Chapter 1

PERSPECTIVES AND PROSPECTS FOR JOB CREATION AND THE FISCAL INTERVENTIONS IN SOUTH AFRICA

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1.1 Introduction

The global economy is going through its worst economic crisis in fifty years, affecting employment and spreading to South Africa. In 2009, South Africa experienced its first economic recession in 19 years. More recently, the economy has been negatively affected by the uncertain global economic climate, in particular because of South Africa's exposure to euro-zone economies through trade and financial markets. Data for early 2010 suggests that unemployment may have peaked and that economic recovery is underway. However, the recovery will not be strong enough to bring the millions of newly unemployed back to work quickly. The main pillars of the government economic policy – the New Growth Path, the Industrial Policy Action Plan and the National Planning Commission's Vision for 2030 – are anchored in a significant ramping up of current and capital expenditure by the state. The government and state-owned companies plan to spend about R845 billion on infrastructure over the next three years, which they expect will contribute significantly to meeting the government job-creation target of five million jobs in 10 years. So much is riding on this state infrastructure spending, as the solution to reducing poverty, inequality and unemployment and generating economic growth.

This chapter studies the efficacy of a broad array of policy approaches designed to reduce unemployment using a labour model embedded within an economy-wide modelling framework. Section 1.2 reviews the facts and myths about the unemployment situation based on findings from the literature, while Section 1.3 explores the relationship between infrastructure and total factor productivity. Section 1.4 builds a national labour model for South Africa and discusses the data used to operationalise the model. In Section 1.5, the general implications of introducing alternative policies in such a framework are discussed, and how it can assist government to solve problems of job creation, while taking into account fiscal consequences. Section 1.6 summarises the main findings and Section 1.7 offers policy recommendations.

1.2 Understanding Causes of Unemployment in South Africa

After more than 19 years since the end of apartheid, high unemployment persists, and South Africa is still facing the challenge of creating sustainable employment for a growing labour force. The economy's poor performance in creating employment has led to many debates. One is South Africa's capacity to compete globally: high unemployment is a sign of domestic industries' inability to compete with either the high-tech or the low-wage countries. Another is trade and technologies: new technologies and globalisation can explain the massive restructuring of South African industries and

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consequent job losses. Other debates point to the skills mismatch, to insufficient aggregate demand or to the overly generous social policies that negatively affect employment.

Figure 1.1 shows South Africa's annual gross domestic product (GDP) growth for the period 1990–2010. Growth in South Africa was positive between 1993 and 2008 but became negative in 2009 following the 2008 global financial crisis. Recovery started slowly in 2010, with a growth rate of 2.9%. Despite this mostly positive growth, South Africa's economic growth needs to be more labour intensive (Nattrass, 2000). The policies that accompanied the institutional transformation of 1994 focused on dealing with the high inequality in wealth, income and opportunity in the South African economy (McCarthy, 2005). However, what is needed is increased employment, as almost all of South Africa's household income comes from participating in the labour market, mainly through wages (Nattrass, 1998).

Figure 1.1. South Africa's annual GDP growth: 1990−2011
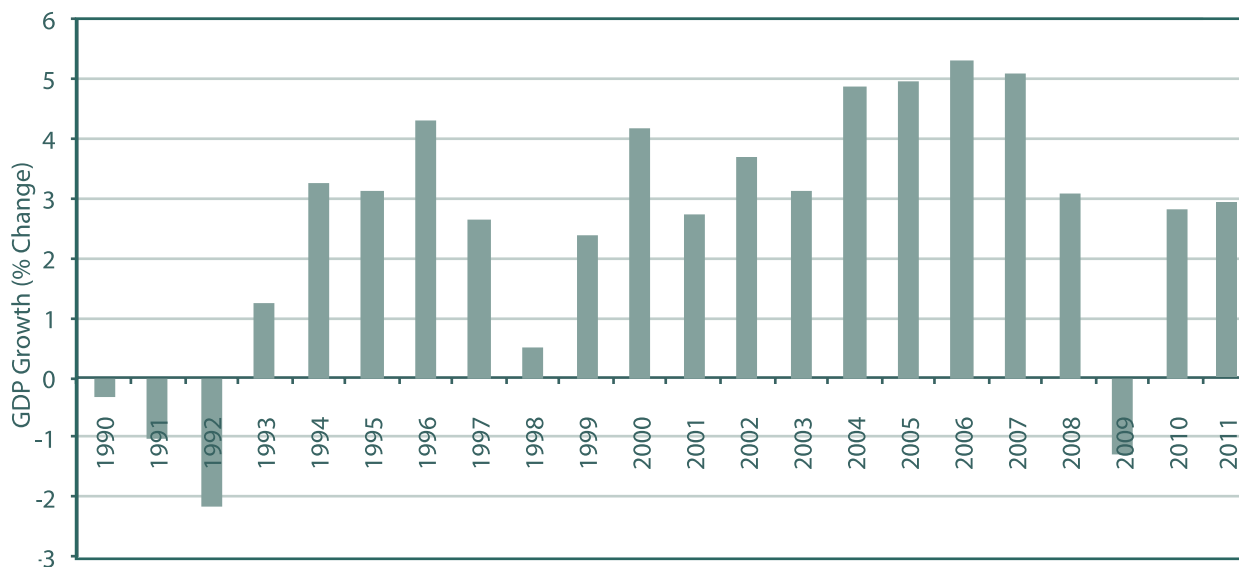
*Source: The South African Reserve Bank, May 2012*

As Figure 1.2 shows, from 1994 unemployment increased, with rates remaining stubbornly above the 20% threshold from 1996. Although international comparisons of unemployment are fraught with problems, the evidence suggests that South Africa has exceptionally high rates of unemployment. As Figure 1.3 illustrates, South Africa's unemployment looks abnormally high when compared with other middle-income countries (as classified by the World Bank).

Figure 1.2. South Africa's unemployment rate: 1994−2010
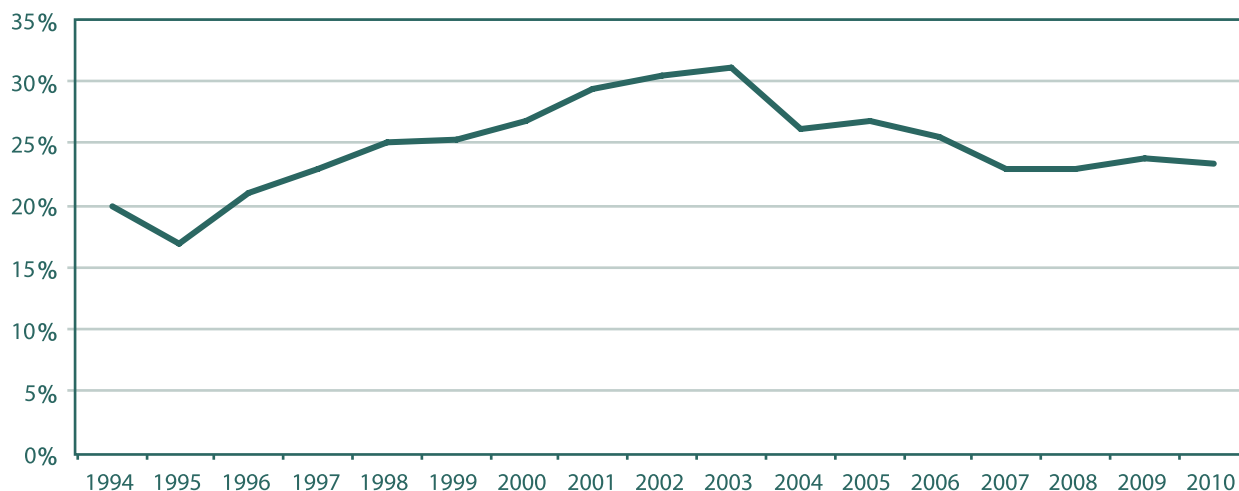
Source: World Bank, 2012; CIA World Fact Book, 2012

Figure 1.3. Unemployment rate for Brazil, China, Mexico, Russia and South Africa (2010)
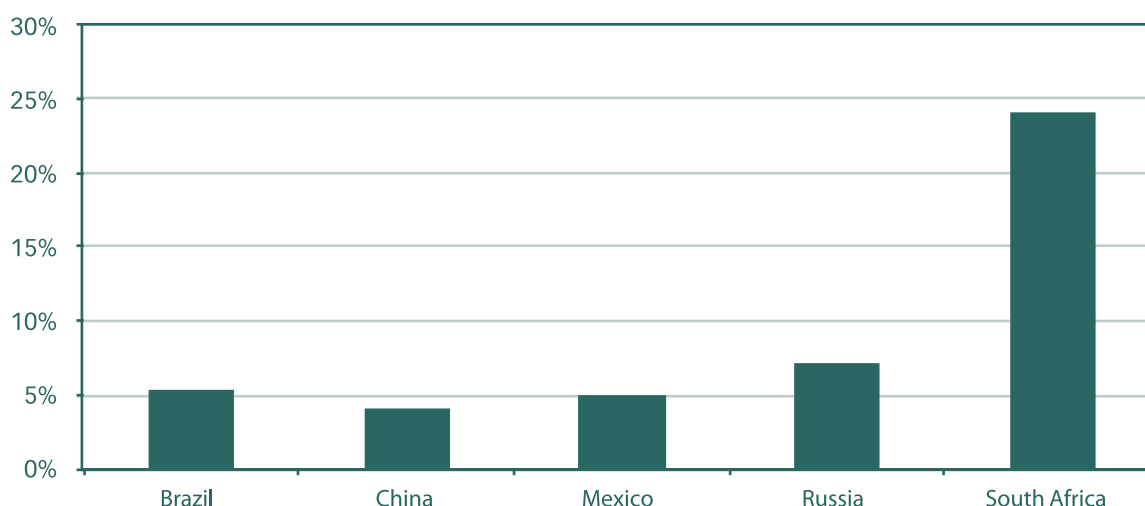
Source: Trading Economics, 2012

South Africa's inability to handle macroeconomic shocks is a central factor that explains employment developments (FFC, 2010). Over the last 18 years, periods of job growth have been followed by periods of heavy job losses. Jobs were created during the recovery periods but were destroyed by the millions in the downturn periods because of (in part) uncoordinated macro and micro-economic policies. This questions the validity of jobless growth in South Africa since the new democratic dispensation and indeed the links among economic growth, job creation and unemployment. Between September 2001 and September 2008, as economic growth continued and accelerated, as many as 2.5 million new formal- and informal-sector jobs were created in South Africa (The Presidency, 2009, p 20). The period of 'jobless growth' during the early and mid-1990s represented an aberration: since the Second World War, employment growth often lagged output growth in South Africa, but jobless growth has been rare (Hodge, 2009, pp 497–498).

Research suggests that supply-side and demand-side factors have hampered the ability of the South African economy to create enough jobs. On the supply side, South Africa has experienced rapid labour-force growth, especially during the second half of the 1990s (Hodge, 2009, pp 499–500).[5] The labour force has expanded much more rapidly than the working-age population (Kingdon and Knight, 2007, pp 816–819), which implies that labour-force participation rates increased markedly.[6] The increase in participation rates – which has been particularly noticeable among African women – has been ascribed to actual and perceived improvements in employment opportunities following the scrapping of apartheid-era restrictions on the mobility of Africans (Burger and Woolard 2005, pp 5–8; Kingdon and Knight 2007, pp 816–819). Other factors include the introduction of employment-equity legislation, rising education levels, and rapid growth in the number of households because of changes in household structure and HIV/AIDS-related deaths among household heads.

Mismatches between labour supply and demand have constrained the labour intensity of economic growth. Most notably, since 1970 the economy has experienced considerable structural change, with the primary sectors (agriculture and mining) shedding labour and new job opportunities arising in tertiary sectors such as finance, wholesale and retail trade and community, social and personal services (Banerjeeet al., 2009, pp 723–724). These changes have contributed to an increase in the demand for more skilled labour accompanied by a fall in the demand for unskilled labour, which has markedly worsened the employment prospects of the large unskilled portion of the South African labour force (Burger and Woolard, 2005, pp 16–18).

Table 1.1 confirms the shift since 1995 in the skills composition of employment, from unskilled and semi-skilled to skilled labour. From 1995 to 2008 only 17.7% of the new jobs created required unskilled workers, and by 2008 only 22.8 % of all jobs were classified as 'unskilled'. Of the new jobs created between 1995 and 2008, 46.4% were in the semi-skilled category, but this category's share of all jobs also decreased. In contrast, jobs requiring skilled workers increased from 21.8 % in 1995 to 26.1 % in 2008.

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5   From 2000 onwards labour-force growth slowed sharply, averaging only 0.7 % per annum from 2000 to 2007 (Hodge, 2009, p 500).

6   Kingdon and Knight (2007, pp 816–819) pointed out that immigration also contributed to rapid labour-force growth. However, as much immigration has been informal or illegal, the extent of this contribution is difficult to quantify.

Table 1.1. The skills composition of employment (1995–2008)

Year	Percentages		
	Unskilled	Semi-skilled	Skilled
1995	25.1	53.1	21.8
2004	23.4	52.7	23.9
2008	22.8	51.0	26.1
Job growth (1995-2008)	17.7	46.4	35.9

Source: National Treasury, 2010, p 41

The relationship between labour-market institutions and outcomes is a controversial aspect of the unemployment debate in South Africa. Since 1995, government has promulgated a series of laws that have substantially changed the labour-market institutions.[7] Some economists (e.g. Arora and Ricci, 2005, pp 25–30) have argued that aspects of this institutional framework – including the laws governing collective bargaining processes and working conditions – have contributed to high unemployment in South Africa by rendering the labour market inflexible.

Having invested much political capital in establishing its labour market framework, the South African government has long resisted calls for reform. Analysis of the South African labour market has highlighted two additional constraints to overcoming the unemployment problem. First, the legacy of apartheid-era spatial planning (which separated black job seekers from job opportunities) and residual vestiges of racial discrimination may well undermine the effectiveness of employment searches in the labour market (Banerjee et al., 2009, p 734). Second, young people seem to experience exceptional difficulty in obtaining their first jobs and are affected particularly harshly by the scarcity of jobs.[8] When making hiring decisions, firms apparently put a high premium on work experience, possibly as a screening mechanism in an environment where virtually all younger workers now have at least ten years of formal education (Banerjee et al., 2009, pp 736–737).

Another notable feature of the South African labour market is the small size of the informal sector (Kingdon and Knight 2004, pp 391–392). In contrast to the situation in most developing countries, the informal sector appears not to have expanded rapidly to compensate for the scarcity of formal-sector jobs.[9] For example, in the fourth quarter of 2009, about 2.1 million workers were active in the non-agricultural informal sector, whereas 5.8 million were either openly unemployed or classified as discouraged work-seekers (StatsSA, 2009, p vi).

1.3 Infrastructure and Total Factor Productivity

Investment in infrastructure was in general very low in the years preceding democracy in South Africa. From 1996 to 2002, during the era of Growth, Employment and Redistribution (GEAR), public infrastructure investment fell from 8.1% to 2.6% of GDP. Fiscal discipline was emphasised more than increased expenditure. It was from the Accelerated and Shared Growth for South Africa (AsgiSA) plan in 2002 that a drive for infrastructure was couched in policy. The AsgiSA plan identified infrastructure as one of the six binding constraints to economic growth. The 2008 Budget Review showed that growth in real gross fixed capital formation increased from 16.5% in the fourth quarter of 2006 to 21.2% in the third quarter of 2007 (National Treasury, 2008). However, the financial and economic crisis that affected South Africa's economy between 2009 and 2010 slowed down the rate of growth in the economy. Thereafter, policy has once again turned to emphasise massive infrastructure investment. In his 2012 State of the Nation address, the President of the Republic of South Africa unravelled an intensive five-year infrastructure investment drive. It is thus appropriate to understand the impact of infrastructure on the South African economy and employment.

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7   The most important pieces of legislation were the Labour Relations Act (1995), the Basic Conditions of Employment Act (1997), the Employment Equity Act (1998), and the Skills Development Act (1998).

8   According to the National Treasury (2010a pp 51, 42), more than three million young people do not work, and 73 % of the unemployed are aged 15–35.

9   According to Heintz and Posel (2008), a comparison of Statistics South Africa and International Labour Organisation data for 2006 confirms that the ratios between non-agricultural employment in the informal sector and total employment were markedly higher in Latin and Northern American middle-income countries such as Argentina (36.1 %), Brazil (40.6 %), Mexico (38.0 %) and Paraguay (50.1 %) than in South Africa (18.5 %). Data on the size of informal sectors in sub-Saharan African and Asian developing countries also suggest that the informal sector in South Africa is unusually small (cf. Kingdon and Knight, 2004, pp 391–392).

Over time, studies on the impact of infrastructure on economies have produced differing results. For instance, Jung and Thorbecke (2003) showed that infrastructure spending benefited poor people in Tanzania but worsened the plight of the poor in Zambia. In a summary of some of the main studies on infrastructure, Kirsten and Davies (2008) show that, in general, studies that looked at various infrastructure sectors, roads, sanitation, electrification and dams show varied results – some are beneficial for poverty reduction, others actually cause poverty. Using a CGE model, Perrault *et al*. (2010) showed that the impact of infrastructure spending is very varied in selected sub-Saharan countries. Further, using the same model, they showed that the financing options produce very different results in the different countries. The analysis shows the importance of the underlying structure in determining the impact of infrastructure expenditure in a country.

The extensive work done by Fedderke and Bogetic (2006) has led to greater interest in analysing the importance of infrastructure, from its impact on growth to its impact on productivity. Fedderke and Bogetic (2006) concluded that infrastructure investment had a positive impact on productivity: total factor productivity increased by 0.04% when investment in economic infrastructure increased by 1%. However, Fedderke and Garlick (2008) suggested that the AsgiSA infrastructure plan might have unfavourable effects in South Africa.

Kirsten and Davies (2008, p 4) point out that the impact of increased infrastructure spending on poverty and employment is not clear, even if higher spending increases the rate of growth. Such micro impacts can only be uncovered by more in-depth sectoral analysis of the expenditure patterns, which is one of the purposes of this chapter.

Using a social accounting matrix (SAM) model, a study of the impact of transport infrastructure in South Africa found that middle-income households benefited the most from an increase in transport infrastructure (Mabugu and Chitiga, 2009). A possible problem is that public infrastructure investment could potentially crowd out other investment (Mabugu and Chitiga, 2009, p 36). However, an increase in infrastructure has positive effects on the economy, increasing consumption and investment and thereby creating spill-over effects (Mabugu et al., 2009). As this study used a static CGE model, it opens the way for a dynamic CGE study, as typically the effects of infrastructure are dynamic.

1.4 Data and Methodology

For the purpose of this study, the labour factor is disaggregated into occupations. Integrated economic accounts from Statistics South Africa (StatsSA) for 2005, where the labour force is split according to occupation and population groups, are used after ensuring concordance with the SAM economic activities codes. The original SAM used is from Quantec for 2005. The different occupations are then identified as skilled, semi-skilled and unskilled using the StatsSA classification, as shown in Table 1.2.

Table 1.2. Correspondence between occupations and skills level

| Skill Category	Occupation
Skilled	Legislators
	Professionals
	Technicians
Semi-Skilled	Clerks
	Service workers
	Skilled agricultural workers
	Craft workers
	Plant and machine operators
Unskilled	Elementary occupations
	Domestic workers
	Occupation unspecified

Gibson (2003) is used for the trade parameters and low-bound export supply, while demand elasticities are obtained from Behar and Edwards (2004). Estimates for parameters in industry production and household demand are not available

for South Africa. Therefore, the 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 StatsSA (2009).

To evaluate the impacts of government's policies in the long run, the dynamic Poverty and Economic Policy (PEP 1-t) standard model by Decaluwé *et al*. (2009) is used. However, several assumptions of this standard model are changed in order to take into account the South African economy. The model has two production factors: capital and labour. Labour is disaggregated into three broad types: unskilled, semi-skilled and skilled workers. Each type of broad labour is then disaggregated into occupations. Each activity uses both production factors.

In line with the SAM, the model has 25 activities and 54 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 skilled, semi-skilled and unskilled labour. Then, the skilled demand is a CES with a low elasticity between legislators, professionals and technicians, capturing the fact that (for instance) it is quite difficult for the firms to substitute a lawyer for a doctor. The semi-skilled demand is a CES with an intermediate value of elasticity between its five components, while the unskilled demand is a CES with a high substitution value, assuming that the producer can relatively easily substitute low skilled workers among them. Figure 1.4 gives the value-added structure.

Figure 1.4. The value-added structure
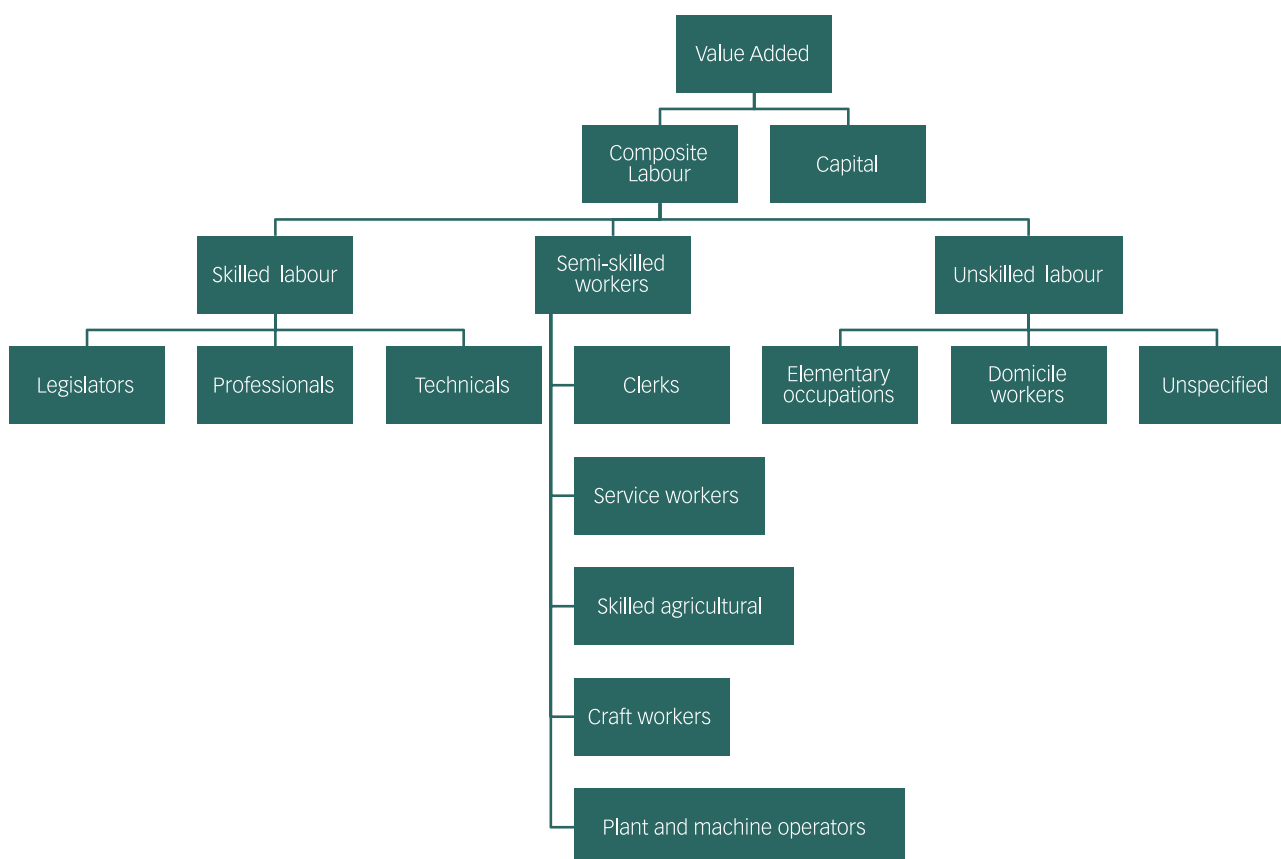
South Africa has high unemployment problems, notably for semi-skilled and unskilled labour. Moreover, unions are very strong in the country. The trade union movement is the most disciplined and the largest in Africa and has influenced labour and other related industrial policies. Unions negotiate salaries and wages, conditions of service, workforce restructuring and retrenchments on behalf of their members. As a result, wages and salaries are rigid, which the model takes into account by assuming a binding minimum wage. Thus, if the production decreases, producers will not be able to decrease their employees' salary below the minimum wage. This rigidity will also have an impact on unemployment, as if producers cannot decrease the wage bill, they will have to retrench some workers.

The nominal exchange rate is the numeraire in the model.[10] Following the assumption that South Africa is a small country, world prices are fixed. However, also assumed is the fact that South African exporters face less than infinite foreign demand for exports: to increase their market share on the world market, they need to reduce their free-on-board (FOB) export prices, 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 force and using an accumulation equation for capital.[11] Transfers between institutions and government's purchases of commodities are fixed at the base year and then grow at the population rate. The assumption is that the rest of the world's savings is a fixed proportion of GDP, which means that South Africa is not allowed to borrow further from the rest of the world.[12]

1.5 Policy Simulations and Results

1.5.1 Policy Simulations

Several forward-looking policy simulations to examine (ex ante) several job creation policy interventions are put forward. Altogether, three sets of scenarios, each one implying four financing scenarios are run. Thus, there are 12 scenarios (which are permutations to the three expenditure scenarios) in total as follows:

1. Government's spending increases by 3% per year during 2013–2016 and then increases at the population rate thereafter.

Four different ways of financing this policy are proposed. First, government totally finances the increase (i.e. government's savings are endogenous and, given the policy set up, might decrease). Then, in the next three scenarios, government's deficit is kept constant, and the increased spending is financed through increasing direct taxes on households (Simulation A), increasing firms' direct taxes (Simulation B), and increasing indirect taxes (Simulation C).

2. Government's investment programme increases. This investment programme is split into three components:

•   Investment in government sectors (e.g. education, justice). These investments will increase the public sector's capital stock.

•   Investment in infrastructure (e.g. roads, harbours, airports). These investments do not increase the capital stock of any sectors. Indeed, a new road belongs to all the sectors and agents and can be considered as a public good.

•   Investment in productive sectors (e.g. investment in the energy sector) that increases the capital stock of a given sector. For instance, when government invests in a nuclear plant, the capital stock of the electricity/energy sector increases.

For this second scenario, an increase in public investment is stimulated for the three components, following the investment plan for the period up to 2016, and thereafter at the population rate. The same four different ways of financing government's deficit as in Scenario 1 are applied.

3. The third scenario presents the same simulation as Scenario 2 but takes into account the productivity effect of infrastructure investment on other sectors. For instance, the construction of a bridge (investment in infrastructure) will have an impact on other sectors if the use of this bridge reduces travel time.

1.5.2 Results

Impact of an increase in government spending

Impact on labour demand and unemployment:

The increase in government spending has a positive impact on labour demand and reduces unemployment for all categories of workers. Government's activities are more intensive in skilled and semi-skilled workers, and so the impact

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10   Note that in the CGE results, a real devaluation of the rand takes the form of a generalised reduction in domestic prices.

11   To specify the accumulation of capital, the Jung and Thorbecke (2001) function is followed.

12   This assumption can seem strange 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.

is greater for these two types of workers. It should be noted that the initial unemployment rate for the skilled is very low (1% according to StatsSA), thus the percentages of variation are incredibly big.

Table 1.3. Impact on unemployment for skilled workers (in % to BAU)

	LEG	PRO	TECH
2012	-81.21	-88.96	-79.89
2020	-35.09	-37.17	-33.88

Table 1.4. Impact on unemployment for semi-skilled workers (in % to BAU)

	SERWO	SKILAG	CRAFTWO	PLANTMACH	CLER
2012	-8.96	-4.05	-2.27	-3.05	-6.08
2020	-3.13	-2.40	-1.16	-1.55	-2.46

Table 1.5. Impact on unemployment for unskilled workers (in % to BAU)

	LEG	PRO	TECH
2012	-81.21	-88.96	-79.89
2020	-35.09	-37.17	-33.88

Next to the decrease of unemployment, and workers also receive an increase in wages. Indeed, as government's activities need more workers to produce, they will attract skilled and semi-skilled workers mainly by offering a better wage than the other activities. Thus, to keep their workers, the other activities will also have to increase the wages they pay to their workers, which results in increased production costs. Sectors with a similar labour demand structure will find it more costly to produce.

The increase in government spending also has an impact on the other sectors through an increase of intermediate demand. To produce more, government sectors need extra public servants, buildings, and all types of commodities produced by the other sectors.

Table 1.6 presents the impacts on production for each sector of the economy. In the short run, most of the sectors increase their production, but in the long run most of them experience a decrease because of the increase in wages and a drop in total investment.

Impact on agents

Table 1.7. Impact on household income (in % to BAU)

	YHL	YHTR	YH
2012	0.80	0.43	0.66
2020	0.34	-0.01	0.20

Household savings and consumption also increase, as they are fixed proportions of disposable income.

The impact on firms is different for the short and long run. In the short run, their capital income, which represents most of their total income, increases. However, in the long run, capital income decreases, and so do firms' income and savings, because of the drop in total investment.

Table 1.6. Impact on total production (in % to BAU)

Sectors	2012	2020
AAGRI	0.18	-0.15
ACOAL	0.05	-0.34
AGOLD	-0.05	-0.21
AOTHM	-0.04	-0.52
AFOOD	0.28	-0.06
ATEXT	0.45	-0.09
AFOOT	0.38	-0.08
APETR	0.21	-0.18
AOTHN	-0.46	-0.54
AIRON	-0.38	-0.54
AELMA	-0.80	-0.67
ARADIO	-0.02	-0.33
ATRANSEQ	0.00	-0.29
AOTHMAN	0.03	-0.29
AELEG	0.35	-0.14
AWATR	0.47	-0.08
ACONS	-1.15	-0.78
ATRAD	0.10	-0.21
AHOT	0.42	-0.13
ATRANSSER	0.13	-0.19
ACOMM	0.38	-0.12
AFINS	0.31	-0.08
ABUSS	0.13	-0.28
AOTHSER	0.61	0.04
AGOVGA	1.98	0.64

The decrease in unemployment and the increase in wages raise household income. Note that their transfer income is composed of dividends they receive from firms (government's transfers are assumed fixed).

Table 1.8. Impact on firms (in % to BAU)

	YFK	YF	SF
2012	0.61	0.54	0.53
2020	-0.02	-0.02	-0.02

Table 1.9 presents all the sources of government's income and how they react to the increase in government spending. The first component represents transfer income and comes mainly from firms (dividends). The second one represents all the taxes on production (on labour, capital, production). The third one is the sum of all taxes on products (import taxes, VAT, export taxes, excise taxes, fuel levy). The final one is the total direct taxes paid by households and by firms.

In the short run, all these components increase, but in the long run the components related to firms and to products decrease slightly.

Table 1.9. Impact on government's income (in % to BAU)

	YGTR	TPRODN	TPRCTS	TDHT	TDFT	YG
2012	0.53	0.56	0.25	0.66	0.61	0.48
2020	-0.02	0.10	-0.04	0.20	-0.02	0.04

Government's income increases by 0.48% in the short run and by 0.04% in the long run. However, the large increase in spending raises the government's deficit a lot, as Figure 1.5 shows.

Figure 1.5. Impact on government savings

Impact on investment:

The huge drop in government savings, followed by the drop in firms' savings, leads to a decrease in total investment. Figures 1.6 and 1.7 present private investment and total investment.

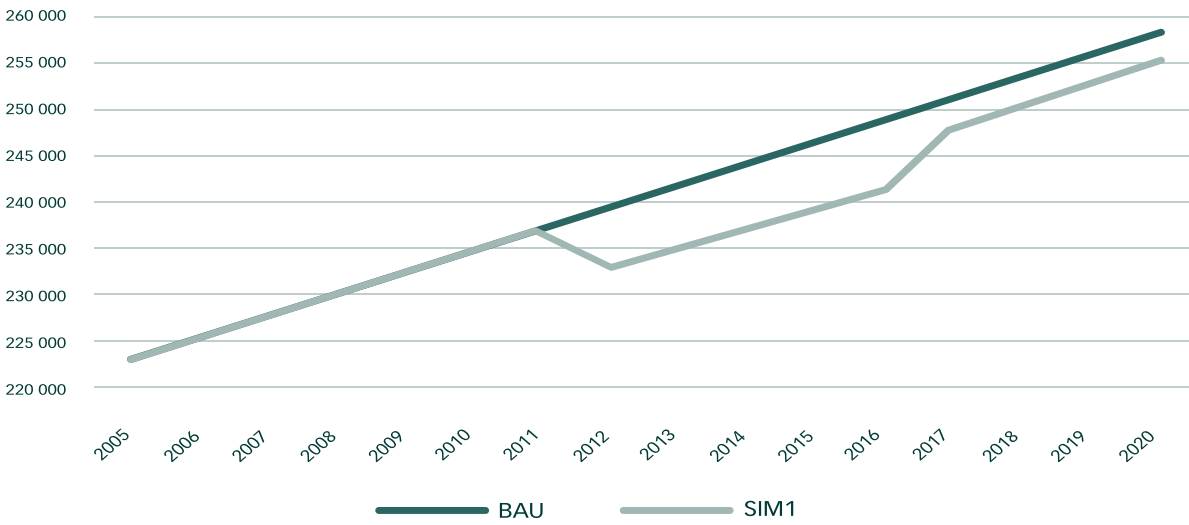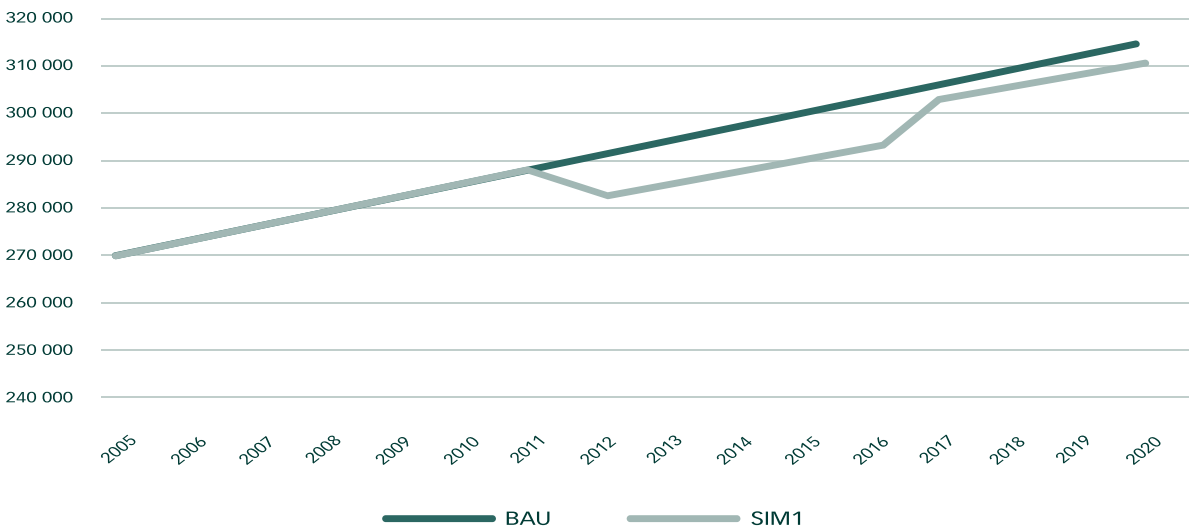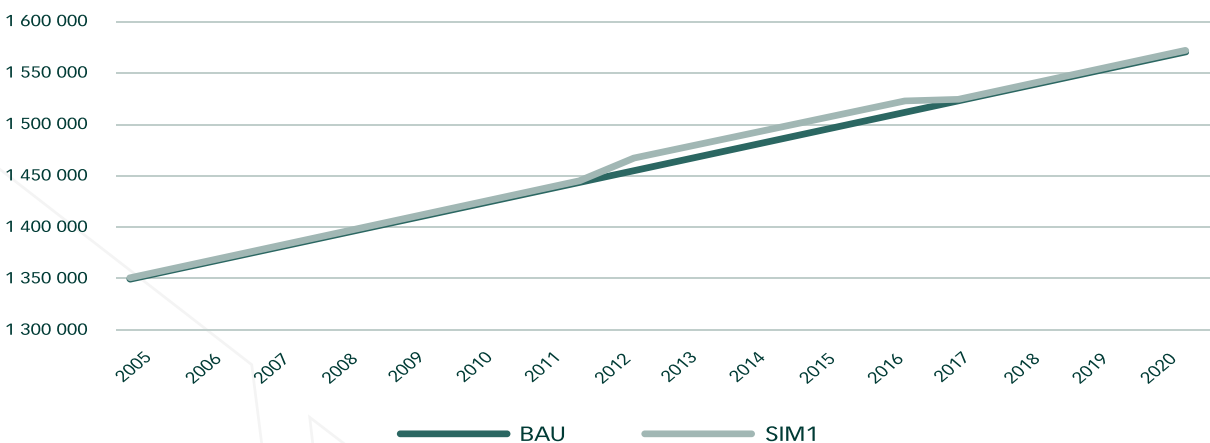## Figure 1.6. Impact on total private investment

Legend: BAU, SIM1

Figure 1.7. Impact on total investment

Legend: BAU, SIM1

Impact on GDP

Finally, the impact on GDP on basic prices is positive for the entire period. Indeed, from 2012 GDP increases and then, after the simulation, the GDP remains a bit higher than in the BAU.

Figure 1.8. Impact on GDP

Legend: BAU, SIM1

This first simulation has very positive results on unemployment and benefits to households. However, in the long term, the drop in total investment tends to reduce economic growth. Moreover, it is not sustainable for South Africa to let its deficit grow unabated.

Therefore, the same simulation is presented, but the closure of the model is changed: government's savings are kept fixed, and an endogenous tax finances the policy.

In Simulation 1A, the direct tax rate of households adjusts. In Simulation 1B, the direct tax rate on firms adjusts, and in Simulation 1C, the indirect tax rate adjusts. The results of these three simulations are presented together.

Impact on labour demand and unemployment:

The impact on unemployment is different and quite interesting in the three simulations (see Table 1.10–1.12). For Simulations 1A and 1B, all the unemployment rates decreases, but the magnitudes are way below those observed in Simulation 1. However, for Simulation 1C, as shown in Table 1.11, unemployment increases slightly for most semi-skilled and low skilled workers.

Table 1.10. Impact on unemployment rate for skilled workers

	LEG		PRO		TECH	
	2012	2020	2012	2020	2012	2020
Simulation 1A	-53.24	-17.06	-57.21	-18.24	-50.99	-16.45
Simulation 1B	-66.03	-24.53	-71.74	-26.05	-64.2	-23.64
Simulation 1C	-4.06	-2.01	-10.6	-3.94	-1.46	-1.09

Table 1.11. Impact on unemployment rate for semi-skilled workers

	CLER		SERWO		SKILAG		CRAFTWO		PLANTMACH	
	2012	2020	2012	2020	2012	2020	2012	2020	2012	2020
Simulation 1A	-3.94	-1.28	-7.9	-2.67	-0.024	-0.08	-1.45	-0.45	-1.35	-0.4
Simulation 1B	-4.91	-1.76	-8.39	-2.85	-1.98	-1.04	-1.82	-0.75	-2.13	-0.88
Simulation 1C	-1.5	-0.53	-6.22	-2.09	2.59	0.63	1.72	0.57	1.65	0.53

Table 1.12. Impact on unemployment rate for low-skilled workers

	ELEMOCC		DOMWORK		OCCUNSP	
	2012	2020	2012	2020	2012	2020
Simulation 1A	-0.43	-0.1	-0.56	-0.18	-0.25	-0.08
Simulation 1B	-0.3	-0.2	-1.01	-0.4	-0.75	-0.3
Simulation 1C	1.32	0.43	0.77	0.26	1.1	0.38

Increasing indirect taxes (Simulation 1C) affects all of the economy, compared with Simulation 1A and Simulation 1B where, respectively, households and firms are hit the hardest. In Simulation 1C, the increase in commodity prices hits all agents and activities (for their intermediate consumption). Thus, activities face an increase in wages for their workers (due to the increase in labour demand) and an increase in their inputs' prices, so their production cost goes up. To adjust, activities will have to cut their costs (mainly by retrenching because the minimum wage means they cannot

decrease wages) and reduce their production. This is clearly shown in Table 1.13, where production for all sectors goes down in Simulation 1C. In Simulation 1A for instance, mostly activities that rely on household consumption are hit, as they face a decrease in household demand. This explains why production goes up in the gold and mining sectors, as these two sectors export most of their total production.

Table 1.13. Impact on production (in % to BAU values)

	Simulation 1A		Simulation 1B		Simulation 1C	
	2012	2020	2012	2020	2012	2020
AAGRI	-0.11	-0.003	0.02	-0.07	-0.33	-0.16
ACOAL	-0.02	0.06	0.01	-0.12	-0.34	-0.17
AGOLD	0.01	0.03	-0.01	-0.07	-0.29	-0.11
AOTHM	0.03	0.11	0	-0.17	-0.20	-0.13
AFOOD	-0.19	-0.03	0.03	-0.05	-0.38	-0.16
ATEXT	-0.31	-0.05	0.04	-0.08	-0.65	-0.27
AFOOT	-0.29	-0.06	0.02	-0.08	-0.62	-0.27
APETR	-0.01	0.05	0.09	-0.06	-0.25	-0.13
AOTHN	0.23	0.15	-0.08	-0.14	-0.16	-0.09
AIRON	0.08	0.1	-0.13	-0.18	-0.38	-0.18
AELMA	0.16	0.11	-0.28	-0.22	-0.34	-0.16
ARADIO	0.01	0.06	0	-0.11	-0.52	-0.23
ATRANSEQ	0.1	0.09	0.06	-0.07	-0.51	-0.22
AOTHMAN	-0.04	0.04	-0.01	-0.1	-0.35	-0.17
AELEG	-0.2	-0.01	0.05	-0.08	-0.40	-0.18
AWATR	-0.04	0.04	0.19	-0.02	-0.23	-0.12
ACONS	0.29	0.15	-0.37	-0.24	-0.27	-0.13
ATRAD	-0.07	0.03	0.01	-0.08	-0.34	-0.15
AHOT	-0.25	-0.03	0.06	-0.09	-0.54	-0.26
ATRANSSER	-0.04	0.03	0.04	-0.07	-0.25	-0.12
ACOMM	-0.09	0.02	0.12	-0.05	-0.29	-0.15
AFINS	-0.09	0	0.09	-0.04	-0.38	-0.18
ABUSS	0	0.07	0.06	-0.08	-0.19	-0.11
AOTHSER	-0.17	-0.01	0.19	0	-0.30	-0.13
AGOVGA	1.99	0.68	1.99	0.66	1.88	0.63

Impact on agents:

The impact on household income is still positive but quite low. For Simulation 1A, household disposable income goes down, as do household savings and consumption.

Table 1.14. Impact on households (in % to BAU values)

	YHL		YHTR		YH	
	2012	2020	2012	2020	2012	2020
Simulation 1A	0.52	0.17	0.29	0.13	0.43	0.15
Simulation 1B	0.65	0.24	-0.87	-0.4	0.07	0
Simulation 1C	0.05	0.02	0.06	-0.01	0.05	0.01

As expected, firms suffer in Simulation1B because their direct tax goes up. Thus, firms' savings would go down in this scenario.

Table 1.15. Impact on firms (in % to BAU values)

	YFK		YF		SF	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**
Simulation 1A	0.41	0.18	0.37	0.16	0.36	0.15
Simulation 1B	0.51	0.09	0.45	0.08	-1.06	-0.46
Simulation 1C	0.09	-0.01	0.08	-0.01	0.07	-0.01

Table 1.16. Impact on government (in % to BAU values)

	YGTR		TPRODN		TPRCTS		TDHT		TDFT		YG	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**	**2012**	**2020**	**2012**	**2020**	**2012**	**2020**
Simulation 1A	0.36	0.15	0.27	0.11	-0.1	0	7.15	2.29	0.41	0.18	2.15	0.71
Simulation 1B	-1.06	-0.46	0.41	0.1	0.06	-0.03	0.07	0	9.08	3.17	2.14	0.72
Simulation 1C	0.07	-0.01	0.17	0.04	5.4	1.84	0.05	0.01	0.09	-0.01	2.18	0.73

The overall impact on government income is essentially the same whatever the scenario. In Simulation1A, the direct tax for households component increases a lot in order to adjust to government's budget, whereas in Simulation1B, firms' taxes increase a lot.

Impact on investment:
For these three simulations, government savings are assumed to be fixed. Therefore, the impact is different from the previous scenario where government saving was hampering private investment.

However, the results here are also interesting. In Simulation 1A, private and total investment increases. In Simulation 1B, the drop in firms' savings has a large effect on private and total investment, as firms are a major contributor to total investment. In Simulation 1C, the results are almost the same as the BAU.

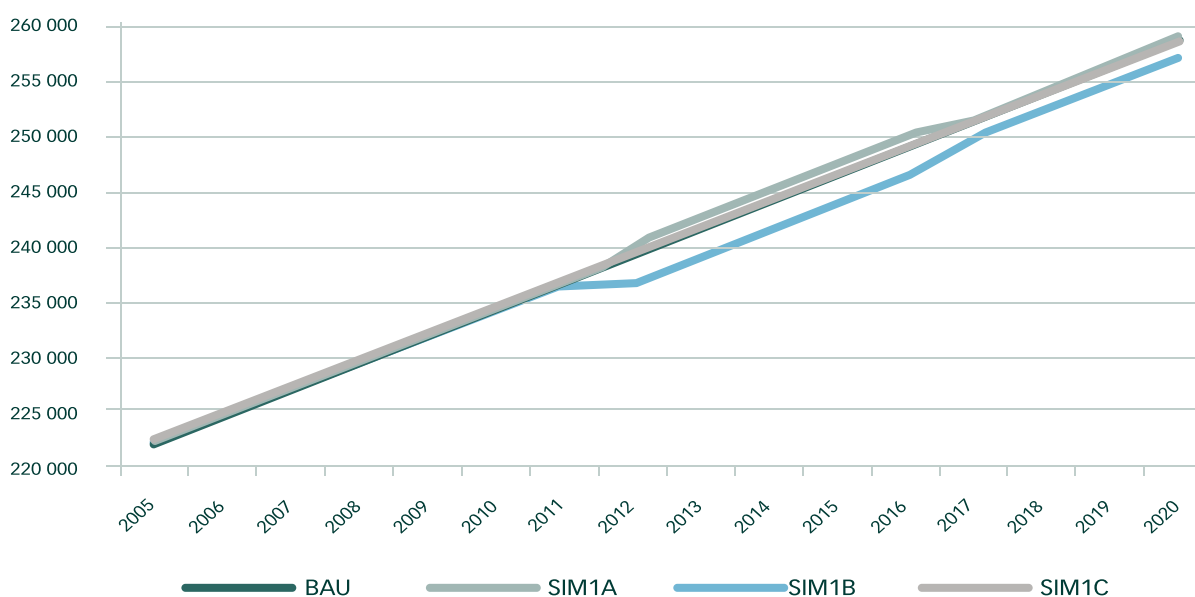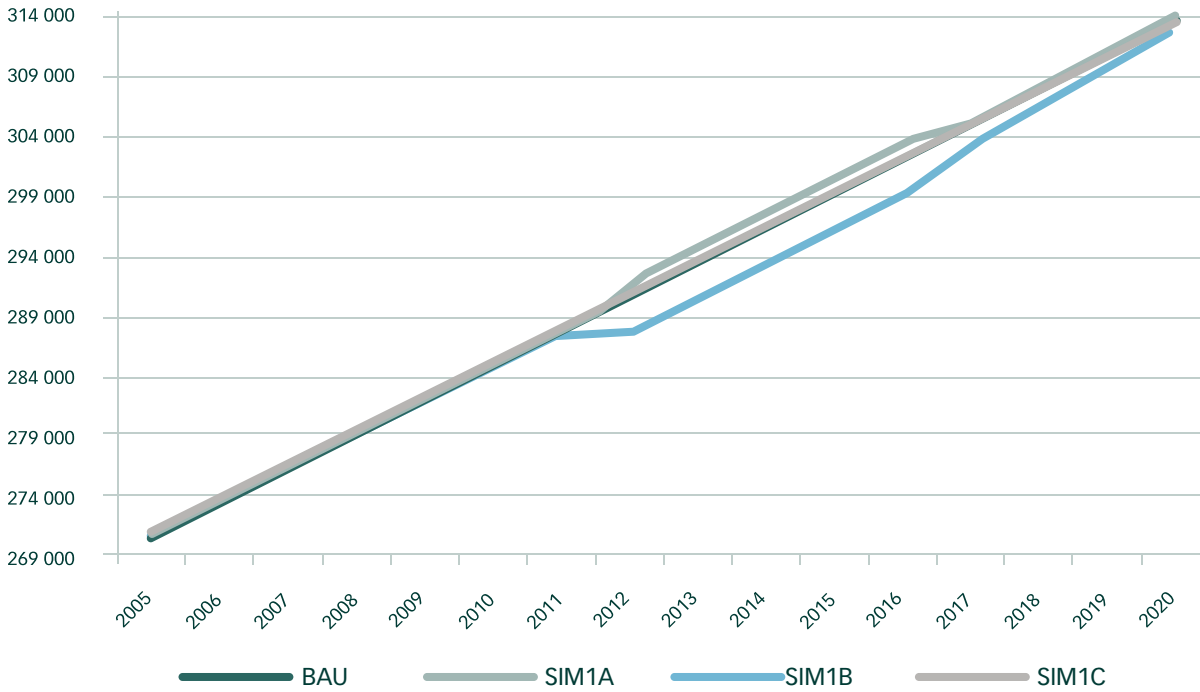Figure 1.9. Impact on private investment

Figure 1.10. Impact on total investment

Impact on GDP at basic price:

Finally, the impact on GDP at the basic price is positive during the shock and slightly above the BAU after 2017.

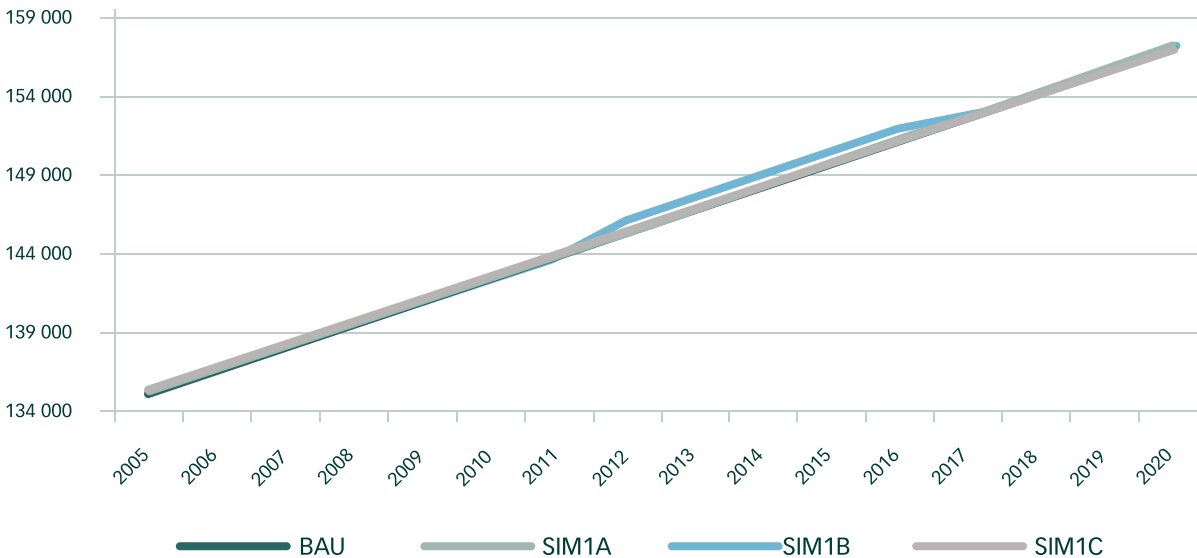Figure 1.11. Impact on GDP (at basic price)

Figure 1.12 represents a ratio between household income and public spending. As the value of public spending is the same for all the simulations (1, 1A, 1B and 1C), the interesting thing here is how the simulation affects household income. This ratio decreases the least in Simulation 1A (if the first scenario without any financing mechanism is excluded).

Figure 1.12. Household income over public spending ratio trend

| BAU | SIM1 | SIM1a | SIM1b | SIM1C |
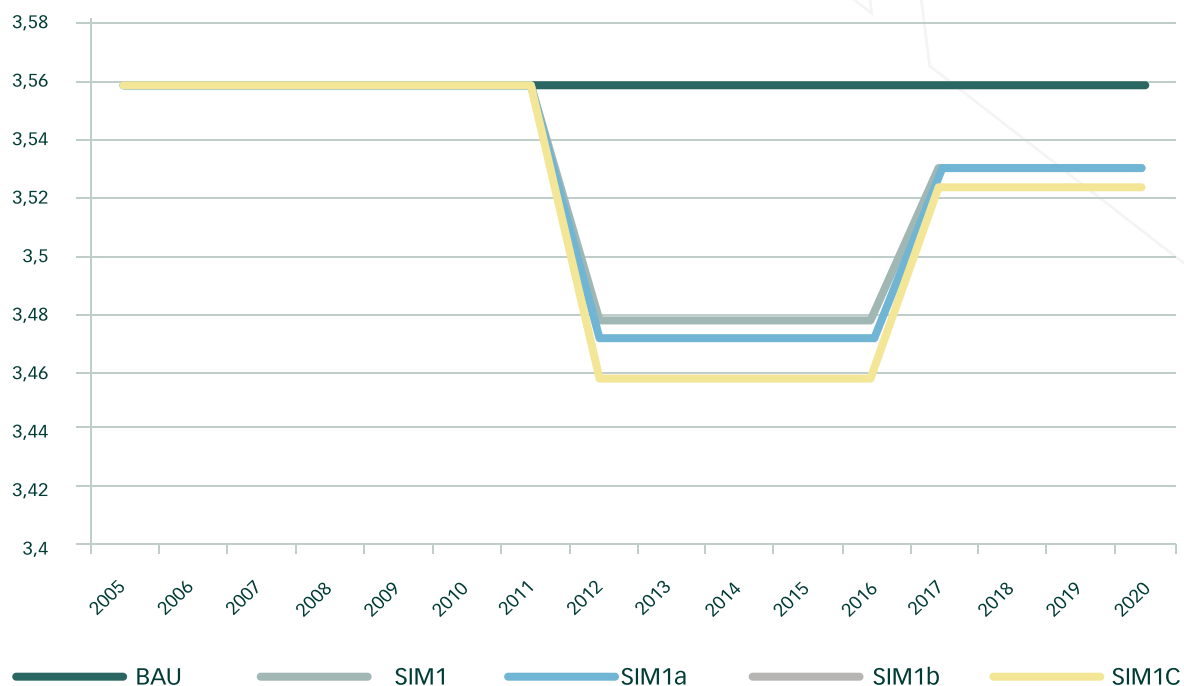
Impact of an increase in government's investment in infrastructure

In the second set of scenarios, government's public investment increases. In the first scenario, government totally finances this increase in investment (i.e. government's deficit will increase). In the following scenarios, the same increase in government investment will be evaluated, but different ways of financing (direct, indirect taxation) will be simulated in order to keep government's deficit constant. First, it will be assumed that there are no productivity effects on the other sectors.

Impact on labour demand and unemployment:

The increase in government's public investment has a very positive impact on unemployment for all the different types of workers. For the skilled, unemployment even disappears from 2015 onwards. Indeed the effect on unemployment remains even after the shocks.

Table 1.17. Impact on unemployment for skilled workers (in % to BAU)

	LEG	PRO	TECH
2012	-9.91	4.65	-1.76
2020			

Table 1.18. Impact on unemployment for semi-skilled workers (in % to BAU)

	SERWO	SKILAG	CRAFTWO	PLANTMACH	CLER
2012	-0.86	-1.64	-1.06	-1.04	-0.3
2020	-16.14	-29.24	-8.65	-14.32	-12.53

Table 1.19. Impact on unemployment for unskilled workers (in % to BAU)

	ELEMOCC	DOMWORK	OCCUNSP
2012	-1.72	-0.74	-0.61
2020	-13.54	-8.03	-5.90

Sectors react differently to a public investment policy. Some sectors clearly benefit from the policy, as they are directly involved in construction, electricity or government sectors. For other sectors, there is a small decrease.

Table 1.20 Impact on production (in % to BAU)

2012	2012	2020
AAGRI	-0.01	-2.80
ACOAL	-0.14	-4.73
AGOLD	0.11	-1.65
AOTHM	-0.12	-6.30
AFOOD	0.00	-1.95
ATEXT	0.02	-2.92
AFOOT	0.00	-2.80
APETR	0.00	-2.97
AOTHN	0.79	1.33
AIRON	-0.76	-10.11
AELMA	-2.31	-21.58
ARADIO	0.61	0.72
ATRANSEQ	0.53	0.67
AOTHMAN	0.66	1.46
AELEG	0.01	-0.93
AWATR	-0.05	-2.92
ACONS	1.70	6.78
ATRAD	-0.05	-3.35
AHOT	-0.04	-3.96
ATRANSSER	-0.04	-2.98
ACOMM	-0.07	-3.60
AFINS	-0.36	-5.06
ABUSS	-0.56	-7.88
AOTHSER	0.03	-1.54
AGOVGA	0.43	6.01

Impact on agents:

Households benefit from the policy, and their income increases slightly due to the increase in their wage component. Transfers they receive decrease because of the drop in firms' income.

Table 1.21. Impact on household income (in % to BAU)

	YHL	YHTR	YH
2012	0.16	-0.20	0.02
2020	2.76	-3.99	0.19

Indeed, firms' income decreases because of the drop in their capital revenues, which represents around 90% of their total income. The crowding out effect of public investment has a serious impact on firms' income and savings.

Table 1.22. Impact on firms (in % to BAU)

|	YFK	YF	SF
2012	-0.28	-0.24	-0.24
2020	-5.67	-5.00	-4.89

The impact on government is actually very small. Direct taxes paid by households and taxes on commodities increase, whereas the other components decrease. Overall, government's income decreases very slightly (by 0.06%) in the short run and a bit more in the long run.

Table 1.23. Impact on government (in % to BAU)

	YGTR	TPRODN	TPRCTS	TDHT	TDFT	YG
2012	-0.24	-0.29	0.05	0.02	-0.28	-0.06
2020	-4.89	-2.71	-0.87	0.19	-5.67	-1.87

It is assumed in this scenario that government is financing its policy by borrowing. Thus, government savings are decreasing.
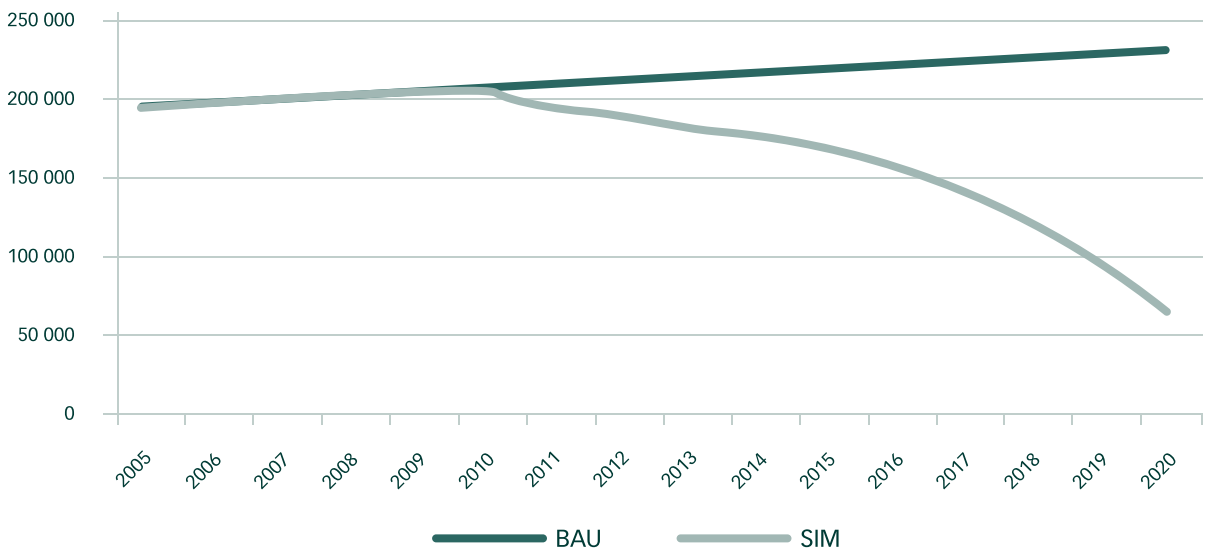
Figure 1.13. Impact on government savings
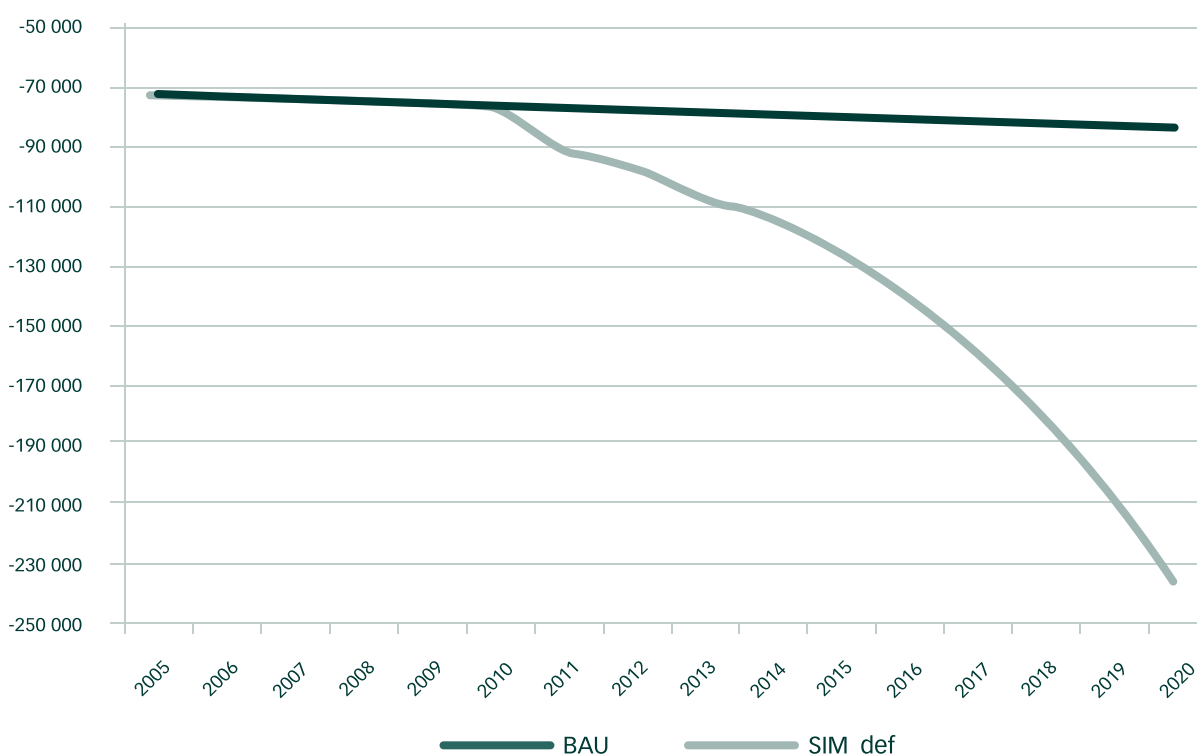
Impact on investment:

Figure 1.14 represents the impact on private investment, and clearly there is a crowding-out effect on private investment.

Figure 1.14. Impact on private investment

In the short run, the impact on GDP is hardly perceptible, and in the long run GDP is a bit lower than in the BAU because of the massive drop in the productive investment.

Impact on GDP:

Figure 1.15. Impact on GDP

With this type of policy, the idea is to see what happens in the long run. It is known that in the short run government deficit increases a lot, but in the long run, can this spending create a greater economic activity in order to generate new revenue? For instance, a policy that creates jobs will have an impact on the fiscal side, as new workers will get income and pay new taxes (direct and indirect).

The following scenarios show the same policy with different types of financing. Depending on the scenario chosen, very different results will be found. In other words, the impacts depend on who finances the policy.

In terms of unemployment, results are very negative. It must be kept in mind that the unemployment level for skilled workers is very low at the base year, and thus variation is very high. Whatever the scenario and the labour type, unemployment increases.

Table 1.24. Impact on unemployment for skilled workers (in % to BAU)

	LEG		PRO		TECH	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**
Simulation 2A	47.59	171.63	72.99	321.73	41.02	161.00
Simulation 2B	21.55	-0.80	42.00	112.16	21.68	51.58
Simulation 2C	162.92	1054.20	192.50	1288.50	124.91	728.59

Direct taxes on firms seems to less harmful to unemployment. Unskilled workers appear to be the least affected type of workers, and unemployment decreases for domestic workers and elementary occupations workers. The results are the worst when indirect taxes increase.

Table 1.25. Impact on unemployment for semi-skilled workers (in % to BAU)

	CLER		SERWO		SKILAG		CRAFTWO		PLANTMACH	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**	**2012**	**2020**	**2012**	**2020**
Simulation 2A	4.73	21.33	1.59	-2.38	7.94	44.43	0.68	-0.59	3.11	14.09
Simulation 2B	2.46	5.47	0.49	-9.26	3.61	12.02	-0.09	-5.35	1.24	0.70
Simulation 2C	10.94	70.09	5.90	34.69	15.14	97.40	8.42	58.18	10.59	71.68

Table 1.26. Impact on unemployment for low-skilled workers (in % to BAU)

	ELEMOCC		DOMWORK		OCCUNSP	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**
Simulation 2A	-2.63	-20.94	1.55	6.87	1.88	9.73
Simulation 2B	-2.21	-18.30	0.52	-0.08	0.76	2.43
Simulation 2C	1.79	12.69	4.95	33.26	5.32	36.22

In terms of production, once again, some sectors benefit from the investment policy, whereas others suffer. Sectors that rely on investment will see their production increase. For instance, the construction sector sees its production increasing substantially (which explains the drop in unskilled unemployment, as this sector is very intensive in unskilled labour).

Table 1.27. Impact on production (in % to BAU)

	Simulation 1A		Simulation 1B		Simulation 1C	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**
AAGRI	-0.63	-4.57	-0.35	-3.70	-1.18	-9.45
ACOAL	-0.17	-0.97	-0.16	-2.50	-1.00	-8.58
AGOLD	0.30	2.89	0.22	1.32	-0.44	-3.02
AOTHM	0.25	2.02	0.08	-1.62	-0.37	-4.11
AFOOD	-1.04	-7.32	-0.57	-4.87	-1.55	-11.29
ATEXT	-1.69	-11.88	-0.91	-7.73	-2.60	-19.53
AFOOT	-1.48	-10.58	-0.81	-6.99	-2.38	-17.65
APETR	-0.41	-2.61	-0.22	-2.65	-1.06	-8.62
AOTHN	2.91	21.77	1.94	12.72	1.83	12.46
AIRON	0.63	4.62	0.00	-1.79	-0.55	-5.32
AELMA	0.53	3.45	-0.76	-7.52	-0.81	-7.68
ARADIO	0.62	4.67	0.61	3.11	-0.67	-6.04
ATRANSEQ	0.66	5.03	0.60	3.26	-0.80	-6.96
AOTHMAN	0.43	3.75	0.53	2.84	-0.33	-2.86
AELEG	-1.24	-8.01	-0.67	-4.65	-1.81	-13.93
AWATR	-1.15	-7.70	-0.65	-5.41	-1.68	-12.86
ACONS	5.77	40.44	3.92	25.65	4.28	28.56
ATRAD	-0.36	-2.40	-0.22	-2.70	-1.06	-8.45
AHOT	-1.51	-11.07	-0.85	-7.68	-2.30	-17.59
ATRANSSER	-0.33	-2.15	-0.20	-2.43	-0.90	-7.28
ACOMM	-1.08	-7.58	-0.62	-5.63	-1.64	-13.14
AFINS	-1.15	-7.91	-0.80	-6.37	-1.94	-14.35
ABUSS	-0.66	-4.68	-0.62	-6.04	-1.21	-10.39
AOTHSER	-1.71	-11.45	-0.92	-6.98	-2.12	-15.17
AGOVGA	0.47	7.41	0.45	7.00	0.17	3.76

The impact on household income is negative. In Simulations 2A and 2C, households suffer from the decrease in demand, as household consumption decreases. In the first case this is because direct taxes increase and then what remains for consumption decreases. In Simulation 2C, prices of commodities increase, and so households decrease their consumption. Knowing that households' demand is going down, firms reduce their production and thus lay off people.

Table 1.28. Impact on household income (in % to BAU)

	YHL		YHTR		YH	
	2012	**2020**	**2012**	**2020**	**2012**	**2020**
Simulation 2A	-0.47	-1.63	-0.44	-4.13	-0.46	-2.59
Simulation 2B	-0.19	0.26	-3.28	-25.51	-1.36	-9.58
Simulation 2C	-1.66	-10.92	-1.05	-9.23	-1.43	-10.27

In Simulation 2B, household income decreases due to the massive decrease in firms' transfers. Firms suffer from the crowding-out effect: they receive less capital income, and then their savings decrease. This has an impact on total investment, as firms' savings contribute a lot to total investment. Surprisingly the impact is worse for firms in Simulation 2C, whereas firms would have been expected to be affected more in Simulation 2B. However, the decrease in the productive activity is such that firms' income and saving decrease more under 2C.

Table 1.29. Impact on firms (in % to BAU values)

|	YFK		YF		SF	
	2012	2020	2012	2020	2012	2020
Simulation 2A	-0.63	-5.88	-0.56	-5.19	-0.54	-5.07
Simulation 2B	-0.47	-5.85	-0.42	-5.16	-4.01	-31.25
Simulation 2C	-1.49	-13.11	-1.31	-11.58	-1.28	-11.31

Table 1.30 represents the composition of government income. Government income increases in all three scenarios. In Simulation 2A, direct taxes from households adjust to maintain government deficit, while in Simulation 2b direct taxes from firms adjust. Note that under this simulation, the transfers received by government drop dramatically.

Table 1.30. Impact on government (in % to BAU)

|	YGTR		TPRODN		TPRCTS		TDHT		TDFT		YG	
	2012	2020	2012	2020	2012	2020	2012	2020	2012	2020	2012	2020
Simulation 2A	-0.54	-5.07	-0.85	-5.36	-0.69	-4.39	15.62	111.41	-0.63	-5.88	4.01	28.41
Simulation 2B	-4.01	-31.25	-0.60	-4.24	-0.36	-2.84	-1.36	-9.58	20.25		3.99	28.48
Simulation 2C	-1.28	-11.31	-1.17	-8.52	12.88	101.24	-1.43	-10.27	-1.49	-13.11	4.23	33.13

Figure 1.16 shows the impact on private investment depending on the fiscal scenario. In every scenario, the result is below the BAU values, and for Simulation 2B very far away from BAU values.
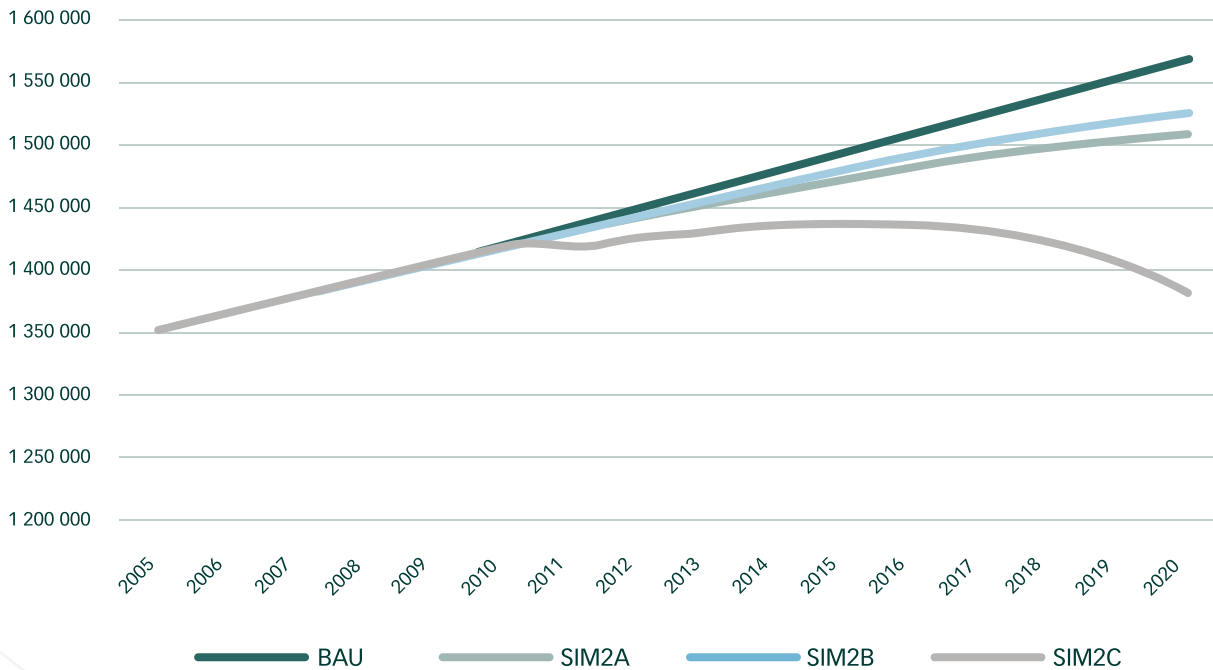
Figure 1.16. Impact on private investment

BAU   SIM2A   SIM2B   SIM2C
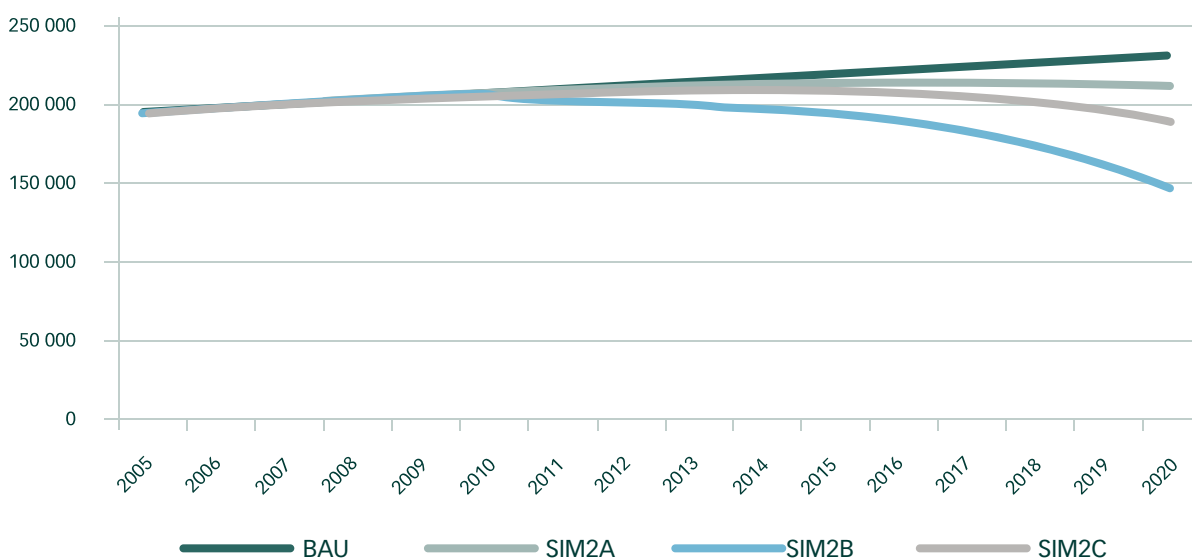
In terms of total investment, all scenarios are above the BAU, driven by the increase in public investment.

Figure 1.17. Impact on total investment
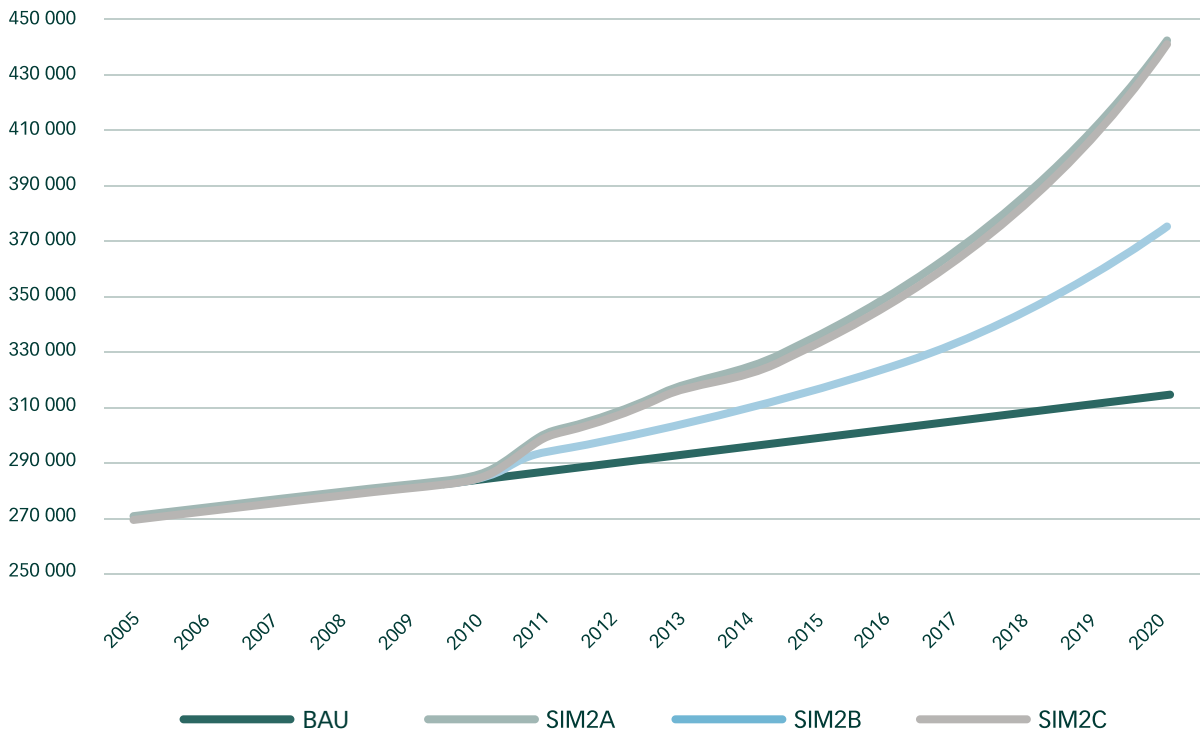
As Figure 1.18 shows, GDP is under the BAU for all the scenarios and worst for Simulation 2C.

Figure 1.18. Impact on GDP (basic prices)

Impact on other sectors of an increase in government investment in infrastructure

This last set of scenarios presents the same simulations as in the previous section but also takes into account the effect of infrastructure productivity on the other sectors. Indeed, it is easily understandable that government investment in building a road (infrastructure spending), or in constructing/renovating a harbour, has impacts on other sectors: their transport margins will decrease and they will be able to trade more, using the same quantities of labour and capital.

Under these scenarios, the effects are the same as in the previous section, but results improve because of the productive investment.

Government financing

Impacts on unemployment are very positive both in short and long run, whatever the labour category. Here again, unemployment disappears for skilled workers from 2015, and positive impacts remain for all categories.

Table 1.31. Impact on unemployment for skilled workers (% to BAU)

	LEG	PRO	TECH
2012	-13.93	-0.06	-5.06
2020			

Table 1.32. Impact on unemployment for semi-skilled workers (% to BAU)

	SERWO	SKILAG	CRAFTWO	PLANTMACH	CLER
2012	-0.92	-1.72	-1.35	-1.27	-0.51
2020	-14.31	-25.64	-11.89	-15.46	-12.83

Table 1.33. Impact on unemployment for low-skilled workers (% to BAU)

	ELEMOCC	DOMWORK	OCCUNSP
2012	-1.88	-0.85	-0.74
2020	-15.08	-8.74	-7.07

The impacts on production are quite positive for most of the sectors. Compared to the previous scenario, activities do not suffer from a total crowding-out effect, as some public investment improves their production.

Table 1.35. Impact on household income (in % to BAU)

	YHL	YHTR	YH
2012	0.20	-0.17	0.06
2020	3.49	-3.26	0.91

Firms are suffering but less than in Scenario 2 (investment in infrastructure without productivity effect).

Table 1.34. Impact on production (% to BAU)

Sectors	2012	2020
AAGRI	0.18	-0.15
ACOAL	0.05	-0.34
AGOLD	-0.05	-0.21
AOTHM	-0.04	-0.52
AFOOD	0.28	-0.06
ATEXT	0.45	-0.09
AFOOT	0.38	-0.08
APETR	0.21	-0.18
AOTHN	0.94	5.26
AIRON	-0.58	-5.75
AELMA	-2.13	-17.06
ARADIO	0.78	4.60
ATRANSEQ	0.68	4.23
AOTHMAN	0.81	5.09
AELEG	0.16	2.94
AWATR	0.09	0.42
ACONS	1.86	10.81
ATRAD	0.07	-0.18
AHOT	0.11	-0.14
ATRANSSER	0.07	-0.07
ACOMM	0.07	-0.18
AFINS	-0.20	-1.44
ABUSS	-0.42	-4.41
AOTHSER	0.15	1.40
AGOVGA	0.53	8.45

Households benefit a lot from this policy, as their income increases in the long run by almost 1%.

Table 1.36. Impact on firms' income (in % to BAU)

	YFK	YF	SF
2012	-0.25	-0.22	-0.21
2020	-4.64	-4.09	-4.00

Government income decreases slightly in the long run because of the decrease in transfers that government receives from firms and the receipts from firms. A drop in government savings is observed, as there is no fiscal policy to finance the investment programme.

Table 1.37. Impact on government (in % to BAU)

	YGTR	TPRODN	TPRCTS	TDHT	TDFT	YG
2012	-0.21	-0.24	0.12	0.06	-0.25	-0.01
2020	-4.00	-1.26	0.86	0.91	-4.64	-0.63

Figure 1.19. Impact on government savings
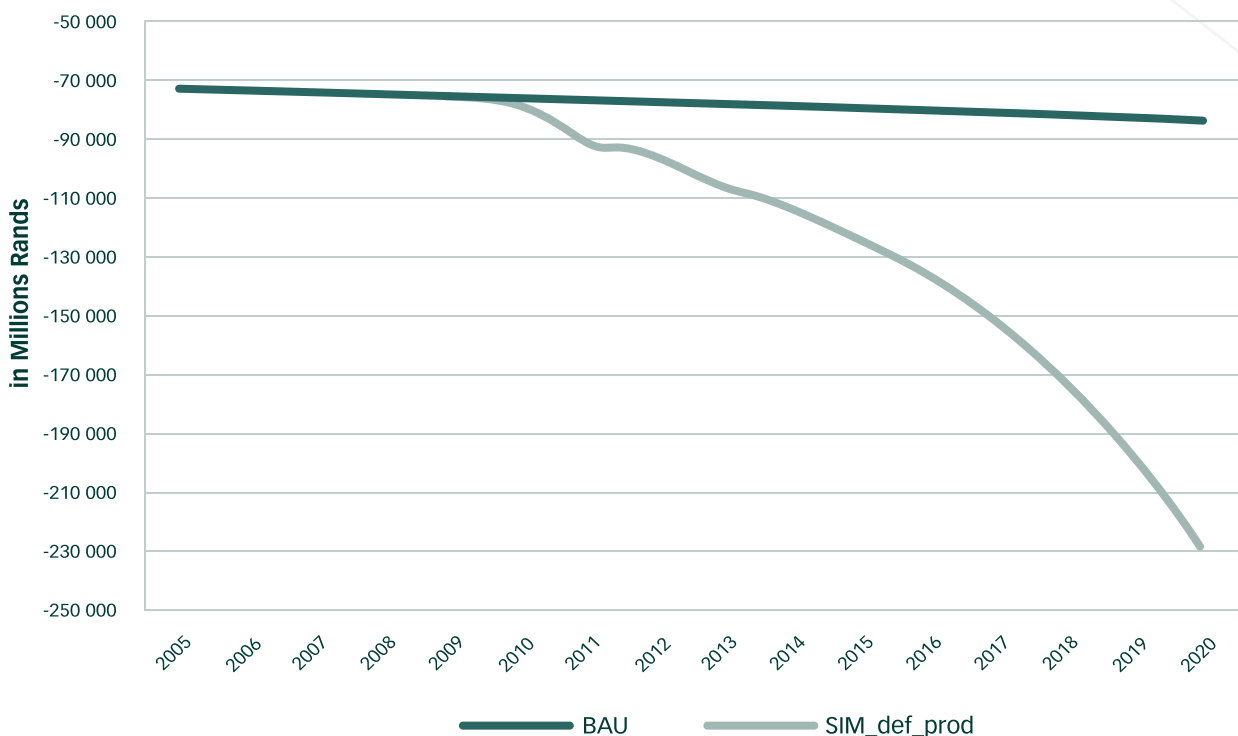
The impact on private investment is less dramatic than in the previous scenario. A crowding-out effect is still there, but the impact on private investment is less harmful because a part of government investment is productive. As seen in Figure 1.20, total investment is slightly below the BAU, given that government deficit is increasing.
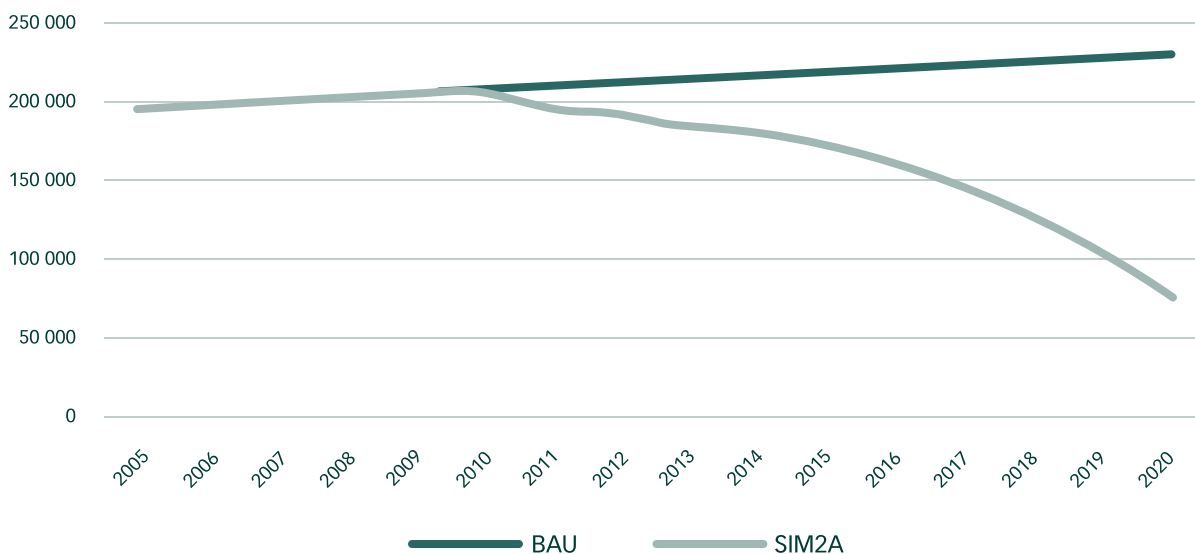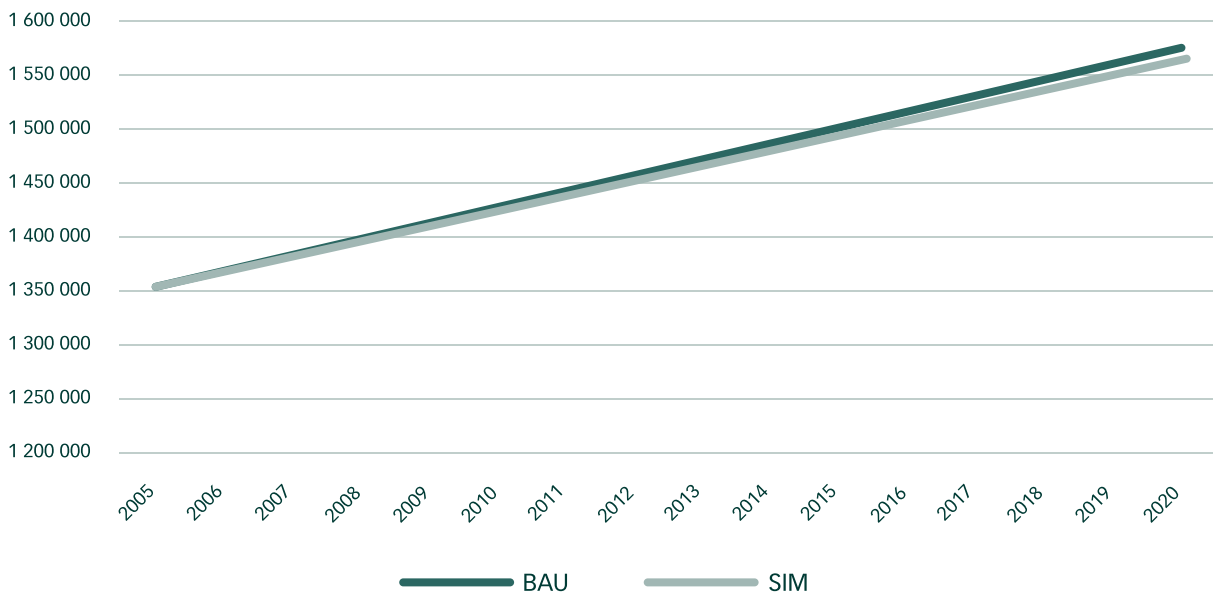
Figure 1.20. Impact on private investment

Figure 1.21. Impact on total investment

In the long run, GDP does not change compared with the BAU.

Figure 1.22. Impact on GDP

Alternative fiscal policy arrangements to finance the investment policy
The impact on unemployment is better than in the second set of scenarios (Scenario 2), and unemployment even decreases in Simulation 3B for all types of workers in the long run. In the short run, only elementary occupation workers benefit from a decrease in unemployment; for the rest, unemployment is rising.

Table 1.38. Impact on unemployment for skilled workers (% to BAU)

	LEG		PRO		TECH	
	2012	2020	2012	2020	2012	2020
Simulation 3A	42.75	50.39	67.29	171.88	37.11	73.07
Simulation 3B	17.09		36.75	-32.04	18.05	-34.51
Simulation 3C	156.38	877.84	185.02	1076.57	119.78	606.59

Table 1.39. Impact on unemployment for semi-skilled workers (% to BAU)

	CLER		SERWO		SKILAG		CRAFTWO		PLANTMACH	
	2012	2020	2012	2020	2012	2020	2012	2020	2012	2020
Simulation 3A	4.46	13.99	1.49	-4.79	7.73	38.36	0.37	-8.44	2.82	6.33
Simulation 3B	2.21	-0.81	0.40	-11.15	3.46	8.20	-0.40	-13.02	0.98	-6.14
Simulation 3C	10.58	60.01	5.74	29.80	14.83	88.72	8.00	47.01	10.20	60.83

Table 1.40. Impact on unemployment for low-skilled workers (% to BAU)

	ELEMOCC		DOMWORK		OCCUNSP	
	2012	2020	2012	2020	2012	2020
Simulation 3A	-2.77	-24.10	1.40	3.00	1.71	5.26
Simulation 3B	-2.36	-21.81	0.39	-3.53	0.60	-1.61
Simulation 3C	1.58	7.61	4.76	28.01	5.10	30.42

Note though that results are still very negative under Simulation C. The impact on the sectors depends on how heavily sectors rely on investment.

Table 1.41. Impact on production (% to BAU)

	Simulation 3A		Simulation 3B		Simulation 3C	
	2012	2020	2012	2020	2012	2020
AAGRI	-0.50	-1.20	-0.23	-0.43	-1.06	-6.00
ACOAL	0.00	3.96	0.01	2.38	-0.82	-3.47
AGOLD	0.55	10.05	0.47	8.46	-0.18	4.12
AOTHM	0.42	7.05	0.25	3.39	-0.19	0.97
AFOOD	-0.94	-4.52	-0.48	-2.20	-1.44	-8.53
ATEXT	-1.50	-6.84	-0.74	-2.97	-2.41	-14.41
AFOOT	-1.32	-6.27	-0.66	-2.89	-2.21	-13.29
APETR	-0.27	1.24	-0.09	1.12	-0.92	-4.60
AOTHN	3.03	25.42	2.08	16.73	1.97	16.45
AIRON	0.79	9.13	0.16	2.93	-0.38	-0.51
AELMA	0.68	7.52	-0.60	-2.97	-0.65	-3.18
ARADIO	0.78	9.18	0.78	7.63	-0.49	-1.23
ATRANSEQ	0.80	9.06	0.74	7.33	-0.64	-2.51
AOTHMAN	0.58	8.00	0.68	7.06	-0.17	1.56
AELEG	-1.08	-2.92	-0.51	0.12	-1.64	-8.62
AWATR	-0.99	-3.43	-0.50	-1.35	-1.52	-8.47
ACONS	5.87	43.49	4.05	29.36	4.40	32.09
ATRAD	-0.23	1.34	-0.09	0.99	-0.91	-4.55
AHOT	-1.34	-6.01	-0.68	-2.94	-2.11	-12.53
ATRANSSER	-0.21	1.27	-0.08	0.93	-0.77	-3.77
ACOMM	-0.92	-3.24	-0.47	-1.48	-1.48	-8.63
AFINS	-0.98	-3.13	-0.63	-1.74	-1.76	-9.49
ABUSS	-0.52	-0.77	-0.48	-2.15	-1.06	-6.25
AOTHSER	-1.57	-7.57	-0.79	-3.31	-1.97	-11.32
AGOVGA	0.57	10.32	0.55	9.89	0.28	6.87

The impact on households is negative because of the drop in transfers they receive from firms and the decrease in labour income they receive. Note that impacts are less dramatic than in the previous scenario.

Table 1.42. Impact on household income (% to BAU)

	YHL		YHTR		YH	
	2012	2020	2012	2020	2012	2020
Simulation 3A	-0.42	-0.34	-0.42	-3.31	-0.42	-1.47
Simulation 3B	-0.14	1.45	-3.21	-23.21	-1.31	-7.96
Simulation 3C	-1.59	-9.11	-1.01	-8.09	-1.37	-8.72

The impact on firms is also negative, notably under Simulation 3B, as they face an increase in the direct taxes they pay. Here, firms' savings drop by almost 30% in the long run, which will have a massive impact on private investment.

Table 1.43. Impact on firms (% to BAU)

|	YFK		YF		SF	
	2012	2020	2012	2020	2012	2020
Simulation 3A	-0.59	-4.70	-0.52	-4.15	-0.51	-4.06
Simulation 3B	-0.44	-4.74	-0.39	-4.18	-3.93	-28.44
Simulation 3C	-1.44	-11.50	-1.27	-10.15	-1.24	-9.92

In the three scenarios, government income increases due to the fiscal mechanism set up.

Table 1.44. Impact on government (% to BAU)

|	YGTR		TPRODN		TPRCTS		TDHT		TDFT		YG	
	2012	2020	2012	2020	2012	2020	2012	2020	2012	2020	2012	2020
Simulation 3A	-0.51	-4.06	-0.79	-3.50	-0.61	-2.10	15.42		-0.59	-4.70	4.00	27.69
Simulation 3B	-3.93	-28.44	-0.54	-2.49	-0.28	-0.69	-1.31	-7.96	19.99		3,98	27.77
Simulation 3C	-1.24	-9.92	-1.11	-6.52	12.76	95.63	-1.37	-8.72	-1.44	-11.50	4.22	31.91

Private investment decreases and, like for Scenario 2, is worse when firms have to finance the policy. This is because firms contribute significantly to private investment.

Figure 1.23. Impact on private investment
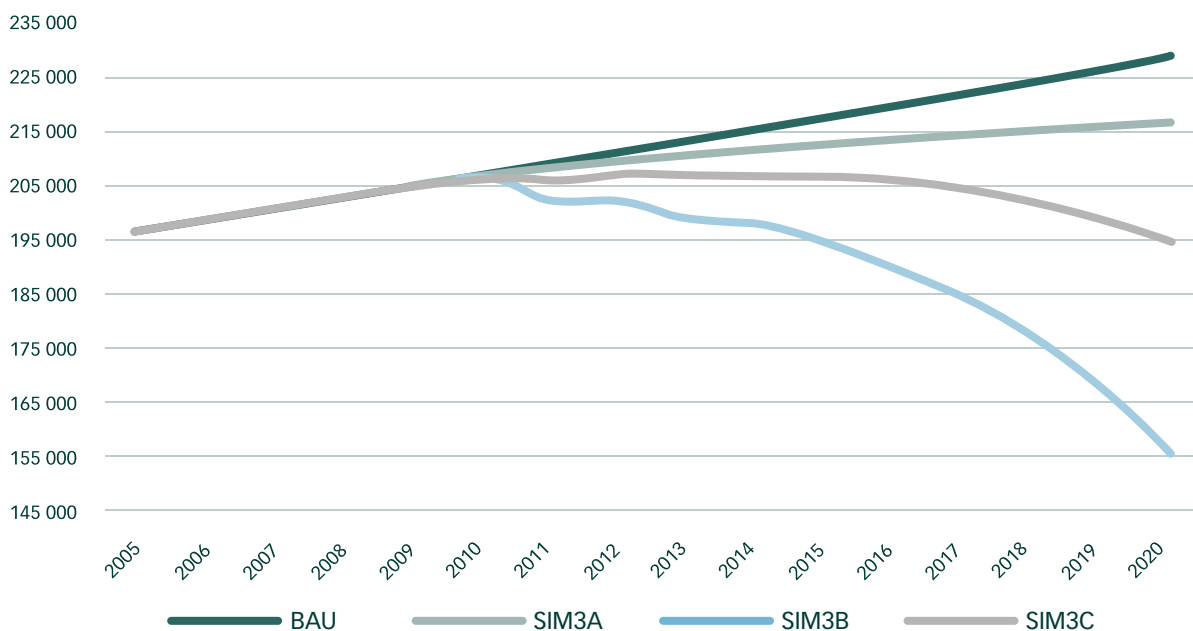
As public investment increases due to the policy, total investment also increases.

Figure 1.24. Impact on total investment
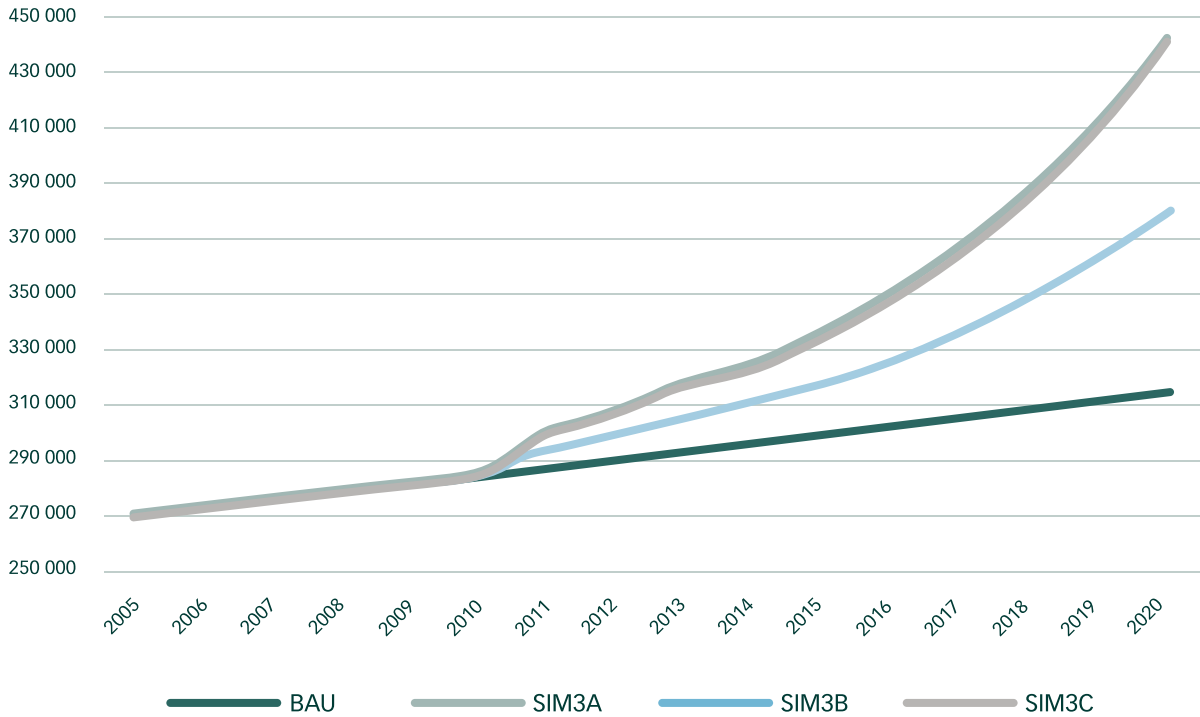
The policy is less harmful to GDP when financed by firms. Indeed, when households finance the policy, the impact on consumption and thus on GDP is too big. Needless to say, in Simulation 3C, the results are very bad. Financing the policy through an increase in indirect tax penalises the entire economy.

Figure 1.25. Impact on GDP (at basic prices)
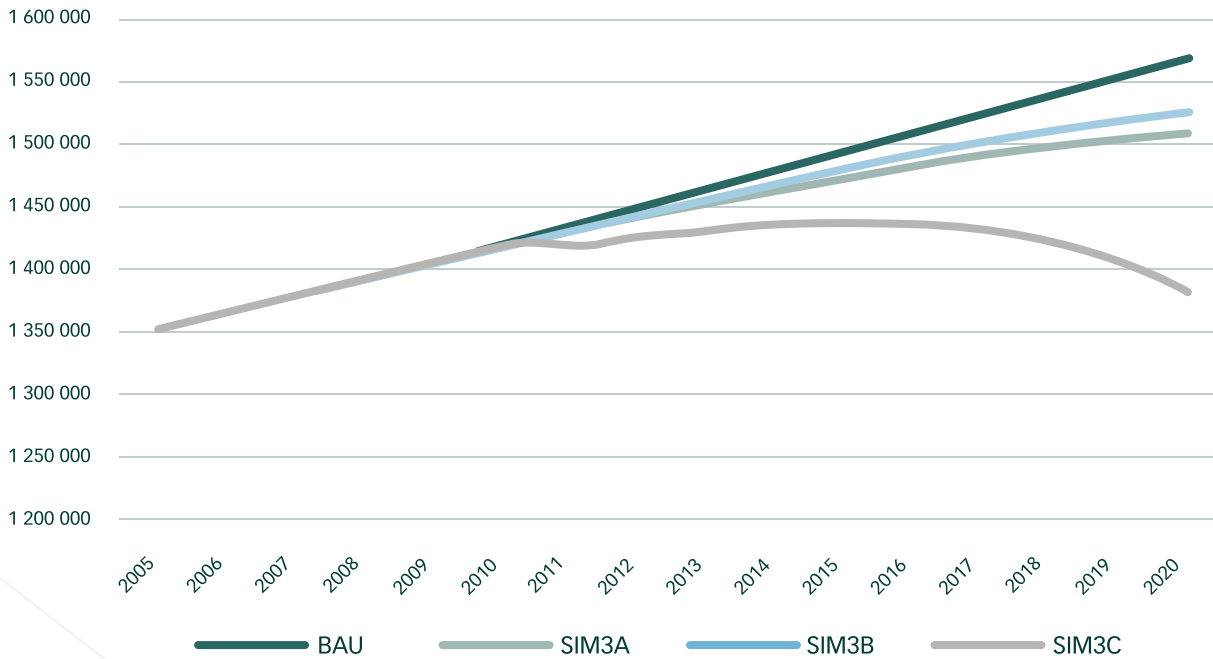
1.6 Conclusion

This chapter has explored several job creation policy interventions. For all the simulations (except one), unemployment decreased for the entire period. Skilled and semi-skilled workers benefit more from proposed interventions, as government's activities are very intensive in these two types of labour. Three different ways of financing were analysed, as for government to let its deficit run unabated is unsustainable. None is neutral. Indeed, financing through household tax will affect households the most, as well as other activities, as the demand for commodities will decrease. Sectors such as food and footwear will be particularly affected. The scenario that finances by taxing firms will be more harmful for firms, as they will pay more direct taxes and will have an impact on total investment in the long run. The VAT financing scenario will negatively affect the whole economy, as the increase in the VAT will affect final and intermediate consumptions for agents and activities.

Financing the policy by increasing firms' direct taxes has negative impacts on investment in the long run, and so on growth. Financing through an increase in VAT has harsh results for the entire economy, as all the agents are negatively affected. Moreover, this fiscal policy would not be 'pro-poor' because all households (including the poor) are hit by an increase in VAT. Finally, the increase of direct tax for households seems to be the least harmful.

Building on these results, the chapter explored whether infrastructure-intensive expenditure will do a better job. The idea with this type of policy is to see what happens in the long run. In the short run, government's deficit increases a lot, but the question is whether this spending can create greater economic activity in order to generate new revenues in the long run. For instance, a policy that creates jobs will have an impact on the fiscal side, as new workers will get an income and pay new taxes (direct and indirect). In terms of unemployment, results are surprisingly very negative. It must be remembered that the unemployment level for skilled workers is very low at the base year, and thus variation is very high. In any case, unemployment increases whatever the scenario and the labour type.

In the last set of scenarios, the same simulations were presented but also took into account the effect of infrastructure productivity on the other sectors. Indeed, it is easily understandable that government investment in building a road (infrastructure spending), or in constructing/renovating a harbour, will have impacts on the other sectors: it will decrease their transport margins, and they will be able to trade more, using the same quantities of labour and capital. In short, the cost of doing business will be lowered. The impact on unemployment is better, and in the long run unemployment decreases for all types of workers under one of the scenarios. In the short run, only elementary occupation workers benefit from a decrease in unemployment; for the rest, unemployment rises.

Analysis has shown that fiscal policy actions intended to increase demand for goods and services can affect employment in three key ways: (1) by boosting households' disposable income, (2) by providing support to businesses and (3) by increasing grants or government spending on infrastructure. A 'J-curved' process of fiscal consolidation is quite feasible provided that the additional stimulus is carefully designed to maximise impact. A key condition is that the fiscal multiplier should be greater than one, that is, each rand of additional short-term stimulus should translate into *more* than one rand of additional aggregate demand. This condition typically exists in a downturn and should be present now as well. Initiatives that reduce the marginal cost to businesses of adding employees, or that target people most likely to spend the additional income (generally people with lower income), would have the greatest effect on employment per rand of budgetary cost. For instance, re-directing government spending towards activities such as health care, durable goods manufacturing, agriculture, community services, and hospitality and food service should complement government's expanded infrastructure expenditure plan, which traditionally has focused chiefly on construction activities (e.g. building highways, power plants, bridges, dams and flood control structures), in creating much-needed additional jobs. Unemployment can also be addressed by focusing on factors other than the weak demand for goods and services.

Despite the near-term economic benefits, such actions would add to the already large projected budget deficits that exist under current policies, either immediately or over time. Unless other actions are taken to reverse the accumulation of government debt, the nation's output and people's income would ultimately be lower than otherwise would have been. The analysis shows clearly that fiscal policy (infrastructure and current expenditures) alone is not going to solve job-creation problems unless complemented by other interventions. The negligible impact on growth of interventions, such as an expansive infrastructure strategy or expanded public expenditures, has important implications for fiscal policy. At the very least, the finding suggests government interventions that emphasise infrastructure alone will make little impression on employment. Infrastructure is only one aspect, but the government has pinned its entire strategy on infrastructure and virtually very little else. Therefore, rather than replacing ageing infrastructure, policy should target public investments that serve as a catalyst to shifts towards jobs and knowledge-intensive production and provision of government services (including maintenance of existing infrastructure). New investments are required that allow shifts

towards jobs and knowledge-intensive production and provision of government services. In all cases, fiscal policy needs to be consistent with long-term fiscal objectives and take into account the limits of direct public-sector employment.

1.7 Recommendations

With respect to unemployment and the intergovernmental transfer system, the Commission recommends that government should:

- Re-direct government spending towards those activities that directly or indirectly create jobs through implementing the expanded infrastructure strategy. Healthcare, durable goods manufacturing, agriculture, community services, and hospitality and food service should form the basis of much of that plan. By and large government should promote lower-paying positions, which have the highest potential for the most job gains, including those found in the informal service sector (which can help undo the losses felt by groups hardest hit by the recession of 2008–2009).

- Reduce unemployment by addressing factors other than the weak demand for goods and services. This should be done by:

  o Re-designing the state procurement framework to incorporate and grow the informal economy and formal micro-enterprises, e.g. requiring recipients of large government contracts to include an informal sector partner in their tender submissions. In addition, the Department of Performance Monitoring and Evaluation should stringently monitor the outcomes of these contracts.

  o Earmarking government procurement contracts for low-technology or service-oriented contracts (e.g. catering) for informal sector companies or micro-enterprises.

  o Better targeting of supply-side interventions for re-skilling and mobility. These policies could be implemented using mechanisms such as block grants (e.g. transport subsidy for unemployed vulnerable groups such as women, youth and the disabled so that they are better connected to employment opportunities).

- Encourage, particularly through the relevant Departments of Labour and Performance Monitoring and Evaluation, those companies that are yielding the highest employment levels both directly and indirectly. This would entail:

  o setting up an employment performance-reward scheme for enterprises that excel in job creation

  o publicising the scheme widely and giving it a high profile.

- Develop and implement credible job plans for each sphere in collaboration with a broad set of actors – not only employers, but also unions, economic development agencies, Sector Education and Training Authorities (SETAs), secondary schools, colleges, universities, vocational training centres and business support providers. To unblock prisoner's dilemma scenarios and work towards amicable social compacts:

  o Ensure collaboration happens, particularly at the level of relatively homogenous local interests.

  o Use the criteria proposed in Box 1.1 in Chapter 1 to evaluate respective job plans.

Box 1.1. Criteria for Evaluating Government Job Plans in South Africa

Magnitude of policy change and debt implications. There is no commonly agreed upon, optimal amount of national debt. Higher debt has a number of negative consequences that the Commission has discussed in its earlier work, but reducing debt or constraining its growth will imply alternatives forgone so that policy changes themselves can have negative consequences. Hence, government will need to make judgments about how much national debt is acceptable.

Specificity of the policy. This criterion asks whether a plan is explicit or not in how job creation would be achieved. Specificity is critical not only to evaluating a plan but also to the effects of the plan. Credible policy changes that would substantially reduce inflation in the coming decade and beyond could boost economic expansion in the next few years by holding down interest rates and increasing people's confidence in the nation's long-term economic prospects. Such an approach would be most effective if the future policy changes were sufficiently specific and widely supported by households, businesses, state and local governments, and if participants in the financial markets believed that the future fiscal restraint would truly take effect.

Amount and composition of government spending. Over time, government will need to collect revenues roughly equal to its expenditure. Hence, government will need to decide the size and composition of such expenditure. Since the 2009 recession, South Africa has experienced a future budget trajectory that looks very different from the past, and budget (job) plans have the opportunity to reinforce current trends or to reverse them.

Short-term economic impact. Government faces difficult trade-offs in deciding how quickly to implement policies to create sustainable jobs. On the one hand, immediate spending cuts or tax increases would represent an added drag on the current weak economic expansion. In addition, implementing spending cuts or tax increases abruptly would give families, businesses, and provincial and local governments little time to plan and adjust. On the other hand, cutting spending or increasing taxes slowly would tend to boost output and employment in the next few years, compared with what would happen if those changes were made rapidly. However, it would also lead to a greater government debt and might raise doubts about whether the longer-term deficit reductions would ultimately take effect.

Medium- to long-term economic impact. Beyond the next few years, budget plans could affect output and income by altering the size and skills of the labour force, the amount and composition of the capital stock, and the efficiency with which those inputs are combined. Smaller deficits would lead to higher national savings in the medium and long term, and higher national savings would lead to a larger capital stock.

Distributional impact. This criterion addresses the question of who would bear the burden of the proposed changes in tax and spending policies. Different sorts of spending cuts and tax increases would affect different people to different extents, both directly (who pays certain taxes or receives certain benefits or services) and indirectly (how the changes in policies affect the economy and thereby affect people's well-being).

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