of imports in total imports. Moreover, it details the sectoral export intensity rates measured as a share of exports in production in each sector and the share of each sector exports in total exports.

**Table 5 : Structure of the South African trade<sup>9</sup> (%)**

Sectors	Exports Intensity rates, as a share of total sectoral production (%)	Sectoral Exports shares as a portion of total exports (%)	Imports penetration rates, as a share of total sectoral supply (%)	Sectoral Imports shares as a portion of total imports (%)

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<sup>9</sup> Please note that this table only refers to tradable sectors, thus government's activities are not represented.

<b>Agriculture, forestry &amp; fishing</b>	21,89	4,14	5,84	1,09
<b>Coal mining</b>	48,96	5,01	4,47	0,26
<b>Gold &amp; uranium ore mining</b>	98,65	6,58	0,53	0,00
<b>Other mining</b>	50,65	12,82	30,55	11,08
<b>Food</b>	8,50	2,38	6,02	2,52
<b>Beverages &amp; tobacco</b>	22,16	2,29	2,54	0,42
<b>Textiles</b>	16,58	0,70	14,40	1,15
<b>Wearing apparel</b>	12,89	0,54	11,41	1,27
<b>Leather &amp; leather products</b>	35,87	0,44	17,45	0,26
<b>Footwear</b>	5,12	0,05	20,39	0,72
<b>Wood &amp; wood products</b>	12,94	0,61	8,98	0,50
<b>Paper &amp; paper products</b>	15,95	1,45	8,81	0,96
<b>Printing, publishing &amp; recorded media</b>	4,89	0,22	14,78	1,10
<b>Coke &amp; refined petroleum products</b>	17,39	2,59	5,34	1,30
<b>Basic chemicals</b>	30,81	4,60	21,66	4,32
<b>Other chemicals &amp; man-made fibres</b>	11,54	2,09	12,53	3,95
<b>Rubber products</b>	23,54	0,48	22,56	0,91
<b>Plastic products</b>	5,54	0,36	9,13	0,73
<b>Glass &amp; glass products</b>	11,56	0,19	12,64	0,29
<b>Non-metallic minerals</b>	7,71	0,46	11,18	0,87
<b>Basic iron &amp; steel</b>	62,48	10,48	11,56	1,24
<b>Basic non-ferrous metals</b>	47,03	2,94	19,44	1,10
<b>Metal products excluding machinery</b>	19,02	1,79	13,88	1,66
<b>Machinery &amp; equipment</b>	67,47	7,11	35,35	12,83
<b>Electrical machinery</b>	13,23	0,97	17,18	2,25
<b>Television, radio &amp; communication equipment</b>	53,25	0,88	39,74	5,26
<b>Professional &amp; scientific equipment</b>	84,86	0,90	30,42	2,40
<b>Motor vehicles, parts &amp; accessories</b>	20,46	6,72	23,08	15,32
<b>Other transport equipment</b>	27,40	0,68	33,73	3,24
<b>Furniture</b>	48,87	1,71	9,48	0,56
<b>Other industries</b>	18,34	1,94	12,97	3,01
<b>Electricity, gas &amp; steam</b>	0,96	0,11	0,02	0,00
<b>Water supply</b>	0,00	0,00	0,00	0,00

<b>Building construction</b>	0,05	0,02	0,26	0,09
<b>Wholesale &amp; retail trade</b>	1,21	1,01	0,06	0,05
<b>Catering &amp; accommodation services</b>	21,33	1,45	22,81	2,49
<b>Railway transport</b>	15,39	0,58	9,16	0,35
<b>Road transport</b>	7,42	1,93	1,55	0,37
<b>Transport via pipeline</b>	16,04	0,04	0,00	0,00
<b>Water transport</b>	13,52	0,53	31,67	2,80
<b>Air transport</b>	20,37	0,65	32,11	2,18
<b>Transport support services</b>	9,87	0,80	12,74	1,21
<b>Communication</b>	7,01	2,21	6,13	2,00
<b>Finance &amp; insurance</b>	6,26	0,61	9,71	1,40
<b>Business services</b>	3,90	4,61	1,70	1,97
<b>Medical, dental &amp; other health &amp; veterinary services</b>	0,60	0,11	1,01	0,20
<b>Community, social &amp; personal services</b>	3,69	1,22	6,47	2,29

Source: Own computations from SAM(2005)

From the table above, we can point out that gold (98% of its production), Scientific equipment (84%) or Machinery and equipment (67%) heavily rely on exports. A decrease in world demand or in international prices for these commodities will thus have a huge effect. In the same way, some commodities depend on imports such as radio and equipment (39%), or other mining (30%). For these sectors, a decrease in international prices will strongly affect them, stimulating imports and increasing competition from foreign suppliers on domestic market. South Africa exports most of its mineral and precious metals, together representing 40.9% of total exports. An external shock on mineral prices would thus have strong effects on the economy.

- **Building the BAU:**

As we mentioned previously, our SAM is based on 2005 data. In that period, South Africa anticipated GDP growth rates of 4.5% per year. We simulate a Business As Usual (BAU) taking into account the expected rate of GDP growth. In order to reach this GDP, we add a total factor productivity parameter. Moreover, we had for 2005, investment by destination

for all the sectors<sup>10</sup>, as well as depreciation rates by activities. Stats SA estimated that population will grow at a rate around 1%. Calibrating the BAU on these “real” data, we found that capital grows faster than labour, so in the BAU we have a decrease in unemployment. Moreover, as our production factors become more and more efficient, prices decrease also in the BAU. These pieces of information are important in order to understand the results.

### **5. The modelling framework:**

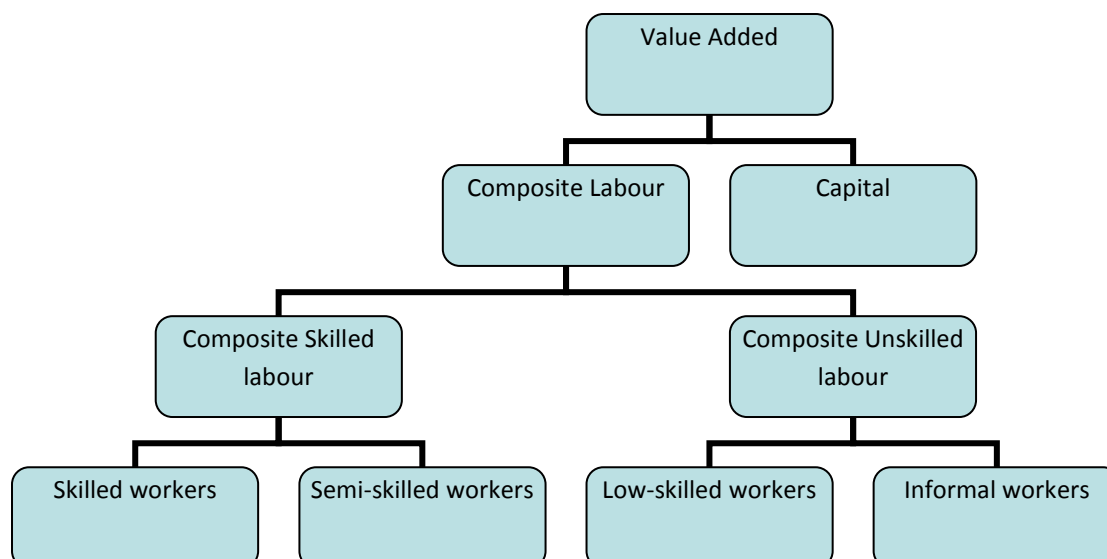
To evaluate the impacts of the world economic crisis on South Africa, we use the dynamic Poverty and Economic Policy (PEP 1-t) standard model by Decaluwé et al (2009). However, we have changed several assumptions of this standard model in order to better take into account the South African economy. Our model has two production factors, capital and labour, but the latter is disaggregated into four types of labour: informal workers, unskilled, semi-skilled and highly skilled workers. Each activity uses both production factors.

In line with the SAM, the model has 54 activities and commodities. The production function technology is assumed to be of constant returns to scale and is presented in a four-level production process. At the first level, output is a Leontief input-output of value added and intermediate consumption. At the second level, a CES function is used to represent the substitution between a composite labour and capital. At the third level, composite labour demand is also a CES function between composite-skilled and composite unskilled labour. Note that the composite skilled demand is a CES with a low elasticity between skilled and semi skilled workers, capturing the fact that it is quite difficult for the firms to substitute semi-skilled for skilled workers. On the other hand, we also use a CES to describe the composite unskilled labour demand between informal and unskilled workers. Here, we assume that for the producer, it is relatively easy to substitute them. Figure 2 gives the value added structure.

#### **Figure 2: The Value Added Structure:**

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<sup>10</sup> In most of dynamic CGE, this information is not available and we have to build a steady state (or regular path) to calibrate capital stock at the base year.



South Africa is faced with high unemployment problems, notably for semi-skilled and unskilled labour. Moreover, unions are very strong in the country. South Africa has the most disciplined as well as the largest trade union movement in Africa. The movement has been influential in policies on the labour market and other related industrial policies. They negotiate salaries and wages, conditions of service, workforce restructuring and retrenchments on behalf of their members. As a result, wages and salaries are strongly rigid downwards. To take this rigidity into account in our modeling, we assume that we have a minimum wage. Thus, if the production decreases, producers won't be able to decrease their employees' salary below the minimum wage. On the other hand, this rigidity will have an impact on unemployment: given that producers can't decrease workers wage rate, they will have to retrench some of them.

The nominal exchange rate is the numeraire in the model<sup>11</sup>. Following the assumption that South Africa is a small country, world prices are fixed. However we assume that S.A exporters face a less than infinite foreign demand equations for exports. In order to increase their market share on the world market they need to reduce their FOB prices for exports increasing their competitiveness with respect to other suppliers on the international market. Factor supplies are fixed in the first period and then grow, at the population rate for labour

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<sup>11</sup> Note that in the CGE results, a real devaluation of the Rand takes the form of a generalized reduction in domestic prices.



force, and using an accumulation equation for capital<sup>12</sup>. Transfers between institutions as well as government's consumption in volume are fixed at the base year and then grow at the population rate. We assume that the rest of the world's savings is a fixed proportion of GDP. Given this assumption, we do not allow South Africa to borrow further from the rest of the world<sup>13</sup>.

## 6. Simulation scenarios

We intend to evaluate the impacts of the world economic crisis on the South African economy. As our dynamic CGE model does not take into account financial flows, the financial consequences of the crisis cannot be captured directly. However the economic consequences of the slowdown of the world economy will be captured through the real side of our CGE model. As we know, the main transmission channels of the world crisis to developing countries are a decrease in export demand and export prices, a decrease of Foreign Direct Investment and a tightening of the capacity to finance a current account deficit, a decrease in remittances and a drop of tourism. However, for South Africa, the latter two channels are not relevant: South Africa does not receive remittances from abroad, and tourism has not decreased<sup>14</sup>. Thus we will focus on the external trade and foreign financing of domestic firms. On the positive side a drop in international prices could lead to a reduction in import prices and a possible reduction in the cost of imported goods especially for imported intermediate and capital goods. This positive impact could be counteracted by increased competition by foreign suppliers in sectors competing with imports

An innovation of our study is that we split the economy in four different groups of activities. Each group is defined by its degree of dependency/exposure to the global crisis and will be affected differently by the crisis. The four groups are defined as follows (see Table 24 in annex)

○ *Group 1*: Sectors that won't be affected. We assume that these sectors will face

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<sup>12</sup> To specify the accumulation of capital, we follow Jung and Thorbecke (2001) function.

<sup>13</sup> This assumption can seem weird given that the country has in the past increased their savings from abroad. However, South Africa does not want to increase substantially its current level of borrowing.

<sup>14</sup> In 2009, many sports events were organized in South Africa (Confederation Cup, Lion's Tour)

neither a reduction in the foreign demand nor a reduction in international prices. Basically, group 1 refers to gold<sup>15</sup>, food and beverage commodities.

○ *Group 2*: Sectors weakly affected. They are not heavily dependent on foreign trade and not very closely related to other sectors. We will find here commodities such as agriculture, clothing and wood.

○ *Group 3*: Sectors mildly affected. As in sectors in group 2 those sectors are not heavily dependent on foreign trade but are closely linked to other sectors. Those sectors will react to a reduction in consumption, investment expenditures or reduction in demand for intermediate goods. This group refers to most of transports products, trade and construction.

○ *Group 4*: Sectors strongly affected. They are closely linked to the international markets either on the export dimension or the import side. Here we find fossil fuel, other mining, machinery and equipment.

Table 6 gives an overview of the South African economy for the different categories described above. We report the shares of output, of exports and imports as well as the composition of local demand and labour market. Thus, we can point out that mildly affected sectors represent around 60% of total output while strongly and mildly affected sectors represent respectively 48.2% and 31.8 % of total exports. These two groups together represent 80 % of total exports.

**Table 6 : Initial shares in 2005 (% in value)**

<b>Commodities/Sectors</b>	<b>Total output</b>	<b>Exports</b>	<b>Imports</b>	<b>Local demand</b>	<b>Labour demand</b>
<b>Non affected</b>	6.2	11.0	4.1	5.1	4.7
<b>Weakly affected</b>	6.2	9.0	8.7	5.7	4.4
<b>Mildly affected</b>	59.5	31.8	32.4	65.2	55.7
<b>Strongly affected</b>	17.0	48.2	54.8	11.5	9.0
<b>All tradable</b>	88.9	100.0	100.0	87.5	73.7
<b>Total</b>	100.0	100.0	100.0	100.0	100.0

Note that the non tradable sector, this sector regroups government sectors and water, is not

<sup>15</sup> In our paper, we do not take into account the speculative surge in the demand for gold. This scenario will be analysed in a futur work.

taken into account and as a result the sum of shares does not add to 100% except, of course, in the case of imports and exports. In the same way, we can underline that the non tradable sector represents more than 25% of the total wage bill and consequently provides employment opportunities to a non negligible part of the population.

In this paper, we simulate the impact of 2 scenarios that are distinguished by the magnitude of the recession (severe or moderate). The next set of Tables present the details of the proposed scenarios.

**Table 7 : Moderate scenario**

<u>Sectors</u>	Changes in world prices of export and import	Changes in world demand for export.
<b>Weakly affected</b>	-2% in 2008 and 2009	
<b>Mildly Affected</b>	-3.5% in 2008-2009 and +2.1% in 2010	-2% in 2008-2009, and +2.1% in 2010
<b>Strongly affected</b>	-5% in 2008-2009 and +2.1% in 2010	-2% in 2008-2009, and +2.1% in 2010

**Table 8: Severe Scenario:**

	Changes in world prices for export and import	Changes in world demand for export.
<b>Weakly affected</b>	-10% in 2008 and 2009	
<b>Mildly Affected</b>	-15% in 2008 and 2009	-10% in 2008-2009, and +1% in 2010
<b>Strongly affected</b>	-20% in 2008 and 2009	-10% in 2008-2009

In terms of the impact of the crisis on Foreign financing of domestic firms, we assume that foreign transfers to firms decrease by 5% in 2008-2009 and then increase by 2.1% in 2010 in the moderate scenario. In the severe scenario, we assume that it decreases by 10% in 2008-2009 and then increase by 1% in 2010. This reduction corresponds globally speaking to a

tightening of the liquidity available to firms to finance their investment program and has an indirect impact on the current account. A reduction in foreign transfers reduces the financial resources available to finance imports and will require an increase in exports to compensate this reduction.

After 2010, world prices recover to their BAU values; world demand increases at the population rate.

## **7. Results:**

Given the magnitude of the different shocks each scenario will generate differential outcomes on industries' output, the entire price structure and, consequently, factor reallocation. However the final impact on households will depend on their factor endowments and their sources of income including transfers as well as their consumption patterns. These effects are different in the short run compared to the long run and this is partly why dynamic analysis is called for. The following sections discuss in detail the impacts of the price and demand shocks as they channel through changes in macroeconomic variables and the government budget, in activities' outputs, and the incomes and savings of agents (individuals and firms).

### **1. Impact on prices**

The reader will remember that in this CGE model we assume that in order to protect their foreign market shares, South African exporters have to adjust their FOB prices taking into account the price of competitors and the world elasticity of demand for South African goods. Table 9 summarises the impact of the two scenarios on export prices. As can be seen, there is a huge decrease in exports prices, following the drop in international prices and demand and the decrease is, of course much greater for the severe scenario. If we look carefully at the impact of the strongly affected sectors the drop of FOB prices is a little bit less than the drop in world export prices (-5% in 2008 and 2009 for world prices and -4% and -2.7% for the FOB prices in the moderate scenario) Apparently the South African firms are losing ground with respect to their competitors and don't adjust completely to the new conditions. The

same is true for the severe scenario. We will see later that in terms of volume of exports, the drop of South African exports is greater than the reduction in the world demand. Note also that for non affected sectors, the decrease in FOB prices is essentially due to the decrease in the cost of trade and transportation margins. In the two scenarios, world prices of exports increase of 2.1% in 2010 and resume their BAU level for the following years (up to 2015). This positive impact of world export prices eliminate nearly the preceding drop, but even in the long run the FOB prices are still below their BAU level.

**Table 9: Impact on export prices (%change from BAU)**

Commodities	Initial exports shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
<b>Non affected</b>	11.0	-0.9	-0.9	-0.4	-0.3	-3.2	-3.7	-1.4	-1.6
<b>Weakly affected</b>	9.0	-1.9	-1.7	-0.2	-0.1	-8.5	-8.7	-0.7	-0.5
<b>Mildly affected</b>	31.8	-3.3	-2.1	-0.5	-0.3	-14.0	-13.9	-2.2	-2.1
<b>Strongly affected</b>	48.2	-4.0	-2.7	-0.3	-0.3	-16.6	-16.3	-1.6	-1.8
<b>All</b>	100.0	-3.3	-2.2	-0.4	-0.3	-13.6	-13.5	-1.7	-1.7

Tables 10 and 11 present the impact of the shocks on import prices and local domestic prices. The drop of world price of imports will reduce the domestic cost of imported goods even if the reduction is, in percentage point, a little bit less than the reduction in world price. For the moderate scenario, in 2008, it can be seen that import prices drop more than local prices for strongly and mildly affected sectors. We would expect for these sectors an increase in imports compared to domestic purchases. The opposite case is found for the weakly or non affected sectors. It is important to note for the latter, we have a decrease in import prices due to margins.

**Table 10: Impact on import prices (%change from BAU)**

Commodities	Initial imports shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
Non affected	4.1	-1.0	-0.8	-0.2	-0.1	-3.9	-3.9	-1.1	-0.7
Weakly affected	8.7	-2.3	-2.1	-0.2	-0.1	-10.4	-10.4	1.1	-0.5
Mildly affected	32.4	-3.4	-1.6	-0.1	-0.1	-14.4	-14.4	-0.5	-0.3
Strongly affected	54.8	-4.5	-2.8	-0.1	-0.1	-17.8	-17.9	-0.6	-0.4
All	100.0	-3.8	-2.3	-0.1	-0.1	-15.5	-15.6	-0.6	-0.4

Table 11: Impact on local demand prices (%change from BAU)

Commodities	Initial local demand shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
Non affected	5.1	-2.4	-2.0	-0.7	-0.4	-9.2	-10.0	-3.4	-2.2
Weakly affected	5.7	-2.4	-2.0	-0.6	-0.4	-9.7	-10.1	-2.8	-2.2
Mildly affected	65.2	-2.9	-2.3	-0.6	-0.4	-11.6	-11.6	-2.9	-2.3
Strongly affected	11.5	-3.3	-2.2	-0.3	-0.2	-13.3	-13.0	-1.3	-1.3
All	100.0	-2.9	-2.3	-0.6	-0.4	-11.2	-11.3	-2.7	-2.3

## 2. Impact on exports, imports and local demand:

As expected, results reported in Table 12 show that exports decrease strongly for products belonging to group 4, and deeper in the severe scenario. In 2008, at the beginning of the crisis, we have a decrease of 21.5% for strongly affected sectors in the severe scenario. The drop in world demand has a direct effect on exports and the lower reduction in FOB prices with respect to world prices also reduces the performance of exports.

It's important here to understand the behavior of the non affected sectors. Globally speaking, they benefit from the difference between local prices (that are sharply decreasing and export prices (that are hardly affected)). The real exchange rate depreciates strongly and this movement favors only the exporting sectors that are not affected by the reduction in foreign demand and international prices. For instance, the gold sector belonging to non affected sectors sees the volume of its exports increasing by 3.1% in 2008 in the moderate scenario and by 10.6% in the severe.

**Table 12: Impact on exports (%change from BAU)**

Commodities	Initial exports shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
<b>Non affected</b>	11.0	3.3	3.2	1.3	0.9	12.4	13.8	4.7	5.4
<b>Weakly</b>	9.0	-0.0	-0.6	0.8	0.3	-3.8	-3.2	3.3	2.2
<b>Mildly</b>	31.8	-2.6	-1.1	-0.5	-0.9	-13.3	-14.6	-4.6	-5.0
<b>Strongly</b>	48.2	-5.2	-3.9	-0.9	-1.1	-21.5	-23.0	-7.0	-6.8
<b>All</b>	100.0	-3.0	-1.9	-0.4	-0.7	-13.6	-14.5	-4.0	-4.1

From table 13, we also note a sharp decrease in imports. As we will see later total income of households will go down substantially (See Table 22) driving a huge reduction in total absorption and a reduction of demand for imported goods. In the moderate scenario this demand reduction is sufficient to compensate for the positive effect of lower import prices. At the end imports fall by 2.1 % in the strongly and mildly affected sectors. However this decrease will be greater for non affected and weakly affected sectors as the local price falls

more than the import price. We also have to keep in mind that we have a constraint on the current account balance which is assumed fixed relative to GDP. This assumption implies that if the country's exports decrease, then its imports would have to follow the same path.

**Table 13: Impact on imports (%change from BAU)**

Commodities	Initial imports shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
<b>Non affected</b>	4.1	-2.5	-2.2	-0.8	-0.8	-10.2	-11.1	-4.8	-4.1
<b>Weakly</b>	8.7	-2.2	-1.6	-1.0	-1.1	-8.4	-9.3	-6.1	-5.5
<b>Mildly</b>	32.4	-2.1	-2.2	-1.0	-1.1	-8.7	-9.6	-5.9	-5.7
<b>Strongly</b>	54.8	-2.1	-2.0	-1.1	-1.3	-9.3	-10.2	-6.4	-6.4
<b>All</b>	100.0	-2.1	-2.0	-1.0	-1.2	-9.1	-9.9	-6.2	-6.0

As explained previously, the contraction on the demand side translates into fewer imports. However as shown in Table 14, this will affect domestic demand even more dramatically due to the increased competitiveness of foreign products created by the reduction in import prices.



**Table 14: Impact on local demand (%change from BAU)**

		Moderate				Severe			
Commodities	Initial local demand shares	2008	2009	2010	2015	2008	2009	2010	2015
Non affected	5.1	-1.1	-0.8	-0.3	-0.5	-4.8	-5.0	-2.5	-2.6
Weakly	5.7	-1.6	-1.4	-0.4	-0.7	-7.5	-7.9	-3.1	-3.2
Mildly	65.2	-2.4	-1.9	-0.8	-1.0	-10.3	-10.2	-5.1	-5.0
Strongly	11.5	-3.1	-2.4	-0.8	-1.0	-13.0	-14.1	-5.4	-5.2
All	100.0	-2.4	-1.9	-0.7	-0.9	-10.3	-11.2	-4.9	-4.7

The decrease in the total demand for goods will have consequences for sectoral production. We would actually expect sectoral production to decrease, and the decrease should be stronger for sectors strongly dependent on exports. On the other hand, sectors that are not directly affected by the crisis might be affected by a reduction of other sectors' demand, in terms of intermediate consumption for instance. This is the case for all transport and trade sectors.

### **3. Impact on production:**

The decrease in the production of most of the sectors will have a number of consequences. First, firms that see their exports and production fall will retrench workers as they are unable to adjust the nominal wage of labour. Thus, we expect labour demand to be reduced. We will have to focus on the composition of the labour force for specific sectors to analyse which category of workers will be vulnerable. Moreover, we know that firms will decrease their labour demand and will simultaneously decrease their demand for intermediate consumption given the reduction in the level of activity. Therefore, some sectors (not directly influenced) will actually be indirectly affected by the decrease in intermediate consumption of the strongly affected sectors. Tables 15 summarises these effects on the sectors for the two scenarios.

**Table 15: Impact on production (%change from BAU)**

Commodities	Initial output shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
<b>Non affected<sup>16</sup></b>	6.2	-0.0	-0.2	0.1	-0.2	-0.5	-0.3	-0.7	-0.5
<b>Weakly</b>	6.2	-1.3	-1.2	-0.2	-0.5	-6.8	-7.0	-1.9	-2.1
<b>Mildly</b>	59.5	-2.4	-1.8	-0.8	-1.0	-10.6	-11.5	-5.1	-5.0
<b>Strongly</b>	17.0	-3.8	-2.9	-0.9	-1.1	-15.8	-17.1	-6.0	-5.8
<b>All</b>	100.0	-2.4	-1.9	-0.7	-0.9	-10.7	-11.6	-4.7	-4.7

#### **4. Impact on labour demand, unemployment rates and wages**

What is the impact of the crisis on labour demand and unemployment? We have seen so far that exports, imports and production are falling. Due to the downward rigidity of nominal wages, firms will adjust to the reduction in demand by laying off workers. As unions are strong in South Africa, we know that producers will not be able to decrease the wage rate to adjust to the falling demand so they will have to retrench more workers. Indeed Table 16 shows the corresponding declines in labour demand.

**Table 16: Impact on labour demand (%change from BAU)**

Commodities	Initial labour demand shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
<b>Non affected</b>	4.7	1.1	1.1	0.3	0.7	3.1	2.3	-2.1	3.9

<sup>16</sup> Note here that we have a difference in this group between gold and the rest. Indeed, gold production increases. This sector does not depend on local purchases, thus it does not face a decrease in local demand. For food and beverage, their production decreases due to the decline in local demand (households).

<b>Weakly</b>	4.4	-2.4	-2.5	-0.5	-0.5	-12.2	-13.3	-4.7	-2.3
<b>Mildly</b>	55.7	-5.5	-3.8	-1.0	-0.8	-23.3	-23.9	-8.3	-4.2
<b>Strongly</b>	9.0	-9.5	-6.1	-0.4	-0.8	-37.3	-36.8	-6.2	-7.8
<b>All</b>	73.7	-4.7	-3.3	-0.8	-0.7	-20.1	-20.7	-6.8	-3.8

All sectors except the non affected retrench workers. Non affected sectors, and notably the gold sector benefit from the crisis. We saw earlier that its production was increasing, and this is only possible by increasing the number of workers.

The process of retrenchments will not be uniform across the different labour categories (Table 17). Highly skilled workers are the ones who suffer the least from the crisis. Although we have important job losses during 2008 and 2009 (and 2010 for severe scenario), we find that the economy would rapidly face a shortage of skilled workers. This situation fits perfectly with the reality in South Africa.

**Table 17: Impact on total labour demand (%change from BAU)**

YEARS	High Skilled		Skilled and Semi Skilled		Low skilled	
	MOD	SEV	MOD	SEV	MOD	SEV
<b>2008</b>	-4.40	-20.73	-4.90	-19.57	-5.86	-23.87
<b>2009</b>	-2.36	-20.82	-3.96	-20.50	-4.23	-24.65
<b>2010</b>	0	-5.49	-1.33	-7.86	-1.04	-8.24
<b>2015</b>	0	0	-1.21	-6.59	-0.99	-5.28

In the BAU, for each labour category, we observe that unemployment is decreasing due to the fact that capital grows faster than labour, and that labour is more and more efficient in the economy. Results reported in Table 18 show that for highly skilled workers only, in the base year, the unemployment rate is very low (1%) and actually decreases in the BAU to reach 0% in 2007. In 2009, in the severe scenario, for skilled workers, their unemployment rate reaches a little more than 20%.

**Table 18: Unemployment rate (%)**

	High Skilled		Skilled and Semi Skilled		Low skilled	
YEARS	MOD	SEV	MOD	SEV	MOD	SEV
2005	1.00	1.00	15.00	15	26.4	26.4
2008	4.40	20.73	17.18	29.96	28.16	41.90
2009	2.36	20.82	15.50	30.05	26.07	41.83
2010	0.0	5.49	12.23	18.04	22.73	28.36
2015	0.0	0.0	7.02	12.08	18.42	21.96

Recall that there are actually 4 types of labour in the model, the 3 described above and informal labour. We assume that we do not have unemployment of informal labour. Therefore, the impact of the crisis for this type of labour will be on their wage rate which falls sharply.

**Table 19: Impact on high skilled and informal wage rate (%) (%change from BAU)**

	High Skilled		Informal	
YEARS	MOD	SEV	MOD	SEV
2008	1.38	1.38	-5.00	-21.10
2009	2.48	2.48	-3.68	-21.85
2010	-1.68	-3.61	-0.97	-7.64
2015	-1.46	-7.99	-0.77	-4.24

On the rate of return of capital, it is not surprising to see a decrease in most of the sectors as depicted in Table 20. Thus, we will expect negative impacts on households' incomes, and even more on firms' incomes, since they rely mainly on capital.

**Table 20: Impact on rate of return to capital (%change from BAU)**

Commodities	Initial rate of return shares	Moderate				Severe			
		2008	2009	2010	2015	2008	2009	2010	2015
Non affected	4.1	-1.3	-1.8	-1.1	-0.3	-4.6	-7.2	-7.0	-1.9
Weakly	5.3	-1.7	-2.1	-0.7	-0.4	-7.7	-9.0	-4.1	-2.1
Mildly	71.3	-4.0	-3.1	-0.9	-0.4	-16.0	-15.9	-4.9	-2.7
Strongly	15.8	-6.2	-3.9	0.0	-0.2	-25.0	-23.1	-0.9	-1.6
All	100	-4.5	-3.4	-0.8	-0.4	-17.9	-17.8	-4.7	-2.7

Taking these results into account, we can now analyze what happens to the different agents following the crisis.

#### 5. Impact on institutions:

- **Firms:**

As we mentioned previously, the rate of return for capital is sharply decreasing. Firms' income is thus strongly affected as this component represents 88% of their total income (Table 21). Moreover, one of the channels through which the crisis operates is modeled as a decrease in transfers from abroad. Thus, we expect their income to decrease strongly. Firms' income decreases by 16% in 2008 in the severe scenario, and even in the long run, it cannot return to its BAU level.

**Table 21: Impact on firms (%change from BAU)**

YEARS	Capital income		Transfers Income		Total Income		Savings	
	MOD	SEV	MOD	SEV	MOD	SEV	MOD	SEV
2008	-4.53	-17.94	-1.87	-3.73	-4.23	-16.34	-4.17	-16.06
2009	-3.72	-18.74	-2.22	-4.06	-3.55	-17.11	-3.52	-16.82
2010	-1.35	-7.24	-1.83	-4.06	-1.40	-6.89	-1.41	-6.83
2015	-1,45	-7.66	-1.83	-4.06	-1.49	-7.30	-1.50	-7.24

Firms' savings are obtained after removing taxes to government and transfers paid to other institutions (mainly households and the rest of the world) from their income. As seen in Table 21, there is a dramatic fall in firms' saving which is more pronounced in the short run. This decrease in firms' savings will have important consequences for total investment. Indeed, firms' savings represent 80.5% of total investment. Here again, we can see that, even in the moderate scenario, the effect of the crisis remains in the long run as, firm's savings remains below its BAU level (-1.5%).

- **Households**

Households receive income from labour and transfers from firms, government and the rest of the world. We assume that transfers from government and the rest of the world are fixed, whereas transfers from firms are a proportion of firms' income.

As shown in Table 22, unemployment rises for all labour categories and labour demand decreases. As households' income is mainly based on labour income, we expect it to decrease. Moreover, as mentioned previously, firms' income is decreasing and so are the dividends it pays. Thus, households' income decreases sharply in both scenarios. This decrease negatively affects household consumption and savings and thus total absorption through a reduction in consumption and investment.

**Table 22: Impact on households (%change from BAU)**

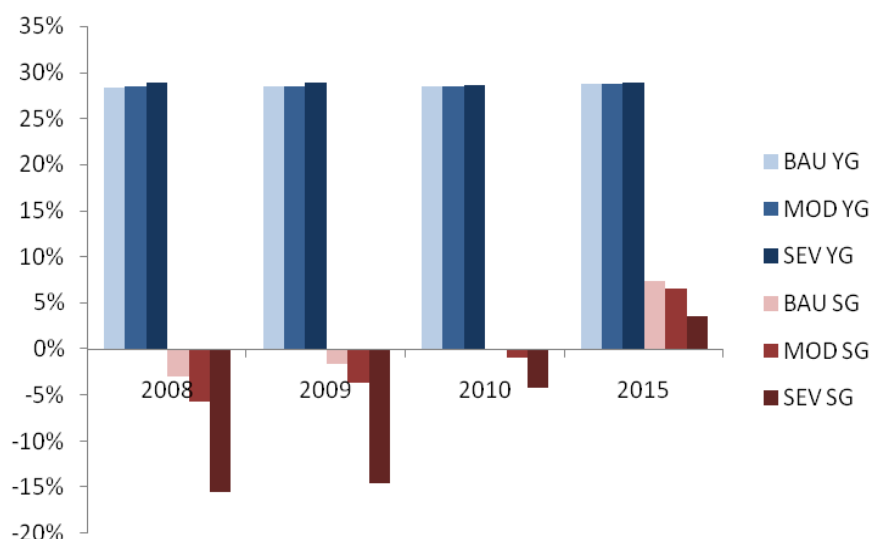
YEARS	Labour income		Transfers Income		Total Income		Savings		Consumption	
	MOD	SEV	MOD	SEV	MOD	SEV	MOD	SEV	MOD	SEV
<b>2008</b>	-5.4	-21.36	-3.43	-13.19	-4.64	-18.24	-4.83	-18.85	-4.62	-18.16
<b>2009</b>	-4.29	-22.26	-2.90	-13.86	-3.76	-19.04	-3.94	-19.69	-3.74	-18.96
<b>2010</b>	-1.37	-8.29	-1.17	-5.64	-1.29	-7.27	-1.38	-7.60	-1.28	-7.24
<b>2015</b>	-1.23	-6.67	-1.26	-6.08	-1,24	-6,44	-1.33	-6.87	-1.23	-6.40

- **Government:**

Government's income is expected to decrease. Indeed, direct taxes are decreasing (as a share of households and firm income), and taxes on products are also decreasing for most of the sectors (decrease in imports, and production). We know that half of government income comes from direct taxes, and around a third comes from indirect taxes on products. Thus, given the above, we expect its income to decrease.

Figure 3 represents the variations of the share of Government's income in GDP as well as government's savings as a percentage of GDP for the BAU and both scenarios.

**Figure 3: Income/GDP and Savings /GDP for government**



In the BAU, government income/GDP is around 28%. This share increases in the scenarios due to the huge drop of GDP. Regarding savings over GDP, in the BAU in 2008, the deficit represents 3% of GDP, and without any shock, the deficit would decrease to reach a surplus in 2015. Note that in the base year, the deficit is quite low, and then, we have a decrease in prices in the BAU (as the economy is becoming more and more efficient through time). It is therefore straightforward to understand why government's savings become positive in the long run.

With the crisis of course, we do not observe the same pattern in the short run. Indeed, the deficit reaches -15% of GDP in 2008 and 2009 in the severe scenario, and around 5% for the

moderate scenario. In the long run, we find that the situation is improved somewhat but we are far behind the BAU situation.

#### 6. Impact on total investment and GDP:

Given all the preceding impacts we are not surprised to observe a huge decrease in total investment (Table 23). What is relevant to note here is that even though the crisis is in effect only in 2008 and 2009, and the recovery starts in 2010, impacts on investment remain in the long run. Indeed, whatever the scenario, in 2015 we observe a decrease in investment.

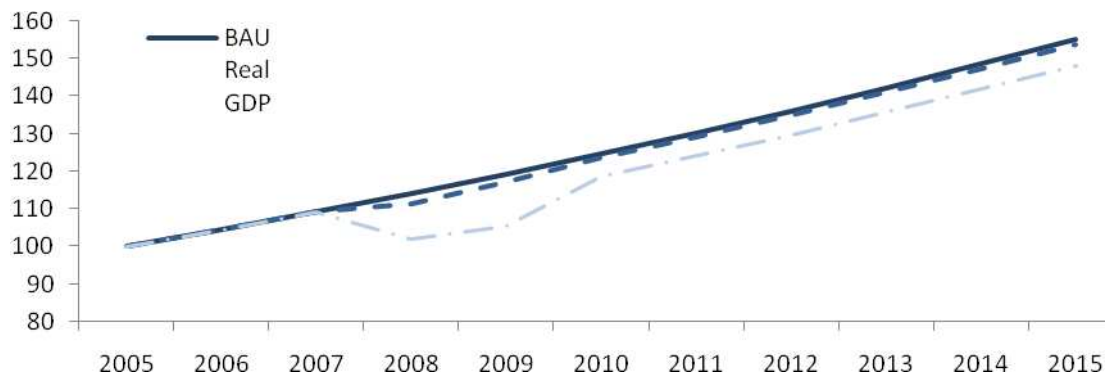
**Table 23: Impact on investment (in %) (%change from BAU)**

YEARS	Total investment (value)		Private investment(value)		Private investment(volume)	
	MOD	SEV	MOD	SEV	MOD	SEV
2008	-6.16	-23.94	-6.00	-23.49	-2.64	-11.20
2009	-5.03	-24.91	-4.99	-24.54	-2.62	-12.47
2010	-1.90	-9.61	-1.99	-10.00	-1.57	-8.21
2015	-1.93	-9.48	-2.03	-9.90	-1.78	-8.48

Now focusing on GDP, we know that the South African projections for GDP were around 4.5% growth per year. The world economic crisis produces a huge drop in GDP (Figure 4). For both scenarios, we can see that GDP falls in 2008 and 2009 and then increases again, but it will never reach its BAU value. In other words, without a deliberate government intervention to stimulate the economy and counteract the negative impact of the world crisis we will never have the same level of GDP as in the BAU scenario.

**Figure 4: Evolution of Real GDP in BAU, Moderate and Severe scenarios**





## 8. Concluding remarks:

As expected, the effects of the world economic crisis on the South African economy are really harsh even in the moderate scenario. Indeed, the decrease in world prices combined with the drop in world demand leads to a fall in production for most sectors. This reduces employment and unemployment rates increase.

The impact on institutions is also worrying. Households see their income drop, and the situation is worse for informal workers that do not benefit from minimum wage. They face a huge drop in their wage rate. Firms also suffer from the crisis as their income and savings decrease strongly.

A relevant fact to note is that even if the crisis only lasts for two years (2008 and 2009), its effects remain even in the long run, notably due to the permanent impact of the drop in investment.

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## 2 Appendix

**Table 24: Sectors grouped according to severity of the impact of the crisis**

<b>Group</b>	<b>Sectors</b>	<b>Number of sectors</b>
<b>Group 1:</b> (Non affected sectors)	Gold & uranium ore mining Food Beverages & tobacco	3
<b>Group 2:</b> Sectors weakly affected	Agriculture, forestry & fishing Textiles Wearing apparel Leather & leather products Footwear Wood & wood products Paper & paper products Water supply Furniture	9
<b>Group 3:</b> Sectors mildly affected:	Building construction Electricity, gas & steam Basic non-ferrous metals Metal products excluding machinery Other industries Basic chemicals Printing, publishing & recorded media Other chemicals & man-made fibres Rubber products Plastic products Glass & glass products Non-metallic minerals Wholesale & retail trade Catering & accommodation services Railway transport Road transport	31

	<p>Transport via pipeline</p> <p>Water transport</p> <p>Air transport</p> <p>Transport support services</p> <p>Communication</p> <p>Finance &amp; insurance</p> <p>Business services</p> <p>Medical, dental &amp; other health &amp; veterinary services</p> <p>Community, social &amp; personal services</p>	
<p><b>Group 4:</b> Sectors strongly affected</p>	<p>Coal mining</p> <p>Other mining</p> <p>Coke &amp; refined petroleum products</p> <p>Basic iron &amp; steel</p> <p>Machinery &amp; equipment</p> <p>Electrical machinery</p> <p>Professional &amp; scientific equipment</p> <p>Other transport equipment</p> <p>Television, radio &amp; communication equipment</p> <p>Motor vehicles, parts &amp; accessories</p>	<p>10</p>