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The Impact of the Public Expenditure Cuts Policy on the Labor Market in Vietnam

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Abstract

The purpose of this study is to evaluate the impact of public expenditure cuts on employment and income to support policies for the development of the labor market. Impact evaluation is of interest for policy makers as well as researchers. This paper presents a method – that is based on a Computable General Equilibrium model – to analyse the impact of the public expenditure cuts policy on employment and income in industries and occupations in Vietnam using macro data, the Input output table, 2006, 2008 and the 2010 Vietnam Household Living Standard Survey.

Keywords: Economic modelling, public expenditure, Vietnam, labor market, impact

1. Introduction

For Vietnam's deeper and deeper integration into the global market[1], its economy is also faced with a number of constraints that are caused by the severe impact of global economic expenditure cuts. The foreign direct investment (FDI) sector , makes up 27 per cent of the total social investment. The import and export value of this sector has often stood at the rate of 55 to 70 precent of the total import and export turnover. After the global economic crisis in 2007-2008, the global market for export and investments narrowed rapidly. This has caused Vietnam's economic recession. Together with the common trend in the world, the Government of Vietnam has applied various measures to cope with its economic recession and to stabilize the environment for the macro economy towards sustainable development. Flexible and comprehensive implementation of a range of fiscal policies and other macro policies has assisted Vietnam's economy to overcome the crisis. The economic growth rate still reached 5.3 per cent in 2009 and the inflation rate decreased to 6.88 per cent from 23 per cent in 2008. One of the measures that was applied by the Government is the extensive fiscal policy (with stimulus packages in 2008 and 2009).

In the period of 2011-2012, in order to stabilize the macro economy and to deal with the accelerating inflation rate, the Government aims at reducing the aggregate demand of the economy via four key measures: increasing the revenue of the state budget; maintaining an over-expenditure rate of less than 5 per cent of GDP; postponing ineffective public investment projects; and saving the recurrent expenditure of less than 10 per cent. Public investment is the reason for inflation because of its low inefficiency. As a result, there is an increase in production costs and product prices. This has had a negative impact on people's income.

Public expenditure needs to be cut to save investment for effective works and projects. Investment needs to be allocated for projects already started that can be finished, but not for new ones. Scarce capital, a high proportion of investment capital in GDP and the high Incremental Capital Output Ratio (ICOR) may affect the employment situation of several industries that provide services and goods because the Government reduces its demands for goods in the market. This can result in constraints for the local production situation and export enterprises. Public expenditure cuts can lead to an unemployment situation and unstable social disorder. They also reduce the driving force for economic growth in the public sector. Meanwhile, the recovery of the national macro economy, the micro financial capacity of enterprises, and the recovery of the purchasing power of the social market has not been sustainable, and may easily cause a second recession in the economy.

In the bad global economic context, if the local economy develops towards an increase in

investment size and intensive labor utilization, the contractionary expenditure policies can lead to negative impacts on the labor market.

Thus, there is a need to carry out a study on "Impacts of the public expenditure cut policy on the labor market" with the aim of considering the influencing level of the employment and income policies in different industries and to recommend policy implications for the future development of the labor market.

2. Literature review

2.1. Local studies

Up until now, there has not been any local study on the impact of public expenditure on employment and income distributions. Studies on fiscal policies have mainly been carried out in relation to the economic growth.

There has been only one study on "the impacts of public expenditure on the economic growth of localities in Vietnam", which was conducted in 2010 by the author, Hoang Thi Chinh Thon, of the Research Centre for Economics and Policy, College of Economics, Hanoi National University. The study evaluated and analyzed how the provincial and district expenditure affected the local economic growth. The study conducted a regression analysis on the basis of collected data from 31 localities in Vietnam. The results of the regression analysis show that district investment expenditure needs further strengthening whilst provincial investment expenditure should be reduced to promote the economic growth in localities. The study also indicated that budget expenditure was divided into different categories, each of which had a different impact on the economic growth. Development investment expenditure can create production capacity for the economy and it has long-term impacts on the economic growth.

A study on "Efficiency of public expenditure in Vietnam in the transitional period of the economy" by Nguyen Khac Minh in 2008 analyzed the efficiency of annual public expenditure and public investment based on the panel data of 34 provinces/cities in Vietnam in the period of 2000 – 2005. The study used the parameter approach (based on the Stochastic Frontier Production Function (SFPF)) and the non-parameter approach (based on DEA - Data Envelopment Analysis). The study results exposed the inefficiency of public expenditure in both annual public expenditure and public investment.

The study on "analysis of the expenditure structure of the Government and economic growth in Vietnam" by Pham The Anh in 2008 utilized the collected data from 61 provinces/cities in the period of 2001-2005 to analyze the relation between the expenditure structure of the Government and the economic growth in the transitional process of the provinces in Vietnam. In the study, a pilot analysis was carried out based on the theoretical model, which was developed from the utilization of the data of all provinces in Vietnam. The findings of the study illustrate that investment expenditure is more efficient in some

industries while recurrent expenditure is more efficient in some others.

A study by Rizwanul Islam in 2011 on "Macroeconomic Policy, Economic Growth, Employment and Poverty: Issues and Challenges for Viet Nam" made a desk review of changes in macro regulating policies from currency, exchange rate policies to fiscal policies (mainly the monetary policies) in the period of 2011 - 2010. The study also indicated challenges for poverty reduction and employment in Vietnam. From the viewpoint of the study, employment is vital for not only (1) annual newcomers in the labor force but also (2) currently unemployed laborers and newly employed poor people, and (3) people who are underemployed. The study also indicates that public investments are also an element to promote economic growth. Especially, public investments in infrastructure construction have created widespread impacts on promoting investment in the private sector. Therefore, if the Government wants to realize the goal of budget deficit reduction, it should pay attention to (1) which public expenditures need cutting to cause no negative impact on public investment in infrastructure construction, and (2) the factors which can promote potential financial resources to the budget.

2.2. International studies

A study by Michal Gradzewicz et al (2007) on "The cost of fiscal tightening in Poland on the road to the Euro: does the labor market matter?"carried out an evaluation on the adjustments of the fiscal policies of Poland by using the CGE model simulations in the period of 2006 – 2008. The two simulation groups that were analyzed were the fixed and flexible wage level. The study indicated that the "contractionary" policies of the Government were not the reason for a decrease in economic growth in the period of 2006 – 2008. On the contrary, they created more driving force for it. When the wage was adjusted to a lower level, the labor cost would also be lower. This would encourage enterprises to hire more workers. As a result, economic growth would be promoted. However, the study also exposed that the contractionary fiscal policies caused no cost for the economy because the labor market was also renovated.

A study by Dario Caldara and Christophe Kamps (2008) on "What are the Effects of Fiscal Policy Shocks? A VAR-based Comparative Analysis (Vector autoregressive - VAR)" piloted various approaches to study fiscal shocks such as the recursive approach, the Blanchard-Perotti approach, the sign-restrictions approach and the event-study approach, based on the quarterly data of the USA in the period of 1995 – 2006. As a result, these approaches brought about qualitative results similar to the quantitative ones. The study split the fiscal shock into two types: the tax shock and the government expenditure shock. The two VAR models with 5 and 6 variables were used to estimate changes in the macro indicators (such as GDP, government expenditure, net tax, inflation, interest, employment and

wages) caused by these shocks. The study also provided various impact evaluation methods of the fiscal shocks to macro variables.

The study by the authors at Monash University, Horridge J.M. and Parameter B.R. (1995) on "macroeconomic, industrial, distributional and regional effects of government spending programs in South Africa" developed a Computable General Equilibrium (CGE) model for South Africa (IDC-GEM). This model was used to analyze the economic impact ofan increase in public expenditure of the South African Government to macro indicators, industries, regions and income distribution. The study simulated short-term impacts of a 10 per cent increase in the government expenditures due to: (1) foreign aid, (2) tax, (3) local debts, and (4) simulation of the sensitivity of the components in the government expenditure. The results showed that for an increase in the government expenditure (with a constant increasing level) gained from the foreign aid, GDP and consumption growth would be promoted; however, this would lead to an increase in the value of domestic currency (increasing the exchange rate), which would promote imports and reduce exports. The provinces that very much depend on imports would be faced with a decrease in GDP growth and the influencing level of income distribution would be low. An increase in government expenditure from taxes would lead to very few impacts on the macro indicators. But if rise in consumption tax induces the impacts on the prices due to substitution effect. An increase in income tax would also cause small impacts on income distributions. The study also indicated appropriate policies used for the simulations. This study also provides another method to evaluate the changing impacts of government expenditure on macro factors.

Adam Hersh (2012) from the Center for American Progress conducted a study on "Austerity is Hammering State Economies: States that Cut Spending in Response to the Recession Fare Worse Economically". The author compared the economic growth and unemployment rate of 20 states that reduced their public expenditure and 30 states that increased their public expenditure. Hersh found that on average, the states that cut their public expenditure had an unemployment rate that was of 4.1 percentage points higher than the states that did not cut their public expenditure. The percentage of employment in the private sector was also reduced by 6 per cent. The economic growth rates of the states after reducing their public expenditure was 2.7 percentage points lower than the period before the reduction.

Most foreign countries have conducted studies on the impact of increasing government expenditure on macro factors. Some others have studied the impact of the contractionary public expenditure policies on macro factors, such as the study by Michał Gradzewicz et al (2007) or the study by Adam S. Hersh (2012) as mentioned above. However, the conditions for the contractionary

policies of the Government in the study by Michał Gradzewicz are different from the conditions for the contractionary policy executed by the Government of Vietnam in 2011. The Government of Poland cut its expenditure related to wages and employment in the public employment sector; meanwhile, the Government of Vietnam cut its inefficient public expenditure and recurrent expenditure for non-wage or irrelevant wage components. These studies have applied different methods for impact evaluation. For European countries, they often apply the VAR model for their studies while the authors of Monash University often use the computable general equilibrium model. In Vietnam, there has not been any impact evaluation of public expenditure cutting on macro factors, especially, the factors of labour, employment and income distribution.

Therefore, the study on the impact of public expenditure cuts on macro factors, employment, labour and income distribution carried out by ILSSA via the application of the computable general equilibrium model designed for Vietnam (ILSSA – MS) reflects a new progress in the relevant studies in Vietnam.

3. Data set

Data is taken from Vietnam's 2005 inter-sectoral balance (GSO 2008b). Socio-economic indicators are updated for the period 2006-2010. The model consists of two main variable groups: GDP (constant price) (rechecked), private consumption, public consumption, sectoral output, labor by sector, profession, and skill. The second group of variables includes: population growth, job growth (GSO, 2011a, 2011b), agriculture land variations (NIAPP, 2010) and export-import tax rates (WTO, 2007). Data for the period 2005-2010 is provided in Appendix 2.

4. The model

4.1. Introduction

The theory of the ILSSA-MS[2] is constructed on the ORANI-G model (Dixon *et al*, 1982; Horridge 2003), with an extension of a detailed modelling of the labor market. The model is solved with the GEMPACK economic modelling software (Harrison and Pearson, 1996).

ILSSA-MS has a theoretical structure, which is typical of a static CGE model. It consists of equations describing, for some time period: producers' demands for produced inputs and primary factors; producers' supplies of commodities; demands for inputs to capital formation; household demands; export demands; government demands; the relationship of basic values to production costs and to purchasers' prices; market-clearing conditions for commodities and primary factors; and numerous macroeconomic variables and price indices.

Demand and supply equations for private-sector agents are derived from solutions to familiar optimisation problems underlying the behaviour of agents described in conventional neoclassical microeconomics. Each industry minimises unit costs, subject to given input

prices and a nested constant returns to scale production function. Three primary factors are identified (labor, capital and land) with labor further distinguished by occupation and qualification. Capital is assumed to be sector-specific, whereas labor is perfectly mobile among industries. Households are modelled as constrained maximisers of Klein-Rubin/Stone-Geary utility functions. Units of new industry-specific capital are cost-minimising combinations of Vietnamese and foreign commodities. For all commodity users, imperfect substitutability between imported and domestic varieties of each commodity is modelled using the Armington[3] constant elasticity of substitution (CES) assumption. The export demand for any given Vietnamese commodity is inversely related to its foreign-currency price. The model recognises consumption of commodities by government, and the details of direct and indirect taxation instruments. It is assumed that all sectors are competitive and all goods market clear. Purchasers' prices differ from producer prices by the value of indirect taxes and trade and transport margins. The agents are assumed to be price-takers, with producers operating in competitive markets, which prevent the earning of pure profits.

4.2. The ORANI-G core of the ILSSA-MS theoretical structure

a. Modelling of the labor market

ILSSA-MS contains detailed modeling of labor demand and supply, distinguished by 113 industries, 26 occupations and 6 qualifications. The industries, occupations and qualifications are listed in Appendix 1.

On the supply side, qualification holders allocate their labor across occupations so as to maximize their utility, subject to given occupational wages and a constraint on the total number of working hours available by each qualification. On the demand side, industries demand labor distinguished by occupation, choosing between different occupational types so as to minimize their labor costs, subject to given occupational wages and their overall demand for labor.

The equations that describe the main relationships describing the supply and demand for labor distinguished by industry, occupation and qualification in the ILSSA-MS model are, in percentage change form, as follows:

$$x_{o,s} = x_s^{(Q)} + \phi_{o,s}^{(Q)}\left[w_{o,s} - w_s^{(Q)}\right] \qquad \text{(E1)}$$

$$x_{o,s} = x_o^{(O)} - \sigma_{o,s}^{(O)}\left[w_{o,s} - w_o^{(O)}\right] \qquad \text{(E2)}$$

$$w_s^{(Q)} = \sum\nolimits_{t\in OCC} S_{t,s}^{(Q)*} \times w_{t,s} \qquad \text{(E3)}$$

$$w_o^{(O)} = \sum\nolimits_{t\in SKILL} S_{o,t}^{(O)*} \times w_{o,t} \qquad \text{(E4)}$$

$$\mathrm{H_o} \times x_o^{(O)} = \sum\nolimits_{i\in IND} \mathrm{H_{i,o}} \times x_{i,o}^{(O)} \qquad \text{(E5)}$$

$$x_{i,o}^{(O)} = x_i^{(I)} - \sigma_{i,o}^{(I)} \times \left[w_{i,o}^{(I)} - w_i^{(I)}\right] \qquad \text{(E6)}$$

where:

$x_{o,s}$ is the percentage change in employment of occupation type o supplied by qualification s;

$x_s^{(Q)}$ is the percentage change in the number of hours of labor supply by qualification s.

The solution year value for this is determined by (E8) discussed below.

$\phi_{o,s}^{(Q)}$ is the elasticity of supply to occupation type *o* by qualification type *s* in response to movements in the relative wage of occupation type *o*;

$w_{O,S}$ is the percentage change in unit wage received by qualification type *s* when supplying labor to occupation type *o*;

$w_s^{(Q)}$ is the percentage change in average wage received by qualification *s*;

$x_o^{(O)}$ is the percentage change in demand for occupation *o*;

$\sigma_{o,s}^{(O)}$ is the elasticity of substitution between labor supplied by different qualifications to occupation *o*;

$w_o^{(O)}$ is the percentage change in the average wage of occupation type *o*;

$S_{t,s}^{(Q)*}$ CRESH weighted average share of qualification *s*'s total wage earnings earned in supplying labor to occupation *t*;

$S_{o,s}^{(O)*}$ CRESH weighted average share of the total wages of occupation *o* represented by wages paid to qualification *t* supplying labor to occupation *o*;

H_o total hours of employment in occupation *o*;

$H_{i,o}$ total hours of employment of occupation *o* in industry *i*;

$x_{i,o}^{(O)}$ percentage change in employment of occupation *o* in industry *i*;

$x_i^{(I)}$ percentage change in employment in industry *i*;

$\sigma_{i,o}^{(I)}$ industry *i*'s elasticity of substitution between different occupational types;

$w_{i,o}^{(I)}$ percentage change in the price of occupation *o* to industry *i*;

$w_i^{(I)}$ percentage change in the price of labor to industry *i*;

Here, we assume that workers holding a given qualification allocate labor across occupations so as to solve the following problem:

Maximise: $U_s\left[X_{1,s}W_1, X_{2,s}W_2, ..., X_{o,s}W_o\right]$ (E7)

subject to: $X_s^{(Q)} = \sum_{o \in OCC} X_{o,s}$

In implementing this problem for ILSSA-MS, we choose the CRESH functional form to describe U. As Dixon and Rimmer (2008) explain, (E7) describes a problem in which workers view wages earned in different occupations as imperfect substitutes. The utility maximising solution to (E7), converted to percentage change form, is (E1). Equation (E1) describes qualification-specific labor supply functions. In the absence of changes in relative wages, under equation (E1) expansion in supply of qualification *s* leads to uniform expansion in the labor supply of all occupations to which qualification *s* supplies labor. A change in the wage of one occupation ($w_{O,S}$) relative to the average wage earned by qualification *s* (w_s^Q) induces transformation towards greater supply of labor to that occupation, with the strength of this substitution governed by the elasticity $\phi_{o,s}^{(Q)}$.

Units of occupation-specific labor are modelled as CRESH composites of occupation-specific labor distinguished by the skill sup-

plying that labor. The percentage change form of the cost-minimising CRESH demand functions are described by equation (E2)[4].

Together, equations (E1) and (E2) describe supply and demand functions for occupation and qualification-specific labor ($x_{O,S}$). This requires wage rates for occupation and qualification-specific labor ($w_{O,S}$) to be endogenous to clear these labor markets. Equations (E3) and (E4) calculate percentage changes in average wages by qualification ($w_s^{(Q)}$) and occupation ($w_o^{(O)}$) respectively, as the appropriate weighted sum of percentage changes in occupation and qualification-specific wage rates.

Economy-wide demand for labor of a specific occupational type is modelled as the sum of demands for that labor across all industries. This is described by equation (E5).

The industry-specific cost-minimising labor demands functions produced by this structure are described by equation (E6).

b. Equations to account for changes in the number of people holding a particular qualification

The ILSSA-MS database describes a solution to the model for the year *t*. A typical simulation with ILSSA-MS will be undertaken in two steps. First, the model will be simulated with a set of shocks that update the model solution to a recent year, such as 2010. Second, the model will be simulated with a set of shocks that represents a forecast out to some distant year, such as 2020. In each case, we require an equation to calculate the change in the number of people holding each of the qualifications in the model.

Here, we describe the equation governing the accumulation of qualifications across the forecast period. We begin by considering a forecast between the years 2010 and 2020. We assume that the number of persons holding qualification *s* in the year 2020, will be equal to:

(i) the number of persons who held qualification *s* in year 2010; less,

(ii) those who held qualification *s* in the year 2010, but who either permanently depart the workforce between 2011 and 2020 or retrain for another qualification; plus,

(iii) the number of people who acquire qualification *s* over the period 2011-2020; minus,

(iv) the number of newly-trained people holding qualification *s* who, either do not enter, or permanently depart, the labor force between 2011 and 2020.

More formally, the stock of persons holding qualification type *s* in the solution year $t + \tau$ is given by:

$$X_q^{(Q)t+\tau} = X_q^{(Q)t} \times (1 - r_q^{(1)})^{\tau} + \sum_{s=0}^{\tau-1} T_q^{t+s} (1 - r_q^{(2)})^{\tau-s-1} \qquad \text{(E8)}$$

where:

$X_q^{(Q)t}$ is the number of workers holding qualification type *q* in period *t*;

$r_q^{(1)}$ is the rate at which persons holding qualification type *q* at the start of the simulation period permanently leave the workforce or undertake training in a different qualifica-

tion;

$r_q^{(2)}$ is the rate at which persons holding qualification type *q*, who join the workforce during the simulation period, permanently leave the workforce or undertake training in a different qualification;

T_q^s is number of people newly qualified with qualification type *q* who enter the labor force in period *s*.

A difficulty with equation (E8) is that it introduces a variable, T_q^s , describing numbers of people newly qualified with a particular skill in each of the years between t and t + τ. We offer the model user two options for the determination of training positions for the years between t and t + τ. The first option is to assume that training numbers grow smoothly between the years t and t + τ. The second option is to assume that training positions adjust instantly to their t + τ value. The first option is implemented via:

$$T_q^{t+s} = T_q^t (T_q^{t+\tau} / T_q^t)^{s/\tau} \qquad \text{(E9)}$$

Substituting (E9) into (E8) gives

$$X_q^{(Q)t+\tau} = X_q^{(Q)t}(1-r_q^{(1)})^{\tau} + \sum_{s=0}^{\tau-1} T_q^t (T_q^{t+\tau}/T_q^t)^{s/\tau}(1-r_q^{(2)})^{\tau-s-1} \qquad \text{(E10)}$$

The rationale for (E9) is the possibility of inertia in the process of the adjustment of the number of annual training positions. Such inertia might reflect the time required to adjust training resources, like teaching facilities and professional staff numbers, to changing student needs. However a potential problem with (E9) is that it may lead to over or under-shooting of solution year training positions relative to long-run trend requirements in simulations in which solution year skill demands change significantly relative to the initial solution year. Apparent excessive adjustment of training positions can be reduced by assuming a one-off year *t*+1 adjustment of training positions for skill *q* to its new level, a level that will be maintained over each year of the simulation period. This second option is implemented via:

$$T_q^{t+s} = T_q^{t+\tau} \qquad (s = t+1 \ldots \tau) \text{ (E11)}$$

Substituting (E11) into (E8) provides:

$$X_q^{(Q)t+\tau} = X_q^{(Q)t} \times (1-r_q^{(1)})^{\tau} + \sum_{s=0}^{\tau-1} T_q^{t+\tau}(1-r_q^{(2)})^{\tau-s-1} \qquad \text{(E12)}$$

Equations (E10) and (E12) can together be written as:

$$X_q^{(Q)t+\tau} = X_q^{(Q)t} \times (1-r_q^{(1)})^{\tau} + \sum_{s=0}^{\tau-1} T_q^t (T_q^{t+\tau}/T_q^t)^{(1+D(s/\tau-1))}(1-r_q^{(2)})^{(\tau-s-1)} + T_q^t(1-r_q^{(2)})^{(\tau-1)} \qquad \text{(E13)}$$

Equation (E13) introduces the dummy variable D. With D equal to 0, equation (E13) becomes (E12). With D equal to 1, equation (E13) becomes equation (E10).

4.3. Updating the model from 2005 to 2010

The ILSSA-MS model database is compiled from the input-output table for Vietnam for the year 2005 (GSO 2008b). To update the model so that it describes the structure of the economy in 2010, we shock the model with observed changes in economic variables over the period 2006-2010. We impose shocks to variables that are normally endogenous (thus requiring

endogenous determination of appropriate structural variables) and variables that are naturally exogenous. In the former category, we include: real GDP (with primary factor productivity determined endogenously), real private consumption (with the average propensity to consume determined endogenously), real public consumption (with the ratio of public to private consumption spending determined endogenously). In the latter category, we include: population growth, employment growth (GSO, 2011a, 2011b), and changes in agricultural land use (NIAPP, 2010). At the sectoral level, we extrapolate historical trends in changes in production technology and household consumption preferences. This updating simulation provides us with a solution to the model for the year 2010. We provide tables describing industry and employment structures for the economy in 2010 in Appendix 2.

5. Empirical results

5.1. Close the model

In an economy the number of economic variables is always bigger than the number of identified relations between them and the number of variables is always bigger than the number of equations. A set of equations can only be solved when the number of variables equals the number of equations. Therefore, we need to predetermine a few variables – exogenous variables – by giving them numerical values. This is done by specifying the shocks. On that basis the set of equations becomes solvable to find out remaining variables – endogenous variables. To close the model, we need to classify variables into exogenous and endogenous ones. In this study we focus on the assessment of policy impact, therefore we will focus on short-term model closing.

Closing short term model

The following variables are usually exogenous in short term simulations:

Capital (K) and land (Lnd). This happens because it takes time to construct and put new land into production;

Structural variables, such as: technology, consumption trend, ratio between private and public expenditure, import preference, position of export demand function and technology in relation to capital. There is no theory that explains these variables in the model. Policy variables such as import tax, interest rate, import commodity price (assuming Vietnam is a small country and consumers accept the price), real wage (assumed to be stable in the short term).

5.2. Policy simulation

In 2011, in order to stabilize the macro economy, restrain inflation and ensure social protection, the Government implemented various measures such as a public investment cut, reducing the over expenditure of the State budget and recurrent expenditure (10 per cent), reducing investment in the economic field (7.7 per cent compared to 2010), reducing investment in construction (17.8 per cent), in transportation and warehousing (10 per cent) and in

Table 1: Investment cut by state sector

#	Sector	Government investment in total investment (per cent)	Per cent cut in 2011 on 2010	Size of shock in the model (per cent)
		1	2	(3)=(2)*(1)/100
1	Agriculture, forestry, fishery	43.49	-5.68	-2.47
2	Construction	56.48	-17.8	-10.05
3	Transport, warehousing	82.38	-10.01	-8.24
4	Information and communication	68.32	-11.72	-8.01
5	Education and training	55.96	-6.97	-3.9
6	Health care and social assistance	86.9	-14.15	-12.3

Source: Calculation based on MOF and GSO data

the media & information field (11.7 per cent).

Table 1 simulates the process of investment cut in some fields, in which, Column 1 presents the proportion of state investment in the total social investment. It is calculated by the ratio of the State budget over the total social investment by industry. The statistical data show that state investment accounts for quite a high proportion in transportation and (82.38 per cent); health and social aids (86.9 per cent). Column 2 presents the percentage of the state investment cut in 2011 compared to that in 2010. This is calculated based on the statistic data on state investment in 2011 and 2010.

Column 3 in Table 1 shows the size of shock of the investment variable in the model. Because in this study, the "investment" variable by industry is used for policy simulation, the magnitude of this simulated variable (investment) is measured by multiplication of the proportion of state investment in the total investment and the percentage of state investment cut.

5.3. Results of the simulation

The results of the simulation show that when the Government implements the contractionary fiscal policies, the recurrent expenditures are reduced by 10 per cent; construction, 17.8 per cent; transportation and warehousing, 10 per cent; and media & information field, 11.7 per cent. The impacts result in a GDP decrease of 0.09 per cent and a decrease of 0.06 per cent of total jobs or 30 thousand jobs[5]. On other hand, about 2.5 per cent of new jobs have not been generated due to the expenditure cut.

It can be seen that the contractionary fiscal policies of the Government have directly influenced the industries that provide goods and services for the Government, such as construction, exploitation, the processing industry, health, healthcare services, and cultural and

sport services. When the Government cuts down the expenditures of these industries, the total demand for these kinds of goods and services in the economy will reduce. Enterprises will have to regulate their production and business to reduce their product size, which will result in a decrease in the common output of the economy. As a result, total jobs will also reduce.

Impact on jobs in some industries:

The results from Table 2 show that due to the contractionary public investment and inflation restraint policies; several industries, such as construction, construction material production, transportation, etc. have been negatively affected when their capacity for job creation is limited. Besides, some other industries such as agriculture, leather and footwear or other manufacturing industries have created more jobs due to these policies.

The direct investment cut for the construction field and ineffective projects has decreased the number of jobs by 1.27 per cent and its backward effects have influenced the business and production of the industries which produce construction materials, cement, and sand and gravel quarrying. As a result, these industries have cut down their production size and the labour demand of these industries have slightly declined (sand and gravel quarrying has a decrease of 0.31 per cent; brick production, 0.69 per cent, cement production, 0.76 per cent, transportation and communication, 0.1 per cent).

The results also show that the most negatively affected industries are construction, cement production, brick production, and paint production. The results from the simulation also indicate that when the Government cut the recurrent expenditure by 10 per cent and a decrease in investment for construction by 17.8 per cent, 40.7 thousand jobs were lost (equivalent to 1.27 per cent). The cement industry did not face a direct cut, but it lost 0.76 per cent of jobs because it is an input for the construction industry.

Table 2 also illustrates that the labour cut in construction, cement production, etc. has led to a reserve employment shift movement from these industries to agriculture. As a result, the number of jobs in agriculture and fishery has increased by 77 thousand or 0.23 per cent and 0.42 per cent, respectively.

Contrary to the above-mentioned trend, some industries still had an increase in labour demand such as the garment and textile industry (0.49 per cent) because they are key and strategic industries in Vietnam.

The results also show the characteristics of Vietnam's labour market, in which there is a close connection between rural and urban areas and the role of agriculture, and rural areas and the informal sector in job creation - in the stagnated economic situation.

Impact on employment by occupation

The results from the simulation show that the public expenditure cut in some industries has affected the total jobs in those industries

Table 2: Percentage of employment change by industry

No	Industry	Percentage of an increase/decrease in employment
1	Forestry	0.23
2	Fishery	0.42
3	Mining	0.16
	Sand and gravel mining	-0.31
4	Food products, beverages and tobacco	0.19
5	Non-metallic products	-0.02
	Brick production	-0.69
	Cement and cement related production	-0.76
6	Metal, machinery	0.16
7	Chemistry	0.28
	Paint	-0.49
8	Textile, footwear	0.49
9	Other manufactured goods	0.28
10	Electricity, water	0.11
11	Construction	-1.27
12	Commerce and repair	-0.05
13	Hotel & Restaurant	0.11
14	Transport and communication	-0.10
15	Financial services	0.24
16	Real estate and business services	0.11
17	Public management	-0.15
18	Education	-0.03
19	Health and social services	0.05
20	Other services	0.10

Source: Calculated from the simulation with ILSSA-MS model

and the employment structure by occupation (illustrated in Table 3). For each industry, labour demand by occupation depends on the total number of jobs in that industry and the relative wage level of the different occupations. However, the results also indicate that impacts on labour demand by occupation are unclear. Public expenditure cuts and promotion of investment in the private sector have assisted the development of agricultural production and other manufacturing industries. As a result, the number of jobs in these industries

increased and unskilled labour demand has increased 0.13 per cent; demand for skilled labour in agriculture, forestry, and fishery has risen 0.27 per cent and the number of labourers working as staff in these fields also increased by 0.01 per cent.

The labour group that has seen the greatest reduction is craftsmen and other relevant skilled workers because they mainly worked in the industries that suffered the most severe cuts with around 11,600 jobs, or 0.19 per cent.

Highly technical and professional workers in industries and skilled installers and machine operators are the second labour group which was negatively affected by the Government's expenditure cut policies (a decrease of 0.1 per cent).

The manager and medium technical worker group was slightly affected because the enterprises that employed them experienced difficulties and the enterprises had to reduce their production or face bankruptcy.

Impact on wages and income

Though public expenditure cuts were only applied for some industries; the outputs of these industries can be the inputs for others. Therefore, expenditure cuts or production size reduction in the industries that the Government applied the expenditure cut policies to, would indirectly affect production and business activities of other industries. As a result, wages and income would be influenced in every industry.

Table 4 show that expenditure cuts caused a decrease in workers' income in all industries of the economy because of job loss or reduction in working hours in construction, cement production, and transportation. There was an increase in the jobs in agriculture and the informal sector. The agricultural industry had a decrease in the percentage points of income and so it was also slightly affected by the policies.

Negative impacts of the policies on wages and income were mainly for the construction

Table 3: Percentage of employment shift by occupation

Occupation	Percentage of employment shift
Leaders and managers	-0.09
High-level professionals	-0.10
Mid-level professionals	-0.07
Elementary professionals and technical personnel	0.01
Skilled workers in personal services,	-0.02
Skilled workers in agriculture, forestry, fishery	0.27
Skilled handicraftsmen and other related workers	-0.19
Assemblers and machine operators	-0.1
Unskilled workers	0.13

Source: Calculated from the simulation with ILSSA-MS model

field. This is the field that was directly influenced by public investment cuts in terms of their production size and number of jobs. The wage level in this industry was stipulated to be 0.52 per cent lower than the wage level before the policies were implemented. Agriculture – forestry – fisheries was affected by the policies least (the wage level was 0.13 per cent lower than the level before the policies were implemented). In fact, when enterprises have difficulties with their orders or the problem of production reduction, they do not often dismiss their workers easily because they are waiting for a new business and production cycle with new expected orders. In such circumstances, workers often have their working hours reduced. As a result, their wages and income tend to fall.

Table 4: Percentage points of change for wage/income by industry (per cent)

#	Industry	% of change
1	Agriculture and forestry	-0.13
2	Fisheries	-0.14
3	Mining	-0.39
4	Food, beverage and tobacco products	-0.31
5	Non-metal products	-0.41
6	Metals, machines and equipment	-0.41
7	Chemicals	-0.46
8	Textile, clothing and footwear	-0.19
9	Other manufacturing products	-0.33
10	Gas, electricity and water	-0.35
11	Construction	-0.52
12	Trade and repair	-0.28
13	Hotels and restaurants	-0.27
14	Transport and communications	-0.33
15	Financial services	-0.38
16	Property and business services	-0.47
17	Public administration	-0.46
18	Education	-0.46
19	Health care	-0.41
20	Other services	-0.29
	Total	-0.34

Source: Calculated from the simulation with ILSSA-MS model

6. Policy implications

Key conclusions

Government expenditure cuts have led to a reduction of about 0.06 per cent in the total number of jobs or about 2,5 per cent of new jobs have not been created.

The industries, the jobs of which were reduced the most, are those facing direct expenditure cuts, including: the construction material and cement production industries, and transportation.

The impact of government expenditure cuts has caused a decrease in the number of jobs in industries. However, the results differ between industries. Most of the industries are faced with job reductions, while some sectors witnessed an increase in jobs.

Impact on labor groups: The handicraftsmen and related technical worker group is the most affected with a job reduction of about 11,600 jobs or 0.19 per cent.

The impact of the policy changes also caused a decrease of 0.1 per cent in jobs in both groups of senior experts in different fields and technical installers and machine operators. The manager and medium-technical worker group were only slightly affected by the policies.

Some industries were less affected by the public expenditure cuts (garments and textiles, export industries). There was an increase in jobs and workers' income decreased slightly.

Policy implications

Expenditure cuts are essential in the context of high inflation, but we need to pay attention to assessing its short-term and long-term impact on the labour market;

Social protection policies to reduce the negative impact of public expenditure cuts play a very important role in acting as a tool to ease the shocks for the unemployed workers or those who suffer from income reduction.

It is necessary to harmoniously combine expenditure cut policies with social security policies (balancing macro policies, assessing potential impact on the labour market and regarding labour as one of the important variables).

It is necessary to encourage the private sector and the whole of society to engage in formulating and monitoring policies on developing labour and the employment market.

Policies need to be designed for vocational training to meet the demand of human resource development, especially highly skilled labours working in key export and import industries, in production and the service providing sectors.

A comprehensive, multi-level, flexible and effective social security system needs to be developed and employment and social security programs for low-income labourers need to be designed.

There is a need to continue to renew goals, content, programmes and methods related to vocational training towards providing a good environment in which learners can practice.

The capacity in monitoring and controlling

quality of vocational training needs to be improved: verifying the quality of vocational training centres and training programmes. On that basis, labourers can play a more active role in dealing with policy changes or difficulties derived from economic crises.

And there is a need to finalize and develop information systems for collecting, processing, analysing and forecasting information on the labour market and to establish banks that can serve labourers and unemployed labourers seeking jobs.

APPENDIX

APPENDIX 1. INDUSTRIES, OCCUPATIONS AND QUALIFICATIONS IN ILSSA-MS

A.1. Industries

There are 113 industries in ILSSA-MS. For reporting purposes, we aggregate them into 20 sectors. The sectors and their component industries are reported below.

Sector 1. Agriculture and forestry: 1. Paddy; 2. Natural rubber in raw forms; 3. Kernel coffee beans; 4. Sugar cane; 5. Un-fermented or partly-fermented tea leaves; 6. Other crops, nec.; 7. Pigs; 8. Cows; 9. Chickens, ducks, geese, etc.; 10. Other livestock, incl. raw materials from them; 11. Irrigation services for agriculture; 12. Other services to agriculture; 13. Forest activities and products.

Sector 2. Fishery: 14. Fishing; 15. Aquaculture.

Sector 3. Mining: 16. Coals and lignite, peat; 17. Metal ores; 18. Stones; 19. Sands, pebbles, gravel, crushed stone; 20. Natural bitumen, asphalt, and other minerals; 21. Crude petroleum and natural gas.

Sector 4: Food, Beverage and tobacco products: 22. Meat products; 23. Animal and vegetable oils and fats; 24. Processed dairy products; 25. Bakery and confectionary products; 26. Processed fruits and vegetables; 27. Alcoholic beverages; 28. Malt liquors and malt; 29. Soft drinks; bottled mineral waters; 30. Sugars and their by-products; 31. Coffee products; 32. Tea products; 33. Tobacco products; 34. Processed sea foods; 35. Milled rice; 36. Food products i.e.; 37. Preparations used in animal feeding.

Sector 5. Non-metal product: 38. Glass and glass products; 39. Ceramics and other clay products; 40. Bricks and tiles; 41. Cements ; 42. Concrete and other cement products; 43. Other building materials; 44. Pulp, paper and paper products; 45. Wood and wood products.

Sector 6. Metals, machines and equipment: 46. Medical equipment and appliances; 47. Optical and precise equipment; 48. Domestic appliances and parts thereof; 49. Motor vehicles, motorbikes, motorised bicycles; 50. Automobiles and parts; 51. Agricultural or forestry machinery ; 52. Other special-purpose machinery; 53. General-purpose machinery ; 54. Bicycles and

wheelchairs; 55. Other transport equipment and parts; 56. Transformers and parts thereof; 57. Other electrical machinery; 58. Radio, television and communication equipment and apparatus; 59. Iron, steel and their products; 60. Non-ferrous metals and their products.

Sector 7. Chemicals: 61. Basic organic chemicals; 62. Basic inorganic chemicals; 63. Chemical fertilisers; 64. Organic fertilisers and other agricultural chemicals; 65. Pesticides; 66. Veterinary medicines; 67. Pharmaceutical products; 68. Rubber and rubber products; 69. Soap products; 70. Cleansers, perfumes and toiletries; 71. Plastics in primary forms; 72. Products from plastics; 73. Paints ; 74. Varnishes, colours, ink; 75. Other chemicals n.e.c.; 76. Petroleum oils and lubricants.

Sector 8. Textile, clothing and footwear: 77. Woven fabrics ; 78. Textile fibres and threads ; 79. Wearing apparel, except fur apparel; 80. Carpets, other textile floor coverings; 81. Other textile fabrics, n.e.c. ; 82. Tanned, dressed, composition leather; 83. Leather products.

Sector 9. Other manufacturing products: 84. Printing accessories and products; 85. Publishing activities and products; 86. Other manufactured products n.e.c.

Sector 10. Gas, electricity and water: 87. Electricity and gas generation and distribution; 88. Water extraction, refining and distribution.

Sector 11. Construction: 89. General construction services of residential and non-residential buildings; 90. Other construction services.

Sector 12. Trade and repair: 91. Wholesale and retail services; 92. Repairs of motor vehicles, domestic appliances and personal stuffs.

Sector 13. Hotels and restaurants: 93. Hotel and motel lodging services ; 94. Meal serving services.

Sector 14. Transport and communications: 95. Road transport and pipeline services; 96. Railway transport services; 97. Water transport services ; 98. Air transport services ; 99. Postal and telecommunication services; 100. Travel services.

Sector 15. Financial services: 101. Financial services; 102. Lottery and related services; 103. Insurance services.

Sector 16. Property and business services: 104. Research and development services; 105. Real estate services; 106. Other business services.

Sector 17. Public administration: 107.Public administration and compulsory social security services

Sector 18. Education: 108. Education and training services

Sector 19. Health care: 109. Human health service, Veterinary services, Social services

Sector 20. Other services: 110. Cultural and sporting services; 111. Services furnished by associations; 112. Other miscellaneous services; 113. Dwelling services.

A2. Occupations

There are 26 occupations in ILSSA-MS, which are aggregates from the 34 occupations in VHLSS 2004, 2006, 2008 and 2010. For this report, we further aggregate them into 11 occupations. The concordances between the 11 occupations in this report and the 34 occupations in VHLSS are as follows:

1 .Leaders and executive managers

2. High-level professionals

3. Mid-level professionals

4. Elementary professional and technicians

5. Skilled workers in service and sales

6. Skilled workers in agriculture, forestry, and aquaculture

7. Skilled craft and related trades workers

8. Assemblers and machine operators

9. Unskilled workers in sales and services

10. Unskilled workers in agriculture, forestry, and aquaculture

11. Unskilled workers in other industries, and armed force personnel

APPENDIX 2

1. Macroeconomic variables

	Value		Average growth rate /year (%)
	2005	2010	
GDP components at constant price 1994 (bill VND)			
GDP	393,031	551,609	7.01
Fixed Asset investment	133,141	227,452	11.31
Government expenditure	25,620	39,323	8.95
Individual expenditure	254,484	378,958	8.29
Foreign trade, Eliminate inflation by foreign trade price index (mill USD)			
Export	240.92	372.12	9.08
Import	310.86	583.57	13.42
Population and working labor (000 people)			
Population	82,392.1	86,927.7	1.08
Total working labor	42,774.9	49,048.5	2.77

Source: GSO

2. Employment by Occupations

Occupations	2005 (1000 person)	2010 (1000 person)	Annual growth (%)
Leaders and managers	297,87	543,09	12,76
High-level professionals	1619,26	2531,28	9,35
Mid-level professionals	1330,48	1805,85	6,30
Elementary professionals and technical personnel	419,50	708,26	11,04
Skilled workers in personal services,	3754,37	7146,47	13,74
Social safety protection and sales	6972,31	7463,85	1,37
Skilled workers in agriculture	5109,57	6207,81	3,97
Skilled handicraftsmen and manual workers	1636,60	3439,76	16,02
Assemblers and machine operators	21634,93	19202,72	-2,36
Total	**42,774,9**	**49049,09**	**2,78**

Source: ILSSA

3. Employment by Industry

Industry	2005 (1000 person)	2010 (1000 person)	Annual growth (%)
Agriculture and forestry, Fishery	23563,20	23896,3	0,28
Mining	256,50	275,6	1,45
Food, beverage and tobacco products	5031,20	6998,8	6,82
Non-metal products	135,40	130,2	-0,78
Metals, machines and equipment	121,00	117,4	-0,60
Chemicals	1979,90	3108,0	9,44
Textile, clothing and footwear	4593,10	5549,7	3,86
Other manufacturing products	1290,40	1416,7	1,89
Gas, electricity and water	824,50	1711,0	15,72
Construction	151,40	257,4	11,20
Trade and repair	185,90	254,5	6,48
Hotels and restaurants	19,00	101,3	39,76
Transport and communications	157,50	217,5	6,67
Financial services	119,50	185,5	9,19
Property and business services	1679,90	1599,2	-0,98
Public administration	1258,00	1673,4	5,87
Education	349,90	437,0	4,55
Health care	82,10	232,4	23,13
Other services	976,30	886,50	-1,91
Total	**42774,9**	**49049**	**2,77**

Source: GSO

4. Factor shares in industry factor costs (%)

Sector	Labour	Capital	Land	Total
1. Agriculture and forestry	53.3	16.4	30.4	100.0
2. Fishery	45.4	26.0	28.5	100.0
3. Mining	28.0	28.8	43.3	100.0
4. Food, beverage and tobacco products	55.3	44.7	-	100.0
5. Non-metal products	45.3	54.7	-	100.0
6. Metals, machines and equipment	56.3	43.7	-	100.0
7. Chemicals	54.7	45.3	-	100.0
8. Textile, clothing and footwear	48.7	51.3	-	100.0
9. Other manufacturing products	46.5	53.5	-	100.0
10. Gas, electricity and water	46.6	53.4	-	100.0
11. Construction	53.1	46.9	-	100.0
12. Trade and repair	55.3	44.7	-	100.0
13. Hotels and restaurants	51.8	48.2	-	100.0
14. Transport and communications	46.0	54.0	-	100.0
15. Financial services	54.5	45.5	-	100.0
16. Property and business services	60.7	39.3	-	100.0
17. Public administration	87.3	12.7	-	100.0
18. Education	79.7	20.3	-	100.0
19. Health care	76.4	23.6	-	100.0
20. Other services	23.6	76.4	-	100.0
Economy-wide average	49.7	40.9	9.4	100.0

Source: Vietnam Input-output data for the year 2005, GSO 2008b, updated with the current forecast

5. Structure of industry costs (%)

Sector	Domestic intermediate inputs	Imported intermediate inputs	Margin	Taxes on intermediate inputs	Labour	Capital	Land	Production on tax	Total
1. Agriculture and forestry	20.8	8.0	0.9	0.6	36.2	11.2	20.7	1.5	100.0
2. Fishery	22.8	20.4	1.2	0.6	24.5	14.1	15.4	1.0	100.0
3. Mining	13.1	13.9	0.8	1.4	15.6	16.1	24.2	14.8	100.0
4. Food, beverage and tobacco products	60.9	14.3	3.7	0.9	10.9	8.8	0.0	0.5	100.0
5. Non-metal products	41.7	30.7	2.3	-0.8	11.5	14.0	0.0	0.6	100.0
6. Metals, machines and equipment	25.1	49.7	4.0	-0.2	11.8	9.2	0.0	0.5	100.0
7. Chemicals	21.1	50.1	2.7	-0.3	14.2	11.8	0.0	0.5	100.0
8. Textile, clothing and footwear	34.2	47.3	2.3	-0.1	7.7	8.2	0.0	0.4	100.0
9. Other manufacturing products	40.0	34.3	3.2	0.3	10.1	11.6	0.0	0.5	100.0
10. Gas, electricity and water	11.3	22.8	1.4	-1.2	30.2	34.6	0.0	0.9	100.0
11. Construction	35.3	31.9	2.9	-0.3	15.5	13.8	0.0	0.9	100.0
12. Trade and repair	29.1	13.3	1.8	3.1	28.3	22.9	0.0	1.5	100.0
13. Hotels and restaurants	29.9	16.3	1.1	-0.6	27.3	25.5	0.0	0.5	100.0
14. Transport and communications	17.3	25.5	1.5	-0.8	25.4	29.8	0.0	1.3	100.0
15. Financial services	24.2	10.5	0.5	1.5	34.1	28.4	0.0	0.9	100.0
16. Property and business services	24.7	14.1	0.9	-0.1	34.3	22.2	0.0	3.9	100.0
17. Public administration	28.5	16.9	0.9	2.4	44.9	6.5	0.0	0.0	100.0
18. Education	18.7	12.6	0.8	1.6	52.6	13.4	0.0	0.3	100.0
19. Health care	18.5	21.9	3.1	2.4	41.0	12.6	0.0	0.5	100.0
20. Other services	12.3	7.6	0.6	0.8	18.3	59.2	0.0	1.1	100.0
Economy-wide average	29.9	25.2	2.1	0.4	20.1	16.6	3.8	1.8	100.0

6. Structure of commodity sales (%)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sector	**Intermediate inputs**	**Investment**	**Household consumption**	**Exports**	**Government consumption**	**Changes in inventories**	**Total**
1. Agriculture and forestry	56.4	0.4	21.6	17.5	1.0	3.2	100.0
2. Fishery	41.8	0.0	41.3	16.1	0.0	0.8	100.0
3. Mining	11.5	0.0	0.5	87.5	0.3	0.2	100.0
4. Food, beverage and tobacco products	18.5	0.0	45.9	31.5	0.1	4.0	100.0
5. Non-metal products	74.0	0.9	5.1	18.5	1.0	0.5	100.0
6. Metals, machines and equipment	40.4	18.8	4.7	36.1	0.0	0.0	100.0
7. Chemicals	57.0	0.0	26.1	17.8	0.0	-0.9	100.0
8. Textile, clothing and footwear	22.4	1.2	5.9	74.4	0.0	-3.9	100.0
9. Other manufacturing products	67.9	1.8	12.5	19.5	0.5	-2.2	100.0
10. Gas, electricity and water	92.0	0.0	8.0	0.0	0.0	0.0	100.0
11. Construction	0.9	97.6	0.0	0.0	1.6	0.0	100.0
12. Trade and repair	79.0	0.0	12.7	8.4	0.0	0.0	100.0
13. Hotels and restaurants	16.9	0.0	58.0	25.1	0.0	0.0	100.0
14. Transport and communications	34.5	20.6	27.7	16.6	0.6	0.0	100.0
15. Financial services	50.9	2.3	31.0	15.8	0.0	0.0	100.0
16. Property and business services	73.7	0.0	7.0	5.2	14.1	0.0	100.0
17. Public administration	0.3	0.0	0.0	0.0	99.7	0.0	100.0
18. Education	13.3	0.0	12.8	2.4	71.4	0.0	100.0
19. Health care	5.3	0.0	47.9	7.4	39.4	0.0	100.0
20. Other services	1.4	0.0	88.0	4.9	5.7	0.0	100.0
Economy-wide average	32.0	13.9	20.5	27.4	5.9	0.4	100.0

Notes:

1. Import and export volume accounts for 150 per cent of GDP
2. In 2010-2011, with technical assistance from AusAID, ILSSA cooperated with the Centre for Policy Studies of Monash University (Australia) to develop a project model for Vietnam's Labour Market and the micro simulation entitled ILSSA – MS on the basis of the Computable General Equilibrium-CGE model.
3. The name is used in honour of the author who first introduced the idea of imperfect substitutability between imported and domestically-produce goods via the linearised form of the CES input demand equations (Armington, 1969).
4. See Dixon *et al.* (1992: 126 – 128) for the derivation of percentage change demand functions from a CRESH function.
5. 30 thousand jobs are calculated by the formula: total number of the jobs which can be created if the expenditure is not cut = the actual number of jobs in 2011 (1+anpha), in this case, anpha=0.06 per cent.

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