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Abstract

While South Africa's growth performance has improved somewhat in recent years, it has generally been poor over the past few decades. This article uses Chenery's factor decomposition method to analyse the sources of growth in South Africa from 1970 to 2007. Using input-output data, the growth of each subsector is decomposed into components associated with export growth, import substitution, growth in domestic demand, and growth in intermediate demand. The results highlight the dependence on domestic demand expansion as a source of growth since 2000, especially for manufacturing. Subsectors which relied primarily on domestic demand expansion generally performed relatively poorly. Technological change is the only component of growth with a consistently positive and statistically significant correlation with subsectoral growth. The analysis contributes to a better understanding of growth in South Africa, particularly in terms of subsectoral dynamics.

JEL codes: C67, D57, E20, O11, O14, O40

Keywords: growth, sectors, factor decomposition, structural change, Chenery, South Africa.

1 Introduction

Only in 2006 did real GDP per capita in South Africa recover to its previous peak of 1981 levels. Between that peak and democratisation in 1994, GDP per capita actually shrank in real terms. Growth rates picked up in the early-mid-1990s that, yet even these improved rates were middling by international standards.

This paper takes a sectoral angle to the analysis of growth in South Africa during the period 1970-2007, with a particular emphasis on the recent period.

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There is a longstanding interest in the sectoral dimensions of growth within heterodox economics. This interest derives in part from recognition of the possibilities of structural imbalance, in the sense that the sectoral distribution of factors of production may well be sub-optimal for growth. This is contrary to neo-classical assumptions of equilibrium and optimal distribution of factors of production based on equilibrating processes in marginal returns.

The analysis presented here decomposes sources of sectoral and subsectoral growth in South Africa. This sheds light on the extent to which growth in each sector is associated with export growth, import substitution, growth in domestic demand, and growth in intermediate demand. The method used is based on Chenery's valuable factor decomposition approach, developed initially in Chenery (1960) and extended and applied by *inter alia* Chenery et al (1962), Chenery and Syrquin (1980), and Kubo et al (1986).

Before proceeding to the empirical analysis, the next section provides an overview of aggregate and subsectoral growth in South Africa over the past four decades, by way of background. The decomposition methodology is set out in section 3. The results from the recent period, from 2000 onwards, are presented and discussed in section 4. Subsectors can be grouped into meaningful categories on the basis on these results, and this is discussed in section 5. Section 6 considers results going back to 1970, analysed by decade. This is followed by an analysis of the relationship between the decomposition results and subsectoral growth rates. Section 8 concludes.

Throughout, 'sectors' refer to broad sectoral categories such as manufacturing and services, while 'subsectors' refer to the more disaggregated categories of activities within these sectors. South African data allow for analysis at the level of 46 subsectors.

2 Background

In order to contextualise the factor decomposition of sectoral growth rates, an overview of growth during the period of analysis is given here, based on overall trends and the existing literature. Figure 1 shows average annualised GDP growth rates (smoothed to three-year moving averages) over the period of analysis, 1970-2007, with important economic and political events indicated. Recent growth rates – prior to the onset of the crisis – were the highest of the entire period (although growth rates higher than these were recorded in the 1960s). The relatively high growth of the mid-2000s was related in part to the commodity boom and was also fuelled in part by credit-financed consumption. While impressive by South African historical standards, these growth rates were slightly below the mean and median growth rates of middle-income countries. Looking further back, there was negative real GDP growth in the early 1990s during the period of political transition before the advent of democracy in 1994. There was also very low growth (actually negative in some individual years) of the early-mid 1980s, related in part to political conditions at that time. Figure 2 compares per capita growth rates in South Africa to those of relevant comparator

groups of countries in which South Africa is included – middle-income countries, Sub-Saharan Africa, and commodity exporters¹ – over the periods used in the later empirical analysis.

McCarthy (1999, p.143) characterises the 1970s as ‘the decade during which a long period of sustained diversifying growth came to an end’. South Africa was negatively affected by the 1973 oil price shocks, with structural economic problems contributing to the depth of the crisis. For Moll (1988), the overall economic slowdown from the 1970s onwards was primarily externally induced. Gelb (1991, p.2) also dates a turning point in the South African economy to 1974 but instead characterises this as an accumulation crisis reflected in the long-run growth rate and with greater volatility and instability in the cyclical pattern of growth.

McCarthy (1988, p. 14-15) identifies a predominant view in both academic and policy circles of the time that most of the possibilities for large-scale import substitution had becoming exhausted by the early 1970s, with remaining imports primarily in heavy industry in which domestic production was constrained. Feinstein (2005) argues that limited scope remained for import substitution in light industries, while substitution of intermediate and capital goods was constrained by *inter alia* poor skills and technology and the limited domestic market. From the 1970s onwards there was a shift in policy focus towards export orientation as a driver of growth, reflected in export incentives and assistance. However, this was constrained *inter alia* by low global growth rates, a strong currency, growing international hostility towards South Africa, and poor international competitiveness of South African products (especially manufactures).

While a buoyant gold price mitigated some of the effects of the crisis in the 1970s, with the collapse in the gold price after its peak in January 1980 the extent of the problems became more evident. Gelb (1991, p.1) characterises the South African economy during the 1980s as beset by stagnant output growth, entrenched double-digit inflation, a weak currency, a permanent decline in foreign exchange reserves, historically low personal savings ratios, and massive and growing unemployment. Figure 2 shows that real GDP per capita contracted during the 1980s. The situation deteriorated sharply immediately after the Rubicon Speech of August 1985, with an outflow of capital and a debt crisis.

The manufacturing sector was especially hard-hit in the 1980s by the rising cost of imports and of working capital, leading to falling profits and increasing financial fragility (Gelb, 1991, p. 27). Black (1991) identifies the structural weaknesses of the manufacturing sector during the 1970s and 1980s as dependence on imports, extremely weak export performance, and a pattern of demand in which the domestic mass market is limited.

The Apartheid government unbanned the African National Congress and other liberation movements and released Nelson Mandela and a number of other political prisoners in 1990. In the decade prior to democratisation in 1994, South Africa experienced its worst growth since World War II. With the beginnings of the transition to democracy in the early 1990s, economic sanctions and associ-

¹The classification of commodity exporters is based on Cashin et al (2002).

ated blockages to trade were removed.

In 1990 there had been a further policy shift towards export promotion with the introduction of the General Export Incentive Scheme (GEIS). Protection against imports was also significantly reduced in the first half of the 1990s, with import surcharges initially lowered and subsequently abolished, and tariffs lowered. There was further trade liberalisation in the second half of the 1990s and the early 2000s. Edwards and Lawrence (2006) argue that the trade liberalisation undertaken in the 1990s not only reduced imports but boosted exports (through lowering import costs as well as reducing the relative profitability of domestic sales).

At a sectoral level, Rodrik (2006) attributes the decline in manufacturing from 1990 onwards primarily to the fall in the relative price of manufacturing, as well as to skill-biased technological change and increased import penetration in the sector. For Rodrik, the under-performance of manufacturing in particular and non-resource tradables in general is fundamental to understanding the poor performance of the South African economy since democratisation.

Several studies have undertaken standard growth accounting over recent periods. Du Plessis and Smit (2007) conclude that multifactor productivity dominated both labour and capital as positive proximate causes of the post-1994 growth revival, with the contribution of multifactor productivity being strongest in the secondary and tertiary sectors, and that the growth rate of the labour factor fell whereas capital made a continued positive contribution. Fedderke (2002) finds that for the 1990s (up to 1997) there was a negative contribution from the labour force input, unlike in the previous two decades, with the single most important contributor to output growth being the growth in total factor productivity. There is evidence of considerable heterogeneity at the sectoral level, however, for instance with total factor productivity growth making a negative contribution in the case of manufacturing. Capital is found to be of increasing importance in the output growth of manufacturing but of declining importance for the other major sectors. The results from Arora (2005) also point to total factor productivity growth as the major component of growth post-1994. He attributes the total factor productivity growth to policy and institutional changes, specifically that increased openness to trade and investment may have facilitated technological spill-over and the import of more advanced technology, and also that increased private sector participation could have increased technological innovation.

Growth picked up since democratisation in 1994. Du Plessis and Smit (2007) regard the revival in growth after 1994 was a modest improvement, both by international standards and by South Africa's own historical standards. Borat and Cassim (2004) characterise economic growth since 1995 as 'tepid' and associate this inter alia with the decline in gross capital formation, slow growth in aggregate demand, difficulties in integrating into the world economy and poor international competitiveness, and unimpressive productivity growth (though noting that productivity growth in 1990s was superior to that in the 1980s). Figure 2 indicates that growth rates in the latter half of the 1990s were below the average rates of middle-income countries, Sub-Saharan Africa, and com-

modity exporters.

Table 1 shows average annualised growth rates of value added at the subsectoral level for the overall period of analysis 1970-2007 and separately for the period since 2000, as well as the share of each subsector in total value added in 2007. Table 2 summarises various relevant subsectoral characteristics averaged over the full period 1970-2007; the numeraire is the aggregate economy so that a subsector's characteristics can be compared to the aggregate economy. (Tables 7 and 8 in the Appendix present these subsectoral characteristics separately for the five subperiods used in the empirical analysis that follows.) Overall, growth was highest for services in both periods, with real growth in value added of 5% since 2000 and 4.7% over the entire period. Growth in agricultural value added was about 2.5% over the full period 1970-2007 but was marginally negative since 2000. Growth in mining was pulled down by the contraction in gold mining, such that overall growth in mining was negative over the full period but in recent years the expansion in platinum mining in particular meant that the mining sector as a whole grew slightly (1% per annum since 2000). Growth in manufacturing was 3.7% for the period 1970-2007 and 3.2% since 2000. Some subsectors of manufacturing – notably the labour-intensive subsectors of textiles and footwear – actually contracted.

3 Methodology

The factor decomposition method applied here was developed by Chenery (1960, 1962) and has since been extended and applied in various studies. It allows for a decomposition of changes in output (by sector) into changes associated with each of domestic demand expansion (contraction), export expansion (contraction), import substitution (penetration) and technological change.

Total gross output X can be written as:

$$X = W + D + E - M, \quad (1)$$

Where the $(nx1)$ vectors W, D, E and M represent domestic intermediate demand, domestic final demand, exports, and imports respectively.

Denoting A as the matrix of input-output coefficients,

$$W = AX$$

Letting m be the matrix of import ratios (such that $M = m(W + D)$), equation (1) can be rewritten as:

$$X = (I - m)D + (I - m)AX + E \quad (2)$$

Further, letting p be the matrix of domestic supply ratios ($p = I - m$), equation (2) can be rewritten as:

$$X = (I - pA)^{-1}(pD + E) \quad (3)$$

Let $L = (I - pA)^{-1}$ for ease of notation (this is the domestic Leontief inverse). Then through basic matrix algebraic manipulation, the change in gross output between two periods t and $t + h$ can be written as follows:

$$\Delta X = L_{t+h}[p_{t+h}\Delta D + \Delta E + \Delta p(A_t X_t + D_t) + p_{t+h}\Delta A X_t] \quad (4)$$

$$= L_t[p_t\Delta D + \Delta E + \Delta p(A_{t+h}X_{t+h} + D_{t+h}) + p_t\Delta A X_{t+h}] \quad (5)$$

The only difference between equations (4) and (5) is that (4) uses base year volume weights and terminal year structural parameters (analogous to the Paasche price index), with the opposite in equation (5) (analogous to the Laspeyres price index). Although the two expressions sum to an identical value, the individual components differ, and this indexing problem is dealt with here through a simple averaging of the components. The four components of total output change for any sector or subsector over the period h are thus calculated as follows:

$$\text{Domestic demand expansion} = \frac{1}{2}[L_t p_t \Delta D + L_{t+h} p_{t+h} \Delta D]$$

$$\text{Export expansion} = \frac{1}{2}[L_t \Delta E + L_{t+h} \Delta E]$$

$$\text{Import substitution} = \frac{1}{2}[L_t \Delta p(A_{t+h} X_{t+h} + D_{t+h}) + L_{t+h} \Delta p(A_t X_t + D_t)]$$

$$\text{Technological change} = \frac{1}{2}[L_t p_t \Delta A X_{t+h} + L_{t+h} p_{t+h} \Delta A X_t].$$

The interpretation of these four components is as follows:

- *Domestic demand expansion* is the (direct and indirect) effect of the expansion in domestic final demand throughout the economy on the output of the sector. (Domestic demand includes household consumption expenditure, government consumption expenditure, gross capital formation, and a residual item.)
- *Export expansion* refers to the (direct and indirect) effect of increasing exports on sectoral output. Note that this is affected not only by direct exports of the sector in question, but by exports of other sectors with which that sector is linked.
- *Import substitution* is the (direct and indirect) effect of increasing the proportion of domestically produced goods on sectoral output. As with export expansion, this reflects not only import substitution in a specific sector, but also derives from import substitution in other sectors with which a sector is linked. A negative result for import substitution could be thought of as import penetration.²
- *Technological change* refers to the change in sectoral output associated with changing economy-wide technical (input-output) coefficients (in terms of the goods and services which go as intermediate inputs into production).

²If comparing the export expansion and import substitution components, an asymmetry needs to be noted in that exports enter as a flow, which is relatively unbounded, whereas imports enter as a ratio to total demand and thus the scope for expansion is bounded at a certain point. (Kubo et al, 1986).

This component is calculated from changes in the matrix of technical coefficients, which shows the flow of intermediate inputs (both domestically produced and imported) into the production of all goods and services in the economy. The technological change component has also been referred to in the literature as intermediate demand expansion.³

A strength of the method is that it takes account of the interlinked nature of the economy, as opposed to analyses of sectoral trends in isolation from one another. For instance, rather than simply looking at changes in exports by sector, this analysis allows for a quantification of the economy-wide effects of changes in exports once intersectoral linkages are factored in. However, definitive conclusions cannot be drawn about causal relationships or the underlying determinants of growth.

Sectoral and subsectoral growth rates were decomposed over five periods: 1970-1980; 1980-1990; 1990-1995; 1995-2000; and 2000-2007.⁴ The 1990s are broken into two periods because of the shift to democracy in 1994, with economic policy only really falling under control of the governing African National Congress (ANC) in 1996; furthermore, there were specific dynamics at work in the dying years of the Apartheid regime and beginning of the political transition in the early 1990s as discussed in section 2. The analysis utilises South African input-output data.⁵

4 Factor Decomposition Results from the Recent Period

The results of these growth decompositions by subsector between 2000 and 2007 are presented in Figure 3. For each of the 46 subsectors, the contributions of the four components (domestic demand expansion, export expansion, import substitution and technological change) to the growth of that subsector are shown. So as to clearly indicate the relative importance of each of the four components in each subsector, the results from the decomposition analysis are plotted as 100% stacked bars (the absolute values of the four bars for each subsector summing to 100%, with the sign of each component reflecting the sign of the ‘raw’ decomposition results). The relative length of each of the four bars (domestic demand expansion, export expansion, import substitution and technological change) for each subsector thus shows the relative importance of these to the growth of that subsector over the period 2000-2007.

³Note that this component includes linkages with both domestically produced and imported intermediates.

⁴Subsectoral characteristics over the same periods are summarised in Tables 7 and 8 in the Appendix.

⁵The input-output tables were accessed through Quantec (<http://quanis1.easydata.co.za/ReportFolders/reportFolders.aspx>) based on data availed by Statistics South Africa, the national statutory statistical agency. These are disaggregated at a 46-sector level.

Domestic demand expansion is positive for all subsectors for 2000-2007. This period is the only one for which this is the case. This can probably be attributed to the relatively high overall growth rates achieved during this period (as discussed in section 2). Most growth for most subsectors is accounted for by the expansion in domestic demand. For certain subsectors of manufacturing (such as textiles), the expansion of domestic demand is actually the only positive component of growth. Output growth in these subsectors was hit particularly hard by negative import substitution (i.e., import penetration). Most subsectors of both manufacturing and services, but particularly of manufacturing, in fact experienced negative import substitution during this period. This is probably associated with the inability of the economy to compete internationally with lower-cost producers, even during this period of relatively rapid growth.

Even exports contributed negatively to output growth for a handful of manufacturing subsectors, primarily the relatively labour-intensive activities. Examples of these are the furniture and clothing subsectors, which (according to the capital / labour ratios shown in Table 7) were the most labour-intensive subsectors of manufacturing during this period. A clear pattern can be observed of export expansion contributing positively (and in some cases to a quite large extent) to output growth in heavy manufacturing, as compared to generally negative contributions in light industry. Relatively export-driven manufacturing subsectors include machinery and equipment; basic iron and steel; and motor vehicles and parts.

As for the export expansion component in the case of services, this was positive for all subsectors and was a significant contributor to output growth in certain subsectors. This is surprising given that services are generally relatively non-tradable. However, this contribution is not dramatically higher than in earlier periods. The latter finding might challenge the idea popular in some academic and policy circles in South Africa that rapid growth in the export of services (particularly finance and retail, and especially to the rest of Africa), is increasingly playing a role as a key engine of growth. We might anticipate a fall in the domestic demand component of services growth in the coming few years with the current economic downturn. If South African companies are able to continue their penetration of African markets in service activities then the export expansion component might be expected to become increasingly important to the growth of services.

Technological change was an important component of output growth in services in particular, which may be related to the increasing dependence of manufacturing and the rest of the economy on intermediate inputs from services and outsourcing to services. The technological change component was negative in all the primary sectors, which is indicative of the relative contraction in demand for intermediate inputs from the primary sectors into the rest of the domestic economy.

5 Typology of Subsectors

Some patterns are evident in the results across subsectors, allowing them to be grouped accordingly. Manufacturing can be broken down into five categories of subsectors based on the results from the recent period (2000-2007).

- First, in five light manufacturing subsectors domestic demand expansion is the only positive component of subsectoral growth. These are essentially labour-intensive activities producing mainly consumer goods: textiles; clothing; footwear; tobacco; and furniture. As can be seen from Table 7, these five include the top three most labour-intensive subsectors of manufacturing – clothing, footwear, and furniture – for which the capital/labour ratios are between 0.1 and 0.3 as compared to the economy-wide average of 2.4 (see Table 7 for details on the measurement of this ratio). Significantly, with the exception of furniture these were amongst the slowest growing subsectors of the entire economy during this period. Several of them shrank in real terms and others barely grew (for example, as indicated in the second column of Table 1 textiles shrank by 1% per annum and footwear shrank by 1.8% per annum over this period)⁶ These industries were probably particularly strongly negatively affected by import competition from lower-cost producers.
- In a second group of relatively labour-intensive light or semi-light manufacturing subsectors, not only the domestic demand expansion but also the technological change components were positive, with the two trade-related components – export expansion and import substitution – being negative as in the first group. This second category includes: food; leather; wood and wood products; and paper and paper products (the latter two might be regarded as ‘semi-light’ manufacturing).
- Third, in a few heavy or semi-heavy industry subsectors the import substitution and technological change components are negative but the domestic demand expansion and export expansion components are positive. These subsectors are: rubber and rubber products; non-metallic minerals; basic non-ferrous metals; electrical machinery; and metal products excluding machinery.
- The fourth category includes most subsectors of heavy industry, in which all components are positive except for import substitution. These are: basic chemicals; other chemicals and man-made fibres; plastic products; glass and glass products; basic iron and steel; machinery and equipment; TV, radio, and communications equipment; and motor vehicles and parts.
- Fifth, in just two subsectors of manufacturing – professional and scientific

⁶A fuller analysis of the correlation between sectoral growth rates and the results of the growth decomposition analysis follows in section 7.

equipment, and other transport equipment⁷ – all four components were positive. It is significant to note that the former was the fastest growing subsector of the entire economy during this period and the latter was among the fastest growing subsectors (see Table 1) This is despite them having two of the four highest import penetration ratios in the economy (refer to the import / domestic consumption ratios set out in Table 7). However, they are very small subsectors: as shown in Table 1, together they account for just 0.33% of total value added.

Three of the 28 subsectors of manufacturing do not fit clearly into this classification. Beverages would be classified into category 3, but we do not include it here as it is a consumer goods subsector unlike the rest of category 3 (although it is worth noting that it is a highly capital-intensive subsector). Conversely, coke and refined petroleum products would fit into category 2, but we have omitted it here since it is a heavy industry. Thirdly, printing, publishing, and recorded media is the only manufacturing subsector with a positive (albeit small) import substitution component (apart from the two subsectors in category 5), and thus it does not fit into any of the five categories set out here for manufacturing. In this respect, it is interesting to note that this subsector has a ‘service’ component and is something of a grey area in terms of the national accounting typology of manufacturing and services. In addition, ‘other manufacturing’ fits into category 3, but we have not allocated it here since the content of this subsector might change over time (as it is something of a residual category within manufacturing) and hence it is not clear how meaningful the results in this respect might be.

Three groups of services subsectors can be distinguished on the basis of the 2000-2007 results. There were no services activities in which the export expansion component was negative (as in the first two categories of manufacturing identified above).

- In just two subsectors of services (wholesale and retail trade, and transport and storage), the import substitution and technological change components were negative, as in category 3 of manufacturing. However, in both cases the negative technological change component was marginal, and hence these cases are actually close to the next category below.
- In four of the nine services subsectors, only the import substitution component is negative: these are communication; finance and insurance; business services; and other services⁸. This group is analogous to category 4 of manufacturing.
- Finally, all four components were positive in catering and accommodation; medical, dental, and veterinary services; and other community social and

⁷‘Other transport equipment’ refers to the manufacture of transport equipment other than motor vehicles and parts (e.g., ships and boats, motorcycles, etc.).

⁸‘Other services’ includes a few specific activities (laundries and dry-cleaning, hairdressing and other beauty treatments, funeral services) and other services not elsewhere classified.

personal services⁹

Considering the primary sectors – agriculture forestry and fishing, and the three mining subsectors coal mining, gold and uranium mining, and other mining – all of these with the exception of gold mining had positive domestic demand expansion and export expansion with negative import substitution and technological change. This is analogous to the third category of manufacturing subsectors discussed earlier. In gold and uranium mining, which experienced a real contraction in output, only the domestic demand component was positive (and only marginally so). There have been specific factors affecting this industry, including the increasing depth at which mines are forced to go to extract gold and changes in the international gold price, which make it unlikely to fit in with the patterns observed in the rest of the economy.

In both of the subsectors of electricity gas and water, domestic demand expansion and export expansion were both positive and the other two components negative, as in category three of manufacturing. In the two subsectors of construction, the bulk of growth was accounted for by positive domestic demand expansion. In building construction only import substitution was negative (only slightly so), as in category 4 of manufacturing, while in civil engineering and other construction both import substitution and technological change were negative (as in the third category of manufacturing subsectors).

6 Overview of Factor Decomposition Results 1970-2007

Table 3 consolidates the results from the various periods analysed, for the economy as a whole and for each of the main sectors. (Detailed subsectoral results for the 1970s, 1980s and 1990s appear in Figures 4-7 in the Appendix.) In this table, the results are shown in percentage form such that each row sums to 100% for sectors that grew in real terms over a given period and to -100% for subsectors that shrank in real terms (note that this is a slightly different way of presenting the results from that in Figures 3-7).

The results seem reasonable and realistic. A few pertinent observations can be made concerning the results from earlier periods. In the 1980s and in the first half of the 1990s, the domestic demand component was negative for a number of subsectors (also for one subsector in the 1970s and two in the second half of the 1990s). This is probably related to South Africa's very poor growth performance during this period, as discussed in section 2, with an average annualised rate of just 1.3% between 1980 and 1995 (i.e., below population growth).

The export expansion component is particularly important in the first half of the 1990s, and the import substitution component heavily negative. These results may be related to the trade liberalisation and export promotion measures

⁹'Other community social and personal services' includes various public and private community, social, and personal activities; the major categories included are as follows: education, sewage and sanitation, non-governmental and membership organisations, media, and the arts.

introduced in 1990 and in the early 1990s (as described in section 2). Table 8 shows that this period is the only one in which the exports / output ratio rose for the total economy, as well as being one of the only two periods in which the imports / domestic consumption ratio rose, indicating the increasing international integration of the South African economy.

In the second half of the 1990s, all four components were positive for all subsectors of services bar one (other services, the residual category of services not classified elsewhere). Technological change was particularly important here (however, this component was of low importance in the early 1990s, so the relatively high importance in the second half of the decade may have been primarily a 'catch-up').

Amongst manufacturing subsectors, technological change has generally been a much more significant source of growth in heavy industry (such as the chemical industries) than in light industry (for example clothing). This makes sense, given the role of heavy industry as a source of intermediate inputs into the rest of the economy whereas light industry produces mostly consumer goods.

The technological change component appears to be increasing over time for the economy as a whole (focussing here on the period from 1980 onwards, since the results from the period 1970-1980 are rather odd in this respect). This is indicative of the increasing contribution of intersectoral linkages to growth. However, it is surprising – and potentially of concern – that the relative importance of this component declines in the most recent period. This is less so in the case of services, which have become increasingly integrated with other sectors. This development with respect to services may be related to the development of the producer services sector providing service inputs to the rest of the economy. It may also be related to outsourcing, where activities previously undertaken in-house in firms in manufacturing or other sectors are hived off to specialised service providers and hence are reclassified into the services sector.¹⁰

The relative importance of domestic demand expansion to the growth of all sectors is highest in the period 2000-2007. As discussed in section 2, South Africa experienced its most rapid sustained growth during these years and hence it is not surprising that domestic demand expanded and accounted for a high proportion of growth. However, this was also a period of reasonably rapid global growth, in which commodity-producing countries in particular benefited from high demand. In this light it is disappointing that export expansion did not play a more important role (as can be seen from the relatively low importance of the export expansion component), especially for the economy as a whole (including mining and agriculture, exports of which would have been expected to flourish during the recent period).

The negative coefficients for import substitution during this period are noteworthy, especially when contrasted with previous periods where these were positive (with the exception of the first half of the 1990s). The particularly large negative value for import substitution for manufacturing during this period

¹⁰See Tregenna (2010) for an estimation of the extent of outsourcing in South Africa and the impact of this on sectoral shares of employment.

could be related to the lack of competitiveness of South African manufacturing. Indeed, as can be observed from the imports / domestic consumption ratios in Table 8, import penetration increased for 23 of the 28 subsectors of manufacturing during this period, in a number of cases increasing at over 10% per annum. Significantly, as noted earlier, the only two manufacturing subsectors for which this component was positive were subsectors that experienced relatively rapid growth during this period.

A final observation is that, in some subsectors and periods, there was a positive contribution from the export expansion component simultaneously with a negative contribution from import substitution. Increased export orientation together with increased import penetration is evident (from Table 8) for some subsectors and periods. The theory of intra-industry trade may be helpful in explaining this (see for instance Krugman (1981, 2009)). The presence of increasing returns to scale (as well as differentiation in consumer tastes) can provide the basis for specialisation, including at a more disaggregated level than what are termed here ‘subsectors’. For instance, within the subsector ‘motor vehicles and parts’, the export expansion component was positive while the import substitution component was negative (i.e. there was positive import penetration), in all three periods from 1990 onwards. This is consistent with trends internationally, with increasing specialisation in the auto industry (which is known to have significant economies of scale) such that it is increasingly common for countries to both import and export large volumes of vehicles (and parts). In the South African case, this trend in the auto industry was encouraged through the Motor Industry Development Programme (MIDP) industrial policy intervention, which explicitly set out to encourage rationalisation of auto lines with increasing specialisation in fewer lines through an import-export complementation programme (see Roberts, 2007). Interestingly, this pattern (of a positive export expansion component with a negative import substitution component) was not found in earlier periods.

7 Relationship with Subsectoral Growth Rates

The final part of this analysis looks at correlations between the relative importance of each of the four components of sectoral growth and the growth rate of each subsector. This analysis of course does not shed light on any causal relationships involved. Nevertheless, it does give some sense of the association between the relative importance of the various components and growth performance, and hence of the dynamics of growth, by subsector.

Table 4 shows these correlation coefficients, by period, calculated across all 46 subsectors of the economy. Tables 5 and 6 presents the correlation coefficients for the subsectors of manufacturing and services respectively. (The number of subsectors in the primary sectors is too low for this analysis to be meaningfully undertaken for those sectors.) Caution should be exercised in the interpretation of the results for services given the small number of subsectors. For each period, we show the correlation between the rankings of each subsector in terms of the

relative importance of that component to subsectoral growth and in terms of subsectoral growth rates.

Technological change is the only component which has a consistently positive correlation with subsectoral growth (in terms of rankings), and this correlation is highly statistically significant in every period except the first half of the 1990s (which was a very specific period politically and economically as discussed elsewhere in this article) for the economy as a whole as well as for manufacturing. This suggests a positive relationship between deepening integration and the strength of intersectoral linkages, and sectoral growth rates.

Somewhat surprisingly, there is no strong or statistically significant correlation between rankings in the relative importance of export expansion and in growth, except in the case of services in later periods. It is not clear why this is the case, and we might only speculate that the underlying determinants of the relative importance of export expansion to subsectoral growth differ from those of subsectoral growth.

There is a generally positive and statistically significant correlation between rankings in the relative importance of import substitution and in subsectoral growth rates in the three periods since 1990 (with the exception of manufacturing between 1990 and 1995, which is positive but not statistically significant, and services between 1995 and 2000, which is negative). There is a particularly strong correlation in this regard since 2000, for the whole economy and for manufacturing, which is interesting as it follows the period of rapid trade liberalisation in the mid- to late-1990s.

This could suggest either that subsectors that were less affected by import penetration (for instance, because they experienced less dramatic tariff liberalisation) were able to grow relatively fast, or that industries that were relatively competitive and healthy were growing fast and were better able to withstand import pressures. While it is beyond the scope of this study to reach a definitive conclusion on the actual causality involved here, a simple comparison of tariff reductions by subsector with subsectoral growth rates over the period 2000-2007 (as shown in Table 1) may provide some evidence for the former explanation. Of the five manufacturing subsectors identified by Edwards (2005) as having experienced the highest cuts in scheduled tariffs between 1994 and 2004, three actually shrank in real terms; import penetration also increased in these subsectors (refer to the imports / domestic consumption ratios in Table 8). In clothing, however, tariffs were cut by 25% between 1994 and 2004 (Edwards 2005) and import penetration increased significantly (see Table 8), but value added growth was nevertheless reasonably healthy (see Table 1). This growth is accounted for by domestic demand expansion, as seen in the decomposition results presented in Figure 3.

Finally, the correlations between the rankings in domestic demand expansion and rankings in subsectoral growth are generally negative and mostly statistically significant. While we cannot impute causality, it is possible that activities which 'rely' primarily on growth in domestic demand are unlikely to be particularly competitive or dynamic. There are particularly high negative correlations for this component since 2000 for the whole economy and for manufacturing,

and these are particularly meaningful given that the results for services would also be influenced by their relatively low tradability. These strong correlations might hint at a distinction between dynamic subsectors that led the relatively rapid growth rates during this period and subsectors that simply depended on the positive spinoffs of this growth by way of expanding domestic demand.

8 Conclusions

In the period since 2000, growth in South Africa has been heavily reliant on domestic demand expansion, particularly in the case of manufacturing. While this is probably in part related to the reasonably high growth rate in this period, in the light of the relatively robust global growth during this time (up until the crisis) a higher contribution from export expansion might also have been expected. In the absence of a more important role for export expansion during the recent past period, when global demand was growing relatively strongly, it is questionable whether export expansion can make a significant contribution in the future without significant structural change. This sort of change could be encouraged by, for instance, industrial policies and changes in the exchange rate that enhance the competitiveness and export capacity of South African exports.

Subsectoral analysis suggests that subsectors which ‘relied’ exclusively or primarily on domestic demand expansion performed relatively poorly. There are negative (and generally statistically significant) correlations between subsectoral rankings in the relative importance of the domestic demand component and in growth. The relationship between dependence on domestic demand expansion and the overall dynamism of a subsector is obviously complex, and it needs to be borne in mind that certain sectors are by their nature more likely to be domestic demand oriented than others. Nonetheless, it is reasonable to surmise that ‘lazy’ sectors that are prone to depend primarily on domestic demand for their growth – for instance because of institutional reasons and patterns of ownership and control – will not only run up against the limits of domestic demand expansion but will also become increasingly vulnerable to import penetration, particularly after any liberalisation of protection against imports. This is even more so with increasing tradability (for example, because of advances in ICT) of many goods or services traditionally regarded as relatively non-tradable.

The capacity of domestic demand to continue to sustain growth in the coming few years is questionable, in the light of the crisis. The level of domestic demand will also be affected by any changes in income distribution, given the differences by income level in marginal consumption propensities, especially of domestically produced goods. Progressive distributional change could potentially boost domestic demand and sustain this component of growth to some extent, even in the face of low overall growth.

The decomposition of subsectoral growth rates also allowed for a typology of the subsectors of each of manufacturing and services, according to the relative importance of each of the four components. Interestingly, the way in which the subsectors fall within the various categories set out has some connection with

the relevant characteristics of those subsectors and their performance, such as in their labour-intensity and in their growth rates. For instance, in most labour-intensive light manufacturing activities domestic demand expansion was the only positive component of growth; these were also amongst the subsectors with the weakest growth performance economy-wide during this period. In contrast, for most of heavy industry import substitution was the only negative component.

The results from this part of the empirical analysis are also suggestive as to the importance of intersectoral linkages to growth. It is significant that the technological change component of growth – which in this context essentially represents changes in intersectoral linkages – is the only component found to have a consistently positive and statistically significant correlation with sectoral growth (in terms of the rankings of each). An interesting finding was that the only two manufacturing subsectors for which all four components were positive in the period since 2000, were among the fastest growing subsectors of the economy (and in one of these two cases, the fastest growing subsector of the whole economy). While definitive conclusions cannot be drawn from this, it might highlight the importance of both competitiveness and increasing integration with the rest of the economy for rapid growth.

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Table 1: Trends in subsectoral value added, 1970-2007

| Subsector | Annual growth (%) | | Value added share 2007 (%) |
|--|-------------------|-----------|----------------------------|
| | 1970-2007 | 2000-2007 | |
| Agriculture, forestry & fishing | 2.5 | 0.0 | 2.36 |
| Coal mining | 2.4 | 0.4 | 1.18 |
| Gold & uranium | -6.2 | -7.4 | 1.19 |
| Other mining | 4.2 | 4.2 | 4.42 |
| Food | 3.4 | 2.4 | 1.99 |
| Beverages | 4.9 | 2.6 | 0.86 |
| Tobacco | 0.3 | 2.9 | 0.34 |
| Textiles | -0.6 | -1.0 | 0.27 |
| Clothing | 3.3 | 1.4 | 0.33 |
| Leather | 5.1 | 11.1 | 0.07 |
| Footwear | -1.1 | -1.8 | 0.09 |
| Wood & wood products | 2.8 | 1.6 | 0.45 |
| Paper & paper products | 5.0 | 6.3 | 0.67 |
| Printing, publishing & recorded media | 1.2 | -0.5 | 0.48 |
| Coke & refined petroleum products | 7.5 | 3.5 | 1.61 |
| Basic chemicals | 5.9 | 0.9 | 0.98 |
| Other chemicals & man-made fibers | 7.2 | 2.0 | 1.20 |
| Rubber products | 2.4 | 0.6 | 0.15 |
| Plastic products | 8.7 | 3.2 | 0.61 |
| Glass & glass products | 5.3 | 9.9 | 0.15 |
| Non-metallic minerals | 1.0 | 2.9 | 0.57 |
| Basic iron & steel | 3.7 | 7.6 | 1.11 |
| Basic non-ferrous metals | 8.8 | 3.4 | 0.77 |
| Metal products excl. machinery | 1.2 | 4.1 | 1.08 |
| Machinery & equip. | 1.4 | 3.7 | 0.99 |
| Electrical machinery | 3.7 | 2.2 | 0.52 |
| TV, radio & communication equip. | 4.0 | -2.8 | 0.16 |
| Professional & scientific equipment | 3.4 | 11.4 | 0.09 |
| Motor vehicles & parts | 4.5 | 3.6 | 1.57 |
| Other transport equip. | -1.5 | 6.7 | 0.24 |
| Furniture | 7.6 | 9.2 | 0.23 |
| Other manufacturing | 5.8 | 2.8 | 1.30 |
| Electricity, gas & steam | 7.0 | 2.2 | 1.80 |
| Water supply | 1.5 | -1.1 | 0.52 |
| Building construction | 1.8 | 10.1 | 1.83 |
| Civil engineering & other construction | 5.1 | 10.9 | 1.32 |
| Wholesale & retail trade | 4.6 | 5.1 | 12.93 |
| Catering & accommodation | 2.3 | 4.6 | 0.96 |
| Transport & storage | 4.8 | 4.7 | 5.87 |
| Communication | 8.5 | 7.6 | 4.17 |
| Finance & insurance | 8.3 | 10.0 | 11.04 |
| Business services | 3.5 | 4.1 | 10.84 |
| Medical, dental & veterinary services | 6.0 | 3.9 | 2.19 |
| Other community social & personal services | 5.3 | 2.9 | 1.22 |
| Other services | 3.4 | 3.2 | 2.89 |
| General government | 3.3 | 2.1 | 14.36 |

Notes: Growth rates calculated on an average annualised basis; data in constant 2000 prices.

Source: Derived from SASID data.

Table 2: Average values of subsectoral characteristics as ratios of national average values, 1970-2007

| Subsector | % employment unskilled | Capital- labour ratio | Exports- output ratio | Imports- domestic consumption ratio | Value added/total output |
|--|------------------------------|--------------------------|--------------------------|--|--------------------------------|
| Agriculture, forestry & fishing | 1.6 | 0.3 | 0.6 | 0.6 | 1.1 |
| Coal mining | 1.3 | 2.1 | 2.6 | 0.2 | 1.1 |
| Gold & uranium | 1.5 | 1.3 | 6.9 | 0.0 | 1.5 |
| Other mining | 1.4 | 1.3 | 2.1 | 2.9 | 1.1 |
| Food | 1.1 | 0.5 | 1.0 | 0.7 | 0.4 |
| Beverages | 1.1 | 1.2 | 0.5 | 0.5 | 0.9 |
| Tobacco | 1.1 | 2.5 | 0.2 | 0.1 | 1.2 |
| Textiles | 1.4 | 0.3 | 1.9 | 2.5 | 0.6 |
| Clothing | 1.4 | 0.1 | 1.3 | 1.5 | 0.7 |
| Leather | 1.4 | 0.1 | 3.0 | 2.8 | 0.1 |
| Footwear | 1.5 | 0.1 | 1.6 | 1.9 | 0.8 |
| Wood & wood products | 1.2 | 0.3 | 1.2 | 0.9 | 0.8 |
| Paper & paper products | 1.2 | 1.3 | 1.5 | 1.7 | 0.5 |
| Printing, publishing & recorded media | 0.6 | 0.4 | 0.2 | 2.0 | 0.9 |
| Coke & refined petroleum products | 0.9 | 21.3 | 1.1 | 0.8 | 0.8 |
| Basic chemicals | 1.0 | 5.1 | 3.0 | 3.5 | 0.5 |
| Other chemicals & man-made fibers | 0.8 | 1.2 | 0.6 | 2.0 | 0.4 |
| Rubber products | 1.2 | 0.5 | 0.8 | 1.5 | 0.7 |
| Plastic products | 1.2 | 0.2 | 0.3 | 0.9 | 0.7 |
| Glass & glass products | 1.3 | 0.7 | 1.0 | 1.7 | 0.7 |
| Non-metallic minerals | 1.3 | 0.7 | 0.9 | 1.1 | 0.9 |
| Basic iron & steel | 1.0 | 2.0 | 4.1 | 1.6 | 0.5 |
| Basic non-ferrous metals | 1.0 | 2.5 | 4.4 | 2.4 | 0.6 |
| Metal products excl. machinery | 1.2 | 0.3 | 0.6 | 0.6 | 0.7 |
| Machinery & equip. | 0.9 | 0.3 | 2.0 | 4.6 | 0.6 |
| Electrical machinery | 1.1 | 0.3 | 0.8 | 2.9 | 0.5 |
| TV, radio & communication equip. | 1.1 | 0.4 | 1.2 | 4.4 | 0.6 |
| Professional & scientific equipment | 1.1 | 0.3 | 4.2 | 7.1 | 1.0 |
| Motor vehicles & parts | 1.0 | 0.6 | 1.1 | 2.6 | 0.5 |
| Other transport equip. | 1.0 | 0.6 | 1.5 | 3.7 | 1.1 |
| Furniture | 1.2 | 0.1 | 1.4 | 0.7 | 0.4 |
| Other manufacturing | 0.9 | 0.3 | 2.5 | 1.4 | 1.0 |
| Electricity, gas & steam | 0.9 | 13.1 | 0.1 | 0.1 | 1.0 |
| Water supply | 0.9 | 23.2 | 0.0 | 0.0 | 0.9 |
| Building construction | 1.3 | 0.1 | 0.0 | 0.0 | 0.6 |
| Civil engineering & other construction | 1.3 | 0.1 | 0.0 | 0.0 | 0.5 |
| Wholesale & retail trade | 0.4 | 0.3 | 0.3 | 0.0 | 1.1 |
| Catering & accommodation | 0.5 | 0.3 | 1.1 | 1.5 | 0.8 |
| Transport & storage | 0.5 | 3.9 | 0.8 | 0.9 | 1.1 |
| Communication | 0.8 | 2.5 | 0.3 | 0.7 | 1.3 |
| Finance & insurance | 0.1 | 7.9 | 0.6 | 0.6 | 1.5 |
| Business services | 0.4 | 7.0 | 0.1 | 0.3 | 1.2 |
| Medical, dental & veterinary services | 0.1 | 0.5 | 0.1 | 0.3 | 1.1 |
| Other community social & personal services | 0.1 | 0.8 | 0.2 | 0.8 | 1.0 |
| Other services | 1.5 | 0.1 | 0.1 | 0.7 | 1.3 |
| General government | 0.4 | 1.7 | 0.0 | 0.0 | 1.4 |

Notes: Averages calculated using the values for all years. % employment unskilled refers to percentage of formal employment classified as semi- or unskilled, categories are based on occupations, semi- and unskilled (shown here) including all employment not falling into the following categories: professional, semi-professional and technical; managerial, executive and administrative; clerical, sales, transport, delivery and communications; service; farmer, farm manager; artisan, apprentice and related occupations; production foreman, production supervisor. Capital / labour ratio measured as R10m of fixed capital stock per number of people. All monetary variables in constant 2000 prices.

Source: Derived from SASID data.

Table 3: Summary of results from growth decompositions

| | | Domestic demand expansion | Export expansion | Import substitution | Technological change |
|------------------|---------------|---------------------------|------------------|---------------------|----------------------|
| 1970-1980 | Total | 74.7 | 7.7 | 18.6 | -1.0 |
| | Agriculture | 81.4 | -22.9 | 25.2 | 16.2 |
| | Mining | 37.9 | 24.1 | 11.1 | 26.9 |
| | Manufacturing | 62.6 | 22.2 | 30.7 | -15.4 |
| | Services | 83.5 | -3.2 | 16.6 | 3.2 |
| 1980-1990 | Total | 52.2 | 14.3 | 9.3 | 24.3 |
| | Agriculture | 16.7 | 15.6 | -1.2 | 68.9 |
| | Mining | 25.4 | -68.1 | 77.9 | -135.3 |
| | Manufacturing | 20.0 | 28.5 | 10.3 | 41.2 |
| | Services | 58.5 | 12.0 | 7.1 | 22.4 |
| 1990-1995 | Total | 61.5 | 72.6 | -70.4 | 36.3 |
| | Agriculture | 109.2 | 193.3 | -312.0 | 109.5 |
| | Mining | 5.9 | 49.1 | -16.4 | 61.4 |
| | Manufacturing | 96.9 | 165.1 | -178.5 | 16.4 |
| | Services | 78.4 | 37.7 | -29.9 | 13.8 |
| 1995-2000 | Total | 29.0 | 22.2 | 10.1 | 38.7 |
| | Agriculture | 12.8 | 25.7 | 21.4 | 40.0 |
| | Mining | -1458.4 | 7119.0 | -769.8 | -4990.7 |
| | Manufacturing | 23.8 | 30.3 | 14.7 | 31.2 |
| | Services | 31.5 | 12.3 | 7.9 | 48.3 |
| 2000-2007 | Total | 84.3 | 18.7 | -18.3 | 15.3 |
| | Agriculture | 210.4 | 25.6 | -41.6 | -94.4 |
| | Mining | 61.8 | 255.7 | -145.6 | -72.0 |
| | Manufacturing | 111.0 | 24.0 | -52.0 | 16.9 |
| | Services | 64.9 | 15.0 | -5.3 | 25.4 |

Source (Tables 3-6): Results from empirical analysis based on SASID data.

Table 4: Correlation coefficients between each component of subsectoral growth and subsectoral growth rate, all subsectors

| | Domestic demand expansion | Export expansion | Import substitution | Technological change |
|------------------|---------------------------|------------------|---------------------|----------------------|
| 1970-1980 | -0.42 ^{***} | 0.05 | -0.06 | 0.52 ^{***} |
| 1980-1990 | 0.37 ^{**} | -0.13 | 0.04 | 0.42 ^{***} |
| 1990-1995 | 0.09 | -0.09 | 0.36 ^{**} | 0.22 |
| 1995-2000 | -0.26 [*] | -0.04 | 0.29 [*] | 0.59 ^{***} |
| 2000-2007 | -0.71 ^{***} | -0.01 | 0.66 ^{***} | 0.58 ^{***} |

Note: ^{***} indicates statistical significance at the 1% level, ^{**} at the 5% level, and ^{*} at the 10% level. N=46.

Table 5: Correlation coefficients between each component of subsectoral growth and subsectoral growth rate, manufacturing subsectors

| | Domestic demand expansion | Export expansion | Import substitution | Technological change |
|------------------|----------------------------------|-------------------------|----------------------------|-----------------------------|
| 1970-1980 | -0.049 ^{***} | -0.18 | -0.15 | 0.66 ^{***} |
| 1980-1990 | 0.56 ^{***} | -0.13 | 0.09 | 0.44 ^{**} |
| 1990-1995 | -0.07 | 0.08 | 0.26 | 0.28 |
| 1995-2000 | -0.49 ^{***} | 0.12 | 0.35 [*] | 0.53 ^{***} |
| 2000-2007 | -0.88 ^{***} | 0.07 | 0.62 ^{***} | 0.56 ^{***} |

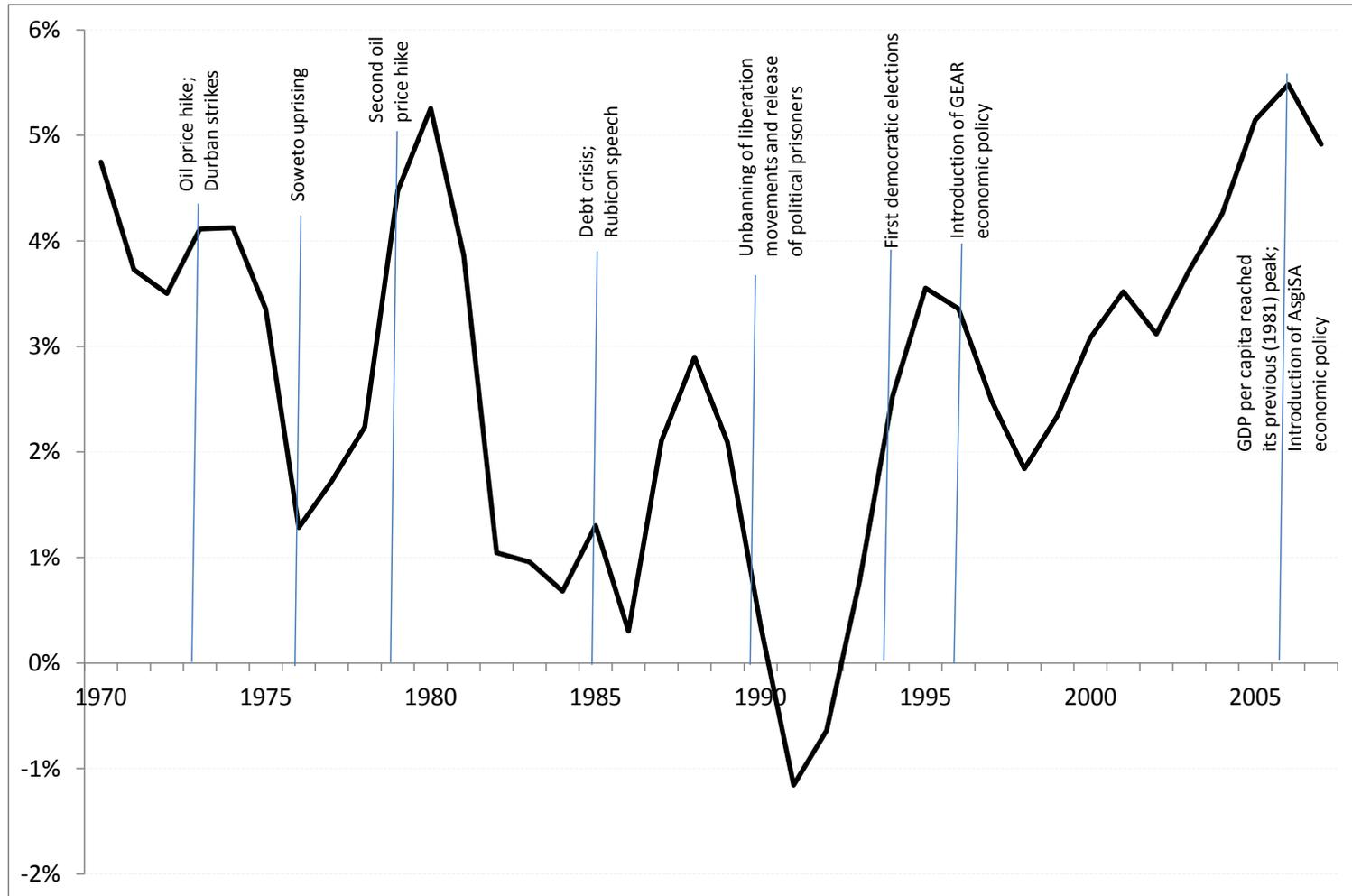
Note: ^{***} indicates statistical significance at the 1% level, ^{**} at the 5% level, and ^{*} at the 10% level. N=28.

Table 6: Correlation coefficients between each component of subsectoral growth and subsectoral growth rate, services subsectors

| | Domestic demand expansion | Export expansion | Import substitution | Technological change |
|------------------|----------------------------------|-------------------------|----------------------------|-----------------------------|
| 1970-1980 | -0.85 ^{***} | 0.07 | 0.25 | 0.64 |
| 1980-1990 | -0.25 | -0.79 ^{**} | 0.19 | 0.29 |
| 1990-1995 | 0.81 ^{***} | -0.72 ^{**} | 0.86 ^{***} | 0.63 [*] |
| 1995-2000 | -0.53 | -0.89 ^{***} | -0.86 ^{***} | 0.68 ^{**} |
| 2000-2007 | -0.49 | -0.40 | 0.73 ^{**} | 0.51 |

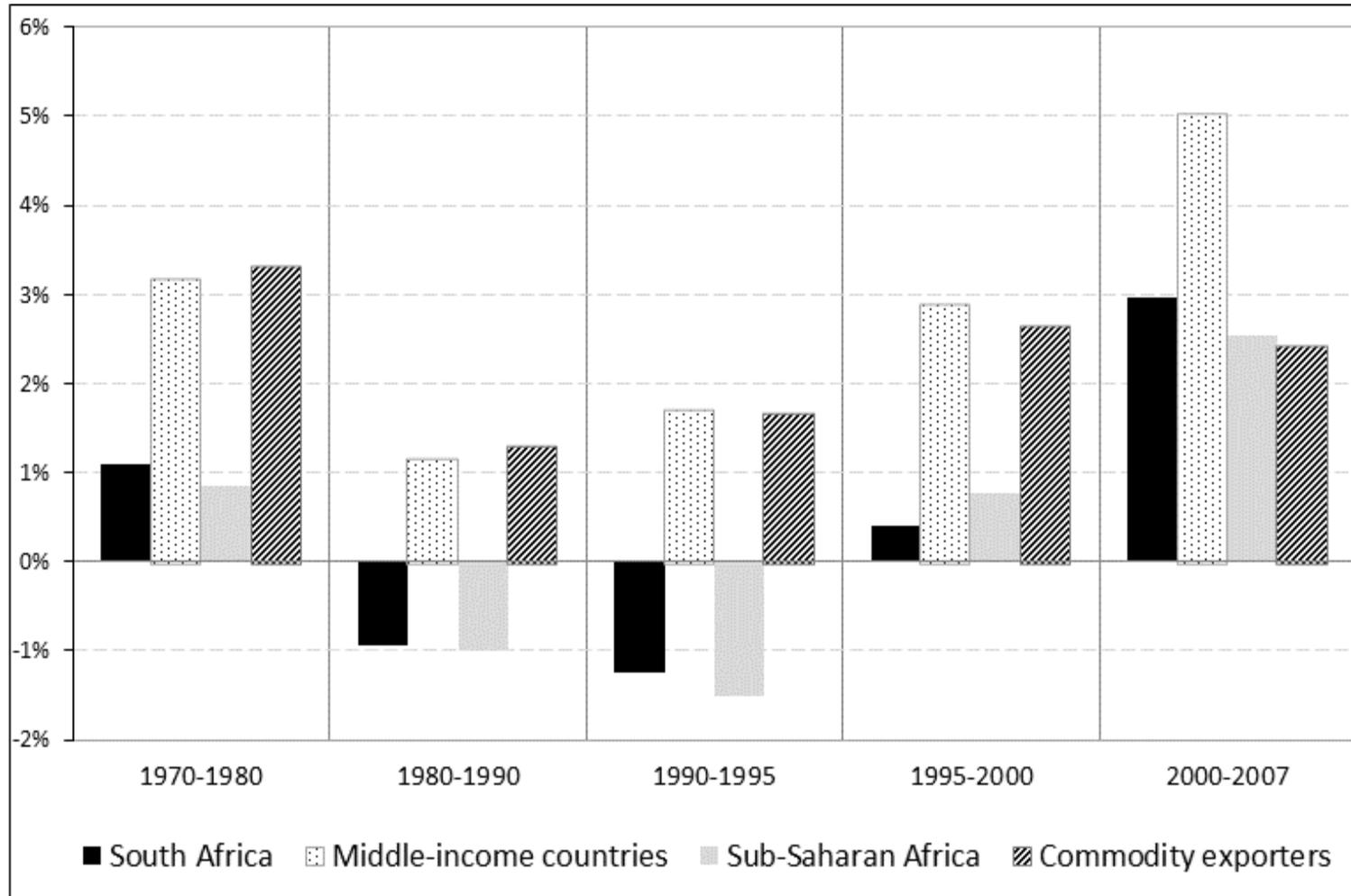
Note: ^{***} indicates statistical significance at the 1% level, ^{**} at the 5% level, and ^{*} at the 10% level. N=9.

Figure 1: GDP growth, 1970-2007



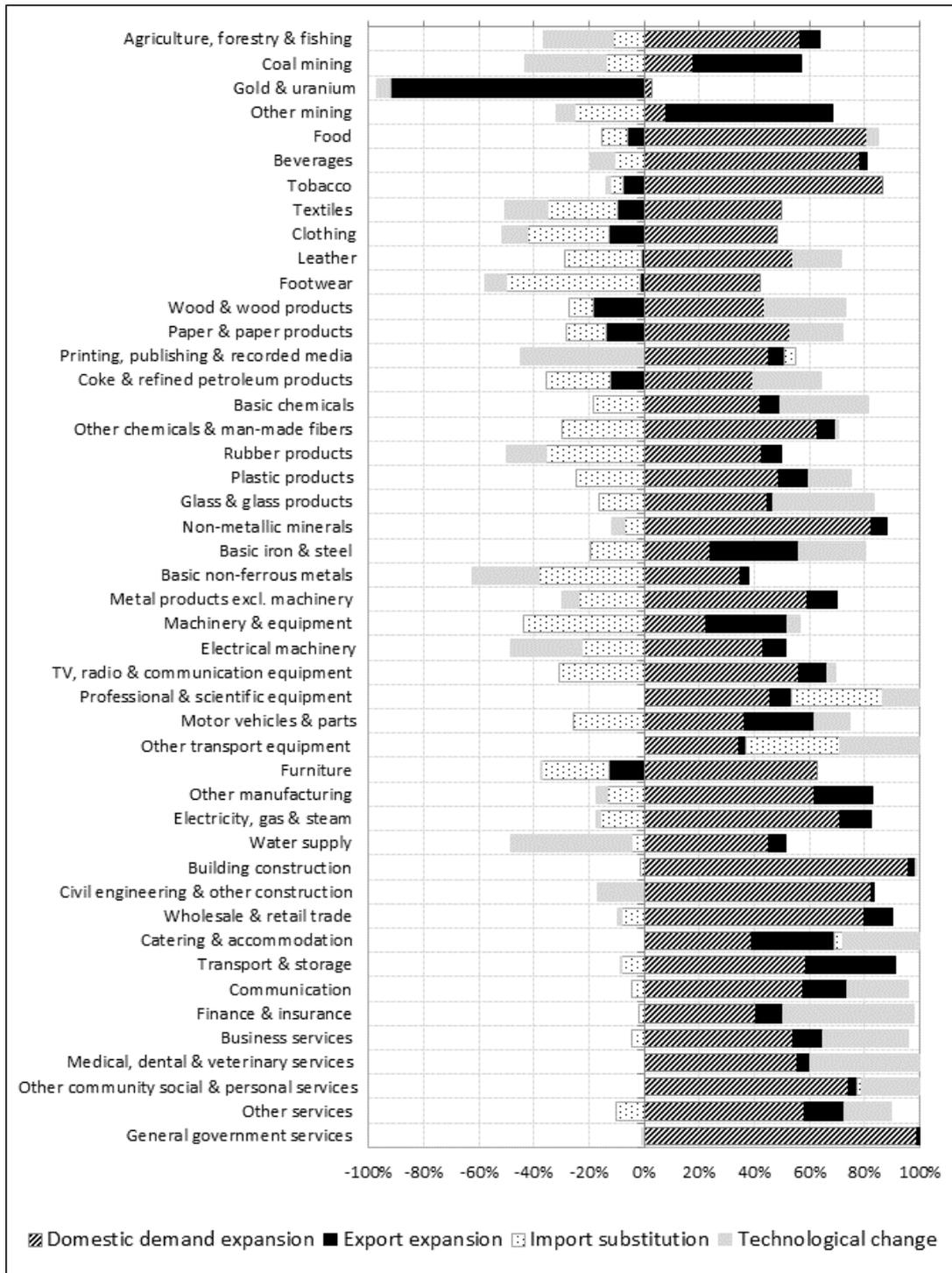
Source: Derived from South African Reserve Bank data; data in constant 2005 prices.

Figure 2: Growth per capita in South Africa and comparator country groups, 1970-2007



Source: Derived from World Bank World Development Indicators; growth rates calculated on annualised average basis; data in constant US\$2000.

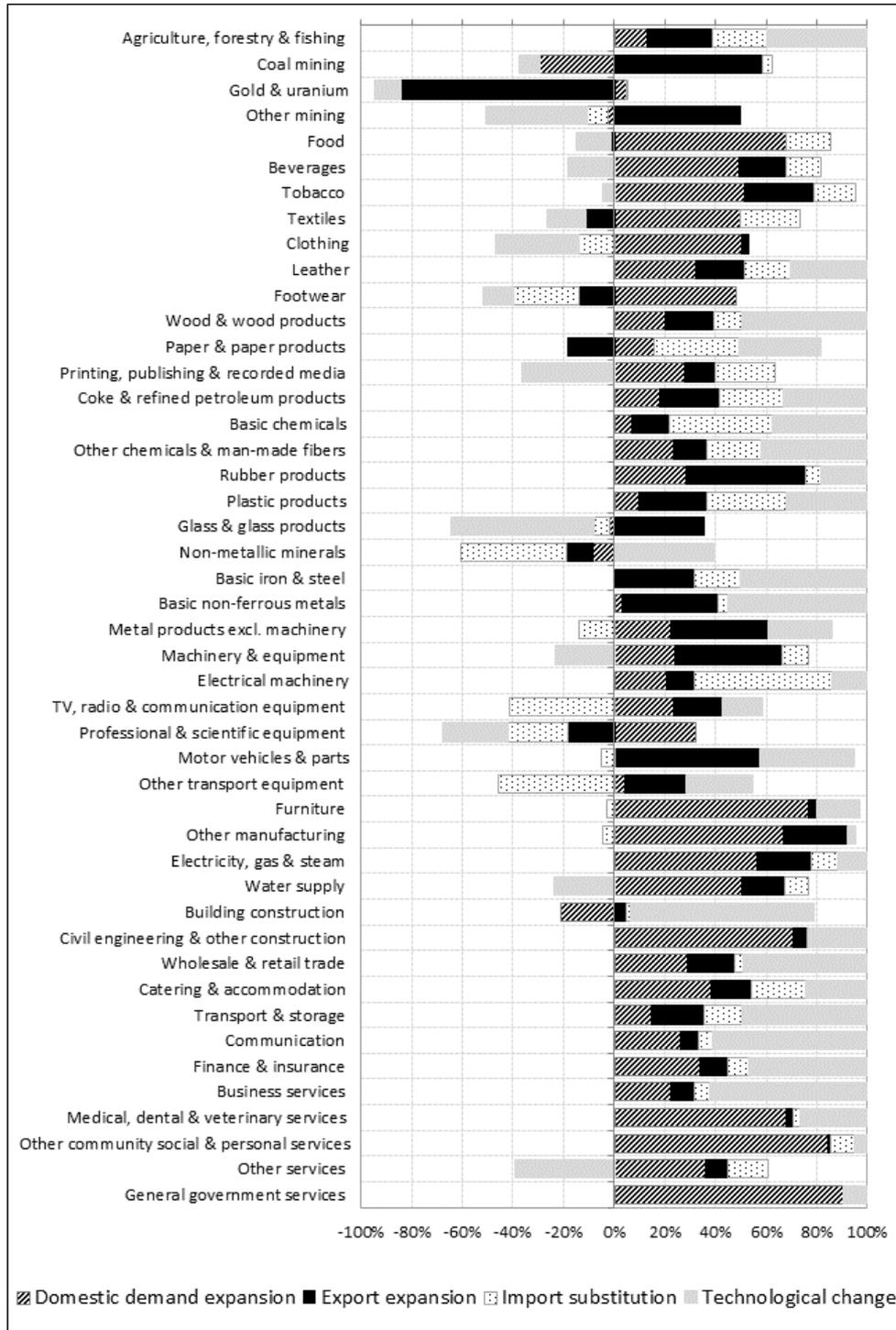
Figure 3: Decomposition of output growth by subsector (%), 2000-2007



Source: Results from empirical analysis based on SASID data.

APPENDIX: ADDITIONAL FIGURES AND TABLES

Figure 4: Decomposition of output growth by subsector (%), 1995-2000



Source (Figures 4-7): Results from empirical analysis based on SASID data.

Figure 5: Decomposition of output growth by subsector (%), 1990-1995

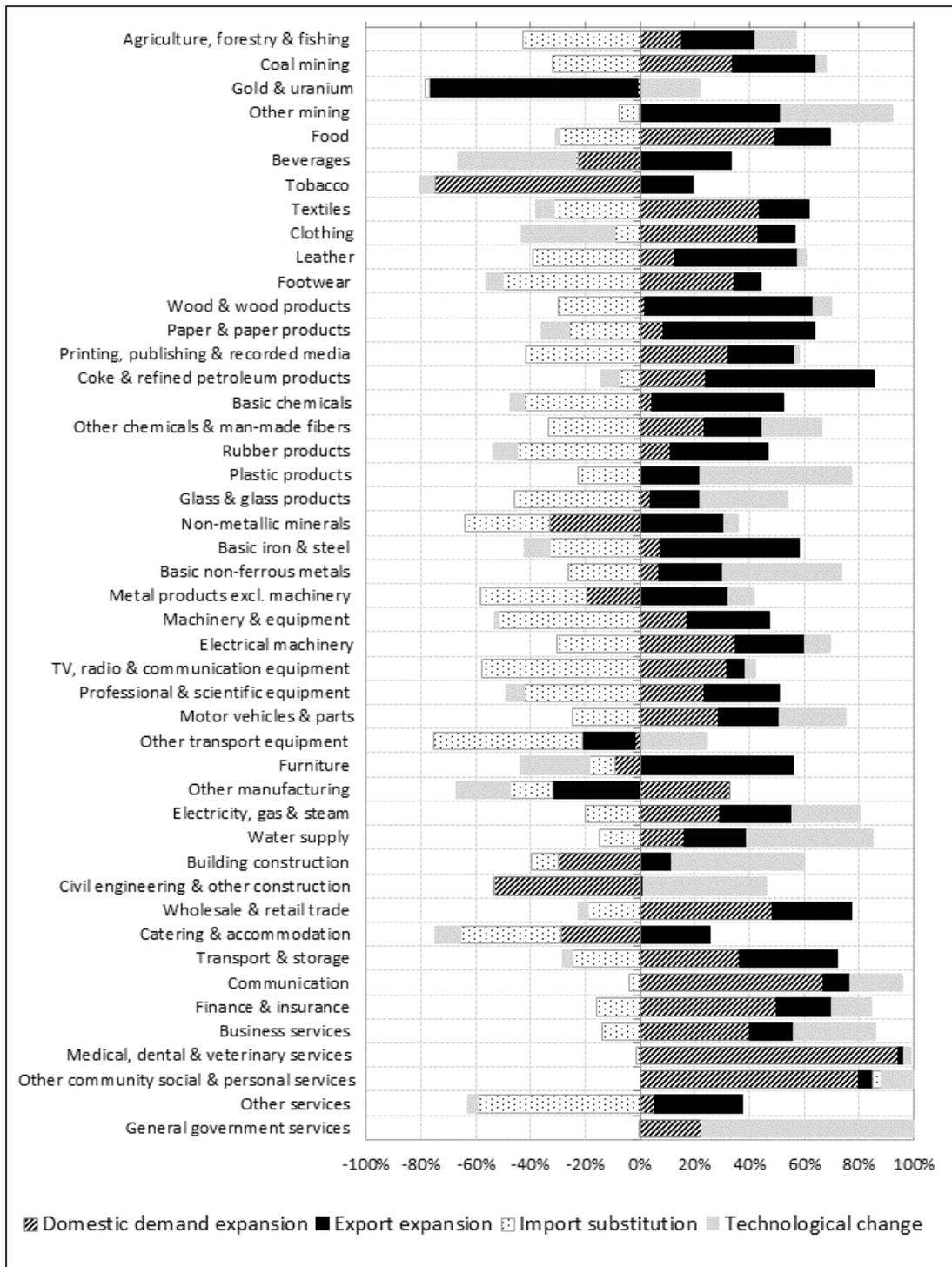


Figure 6: Decomposition of output growth by subsector (%), 1980-90

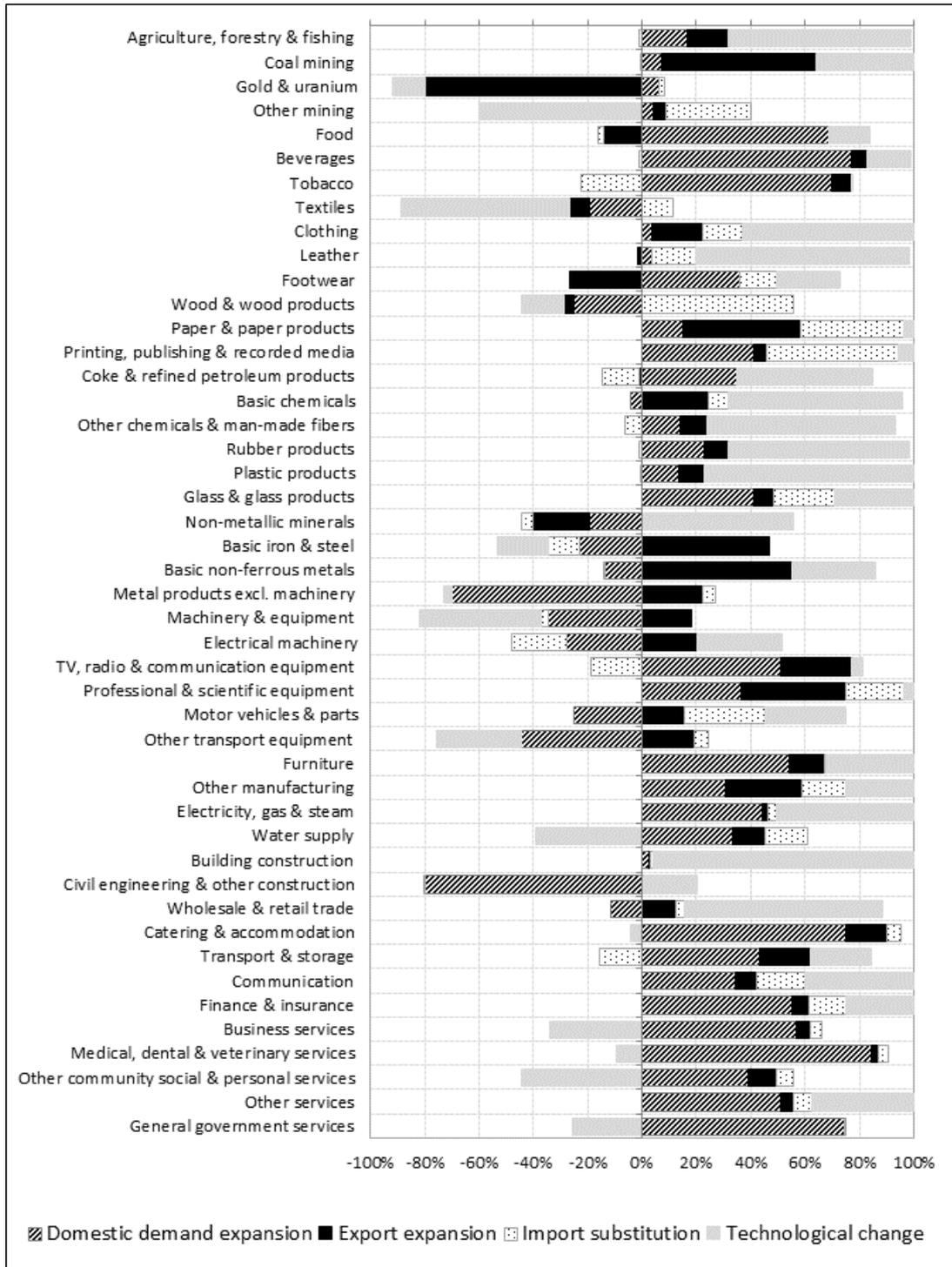


Figure 7: Decomposition of output growth by subsector (%), 1970-1980

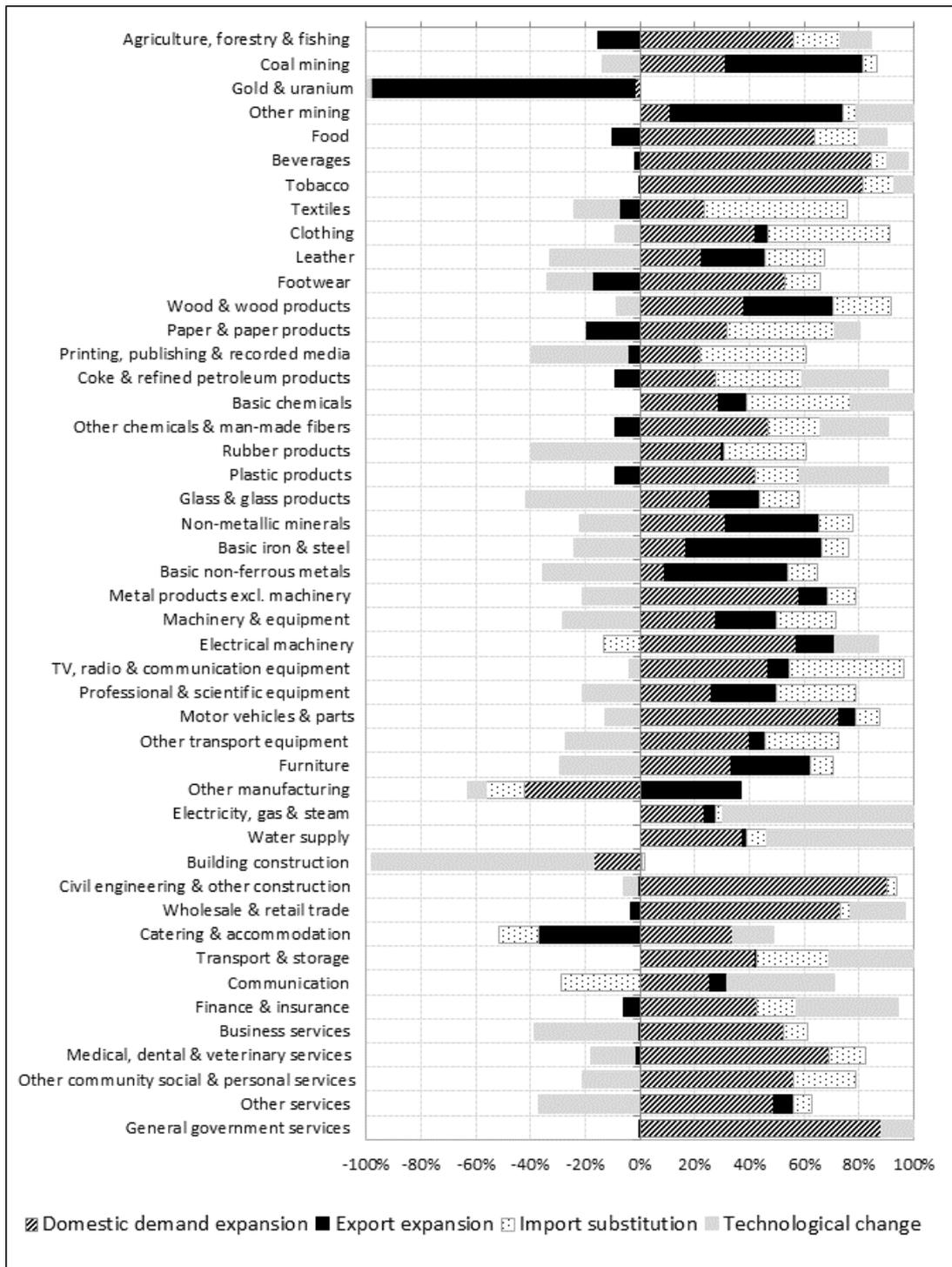


Table 7: Average values of subsectoral characteristics, 1970-2007 by subperiods

| Variable | % employment unskilled | | | | | Capital / labour ratio | | | | | Exports/output ratio | | | | | Imports / domestic consumption ratio | | | | | Value added / total output | | | | |
|---------------------------------------|------------------------|------|------|------|------|------------------------|------|------|------|------|----------------------|------|------|------|------|--------------------------------------|------|------|------|------|----------------------------|-----|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Agriculture, forestry & fishing | 96.9 | 96.3 | 95.3 | 94.1 | 92.6 | 0.7 | 0.7 | 0.6 | 0.6 | 0.8 | 12.1 | 5.8 | 6.1 | 7.0 | 10.5 | 9.5 | 5.6 | 6.9 | 7.4 | 6.1 | 0.7 | 0.6 | 0.5 | 0.5 | 0.4 |
| Coal mining | 87.9 | 80.9 | 72.6 | 67.2 | 64.4 | 0.8 | 2.0 | 5.4 | 8.4 | 10.4 | 16.8 | 45.0 | 32.9 | 38.4 | 47.6 | 0.3 | 0.2 | 1.3 | 3.1 | 6.3 | 0.7 | 0.5 | 0.5 | 0.5 | 0.5 |
| Gold & uranium | 88.1 | 89.5 | 87.7 | 86.4 | 87.5 | 1.3 | 2.1 | 3.0 | 3.7 | 5.1 | 95.0 | 95.0 | 95.0 | 94.8 | 94.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 |
| Other mining | 84.8 | 79.1 | 79.3 | 78.4 | 76.5 | 1.6 | 2.4 | 3.0 | 3.8 | 3.8 | 0.1 | 31.4 | 40.5 | 42.8 | 50.8 | 19.8 | 31.5 | 37.8 | 48.6 | 55.9 | 0.7 | 0.5 | 0.5 | 0.5 | 0.5 |
| Food | 78.2 | 70.4 | 58.7 | 54.7 | 52.8 | 0.8 | 1.0 | 1.0 | 1.3 | 1.4 | 22.3 | 10.6 | 11.8 | 12.8 | 8.9 | 11.9 | 6.0 | 6.7 | 9.7 | 8.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Beverages | 72.2 | 64.7 | 57.2 | 53.3 | 52.0 | 1.7 | 2.2 | 2.8 | 3.3 | 3.4 | 1.9 | 1.4 | 7.3 | 11.8 | 14.3 | 7.9 | 6.4 | 6.0 | 6.9 | 5.3 | 0.5 | 0.5 | 0.5 | 0.4 | 0.4 |
| Tobacco | 72.2 | 64.7 | 57.2 | 53.3 | 52.0 | 6.5 | 6.4 | 5.2 | 4.1 | 3.8 | 0.3 | 0.4 | 3.8 | 6.6 | 6.5 | 1.6 | 2.1 | 2.9 | 1.6 | 1.1 | 0.6 | 0.7 | 0.6 | 0.5 | 0.5 |
| Textiles | 87.0 | 82.9 | 81.8 | 80.5 | 79.0 | 0.6 | 0.6 | 0.6 | 0.7 | 0.7 | 30.6 | 28.8 | 28.7 | 26.1 | 14.5 | 38.9 | 29.3 | 30.4 | 29.6 | 23.8 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 |
| Clothing | 81.4 | 82.7 | 82.6 | 81.8 | 82.4 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 15.7 | 12.7 | 24.1 | 26.0 | 15.8 | 24.5 | 12.1 | 11.6 | 15.8 | 24.2 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 |
| Leather | 89.1 | 87.6 | 82.0 | 80.1 | 78.6 | 0.2 | 0.2 | 0.2 | 0.3 | 0.4 | 33.9 | 36.1 | 50.0 | 61.7 | 42.1 | 32.4 | 28.3 | 41.1 | 53.6 | 32.5 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 |
| Footwear | 89.2 | 89.0 | 90.1 | 89.9 | 90.5 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 45.3 | 20.2 | 14.0 | 15.4 | 3.9 | 22.9 | 13.7 | 16.7 | 31.1 | 35.8 | 0.5 | 0.5 | 0.3 | 0.3 | 0.2 |
| Wood & wood products | 80.1 | 66.0 | 64.0 | 65.7 | 60.1 | 0.7 | 0.8 | 0.7 | 0.6 | 0.5 | 11.4 | 13.0 | 19.3 | 26.9 | 20.1 | 14.1 | 8.6 | 10.7 | 13.0 | 11.0 | 0.5 | 0.4 | 0.4 | 0.4 | 0.3 |
| Paper & paper products | 74.2 | 69.9 | 65.6 | 62.9 | 61.5 | 1.8 | 2.8 | 2.3 | 3.1 | 4.1 | 21.4 | 15.4 | 25.5 | 28.6 | 18.2 | 35.1 | 18.4 | 17.0 | 17.4 | 10.7 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 |
| Printing, publishing & recorded media | 40.5 | 37.5 | 27.9 | 25.4 | 23.9 | 0.8 | 1.0 | 0.8 | 1.0 | 0.8 | 2.4 | 1.1 | 1.3 | 3.6 | 3.3 | 36.2 | 29.5 | 14.9 | 17.5 | 12.2 | 0.6 | 0.5 | 0.4 | 0.4 | 0.3 |
| Coke & refined petroleum products | 65.2 | 54.4 | 45.4 | 44.3 | 39.6 | 15.6 | 33.9 | 52.8 | 82.6 | 80.0 | 18.0 | 5.5 | 13.2 | 25.7 | 20.7 | 13.4 | 4.5 | 5.3 | 9.2 | 12.2 | 0.4 | 0.5 | 0.4 | 0.3 | 0.3 |
| Basic chemicals | 65.4 | 60.2 | 57.3 | 56.4 | 54.4 | 4.8 | 9.5 | 9.6 | 13.0 | 20.9 | 44.2 | 31.8 | 50.9 | 58.0 | 36.7 | 52.1 | 36.9 | 48.4 | 52.6 | 31.8 | 0.2 | 0.3 | 0.3 | 0.3 | 0.2 |
| Other chemicals & man-made fibers | 52.4 | 49.5 | 47.6 | 44.6 | 42.1 | 2.1 | 2.6 | 2.2 | 3.2 | 3.5 | 11.2 | 5.2 | 8.9 | 11.6 | 8.6 | 27.1 | 21.9 | 27.9 | 28.3 | 22.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Rubber products | 78.3 | 73.6 | 70.0 | 67.5 | 67.4 | 1.0 | 0.9 | 1.0 | 1.1 | 1.4 | 5.3 | 3.7 | 10.6 | 20.9 | 19.6 | 12.6 | 11.5 | 17.1 | 26.1 | 29.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 |
| Plastic products | 78.3 | 73.6 | 70.1 | 67.6 | 67.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.6 | 4.7 | 1.9 | 4.7 | 7.5 | 6.9 | 10.6 | 8.9 | 10.8 | 13.9 | 14.1 | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 |
| Glass & glass products | 81.9 | 77.0 | 75.3 | 74.3 | 72.8 | 0.9 | 1.6 | 1.3 | 1.6 | 2.0 | 15.5 | 12.4 | 14.7 | 16.6 | 13.0 | 27.9 | 18.0 | 17.4 | 22.9 | 19.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| Non-metallic minerals | 81.9 | 77.0 | 75.4 | 74.3 | 72.8 | 1.3 | 1.6 | 1.2 | 1.4 | 2.0 | 21.7 | 7.9 | 9.2 | 12.8 | 9.6 | 15.8 | 9.0 | 11.7 | 16.9 | 15.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.4 |
| Basic iron & steel | 70.9 | 60.6 | 58.7 | 57.7 | 53.8 | 2.8 | 3.2 | 4.0 | 6.7 | 6.8 | 45.9 | 51.4 | 72.0 | 69.8 | 58.2 | 24.1 | 13.4 | 28.0 | 24.6 | 14.6 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 |
| Basic non-ferrous metals | 70.9 | 60.5 | 58.7 | 57.6 | 53.8 | 2.8 | 2.9 | 4.9 | 9.2 | 10.8 | 59.3 | 65.0 | 64.7 | 66.6 | 51.8 | 34.6 | 21.4 | 27.0 | 39.5 | 31.1 | 0.3 | 0.3 | 0.4 | 0.4 | 0.3 |
| Metal products excl. machinery | 73.3 | 68.2 | 65.8 | 64.6 | 63.4 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 | 4.3 | 5.1 | 11.3 | 14.9 | 12.5 | 6.7 | 4.8 | 5.6 | 9.4 | 12.4 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 |
| Machinery & equip. | 59.7 | 53.6 | 50.2 | 48.0 | 47.4 | 0.6 | 0.8 | 0.8 | 0.7 | 0.7 | 18.3 | 10.8 | 24.7 | 45.3 | 50.5 | 52.8 | 44.5 | 54.7 | 69.8 | 70.8 | 0.3 | 0.4 | 0.3 | 0.3 | 0.3 |
| Electrical machinery | 66.7 | 62.4 | 61.2 | 60.4 | 59.0 | 0.6 | 0.8 | 0.7 | 0.8 | 0.8 | 9.1 | 6.4 | 14.2 | 16.9 | 12.9 | 39.2 | 38.6 | 40.4 | 34.5 | 27.7 | 0.3 | 0.3 | 0.3 | 0.3 | 0.2 |
| TV, radio & communication equip. | 66.7 | 62.4 | 61.2 | 60.4 | 59.1 | 1.0 | 1.0 | 0.7 | 0.7 | 1.0 | 7.2 | 4.8 | 15.1 | 33.2 | 35.0 | 44.7 | 35.6 | 50.0 | 77.5 | 81.1 | 0.3 | 0.2 | 0.3 | 0.4 | 0.3 |

| Variable | % employment unskilled | | | | | Capital / labour ratio | | | | | Exports/output ratio | | | | | Imports / domestic consumption ratio | | | | | Value added / total output | | | | |
|--|------------------------|-------------|-------------|-------------|-------------|------------------------|------------|------------|------------|------------|----------------------|-------------|-------------|-------------|-------------|--------------------------------------|-------------|-------------|-------------|-------------|----------------------------|------------|------------|------------|------------|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Professional & scientific equipment | 66.9 | 62.3 | 61.3 | 60.4 | 59.0 | 0.6 | 0.6 | 0.5 | 0.6 | 0.8 | 84.3 | 29.4 | 56.3 | 88.1 | 43.0 | 97.2 | 78.4 | 87.1 | 96.8 | 82.2 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 |
| Motor vehicles & parts | 64.6 | 60.1 | 54.1 | 51.9 | 50.3 | 0.8 | 1.1 | 1.3 | 1.2 | 1.8 | 13.2 | 11.1 | 11.3 | 16.7 | 24.6 | 36.5 | 29.4 | 26.4 | 31.5 | 35.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 |
| Other transport equip. | 64.6 | 60.2 | 54.1 | 51.9 | 50.3 | 0.9 | 1.1 | 1.5 | 2.0 | 1.9 | 5.7 | 8.5 | 30.3 | 60.0 | 27.5 | 39.6 | 24.8 | 43.3 | 75.3 | 66.8 | 0.7 | 0.7 | 0.6 | 0.5 | 0.3 |
| Furniture | 66.7 | 66.0 | 69.1 | 70.0 | 69.7 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 3.2 | 7.1 | 23.5 | 47.1 | 35.5 | 4.2 | 3.3 | 5.7 | 12.8 | 18.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |
| Other manufacturing | 61.4 | 58.5 | 51.0 | 46.2 | 47.4 | 0.7 | 0.4 | 0.5 | 0.4 | 0.8 | 45.6 | 36.9 | 28.9 | 24.6 | 27.0 | 26.9 | 19.1 | 8.0 | 12.3 | 13.3 | 0.5 | 0.6 | 0.5 | 0.5 | 0.4 |
| Electricity, gas & steam | 72.1 | 57.8 | 48.3 | 42.7 | 36.3 | 24.5 | 26.7 | 34.9 | 32.1 | 29.6 | 1.1 | 1.2 | 1.2 | 1.3 | 1.2 | 0.0 | 0.4 | 1.2 | 1.7 | 1.3 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Water supply | 72.2 | 57.7 | 48.3 | 42.8 | 36.3 | 56.7 | 51.0 | 48.3 | 48.3 | 42.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.4 | 0.4 | 0.5 | 0.4 |
| Building construction | 75.2 | 75.2 | 75.9 | 74.3 | 74.5 | 0.2 | 0.1 | 0.1 | 0.2 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 |
| Civil engineering & other construction | 75.2 | 75.4 | 75.6 | 74.3 | 74.6 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.4 | 0.3 | 0.3 | 0.3 | 0.2 | 0.9 | 0.2 | 0.3 | 0.7 | 0.5 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Wholesale & retail trade | 29.1 | 25.2 | 21.6 | 20.4 | 19.7 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 | 4.2 | 2.0 | 3.5 | 5.2 | 5.2 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 |
| Catering & accommodation | 38.0 | 32.8 | 27.9 | 26.9 | 25.0 | 0.7 | 0.6 | 0.6 | 0.6 | 0.6 | 12.7 | 9.6 | 15.8 | 21.5 | 18.9 | 18.0 | 16.1 | 19.6 | 21.6 | 18.2 | 0.4 | 0.4 | 0.5 | 0.5 | 0.4 |
| Transport & storage | 35.3 | 30.0 | 30.2 | 30.8 | 28.6 | 6.9 | 7.3 | 8.3 | 9.6 | 11.2 | 14.3 | 7.8 | 10.1 | 11.8 | 11.3 | 16.5 | 8.4 | 12.3 | 11.5 | 9.1 | 0.7 | 0.5 | 0.5 | 0.5 | 0.4 |
| Communication | 57.3 | 51.3 | 38.7 | 31.9 | 29.0 | 4.2 | 4.4 | 4.5 | 7.0 | 8.0 | 3.0 | 3.4 | 4.1 | 3.5 | 5.2 | 9.1 | 12.5 | 8.0 | 4.8 | 4.5 | 0.8 | 0.8 | 0.6 | 0.5 | 0.4 |
| Finance & insurance | 2.9 | 3.9 | 3.4 | 3.4 | 3.8 | 22.6 | 19.9 | 15.3 | 12.9 | 10.1 | 13.8 | 6.5 | 5.7 | 6.8 | 5.0 | 15.2 | 6.8 | 4.0 | 3.0 | 1.5 | 0.8 | 0.8 | 0.7 | 0.6 | 0.6 |
| Business services | 30.4 | 25.8 | 20.2 | 17.9 | 17.2 | 26.4 | 18.4 | 10.6 | 7.3 | 3.8 | 0.9 | 0.7 | 1.0 | 1.4 | 2.3 | 5.1 | 3.0 | 2.8 | 2.4 | 1.4 | 0.6 | 0.6 | 0.6 | 0.6 | 0.5 |
| Medical, dental & veterinary services | 10.8 | 7.0 | 3.2 | 2.5 | 2.0 | 1.2 | 1.3 | 1.2 | 1.0 | 0.8 | 1.9 | 1.3 | 1.3 | 1.1 | 1.0 | 7.6 | 3.6 | 2.6 | 1.5 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.4 |
| Other community social & personal services | 10.7 | 7.0 | 3.1 | 2.4 | 2.0 | 0.8 | 1.7 | 2.3 | 2.3 | 2.1 | 2.8 | 1.7 | 2.8 | 2.6 | 1.7 | 15.4 | 10.6 | 10.4 | 6.0 | 2.6 | 0.5 | 0.5 | 0.6 | 0.6 | 0.4 |
| Other services | 91.0 | 90.0 | 89.7 | 90.0 | 90.0 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.8 | 1.1 | 2.2 | 8.1 | 7.7 | 10.4 | 9.2 | 7.1 | 0.6 | 0.7 | 0.7 | 0.7 | 0.7 |
| General government | 34.2 | 26.8 | 19.9 | 16.9 | 16.2 | 3.7 | 3.5 | 3.5 | 3.7 | 4.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.7 | 0.7 | 0.7 | 0.6 |
| Total economy | 69.4 | 62.0 | 55.6 | 51.5 | 46.2 | 1.8 | 2.2 | 2.3 | 2.4 | 2.4 | 15.1 | 12.1 | 13.6 | 15.3 | 13.5 | 14.1 | 10.2 | 11.2 | 13.7 | 12.9 | 0.6 | 0.5 | 0.5 | 0.5 | 0.4 |

Notes: Periods abbreviated as follows: 1=1970-1980; 2=1980-1990; 3=1990-1995; 4=1995-2000; 5=2000-2007. Averages calculated using the values for all years in the relevant period. % employment unskilled refers to percentage of formal employment classified as semi- or unskilled, categories are based on occupations, semi- and unskilled (shown here) including all employment not falling into the following categories: professional, semi-professional and technical; managerial, executive and administrative; clerical, sales, transport, delivery and communications; service; farmer, farm manager; artisan, apprentice and related occupations; production foreman, production supervisor. Capital / labour ratio measured as R10m of fixed capital stock per number of people. All monetary variables in constant 2000 prices.

Source: Derived from SASID data.

Table 8: Percentage change in subsectoral characteristics, 1970-2007 by subperiods

| Variable | % employment unskilled | | | | | Capital / labour ratio | | | | | Exports/output ratio | | | | | Imports / domestic consumption ratio | | | | | Value added / total output | | | | |
|---------------------------------------|------------------------|------|------|------|------|------------------------|------|------|------|------|----------------------|-------|------|-------|-------|--------------------------------------|-------|------|-------|------|----------------------------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Agriculture, forestry & fishing | 0.0 | -0.1 | -0.2 | -0.3 | -0.2 | 2.5 | -1.2 | -2.1 | 0.6 | 6.2 | -10.7 | -3.5 | 3.4 | 2.0 | 7.4 | -8.6 | -2.1 | 20.2 | -12.1 | 5.4 | -0.2 | -0.6 | -4.7 | 0.1 | -2.7 |
| Coal mining | -0.8 | -1.0 | -2.0 | -0.9 | -0.8 | 8.5 | 8.4 | 21.2 | 4.6 | 2.7 | 12.2 | 0.0 | -0.8 | 5.4 | 3.5 | 12.0 | 12.1 | 9.1 | 14.5 | 12.2 | -2.2 | -1.1 | 0.8 | -0.1 | 0.1 |
| Gold & uranium | 0.3 | -0.1 | -0.6 | 0.1 | 0.1 | 2.8 | 6.6 | 1.5 | 9.2 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | | | -2.0 | 2.6 | -3.0 | -2.5 | 0.0 |
| Other mining | -0.6 | -0.3 | 0.0 | -0.4 | -0.3 | 5.7 | 2.5 | 5.9 | 5.2 | -3.8 | -2.9 | 93.7 | -1.9 | 3.6 | 3.0 | -8.6 | 12.2 | 4.5 | 4.6 | 1.3 | -1.1 | -0.7 | 0.0 | 1.2 | 0.0 |
| Food | -0.5 | -2.1 | -1.9 | -0.8 | -0.7 | 1.7 | -0.2 | 4.9 | 2.7 | 3.7 | -5.6 | -5.4 | 4.9 | -1.8 | -8.1 | -8.8 | -1.5 | 13.1 | -4.2 | 4.1 | 0.5 | -0.4 | -0.1 | -1.7 | 0.5 |
| Beverages | -0.7 | -1.4 | -2.0 | -0.6 | -0.6 | 0.8 | 3.8 | 4.1 | 3.6 | -4.8 | -5.2 | 4.0 | 24.8 | 4.8 | 2.2 | -2.6 | -1.0 | -2.5 | -7.6 | 11.3 | 0.9 | -2.1 | 0.2 | -1.5 | -2.7 |
| Tobacco | -0.7 | -1.4 | -2.0 | -0.6 | -0.6 | 2.0 | -4.4 | -0.6 | -6.2 | -0.1 | -2.1 | 9.0 | 41.0 | 9.1 | -1.6 | -11.9 | 11.6 | -4.9 | -24.6 | 20.5 | -2.4 | 1.2 | -3.3 | -1.0 | -2.1 |
| Textiles | -0.5 | -0.3 | -0.2 | -0.4 | -0.3 | -0.2 | -0.1 | 2.3 | 2.8 | -0.6 | -4.1 | -1.7 | 0.2 | -6.2 | -8.8 | -4.7 | -2.9 | 4.2 | -5.8 | 2.7 | 1.2 | -0.1 | -4.9 | -5.4 | 2.4 |
| Clothing | 0.1 | 0.2 | -0.4 | 0.1 | 0.1 | -2.8 | -1.2 | -5.5 | -0.3 | -1.3 | -1.9 | -2.9 | 8.6 | 1.0 | -20.6 | -7.2 | -7.3 | 4.5 | 8.2 | 11.9 | 0.9 | -2.7 | 2.1 | -1.6 | 1.5 |
| Leather | 0.0 | -0.7 | -0.7 | -0.3 | -0.4 | -1.4 | -3.0 | 9.5 | -1.9 | 12.0 | 4.9 | -3.5 | 11.6 | -4.4 | -2.6 | -0.7 | -3.6 | 13.9 | -5.2 | 0.8 | 0.1 | -2.7 | -1.0 | -3.1 | 34.0 |
| Footwear | -0.3 | 0.3 | -0.1 | 0.0 | 0.1 | 1.2 | -1.6 | 1.4 | 5.5 | 5.2 | -1.2 | -19.1 | 21.0 | -17.2 | -18.7 | -2.8 | -15.4 | 41.6 | 2.0 | 7.3 | 1.1 | -3.1 | -1.9 | -5.0 | 0.3 |
| Wood & wood products | -0.1 | -2.4 | 2.0 | -1.1 | -1.3 | 2.7 | -0.6 | -2.7 | -2.9 | 3.3 | 10.3 | -3.4 | 14.0 | -1.1 | -9.3 | -2.1 | -4.2 | 12.4 | -4.4 | 2.1 | 0.2 | -0.1 | 0.4 | -4.0 | -2.0 |
| Paper & paper products | -0.4 | -0.8 | -1.1 | -0.4 | -0.4 | 3.3 | 1.7 | 1.4 | 8.1 | 5.8 | -6.2 | 0.5 | 13.7 | -8.6 | -7.2 | -3.5 | -7.9 | 10.6 | -14.1 | 4.0 | 1.8 | -1.8 | -0.7 | -4.0 | 0.6 |
| Printing, publishing & recorded media | -0.9 | -2.7 | -2.9 | -1.1 | -1.1 | 0.5 | -0.3 | 3.0 | -1.4 | 2.2 | -10.9 | -11.8 | 27.6 | 6.0 | -0.8 | -0.5 | -7.9 | 3.9 | -7.6 | -6.1 | 0.5 | -3.5 | -0.7 | -0.4 | -3.9 |
| Coke & refined petroleum products | -0.8 | -3.0 | 0.0 | -1.5 | -1.7 | 19.2 | 2.2 | 8.5 | 11.3 | -8.6 | -11.9 | -14.0 | 56.1 | 2.0 | -11.5 | -12.8 | -2.2 | 9.0 | -8.2 | 24.6 | -6.2 | 1.9 | -4.6 | -2.3 | -0.1 |
| Basic chemicals | -1.5 | -0.6 | -0.5 | -0.1 | -1.1 | 2.2 | 4.4 | 1.5 | 9.3 | 5.6 | -3.9 | -3.2 | 14.4 | -8.1 | -3.0 | -3.8 | -2.9 | 11.7 | -9.6 | -1.6 | -2.8 | 3.0 | 0.1 | -3.8 | -1.3 |
| Other chemicals & man-made fibers | -3.4 | 0.4 | -1.3 | -1.2 | -0.8 | 5.5 | -3.7 | 4.9 | 5.7 | 0.5 | -11.0 | -1.1 | 8.0 | -3.7 | 0.0 | -2.7 | 0.1 | 4.5 | -6.9 | 3.6 | 1.7 | -0.2 | -1.3 | -3.0 | 2.1 |
| Rubber products | -0.3 | -0.7 | -0.9 | -0.3 | -0.1 | -1.2 | 0.9 | 2.7 | 3.7 | 4.1 | -6.1 | -1.5 | 28.5 | 4.1 | -1.3 | -4.2 | 0.2 | 13.2 | -0.1 | 9.1 | 3.1 | -4.3 | 0.4 | -3.3 | -1.7 |
| Plastic products | -0.3 | -0.7 | -0.9 | -0.3 | -0.1 | 0.6 | 0.8 | -5.3 | 10.0 | 1.9 | -17.0 | 1.9 | 17.8 | -2.3 | 4.1 | -4.2 | -0.9 | 8.4 | -1.9 | 7.3 | 4.6 | -0.3 | -1.6 | 0.2 | 0.6 |
| Glass & glass products | -0.4 | -0.6 | -0.2 | -0.3 | -0.3 | 6.5 | 0.1 | 1.2 | 4.5 | 5.6 | 60.9 | -6.4 | -1.4 | 9.4 | -9.8 | -0.5 | -6.2 | 6.6 | 2.3 | 1.8 | 2.9 | -1.9 | 5.3 | -2.1 | -1.6 |
| Non-metallic minerals | -0.5 | -0.6 | -0.2 | -0.3 | -0.3 | 3.7 | -0.8 | -3.8 | 9.8 | 4.4 | 58.7 | -12.9 | 20.1 | -3.6 | -2.6 | -2.0 | -0.6 | 8.6 | 2.6 | 2.7 | -0.2 | -0.7 | 1.2 | -3.2 | -3.9 |
| Basic iron & steel | -0.7 | -1.4 | 0.4 | -1.1 | -1.0 | 4.3 | 1.6 | 6.7 | 12.8 | -5.8 | 40.1 | 2.0 | 2.1 | -3.1 | -0.3 | -1.3 | 5.8 | 5.8 | -14.6 | 6.7 | -0.6 | -0.9 | -0.3 | -5.2 | 1.9 |
| Basic non-ferrous metals | -0.7 | -1.3 | 0.3 | -1.1 | -1.0 | 2.4 | -0.6 | 22.4 | 7.2 | -3.9 | 34.3 | -1.3 | 0.3 | -4.5 | -0.9 | -2.8 | -3.7 | 11.3 | -1.1 | -2.2 | 3.0 | 0.5 | 2.1 | -2.2 | 1.4 |
| Metal products excl. machinery | -0.6 | -0.7 | -0.2 | -0.4 | -0.3 | 3.3 | -1.4 | 3.8 | -0.7 | -1.6 | 66.0 | 7.3 | 5.7 | 2.8 | -1.7 | -2.0 | -2.7 | 8.1 | 9.6 | 7.5 | 1.5 | -2.1 | -1.7 | -2.9 | 2.0 |
| Machinery & equip. | -0.3 | -1.1 | -1.0 | -0.4 | -0.3 | 1.7 | 0.6 | -1.3 | -0.5 | 0.5 | 28.8 | -1.2 | 22.0 | 2.7 | 7.6 | 0.2 | -1.3 | 7.6 | -0.3 | 4.2 | 2.2 | -1.7 | -1.0 | -3.8 | 3.6 |
| Electrical machinery | -0.9 | -0.5 | 0.0 | -0.5 | -0.4 | 4.7 | 0.5 | -1.1 | 2.9 | 0.5 | 54.0 | 0.9 | 8.4 | -7.0 | 4.6 | 6.0 | -0.5 | 1.2 | -11.4 | 7.4 | 3.3 | 0.0 | -1.7 | -4.9 | 1.8 |

| Variable | % employment unskilled | | | | | Capital / labour ratio | | | | | Exports/output ratio | | | | | Imports / domestic consumption ratio | | | | | Value added / total output | | | | |
|--|------------------------|------|------|------|------|------------------------|------|------|------|-------|----------------------|------|------|-------|-------|--------------------------------------|------|------|-------|-------|----------------------------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| TV, radio & communication equip. | -0.9 | -0.5 | 0.0 | -0.4 | -0.4 | -2.6 | -1.7 | -1.1 | 0.4 | 6.4 | 31.6 | 3.8 | 13.5 | 13.9 | 5.7 | -1.9 | -0.8 | 13.1 | 4.0 | 1.7 | 3.4 | -0.4 | 4.9 | -2.4 | 0.2 |
| Professional & scientific equipment | -0.9 | -0.5 | 0.0 | -0.5 | -0.4 | 2.9 | -2.8 | -2.7 | 8.4 | 2.4 | 23.9 | -2.9 | 8.6 | -1.7 | -4.7 | 0.4 | -0.9 | 1.7 | -0.2 | -0.8 | -2.6 | -1.2 | -4.8 | -5.3 | -1.4 |
| Motor vehicles & parts | -0.1 | -1.5 | -0.9 | -0.6 | -0.5 | 0.1 | 3.0 | 1.1 | 1.9 | 7.9 | 55.0 | -3.7 | -2.0 | 17.6 | 2.9 | 1.6 | -4.4 | 2.7 | 1.3 | 5.0 | 2.5 | 0.0 | -5.0 | -6.2 | 0.1 |
| Other transport equip. | -0.1 | -1.5 | -0.9 | -0.7 | -0.6 | 3.7 | 2.1 | 8.5 | 5.6 | -4.9 | 40.1 | 16.8 | -1.6 | 16.3 | -14.5 | -1.1 | -3.3 | 22.9 | 8.5 | -3.6 | 1.4 | -2.2 | -1.4 | -8.4 | -1.5 |
| Furniture | -0.9 | 0.8 | 0.4 | 0.0 | 0.0 | 1.0 | -2.5 | -0.4 | 2.5 | -1.7 | 72.0 | -1.9 | 36.6 | -5.7 | -4.7 | -1.7 | -2.5 | 25.9 | 1.3 | 12.4 | 5.3 | -5.2 | 3.1 | 1.7 | 4.3 |
| Other manufacturing | -1.6 | -0.3 | -3.1 | -0.2 | 0.2 | -5.6 | -1.7 | -0.9 | 2.1 | 14.1 | 43.0 | -6.3 | -3.1 | 1.0 | 3.9 | 11.3 | -16. | 9.1 | 2.4 | 9.2 | 6.4 | -0.8 | -0.1 | -2.8 | -1.0 |
| Electricity, gas & steam | -1.6 | -2.5 | -2.3 | -2.7 | -2.5 | -0.7 | 2.7 | 1.6 | -3.7 | -0.3 | 27.4 | -8.0 | 6.5 | -3.5 | 0.7 | | | 9.8 | -1.9 | -1.6 | 0.0 | 0.7 | 0.0 | -1.6 | 0.6 |
| Water supply | -1.5 | -2.6 | -2.1 | -2.8 | -2.4 | 0.4 | -1.7 | -0.1 | -1.0 | -2.2 | | | | | | | | | | | -0.5 | -0.2 | 0.5 | -1.8 | -0.5 |
| Building construction | -0.4 | 0.4 | -0.6 | -0.1 | 0.0 | 3.4 | -4.1 | 0.0 | 11.8 | 5.9 | | | | | | 12.8 | -8.4 | 11.7 | 6.5 | -3.0 | 1.5 | -2.0 | -2.3 | -3.7 | 1.1 |
| Civil engineering & other construction | -0.4 | 0.3 | -0.6 | 0.0 | 0.0 | 10.9 | -7.9 | -8.4 | 7.8 | 9.5 | -22.5 | -2.7 | 29.3 | -13.4 | -4.7 | -23.7 | 1.4 | 13.6 | 5.8 | -3.3 | 3.4 | -1.9 | -1.4 | 1.1 | 0.8 |
| Wholesale & retail trade | -1.2 | -2.1 | -1.2 | -0.9 | -0.6 | 0.6 | -0.8 | -0.8 | -1.7 | 0.9 | -10.4 | 5.6 | 8.4 | 3.4 | -0.3 | 0.2 | -1.0 | 3.7 | -8.3 | -2.9 | 0.1 | 0.2 | -0.7 | -1.5 | -0.5 |
| Catering & accommodation | -0.3 | -2.5 | -0.8 | -1.1 | -1.1 | -0.9 | -1.7 | -0.2 | 4.4 | -2.4 | -11.7 | 6.1 | 9.6 | -1.2 | 0.8 | 5.1 | -1.0 | 7.4 | -5.1 | -0.3 | -2.7 | 1.9 | 2.2 | -4.1 | -1.1 |
| Transport & storage | -2.0 | -1.2 | 2.0 | -1.1 | -1.0 | 0.2 | 1.1 | 2.6 | 4.5 | 0.2 | -9.0 | 0.9 | 4.9 | -2.8 | 1.0 | -11.5 | 4.3 | 4.0 | -8.3 | -1.6 | -2.1 | -1.2 | 0.4 | -3.9 | 0.2 |
| Communication | -0.3 | -2.5 | -5.0 | -2.1 | -1.7 | 3.6 | -1.1 | 3.0 | 14.0 | -0.8 | 38.9 | 2.7 | -1.2 | -4.1 | 10.8 | 47.7 | -8.0 | -2.6 | -13.2 | 3.5 | -1.0 | -1.3 | -2.8 | -5.7 | 0.6 |
| Finance & insurance | -1.2 | 1.4 | -2.8 | 2.5 | 1.0 | 0.6 | -2.8 | -4.1 | -1.6 | -3.3 | -9.1 | -2.1 | 0.6 | -1.7 | -2.6 | -3.8 | -9.9 | -0.1 | -13.8 | -9.0 | 0.2 | 0.1 | -3.9 | -1.1 | -1.3 |
| Business services | -1.3 | -2.7 | -3.1 | -1.4 | -0.5 | -2.0 | -5.8 | -7.2 | -7.0 | -11.4 | -11.1 | 7.4 | 1.4 | 6.1 | 8.6 | -3.1 | -2.6 | 0.1 | -11.2 | -5.2 | 1.3 | -1.2 | 1.3 | -5.1 | -0.7 |
| Medical, dental & veterinary services | -2.4 | -8.6 | -6.9 | -3.3 | -3.2 | 3.1 | -0.3 | -2.1 | -1.3 | -2.3 | -7.5 | 3.9 | -8.3 | -1.6 | -1.2 | -8.7 | -6.6 | -3.3 | -17.4 | -13.3 | -1.7 | 1.1 | 1.4 | -4.4 | -3.6 |
| Other community social & personal services | -2.3 | -8.5 | -7.7 | -2.9 | -3.1 | 5.9 | 6.9 | 2.5 | 0.5 | -0.2 | -6.2 | 8.6 | 1.1 | -8.3 | -3.4 | -8.1 | -0.4 | -3.5 | -18.0 | -9.4 | 1.8 | 0.5 | 2.6 | -4.5 | -3.2 |
| Other services | 0.0 | -0.1 | 0.1 | 0.1 | 0.1 | 3.7 | 2.5 | 1.1 | -2.0 | -0.9 | -11.7 | 14.8 | 10.5 | 4.3 | 16.3 | 0.6 | -0.4 | 5.8 | -9.5 | -0.9 | 1.7 | 0.1 | 0.9 | -1.0 | -0.5 |
| General government | -2.4 | -3.2 | -4.5 | -1.5 | -0.8 | 0.9 | -0.8 | 0.9 | 2.4 | 0.1 | | | | | | | | | | | -1.5 | 0.8 | 0.5 | -1.4 | -2.5 |
| Total economy | -1.1 | -1.4 | -1.4 | -1.5 | -1.9 | 3.3 | 0.9 | 0.4 | 1.4 | -0.1 | -2.5 | -0.6 | 3.8 | -0.7 | -1.1 | -2.4 | -2.2 | 7.3 | -2.6 | 3.3 | -0.4 | -0.1 | -0.7 | -2.6 | -0.7 |

Notes and source as in Table 7. Growth rates shown on an average annualised basis (using the first and last years of the relevant periods).