FISCAL POLICY IN SOUTH AFRICA: CLOSED INPUT-OUTPUT INCOME AND EMPLOYMENT MULTIPLIERS

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ABSTRACT

This paper estimates income and employment multipliers for South Africa, based on a closed input-output model for the year 2018. We find that income multipliers for South Africa are larger than 1 and employment multipliers are sizeable as well. Our results are in line with the literature on fiscal multipliers in South Africa and apply to the current conditions of high unemployment, economic stagnation and a negative output gap. Based on our estimates, we predict that the fiscal belt-tightening proposed in South Africa's 2020 Budget, will reinforce the slow growth of the South African economy and augment the already high rate of unemployment.

1 INTRODUCTION

South Africa's 2020 Budget proposes, over the next three years, reductions in public spending of approximately R48 billion and tax relief and rebate measures.[1] Policymakers in South Africa are embracing fiscal consolidation – or austerity – in the belief that this will help to revive the stagnating South African economy, presumably by inspiring 'confidence' of the business sector and global financial markets, and to raise economic growth and contribute to the sustainability of public debt. However, the obsession over the supposedly 'expansionary' fiscal belt-tightening has been criticised, arguing that austerity has, in fact, contributed to the slow growth of the South African economy and to growing income inequality in the 2010s. If this is the case, should the South African government let up on fiscal austerity? And under what circumstances would it be wise to do so?

This note argues, on the basis of new empirical evidence on South African multipliers, that continued fiscal belt-tightening is counter-productive and a distraction from developing a strategy to raise the country's long-run growth. The note is organised as follows. In section 2 we consider the state of South Africa's macro-economy and we review the extant literature on the fiscal multiplier for South Africa. In section 3 we explain the methodology used to estimate closed input-output model fiscal multipliers. Section 4 presents our main findings. Section 5 is the conclusion.

2 THE SOUTH AFRICAN ECONOMY HAS ROOM FOR EXPANSION

Economic growth in South-Africa has been low for almost a decade – averaging around 1% per year during 2014-2020 (see Table 1). Economic growth has been lower than population growth during this period, and per capita income growth averaged -0.5% per year. Actual growth has also been consistently lower than *potential* growth, which is estimated to be in the 1.9%–2.3% range (Fedderke and Mengisteab 2017). Concerns are mounting that potential growth is on a secular declining trend and may be headed toward around 1%, but even in this case, actual growth (which hovers around 0.4-0.8% per annum) falls short of potential growth. Subdued growth is largely attributable to stagnant private investment and lackluster export growth. 29% of South African workers, more than 6.7 million persons, are unemployed (Table 1) and youth unemployment is inordinately high, with 55% of those aged 15-24 years being without a job. Domestic demand growth per person has been negative during 2014-2020. And inflation (running

[1] The 2020 National Budget entailed a reduction of R261 billion in baseline expenditure. However, it included a number of additions in overall spending. The R48 billion is estimated using the main budget framework. We calculate what government expenditure would be if maintained at the same level in real terms, that is, if increased by inflation each year for the next three years, and subtract that from actual planned expenditure. The difference is a deficit of R48 billion.

at more than 4%) is below the inflation target of the Reserve Bank of South Africa (which is 5%).

These numbers suggest a considerable underutilisation of productive capacity in the South African economy and this, in turn, could be taken to indicate that there is considerable space for non-inflationary fiscal stimulus. This is not the view of the ruling South African government and the International Monetary Fund (2020), however. While accepting that South Africa's actual growth is considerably below potential growth, the IMF (2020) argues that South Africa's economic growth is mostly constrained by (micro-economic) supply-side factors, including infrastructural bottlenecks (in electricity generation and supply), over-regulated (formal) labour markets, and increases in product market concentration (as witnessed by rising profit markups). As a result, the fiscal multiplier is low (*i.e.* below unity). This is also the view of the government (see National Treasury of South Africa 2019).

In addition, the IMF (2020) highlight *negative macro-economic risks*, particularly the risk of an unsustainable fiscal deficit (which is now around 6% of GDP) and sharply rising public indebtedness, which is now around 61% of GDP, but rising. It must be noted that the increase in the fiscal deficit is largely due to the poor performance of Eskom, the national power company with commercial and developmental mandates, which generates 90 percent of the domestic electricity consumption, and also exports energy to neighbouring states. The South African government provided Eskom with exceptional financing with a value of 9% of GDP during Fiscal Year 2008-08 and Fiscal Year 2018-19 (IMF 2020). This has directly increased South Africa's public indebtedness. In the IMF assessment, the South African government has no fiscal policy space. Hence, the IMF recommends fiscal consolidation (reducing the deficit by as much as 3 percentage points of GDP), labour market deregulation, and tax cuts – all with the intention to promote private-sector led, inclusive growth (IMF 2020, p. 2).

The problem with drastic fiscal consolidation is that it runs the risk of reinforcing the stagnationist tendencies in South Africa's economy, rather than reversing them. The spending reduction of R48 billion will reduce already stagnating domestic demand by around 0.5 percentage points, slowing down growth, hurting business investment and lowering labour demand. Depending on the size of the fiscal multiplier, the austerity may also be self-defeating: if the spending reduction of R48 billion reduces GDP by more than R48 billion, the public-debt-to-GDP will *increase*, rather than decline. This is what happened in Greece, Italy and other countries in the EU, following the austerity measures introduced in the wake of the Eurozone crisis (2010-2014). The fact that fiscal austerity can be self-defeating has been acknowledged by the IMF itself (Blanchard and Leigh 2013).

Table 1 South Africa: Macro-economic indicators 2014-2020

	2014	2015	2016	2017	2018	2019	2020
GDP growth	1.8	1.2	0.4	1.4	0.8	0.4	0.8
GDP per capita growth	0.3	-0.3	-1.1	-0.1	-0.7	-1.1	-0.7

Govt. deficit (%)	-4.3	-4.8	-4.1	-4.4	-4.3	-6.1	-6.7
Public debt/GDP (%)	47	49.3	51.5	53	56.7	60.8	65.3
Inflation (CPI)	6.1	4.6	6.3	5.3	4.6	4.2	5.2
Unemployment (%)	25.1	25.4	26.7	27.5	27.1	28.6	29.8
Per capita domestic demand growth (%)	-1.0	0.5	-2.4	0.4	-0.6	-0.8	-0.7

Source: IMF (2020). *South Africa Country Report* No. 20/33.

Note: The numbers for the year 2020 are IMF-staff projections.

Many studies on fiscal multipliers in South Africa (e.g. Mabugu *et al* 2013) assume from the outset of the analysis that the economy is supply-constrained and, predictably, find that only interventions which increase the supply potential of the economy lead to positive multiplier impacts. However, these models do not capture the fact that the South African economy is performing considerably below potential (there is a significant negative output gap) nor that unemployment is very high. In contrast, Makrelov, Arndt, Davies and Harris (2018) find (using a stock-flow-consistent model for South Africa for the post-2008 period) that the fiscal multiplier takes a value of 2.5 under the conditions of a large negative output gap, a lack of supply-side constraints, a well-functioning financial sector and relatively low government debt levels. These authors argue that the high fiscal multiplier is due to the fact that higher public expenditure does increase aggregate demand and employment, which in turn pushes inflation (expectations) up. Higher inflation reduces real interest rates, and this 'crowds in' business investment — and raises economic growth further. The high fiscal multiplier is mostly the result of the additional business investment, *induced* by the fiscal stimulus.

Burrows and Botha (2013) estimate the closed input-output income multipliers for South Africa using a time-series of seven input-output tables for the period 1980-2010. Their closed income multiplier estimates (appearing in Table 2) include the direct effect, the indirect effects and the induced consumption effect (but *not* the induced investment effect). The average (fiscal) income multiplier for the period 1980-2010 is 1.72, which means that an increase in public expenditure of R1 billion raises South Africa's GDP by R 1.72 billion. But as can be seen in Table 2 (which reproduces their main findings), South Africa's closed income multiplier shows a declining time trend – going down from 1.82 in 1980 to 1.60 in 2010. Burrows and Botha (2013) attribute this decline to the increasing openness of South Africa's economy (after the end of apartheid) and the stagnation of household incomes (which has lowered the induced consumption effect). However, even in 2010, the income multiplier is estimated to be equal to 1.6.

Table 2 Closed input-output income multipliers for South Africa, 1980-2010

	1980	1985	1990	1995	2000	2005	2010

Closed IO income multiplier	1.824	1.874	1.783	1.714	1.673	1.579	1.600

Source: Burrows and Botha (2013), Table 3.

Notes: These closed income multipliers do include the direct effect, the indirect effects and the induced consumption effect (but not the induced investment effect).

Actual economic growth in South Africa is considerably below potential growth and the South African economy is not functioning near full capacity — as is argued by Makrelov, Arndt, Davies and Harris (2018) as well. It is true that the economic expansion may run into infrastructural constraints (e.g. shortage of electricity), but such shortages could be overcome if the fiscal expansion is targeted at removing and/or easing these infrastructural bottlenecks. And to the extent that the fiscal stimulus will prove to be inflationary, this may well lower real interest rates and 'crowd in' additional private-sector investment, as pointed out by Makrelov, Arndt, Davies and Harris (2018). In this case the fiscal stimulus and induced private investment will raise the economy's rate of potential growth, because the investment expands the economy's productive capacity (see Storm 2020). There is a growing recognition, also within the IMF (Kopp *et al.* 2019), that a programme of fiscal stimulus can have a permanent impact on a country's growth (see also Girardi, Paternesi Meloni and Stirati 2018).

The key issue, therefore, is the size of the fiscal multiplier. In the next sections we present the (closed) input-output modelling methodology we used to estimate fiscal multipliers and our results for the South African economy in 2018.

3 ESTIMATING CLOSED INPUT-OUTPUT INCOME AND EMPLOYMENT MULTIPLIERS FOR 2018

The input–output model is widely used to investigate the extent to which changes in final demand, given the structural relations between industries, generate changes in other economic variables such as income and employment.[2] This approach is known as impact analysis (Miller and Blair 2009). The input–output model treats final demand as exogenous. It assumes that industries use inputs in fixed proportions in the double sense. The industries are assumed to use all inputs in fixed proportion to output (constant returns to scale), and they use all inputs in fixed proportion to each other (no factor substitution). In other words, the technical coefficients, which determine the quantities of intermediate inputs necessary to produce one unit of gross output, are fixed. The

[2] The description of the IO model closely follows Picek and Schröder (2018).

input–output model furthermore assumes that additional supply is always able to meet an exogenous increase in final demand—the economy operates below full capacity.

To illustrate how the input-output model works, let us assume that final demand for cars increases by R1 million. How much would income and employment in all industries increase in order to meet the new demand? Because the automotive industry uses intermediate inputs from itself and from other supplying industries (e.g. rubber, plastics and so on), the demand for intermediate inputs will increase directly and indirectly (because the production of intermediate inputs supplied to the car industry in turn depends on the supply of intermediate inputs, which in turn depends on the supply of intermediate inputs, and so forth). The *open* input–output model includes these direct and indirect effects operating through the demand for intermediate inputs.

The *closed* input–output model recognises that final demand is not entirely exogenous. Basic consumption theory predicts that higher household income causes higher consumption spending. A final demand shock will initiate additional production; additional production will require more labour input; the higher demand for labour services will increase labour income; and this will increase the amounts spent by households on consumption. In input–output economics, the endogenisation of household consumption is known as closing the model with respect to households. This step can be likened to the addition of industry-specific Keynesian consumption functions to the input–output model. The total effect of an exogenous increase in final demand is composed of (*a*) the direct effect, (*b*) the indirect effect and (*c*) the induced consumption effect. The induced consumption effect represents the change in income and employment that arises from households spending the increased labour income earned in (say) the car industry and in supporting industries.

One can go one step further and postulate that higher income not only generates additional consumption spending but also additional investment spending. Using the example of higher final demand for cars, Picek and Schröder (2018, p. 2219) justify this step as follows:

> "The higher profits earned in the car industry and in supporting industries might induce firms to increase their investment expenditure. In a theoretical ideal, investment expenditure would depend only on the availability of profitable investment opportunities and would be independent of current income. In the presence of capital market imperfections, many firms will be liquidity-constrained and they will tend to raise their investment expenditure when higher current income relaxes this constraint. With adaptive expectations, higher current income will raise the prospective yield of investment and the expectation of increased profits in future periods will induce investment in the current period. In an input–output model that is closed with respect to (households and) firms, the total effect of an exogenous increase in final demand is composed of the direct effect, the indirect effect, the induced consumption effect and the induced investment effect. The induced investment effect represents the change in output/income/employment that arises from firms investing a fraction of the additional profits earned in the car industry and in supporting industries. The fraction of current-period profits that turns into current-period investment is industry-specific and given by the ratio of industry-level investment expenditure to total economy-wide profits."

Recent econometric findings on U.S. business investment (during 1983Q4 and 2016Q4) by IMF economists Kopp, Leigh, Mursula and Tambunlertchai (2019, p. 4) confirm that business investment is overwhelmingly determined by (expected) demand. Makrelov, Arndt, Davies and Harris (2018) have shown that the induced private-sector investment contributes significantly to the fiscal multiplier in South Africa. The estimations presented here include such an induced investment effect.

We briefly describe the equations and the intuition behind the input–output model. Using standard notation from matrix algebra, the accounting equation (1) states that gross output by industry (i = 1, ...*n*) is equal to intermediate demand **Z i** and final demand **f**:

$$\mathbf{x} = \mathbf{Z}\,\mathbf{i} + \mathbf{f} \quad (1)$$

x is the (1 x *n*) gross output vector, **Z** is the (*n* x *n*) inter-industry flow matrix and **f** is the (*n* x 1) final demand vector. **i** is the (*n* x 1) unit vector which is used to take the row sums of matrix **Z**. The (*n* x *n*) input-output coefficient matrix **A** is defined as:

$$\mathbf{A} = \mathbf{Z}\,\hat{\mathbf{x}}^{-1} \quad (2)$$

What we assume is that $a_{ij} = \frac{z_{ij}}{x_j}$, which means that industry *j* requires a fixed amount of intermediate inputs produced by industry *i* (per unit of gross output *j*). An element a_{ij} of matrix **A** represents the direct impact of an increase in final demand for goods produced by industry *j* on the gross output of industry *i*. The hat in eq. (2) denotes a diagonal matrix, and the superscript $^{-1}$ denotes the inverse of a matrix. From eq. (2), it follows that $\mathbf{Z} = \mathbf{A}\,\hat{\mathbf{x}}$. Substitution of this expression into eq. (1) gives:

$$\mathbf{x} = \mathbf{A}\mathbf{x} + \mathbf{f} \quad (3)$$

Eq. (3) can be used to derive the reduced-form equation for the input-output model as follows:

$$\mathbf{x} = [\mathbf{I} - \mathbf{A}]^{-1}\ \mathbf{f} = \mathbf{L}\ \mathbf{f} \quad (4)$$

where $\mathbf{L} = [\mathbf{I} - \mathbf{A}]^{-1}$ is the so-called Leontief inverse (Miller and Blair 1985). An element l_{ij} of matrix **L** represents the direct and indirect impact of an increase in final demand in industry *j* on the gross output of industry *i*.

4 ESTIMATES OF THE FISCAL MULTIPLIERS FOR THE YEAR 2018

To estimate the fiscal multipliers, we have used the balanced 91-industries input-output table for 2018 (in basic prices) provided by Quantec Research.[3] The 91 industries included in the analysis and the industry specific multipliers are listed in Appendix A. To estimate the closed input-output multipliers, we used eq. (4), but we endogenise household consumption and private investment.

- To endogenise household consumption, the input-output model is closed by expanding the inter-industry flow matrix **Z** of the open model in eq. (1). The input–output model closed with respect to households regards the household sector as an additional industry; it effectively treats wages and salaries as the "output" of the household sector, and household consumption as the "input" to the household sector. The expanded inter-industry flow matrix $\bar{\boldsymbol{Z}}$ has the dimension (n + 1) x (n + 1).

- The input-output model closed with respect to households (consumption) and firms (investment) treats the corporate sector as an additional industry; it effectively models profits as the "output" of the corporate sector, and corporate investment as the "input" to the corporate sector. In this case, we add two additional "industries" (household and corporate sector), so the expanded inter-industry flow matrix $\bar{\boldsymbol{Z}}$ has the dimension (n + 2) x (n + 2).

The Leontief inverse corresponding to the closed models then becomes:

$$\bar{\mathbf{x}} = [\mathbf{I} - \bar{\boldsymbol{A}}]^{-1}\ \bar{\mathbf{f}} = \bar{\mathbf{L}}\ \bar{\mathbf{f}} \tag{5}$$

The column sums of the open model's Leontief inverse give the simple gross output multipliers. The column sums of the closed model's Leontief inverse give the total gross output multipliers, which include the induced consumption and investment effects (we study the impacts on the n original industries, so the column sum is formed over the first n rows of $\bar{\boldsymbol{L}}$). For total income and employment multipliers, each row of the Leontief inverse is multiplied by the industry-specific value added coefficient ($vc_i = va_i/x_i$) or the employment coefficient ($ec_i = emp_i/x_i$):

$$\widehat{\boldsymbol{vc}}\ \bar{\mathbf{L}}_n \quad \text{and} \quad \widehat{\boldsymbol{ec}}\ \bar{\mathbf{L}}_n \tag{6}$$

where the hat denotes a diagonal matrix of impact coefficients and the subscript n highlights that only the first n rows and columns of the closed model's Leontief inverse are taken into account. The column sums are sector-to-economy multipliers: they give n total income multipliers and n total employment multipliers.

[3] This paper makes use of the South African Standardised Industry Indicator Database, which is compiled, administered and owned by Quantec Research. According to Quantec Research (2018:1), the database is compiled by combining a comprehensive set of industry and national account indicators with a consistent supply and use framework spanning three decades. These input-output tables are commonly used by academics and policy makers working on South Africa (*e.g.* Burrows and Botha 2013).

Our ultimate interest rests with economy-wide impacts of stimuli to the whole economy, which are determined by economy-to-economy multipliers. The impacts depend on the size of the stimulus and its composition (or the size of the expenditure cut and its composition). Without information about the composition of a fiscal spending program, we simply assume that final demand for all sectors increases in proportion to their share in final demand. We use the composition of the final demand vector $\mathbf{f}$ to weight the sector-to-economy multipliers. The weights are given by final demand for the output of an industry as a share of total final demand. Our main findings appear in Table 3. The appendix reports the sector-to-economy multipliers.

Table 3 Closed input-output income and employment multipliers for South Africa, 2018

	Income	Employment
average multiplier	1.68	6.9
direct + indirect + induced consumption effect	1.50	6.1
direct + indirect + induced consumption effect + induced investment effect	1.87	7.7

Source: Estimated by authors based on data from Quantec Research (2019).

Notes: The income multiplier is the extra income generated in the economy as a result of an expenditure-weighted increase in spending by R1. The employment multiplier gives the number of jobs created by an expenditure-weighted increase in spending of R1 million.

According to our results, a stimulus of R1 will raise South Africa's GDP by R1.5, when we only take the *induced household consumption effect* into account. This estimate can be compared to the closed multipliers estimated by Burrows and Botha (see Table 2). It can be seen that the trend decline in the aggregate multiplier observed by Burrows and Botha — from a multiplier value of 1.82 in 1980 to a value of 1.60 in 2010 — has continued.

However, our estimate of the multiplier is 1.87 when we include both the induced consumption effect and the induced investment effect. Endogenising investment raises the magnitude of the aggregate multiplier and brings it closer to the value of 2.5 obtained by Makrelov, Arndt, Davies and Harris (2018). Taking the investment response to higher GDP and higher profit income into consideration is clearly an improvement, as the multiplier estimate becomes more comprehensive. However, in our analysis we could not distinguish private-sector and public investment (because of data limitations) and we have therefore endogenised *total* investment (rather than merely private-sector investment). Because of this limitation, we think that a value of 1.87 likely represents an over-estimate of the aggregate multiplier. Table 3 therefore presents the 'average' of the two closed input-output multipliers as a compromise. The average multiplier for South Africa is equal to 1.68 in 2018. All our estimates of South Africa's multiplier are substantially higher than 1. Fiscal stimulus not only generates income but also employment. On average, an increase of R1 million in expenditure will lead to creation of around 7 jobs.

5 CONCLUSION

According to our estimates of the closed input-output income and employment multiplier impacts due to fiscal stimulus, R1 billion of extra spending will generate R1.68 billion extra income, creating 6,900 new jobs (see Table 3). Our findings for the year 2018 are in line with earlier input-output multipliers for the period 1980-2010 estimated by Burrows and Botha (2013) as well as with findings by Makrelov, Arndt, Davies and Harris (2018) — and these multiplier effects apply in current conditions of a negative output gap, a stagnant economy, and high unemployment.

Our findings imply that the proposed cut in public expenditure by R48 billion will likely reduce South Africa's GDP by R81 billion over the next three years 2020-2022. This amounts to a decline in GDP by around 0.5 percentage points, accompanied by the likely destruction of approximately 330 000 jobs. The 2020 austerity Budget is socially and economically destructive.

We would like to end on a cautionary note. First, our estimates of the fiscal income and employment multipliers must be interpreted within the (current) conditions of South Africa's demand-constrained economy which is growing at a rate lower than the potential growth rate. It is in these circumstances that a well-designed strategy of fiscal expansion, targeting potential infrastructural weaknesses in the economy as well as redistribution income toward the lower-income groups, will have high pay-offs not just in terms of induced consumption demand and induced business investment, but also in lowering South Africa's public-debt-to-GDP ratio. The fiscal expansion should be 'productivist' — promoting investment, building infrastructure and productive capacity and capabilities, supporting economic diversification, and stimulating R&D and innovation. Second, the fiscal stimulus will spill over into higher imports — and raise the deficit on South Africa's current account (of the Balance of Payments). South Africa will become more reliant on the inflow of foreign savings, but as argued by Blanchard, Ostry, Ghosh and Chamon (2016) and by Makrelov *et al.* (2018), when managed properly, the inflow of foreign finance will support the fiscal expansion and lead to higher fiscal multipliers, because inflows may decrease non-bond interest rates and thus reduce the cost of financial intermediation. The end result may well be that the fiscal stimulus 'crowds in' private investment.

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APPENDIX

Table A

	vai	vac	empi	empc	va	emp	exsh
Agriculture [QSIC 11]	1.51	1.15	8.77	7.23	1.33	8.00	2.19
Forestry [QSIC 12]	1.57	1.25	10.86	9.47	1.41	10.16	0.14
Fishing [QSIC 13]	1.77	1.33	10.80	8.91	1.55	9.85	0.09
Coal [QSIC 21]	1.72	1.31	5.10	3.29	1.52	4.20	0.06
Gold [QSIC 23]	2.16	1.78	7.68	6.07	1.97	6.87	0.00
Iron ore [QSIC 241]	1.76	1.37	5.17	3.50	1.56	4.33	0.00
Chrome [QSIC 2421]	1.91	1.54	6.33	4.72	1.73	5.52	0.00
Copper [QSIC 2422]	1.99	1.61	6.54	4.91	1.80	5.73	0.00
Manganese ore [QSIC 2423]	1.73	1.36	5.21	3.63	1.54	4.42	0.00
Platinum group metals [QSIC 2424]	1.76	1.38	6.07	4.44	1.57	5.25	0.00
Other metallic minerals [QSIC 2429]	1.55	1.20	4.90	3.36	1.37	4.13	0.00
Other mining and quarrying [QSIC 22, 25-29]	1.77	1.39	5.33	3.69	1.58	4.51	0.00
Meat , fish, fruit etc. [QSIC 301]	1.59	1.23	6.30	4.74	1.41	5.52	2.28
Dairy products [QSIC 302]	1.73	1.37	6.61	5.05	1.55	5.83	0.84
Grain mill products [QSIC 303]	1.65	1.29	6.73	5.19	1.47	5.96	1.35
Other food products [QSIC 304]	1.75	1.39	7.51	5.94	1.57	6.73	1.79
Beverages [QSIC 305]	1.72	1.37	6.30	4.77	1.54	5.53	1.64
Tobacco [QSIC 306]	1.80	1.42	6.19	4.54	1.61	5.37	0.37
Textiles [QSIC 311]	1.46	1.17	6.57	5.33	1.32	5.95	0.00
Other textile products [QSIC 312]	1.44	1.17	6.20	5.01	1.31	5.61	0.21
Knitted, crocheted articles [QSIC 313]	1.50	1.23	7.60	6.40	1.36	7.00	0.03

Wearing apparel [QSIC 314]	1.47	1.21	7.39	6.28	1.34	6.84	0.39
Leather and leather and fur products [QSIC 315-316]	1.53	1.18	7.07	5.58	1.35	6.33	0.07
Footwear [QSIC 317]	1.40	1.13	6.36	5.18	1.26	5.77	0.16
Sawmilling and planing of wood [QSIC 321]	1.78	1.42	8.68	7.14	1.60	7.91	0.00
Products of wood [QSIC 322]	1.75	1.39	6.56	4.97	1.57	5.76	0.07
Paper and paper products [QSIC 323]	1.62	1.29	6.42	4.97	1.45	5.70	0.36
Printing , recorded media [QSIC 324-326]	1.78	1.47	7.49	6.14	1.63	6.81	0.17
Coke, petroleum products and nuclear fuel [QSIC 331-333]	1.26	0.96	3.67	2.40	1.11	3.04	0.80
Basic chemicals [QSIC 334]	1.33	1.07	4.63	3.49	1.20	4.06	0.25
Other chemical products [QSIC 335-336]	1.53	1.25	5.82	4.61	1.39	5.22	1.37
Rubber products [QSIC 337]	1.55	1.24	5.83	4.52	1.40	5.17	0.10
Plastic products [QSIC 338]	1.70	1.41	6.87	5.59	1.55	6.23	0.10
Glass and glass products [QSIC 341]	1.57	1.31	5.80	4.66	1.44	5.23	0.07
Non-metallic mineral products [QSIC 342]	1.40	1.11	5.57	4.32	1.26	4.95	0.07
Basic iron and steel products [QSIC 351]	1.51	1.20	5.30	3.94	1.35	4.62	0.04
Non-ferrous metal products [QSIC 352]	1.56	1.24	5.31	3.94	1.40	4.63	0.05
Structural metal products [QSIC 354]	1.79	1.47	7.43	6.04	1.63	6.74	0.05
Other fabricated metal products [QSIC 355]	1.74	1.42	6.86	5.51	1.58	6.19	0.47
General purpose machinery [QSIC 356]	1.65	1.35	6.73	5.45	1.50	6.09	0.13
Special purpose machinery [QSIC 357]	1.72	1.41	6.87	5.51	1.57	6.19	0.79
Household appliances [QSIC 358]	1.45	1.17	6.22	4.99	1.31	5.60	0.06
Office, accounting, computing machinery [QSIC 359]	1.56	1.23	5.53	4.11	1.40	4.82	0.12

Electric motors, generators, transformers [QSIC 361]	1.57	1.29	7.29	6.08	1.43	6.69	0.08
Electricity distribution and control apparatus [QSIC 362]	1.54	1.26	6.25	5.04	1.40	5.64	0.07
Insulated wire and cables [QSIC 363]	1.22	0.99	5.11	4.11	1.11	4.61	0.11
Other electrical equipment [QSIC 364-366]	1.50	1.21	6.00	4.78	1.36	5.39	0.18
Radio, television and communication apparatus [QSIC 371-373]	1.61	1.31	5.78	4.49	1.46	5.13	0.04
Professional equipment [QSIC 374-376]	1.54	1.22	6.43	5.06	1.38	5.74	0.04
Motor vehicles [QSIC 381-382]	1.30	1.05	5.04	3.95	1.17	4.50	0.55
Parts and accessories [QSIC 383]	1.50	1.22	5.88	4.66	1.36	5.27	0.58
Other transport equipment [QSIC 384-387]	1.63	1.35	6.31	5.09	1.49	5.70	0.18
Furniture [QSIC 391]	1.71	1.38	8.02	6.60	1.55	7.31	0.39
Other manufacturing groups [QSIC 392-395]	1.53	1.16	4.95	3.36	1.34	4.16	0.68
Electricity and gas [QSIC 41]	1.74	1.31	4.58	2.74	1.52	3.66	2.38
Water [QSIC 42]	1.76	1.33	4.61	2.75	1.55	3.68	0.54
Site preparation [QSIC 501]	1.57	1.23	5.89	4.42	1.40	5.15	0.27
Building of complete constructions [QSIC 502]	1.56	1.24	7.01	5.62	1.40	6.32	6.49
Building installation [QSIC 503]	1.57	1.24	6.74	5.31	1.40	6.03	2.12
Building completion [QSIC 504]	1.62	1.30	8.01	6.60	1.46	7.30	1.36
Renting of construction equipment [QSIC 505]	1.82	1.43	9.22	7.52	1.62	8.37	0.00
Wholesale trade, commission trade [QSIC 61]	1.81	1.44	7.45	5.85	1.62	6.65	2.71
Retail trade [QSIC 62]	1.79	1.37	8.13	6.31	1.58	7.22	4.70
Sale, maintenance, repair of motor vehicles [QSIC 63]	1.89	1.51	9.44	7.79	1.70	8.62	1.65

Catering and accommodation services [QSIC 64]	1.77	1.39	10.83	9.18	1.58	10.00	1.27
Land transport, transport via pipe lines [QSIC 71]	1.68	1.28	5.54	3.81	1.48	4.67	4.81
Water transport [QSIC 72]	1.39	1.02	4.10	2.49	1.21	3.30	0.05
Air transport [QSIC 73]	1.54	1.19	5.27	3.75	1.37	4.51	0.55
Auxiliary transport [QSIC 74]	1.77	1.40	7.07	5.47	1.59	6.27	0.47
Postal and related courier activities [QSIC 751]	1.79	1.50	7.12	5.88	1.64	6.50	0.12
Telecommunication [QSIC 752]	1.53	1.19	5.65	4.19	1.36	4.92	1.45
Financial intermediation except insurance and pension funding [QSIC 81]	2.16	1.75	6.87	5.09	1.96	5.98	2.48
Insurance and pension funding [QSIC 82]	2.09	1.67	6.61	4.80	1.88	5.71	3.44
Activities auxiliary to financial intermediation [QSIC 83]	2.33	1.92	6.90	5.12	2.13	6.01	0.01
Real estate activities [QSIC 84]	1.57	1.17	4.30	2.60	1.37	3.45	5.84
Renting of machinery and equipment, without operator and of personal and household goods [QSIC 85]	1.75	1.39	7.70	6.14	1.57	6.92	0.08
Computer and related activities [QSIC 86]	1.69	1.38	9.45	8.10	1.54	8.77	0.00
Research and development [QSIC 87]	1.68	1.26	5.37	3.57	1.47	4.47	0.55
Legal, accounting, bookkeeping and auditing activities [QSIC 881]	1.83	1.44	7.98	6.33	1.64	7.15	0.60
Architectural, engineering and other technical activities [QSIC 882]	1.87	1.50	7.93	6.36	1.69	7.15	0.01
Advertising [QSIC 883]	1.58	1.25	6.32	4.91	1.41	5.62	0.00
Business activities n.e.c. [QSIC 889]	1.87	1.51	13.17	11.62	1.69	12.39	1.93
National departments [QSIC 91101]	2.21	1.83	7.59	5.97	2.02	6.78	9.40
Provincial departments [QSIC 91102]	2.51	2.12	9.51	7.82	2.32	8.66	10.38
Local government [QSIC 91300]	2.03	1.73	7.92	6.61	1.88	7.27	6.32

Education [QSIC 92]	1.72	1.35	7.53	5.93	1.53	6.73	1.72
Health and social work [QSIC 93]	1.71	1.36	7.33	5.82	1.53	6.57	3.41
Sewerage, refuse, sanitation [QSIC 94]	1.72	1.34	16.85	15.19	1.53	16.02	0.06
Membership activities [QSIC 95]	1.72	1.36	10.25	8.69	1.54	9.47	0.00
Recreation, cultural, sport activities [QSIC 96]	1.61	1.28	7.91	6.49	1.45	7.20	1.17
Other activities [QSIC 99]	2.51	2.14	25.59	23.98	2.32	24.78	2.09
Expenditure-weighted aggregate multipliers:					1.68	6.87	

Notes: vai = closed income multiplier (including induced consumption and investment effects); vac = closed income multiplier (including induced consumption effect); empi = closed employment multiplier (including induced consumption and investment effects); empc = closed employment multiplier (including induced consumption effect); va = average of vai and vac; emp = average of empi and empc; exsh = final expenditure on industry output in percent of total expenditure; expenditure-weighted aggregate multipliers are the weighted average of the industry-specific multipliers (va and emp).