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A Decomposition Approach

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Outsourcing and Employment:

A Decomposition Approach

by
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Abstract

In this paper we study the employment effects of changes in the levels and patterns of outsourcing in the Austrian economy over the periods 1995-2000 and 2000-2003. Based on an input-output framework we apply a hierarchical decomposition analysis to disentangle the employment effects of changes in labour productivity, technical input coefficients and final demand components. Outsourcing is modelled as changes in the shares of domestically produced intermediates. For this some further details can be derived by distinguishing between intermediate imports of energy, material and service products or according to educational intensities of the imported intermediate products. Following this approach first allows to study the direct and indirect effects of changes in the levels and structures of outsourcing. Second, the framework takes account of all 60 sectors (products) of the economy and thus also includes employment effects of service offshoring. Third, we also calculate the employment effects for three employment groups distinguished by educational attainment levels. This paper thus provides a comprehensive picture of employment effects of outsourcing in the Austrian economy.

OUTSOURCING AND EMPLOYMENT:
A DECOMPOSITION APPROACH[1]

1 Introduction

The employment effects of outsourcing and offshoring are still debated in the economics profession but even more represent a matter of concern for policy makers. The concern is that the recent phenomena of outsourcing stages of production abroad affect the level of employment and the structure of demand for labour (e.g. according to educational attainment categories) at home. This is reflected in rising unemployment rates in general and parts of the labour force in particular (e.g. unskilled workers) together with rising wage differentials between skilled and unskilled workers.

The theoretical literature identified the effects of outsourcing on relative labour demand in a variety of contributions. In general, effects on relative labour demand mainly depend on the outsourcing sector and the skill intensity of the stage of production outsourced abroad (see Arndt and Kierzkowski, 2001, for an overview). In the empirical literature the effects of outsourcing have been studied by regressing a measure of outsourcing on changes in labour demand, relative wages or the wage bill shares as the dependent variable and controlling for other variables such as skill-biased technical change (see Feenstra and Hanson, 1999, for an important contribution). It goes, however, beyond the scope of this paper to give a comprehensive review of the literature (see Crinò, 2007, for a recent overview). Let us only note that most of these studies mainly refer to material offshoring and do not include the effects of service offshoring which are discussed only recently. The measure for outsourcing was either constructed using input-output or use tables

following the suggestion by Feenstra and Hanson (1996) - the 'wide' and 'narrow' measure of outsourcing - or by applying end-use categories to detailed trade data.[2] The results concerning the effects of outsourcing on employment and wages found in this literature are rather mixed, although there seems to be a consensus that outsourcing has adverse effects on demand for unskilled workers. However, following Feenstra and Hanson (1999), many studies also argue that effects of skill-biased technical change are even more important. Concerning that paper we should also mention that contributions in this tradition only provide evidence for direct employment effects as typically a particular measure of outsourcing in a particular sector is regressed on an employment variable of this sector as the dependent variable.

Although the subject of outsourcing - trade in intermediate products - could also be a key issue in the input-output framework, it is surprising that only very few contributions tackle this issue (see Wixted et al., 2006; OECD, 2007, for an overview of current useages of the input-output framework in an international context). Reasons for this lack of studies may be the lack of appropriate data (input-output tables including international flows at constant prices in particular) as well as methodological problems. Whereas the first issue is 'solved' in this paper rather ad hoc (see Section 3 below) we suggest a decomposition approach to encounter the employment effects of outsourcing. Although this approach also has some shortcomings (potential caveats and critical issues are discussed below in Section 5) we nonetheless think it provides additional insights and may lay the ground for future research. Based on input-output modelling we employ a different strategy of assessing the impact of outsourcing on employment levels and structures. Starting from the classical input-output framework including international trade (for an early contribution see Stone, 1969) we apply a hierarchical decomposition approach to single out the effects of changes in labour productivity, in the coefficients matrix, in final demand components and in international outsourcing. This latter effect is tackled by applying a share matrix (see Skolka, 1977) capturing the effects

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[2]For a review of the various concepts used see, for example, Horgos (2007).

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of changes in the share of imported intermediates. This effect can further be split up into the effects of imports of particular groups of products (e.g. according to the energy, material and service inputs and/or according to the skill content of these products). Details of these calculations are provided in Section 2.

Let us finally summarize what in our view are the main contributions of the present paper to the existing literature. Compared to the econometric approaches mentioned above, one should note that in our approach we take direct and indirect employment effects of outsourcing into account and thus provide a more complete picture of the effects of outsourcing. Further, in this paper we can also assess the effects of 'insourcing' which means that for some reasons firms or sectors may reintegrate production stages in the domestic economy. As we will see below, this has non-negligible employment effects. Finally, within the input-output literature we are not aware of such an approach to study the effects of outsourcing and thus this paper could provide some suggestions in modelling and studying the effects of trade in intermediates in the input-output framework.

The paper is structured as follows. In Section 2 we present the methodological framework. Section 3 provides information about the data used and summarizes some important changes in the structure of outsourcing. In Section 4 we discuss the results of the decomposition analysis in detail with a particular focus on the employment effects of outsourcing. Section 5 concludes.

2 Employment effects of outsourcing: A decomposition approach

In this paper we are mainly interested in the changes in the levels of employment (differentiated by educational attainment groups) and the particular role of outsourcing in these changes. We start from the relationship $\mathbf{q} = \mathbf{A}_d\mathbf{q} + \mathbf{f}_d = \mathbf{L}_d\mathbf{f}_d$, i.e. the vector of output levels $\mathbf{q}$ equals the (domestic) Leontief inverse times the vector of final demand (including exports) for domestic products. More specif-

ically, the Leontief inverse can be written as $\mathbf{L}_d = (\mathbf{I} - \mathbf{D}_A \otimes \mathbf{A})^{-1}$. In this term $\mathbf{A}$ denotes the matrix of technical input coefficients and $\mathbf{D}_A = \mathbf{A}_d \oslash \mathbf{A}$, i.e. the matrix of domestic shares; $\oslash$ and $\otimes$ denote denote elementwise division and multiplication of matrices or vectors of conforming dimensions, respectively. The employment level is then calculated by multiplying the expression above with the vector of labour input coefficients, i.e. $\mathbf{b}'\mathbf{L}_d\mathbf{f}_d$; to calculate sectoral employment levels the vector of labour input coefficients has to be replaced by a matrix with the labour input coefficients on the diagonal denoted by $\hat{\mathbf{b}}$; i.e. sectoral employment levels are obtained as $\hat{\mathbf{b}}\mathbf{L}_d\mathbf{f}_d$.

Changes in the (sectoral) employment levels are then caused either by changes in the vector of labour input coefficients, changes in the Leontief inverse and changes in the vector of final demand for domestic products. The changes in the Leontief inverse can either stem from changes in the matrix of technical input coefficients or changes in the sourcing structure (i.e. whether the share of intermediate inputs purchased abroad is rising or falling). Similarly, the vector of final demand for domestic products can be written as the sum of domestic demand $\mathbf{h}_d$ and exports $\mathbf{x}_d$, i.e. $\mathbf{f}_d = \mathbf{h}_d + \mathbf{x}_d$.

To disentangle the employment effects of the factors described above, we apply a hierarchial decomposition (see Sonis and Hewings, 1990; Rose and Casler, 1996). The number of mutually equivalent decomposition forms is $n!$ where n denotes the number of determinants (see Dietzenbacher and Los, 1998, 2000). In our case this means that decomposing the expression $\mathbf{b}'\mathbf{L}_d\mathbf{f}_d$ yields 3! equivalent decomposition forms. The domestic Leontief inverse $\mathbf{L}_d = (\mathbf{I} - \mathbf{D}_A \otimes \mathbf{A})^{-1}$ is again decomposed (2! decomposition forms) which in particular shows the employment effects of net outsourcing, i.e. the changes in the domestic share matrix $\mathbf{D}_A$. For this we can differentiate between the effects of (net) outsourcing of materials, energy and services[3] which again means 3! decomposition forms.[4] For each of these

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[3]These are defined according to the correspondence used in the EU KLEMS project (see Timmer et al., 2007, and www.euklems.net for detailed information).

[4]Alternatively we could decompose the inputs according to educational intensities, which is a

components we will again have a more detailed look at the effects of changes in the (share of) imported intermediate inputs: for those products for which the share of imported intermediates is increasing and for those for which that share is decreasing. The former group of products represents the goods which are outsourced internationally whereas the latter group means that the share of outsourced products in total demand for intermediates is declining. We will report this exercise for the imports of materials and services only as these show the largest employment effects. Finally, final demand for domestic products is decomposed into domestic demand and exports.

In total we thus compute $3! * (2! + 2!) * 3! * (2! + 2!)$ at the four levels of our hierarchical decomposition analysis. Dietzenbacher and Los (1998) suggest to compute the averages over the $n!$ decomposition forms which we will follow in this paper. I.e. we report the arithmetic mean of the decomposition forms at the four levels of the hierarchical decomposition.[5] Furthermore we distinguish the employment effects by three educational attainment categories (low, medium, high according to ISCED categories). This means that we compute $\mathbf{b}'_e \mathbf{L}_d \mathbf{f}_d$ for each of the three groups denoted by e.

3 Data and descriptive results

3.1 Data

Our input-output analysis is based on the commodity-by-commodity framework. The main data sources are the official Austrian input-output tables for the years 1995 and 2000 and the supply and use table for the year 2003 published by Statistik Austria (Statistik Austria, 2001, 2004, 2006). For the construction of the symmetric input-output table for 2003 from the supply and use tables an approach was used that is based on the commodity technology assumption (CTA) but allows for small

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point on the further agenda.

[5]Detailed results including minima, maxima, ranges and standard deviations are available upon request.

deviations from that assumptions in order to avoid negative elements and other implausible values (Almon, 2000; Koller, 2007). Furthermore, for some parts of the Austrian economy, where large deviations from the CTA are known to exist, the input structure was estimated in a separate step. At this task we could profit from the experiences gained at the preparation of the database of the Austrian INFO-RUM model (Böhm and Richter, 2007). The data preparation procedures included also the preparation of the employment data in a fashion compatible to the input-output table, i.e. in the dimension of commodities. Several plausibility checks were applied to the data.

The employment data were prepared in total and by educational attainment categories. Statistik Austria provides employment data in full time equivalents (FTE), which for the years 1995 and 2000 are available both in the industries and in the commodity dimension or which, in the case of 2003, were transformed into the commodity dimension with the help of the above mentioned procedures. The data source for employment by educational attainment categories, (based on data from EU KLEMS), contains data in the dimension of industries. We used the following procedure to transform these data into the commodity dimension. First we used the composition with respect to educational attainment categories according to ISCED categories (high, medium, low) to calculate the FTEs by industries and educational attainment categories. Then, we used the algorithm of Almon (2000) and Koller (2007) for the construction of FTEs by commodities and educational attainment categories.

For the comparison of input-output-tables over time it is crucial to use tables at constant prices. For Austria, tables at constant prices are currently not available. Therefore, we invested some efforts to construct tables at constant prices of 1995, i.e. deflate the data for 2000 and 2003. Against the background of data availability, a feasible approach involves the construction of a price index vector $\mathbf{p} = (p_i)$, where p_i is the price index of commodity i, and assuming that p_i for commodity i is the same irrespective of its seller and buyer. We applied three different approaches

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and data sources to construct **p**. Here we sketch only the first of these approaches. The description of the other approaches and the respective results are available on request.

EU KLEMS publishes in its database nominal values and volume indices for intermediate inputs by using industries, differentiated by energy inputs, materials and services. Though these data are at purchaser prices while the input-output tables are at producer prices, it seems appropriate to use them for the calculation of **p** in view of further concessions with respect to aggregation. Thus, in this approach we assumed that p_i is identical for all services and set it to the average of the value implied by EU KLEMS for service inputs. We proceeded correspondingly for material inputs. For energy inputs we used a simple regression approach (without intercept) to explain the price indices for energy across using industries by the share of different energy inputs in total energy inputs. The coefficients of this regression are the values for p_i for energy input i. Though our deflation procedures are rather provisional, they furnished robust results with respect to the analysis at hand.

3.2 Changes in the domestic share matrix

We now go on to discuss the changes in the patterns of outsourcing which can be derived from the input-output tables. We do not intend to provide a detailed descriptive analysis but will focus on the domestic share matrix as introduced above since this is of main interest for studying the employment effects of outsourcing below. For doing so we present the changes in the shares of the domestic share matrix $\mathbf{D}_A$ as introduced above over the period 1995-2000 and 2000-2003, respectively, in Table 1.[6] Note that these shares are calculated from the nominal tables whereas the results on employment reported in Section 4 are based on deflated tables. We group the using products into seven categories according to educational skill inten-

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[6]In particular we do not give a detailed description of the levels of outsourcing which would go beyond the scope of this paper.

sities taken from Peneder (2007).[7] For simplicity we grouped the products used into only three categories out of the seven categories in this taxonomy: the first category [1] includes the very high and high educational intensive products, the last group [3] the low and very low educational intensive products and group [2] the remaining. A negative sign shows that the domestic share in the use of intermediate products have declined, thus the share of imported intermediates has risen. This classification into educational intensities provides interesting insights as in theory the overall employment and wage effects depend on the skill intensity of the outsourcing sectors and the skill intensity of the outsourced fragment.

	[1]	[2]	[3]
	1995-2000		
Very high	-0.26	-0.42	-0.86
High	-0.54	-0.52	-0.27
Med-high	-0.72	-0.81	-1.88
Intermediate	0.23	-1.26	0.15
Med-low	-0.67	-0.54	0.10
Low	-0.40	-0.07	-1.95
Very low	-0.06	-0.37	-0.63
	2000-2003		
Very high	-0.46	-1.14	0.95
High	-3.24	0.70	0.75
Med-high	-1.88	1.28	0.28
Intermediate	0.19	1.18	1.15
Med-low	-0.86	1.27	-0.60
Low	0.20	0.30	-0.10
Very low	-1.18	-1.02	0.27

Notes:
Classification according to Peneder (2007)
1 = very high and high educational intensive
2 = med-high, intermediate and med-low
3 = low and very low.

Table 1: Average annual change in domestic shares (in percentage points)

Strikingly, almost all of the entries in the first subperiod 1995-2000 show a negative sign (there are only three exceptions to this). In the second subperiod 2000-2003 a number of positive entries appears in particular in the use of interme-

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[7]Note that this taxonomy was developed for NACE 2-digit industries, whereas we apply it to the CPA product classification. The results presented are according to the 'International classification' - Peneder (2007).

diate [2] or low [3] educational intensive products. In particular there seems to be insourcing of lower educational intensive fragments in the production of relatively educational intensive products in the second period. A similar conclusion applies for the use of intermediate educational intensive products for which increased outsourcing is only found in production of the most and the least educational intensive products. On the other hand, outsourcing activities with respect to high educational intensive products [1] have gained momentum in the second subperiod. In particular imports of high educational intensive products in the second and third most skill intensive product categories ('High' and 'Med-high') increased strongly.

The main concern of this paper being employment effects. we shall not go into detail regarding the outsourcing and insourcing patterns and their changes over time. Let us next turn to a discussion of the results with respect to employment effects of outsourcing.

4 Results

4.1 Total economy

Let us first discuss the employment effects at the total economy level which are presented in Table 2. The table reports the absolute changes, the average changes per year and the relative changes per year (i.e. the average percentage change per year) for both subperiods in terms of full-time equivalents (FTE). These figures are presented for each level of the hierarchical decomposition denoted by dots. The last line presents the total change (i.e. the sum of the effects of changes in labour input coefficients, the domestic Leontief inverse and the changes in final demand). Further we present the figures for the total economy together with the results not including the agricultural products (CPA 01, 02 and 05) for reasons of data reliability.[8] According to these figures total employment (in full-time equivalents) was changing by about minus one per cent per year between 1995 and 2000 and increas-

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[8]Note, however, that these products have still been included in the decomposition.

	Absolute changes		Absolute changes p.y.		Relative changes p.y.	
	1995-2000	2000-2003	1995-2000	2000-2003	1995-2000	2000-2003

			Total economy			
Labour input coefficients	-732133	-123927	-146427	-41309	-4.07	-1.21
Domestic Leontief inverse	-2332	-8152	-466	-2717	-0.01	-0.08
.Input coefficients	42809	5872	8562	1957	0.24	0.06
.Domestic share matrix	-45142	-14024	-9028	-4675	-0.25	-0.14
..Energy	-3016	-2961	-603	-987	-0.02	-0.03
..Materials	-35470	10137	-7094	3379	-0.20	0.10
...Outsourcing	-74840	-29658	-14968	-9886	-0.42	-0.29
...Insourcing	39370	39795	7874	13265	0.22	0.39
..Services	-6657	-21200	-1331	-7067	-0.04	-0.21
...Outsourcing	-28595	-39078	-5719	-13026	-0.16	-0.38
...Insourcing	21938	17877	4388	5959	0.12	0.17
Final demand	546734	162737	109347	54246	3.04	1.59
.Final domestic demand	200508	95595	40102	31865	1.11	0.93
.Final export demand	346226	67142	69245	22381	1.92	0.66
Total	-187731	30658	-37546	10219	-1.04	0.30

			Total economy without agriculture			
Labour input coefficients	-390105	-124291	-78021	-41430	-2.50	-1.27
Domestic Leontief inverse	16719	-8410	3344	-2803	0.11	-0.09
.Input coefficients	56064	4745	11213	1582	0.36	0.05
.Domestic share matrix	-39345	-13155	-7869	-4385	-0.25	-0.13
..Energy	-2974	-2947	-595	-982	-0.02	-0.03
..Materials	-29819	10944	-5964	3648	-0.19	0.11
...Outsourcing	-48704	-23055	-9741	-7685	-0.31	-0.24
...Insourcing	18885	33999	3777	11333	0.12	0.35
..Services	-6553	-21152	-1311	-7051	-0.04	-0.22
...Outsourcing	-28298	-38920	-5660	-12973	-0.18	-0.40
...Insourcing	21745	17768	4349	5923	0.14	0.18
Final demand	507741	153427	101548	51142	3.25	1.57
.Final domestic demand	187821	94092	37564	31364	1.20	0.96
.Final export demand	319920	59335	63984	19778	2.05	0.61
Total	134355	20726	26871	6909	0.86	0.21

Table 2: Results for the total economy

ing by 0.3 per cent over the period 2000-2003. Excluding agriculture, however, employment was rising by about 0.9 per cent per year in the first period as well. In the first period we can see a strong increase in labour productivity (reflected in decreasing labour input coefficients) which flattened in the period 2000-2003. On the positive side, changes in final demand contributed positively to employment growth in the first period (about 3 per cent per year over 1995-2000 compared to 1.6 per cent per year over 2000-2003). Note that employment growth due to exports was almost twice as high as employment growth driven by domestic demand in the first subperiod, whereas it was lower in the second subperiod. Changes in the domestic Leontief inverse contributed only marginally, showing a negligible (total economy) or small positive effect (total economy without agriculture) in the first and a small negative effect in the second period.

At the second level of the hierarchical decomposition, these changes in the Leontief inverse can be traced back to changes in the input coefficients and changes in the domestic share matrix. The first component turned out to be positive in both subperiods, but it was declining in the second subperiod. The positive effect can be interpreted as an increase in the roundaboutness of production.

From the outsourcing perspective the effects of changes in the domestic share matrix provides insights into the employment effects of this phenomenon. A negative sign points towards a negative (direct and indirect) employment effect of outsourcing. In fact we can see that the employment effects of outsourcing are negative in both subperiods with about -0.25 per cent per year on average in the first and -0.14 per cent per year on average in the second period. Thus, as expected, we find a stronger impact of outsourcing at the end of the 1990s when strong trade integration with the Central and Eastern European countries took place; the effects however faded out somewhat in the second subperiod.

At the third level of the decomposition these changes in the domestic share matrix can be traced back to changes in the shares of imported energy inputs, service inputs and material inputs. One can clearly see that the changes in the shares of

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energy inputs contributed only marginally to the employment effects in both sub-periods. With respect to service and material inputs, however, an interesting shift was observed: Imports of service imports had only a small negative effect on employment in the period 1995-2000 (-.04 per cent per year on average) but this effect became strongly negative over the period 2000-2003 (with -0.2 per cent per year on average). On the other hand, employment effects of imported material inputs were strongly negative in the first subperiod (-0.2 per cent per year on average), but became even positive in the second subperiod with about 0.1 per cent per year on average. The effects of an increase in purchasing material inputs from abroad have further been disentangled to products which show an increasing share of imported intermediates and those with declining shares. The first group has a negative employment effect whereas the second has a positive one, despite considering direct and indirect effects. The first effect was strongly negative in the first period but became much smaller in the second period. This means that the employment effects of outsourcing of material inputs lost momentum in the second period. On the other hand, one can also see a positive employment effect of insourcing even in the first period - which is, however, only about half of the outsourcing effect. Nonetheless, it indicates that even in the first period when a number of firms outsourced intermediate stages of production, also domestic demand for intermediate material inputs has risen. However, the results also show that the outsourcing effect lost momentum in the second period and the negative effect became even smaller than the positive effect, resulting in a positive overall effect. With respect to insourcing and outsourcing of service activities, one finds that the positive effects of insourcing activities slightly increased; however, the strong negative effect on employment stems from a sharp increase in the effects of outsourcing activities.

4.2 Results by educational categories

Let us now come to the employment effects distinguishing educational attainment categories high, medium and low. Table 3 presents the results for these three groups

at the total economy level. Let us focus only on the effects of the changes in the domestic share matrix. Surprisingly, the (negative) employment effects of outsourcing were stronger for the highly educated workers in both periods (in the second period the relative effect was similarly strong for the medium-educated workers). Note, however, that this includes direct as well as indirect effects. But, in general, the employment effects were stronger in the first period than in the second for all three educational groups. Further, it is interesting to note that for the low-educated workers mainly outsourcing of material inputs accounts for the negative effects whereas for the highly educated workers both material and service outsourcing is important in the first period at least. In the second period the effects of material outsourcing turn even positive for this group whereas the effects of service outsourcing are becoming stronger. For the medium-educated workers we can see that the negative effect in the first period mainly stems from outsourcing of material inputs whereas in the second period service outsourcing is the dominant factor; the materials effect is even positive.

4.3   Results by using products

These findings at the total economy level already reveal interesting patterns across time and the relative contributions of outsourcing processes to changes in employment levels. We now proceed to show a more detailed picture according to CPA 1-digit using products in Tables 4 and 5. Table 4 presents the average relative changes per year whereas Table 5 shows the absolute average changes. We do this only for the average relative changes for both subperiods.[9]   From this latter table one can see that in the first subperiod the sectors manufacturing (D) and financial intermediation (J) faced the largest declines in employment levels due to outsourcing in absolute terms in the first period; for the transport sector (I) we find a positive employment effect ('insourcing' of activities). While in the manufacturing sector imports of intermediate materials were the main reason for the employment losses,

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[9]Selected detailed results at the CPA 2-digit level are presented in the Appendix.

	Absolute changes		Absolute changes p.y.		Relative changes p.y.	
	1995-2000	2000-2003	1995-2000	2000-2003	1995-2000	2000-2003
			Low			
Labour input coefficients	-459562	-88820	-91912	-29607	-9.13	-4.46
Domestic Leontief inverse	-7394	1249	-1479	416	-0.15	0.06
.Input coefficients	3420	1805	684	602	0.07	0.09
.Domestic share matrix	-10814	-556	-2163	-185	-0.21	-0.03
..Energy	-502	-304	-100	-101	-0.01	-0.02
..Materials	-10771	1220	-2154	407	-0.21	0.06
...Outsourcing	-25693	-7807	-5139	-2602	-0.51	-0.39
...Insourcing	14922	9027	2984	3009	0.30	0.45
..Services	459	-1472	92	-491	0.01	-0.07
...Outsourcing	-4190	-3951	-838	-1317	-0.08	-0.20
...Insourcing	4649	2479	930	826	0.09	0.12
Final demand	124752	28619	24950	9540	2.48	1.44
.Final domestic demand	44366	17024	8873	5675	0.88	0.85
.Final export demand	80386	11595	16077	3865	1.60	0.58
Total	-342204	-58952	-68441	-19651	-6.80	-2.96
			Medium			
Labour input coefficients	-443412	-83788	-88682	-27929	-3.88	-1.27
Domestic Leontief inverse	433	-9785	87	-3262	0.00	-0.15
.Input coefficients	29376	1100	5875	367	0.26	0.02
.Domestic share matrix	-28942	-10885	-5788	-3628	-0.25	-0.16
..Energy	-2048	-2082	-410	-694	-0.02	-0.03
..Materials	-22099	7326	-4420	2442	-0.19	0.11
...Outsourcing	-44264	-18426	-8853	-6142	-0.39	-0.28
...Insourcing	22165	25752	4433	8584	0.19	0.39
..Services	-4796	-16130	-959	-5377	-0.04	-0.24
...Outsourcing	-19646	-27965	-3929	-9322	-0.17	-0.42
...Insourcing	14850	11836	2970	3945	0.13	0.18
Final demand	361604	99508	72321	33169	3.17	1.51
.Final domestic demand	129438	53266	25888	17755	1.13	0.81
.Final export demand	232166	46242	46433	15414	2.03	0.70
Total	-81375	5935	-16275	1978	-0.71	0.09
			High			
Labour input coefficients	170835	48681	34167	16227	10.99	2.97
Domestic Leontief inverse	4629	384	926	128	0.30	0.02
.Input coefficients	10014	2968	2003	989	0.64	0.18
.Domestic share matrix	-5385	-2583	-1077	-861	-0.35	-0.16
..Energy	-466	-576	-93	-192	-0.03	-0.04
..Materials	-2600	1591	-520	530	-0.17	0.10
...Outsourcing	-4884	-3424	-977	-1141	-0.31	-0.21
...Insourcing	2284	5016	457	1672	0.15	0.31
..Services	-2320	-3599	-464	-1200	-0.15	-0.22
...Outsourcing	-4758	-7161	-952	-2387	-0.31	-0.44
...Insourcing	2439	3562	488	1187	0.16	0.22
Final demand	60379	34610	12076	11537	3.88	2.11
.Final domestic demand	26705	25305	5341	8435	1.72	1.54
.Final export demand	33674	9305	6735	3102	2.17	0.57
Total	235843	83675	47169	27892	15.17	5.10

Table 3: Results by educational attainment categories

	AtB	C	D	E	F	G	H	I	J	K	L	M	N	O	P
								1995-2000							
Labour input coefficients	-14.36	-4.83	-5.29	-2.37	-2.70	-2.22	-2.89	-4.94	-4.58	1.79	0.47	-4.20	3.15	-0.28	10.98
Domestic Leontief inverse	-0.80	2.53	-0.57	-2.88	0.20	0.21	-0.23	1.25	-2.96	2.32	0.29	0.03	0.97	-0.08	0.00
.Input coefficients	-0.56	5.13	-0.01	-2.19	0.43	0.23	-0.17	0.75	-0.41	2.60	0.14	0.04	0.97	0.38	0.00
.Domestic share matrix	-0.24	-2.60	-0.55	-0.69	-0.23	-0.02	-0.06	0.50	-2.56	-0.28	0.14	-0.01	0.00	-0.46	0.00
..Energy	-0.00	-2.12	-0.02	-0.45	-0.00	-0.01	-0.00	-0.02	-0.01	-0.02	-0.00	-0.00	-0.00	-0.00	0.00
..Materials	-0.24	-0.49	-0.54	-0.23	-0.21	-0.07	-0.02	-0.19	-0.11	-0.18	-0.00	-0.01	-0.00	-0.04	0.00
...Outsourcing	-1.10	-1.20	-0.93	-0.33	-0.23	-0.12	-0.04	-0.28	-0.19	-0.30	-0.00	-0.01	-0.01	-0.07	0.00
...Insourcing	0.86	0.71	0.39	0.10	0.02	0.05	0.02	0.09	0.07	0.12	0.00	0.00	0.01	0.03	0.00
..Services	-0.00	0.00	0.00	-0.01	-0.02	0.06	-0.04	0.71	-2.43	-0.08	0.14	-0.00	0.01	-0.42	0.00
...Outsourcing	-0.01	-0.04	-0.03	-0.07	-0.04	-0.04	-0.10	-0.13	-2.51	-0.58	-0.00	-0.01	-0.00	-0.46	0.00
...Insourcing	0.01	0.04	0.03	0.06	0.02	0.10	0.06	0.84	0.08	0.50	0.14	0.01	0.01	0.05	0.00
Final demand	1.64	3.98	3.93	3.34	2.19	2.90	2.64	5.03	7.22	6.21	1.24	1.35	1.05	3.62	0.36
.Final domestic demand	0.53	1.57	-0.47	1.44	1.56	1.67	2.35	1.92	1.31	2.14	1.23	1.29	1.02	2.90	0.36
.Final export demand	1.10	2.41	4.40	1.91	0.63	1.23	0.30	3.11	5.91	4.08	0.01	0.07	0.02	0.72	0.00
Total	-13.53	1.67	-1.92	-1.90	-0.32	0.89	-0.48	1.34	-0.32	10.32	2.00	-2.82	5.16	3.26	11.34
								2000-2003							
Labour input coefficients	0.08	-5.28	-3.75	-20.76	-2.31	1.17	-3.57	-3.59	1.43	-0.57	2.96	2.19	-1.64	-0.23	5.59
Domestic Leontief inverse	0.06	-0.46	0.21	5.19	-0.03	-0.09	0.35	0.11	-12.72	3.36	0.09	-0.02	-0.86	-0.01	0.00
.Input coefficients	0.24	1.16	-0.34	6.39	0.51	-0.12	0.33	0.36	-7.55	3.22	0.09	-0.01	-0.86	0.12	0.00
.Domestic share matrix	-0.19	-1.62	0.54	-1.20	-0.54	0.03	0.02	-0.25	-5.16	0.14	-0.00	-0.01	-0.00	-0.13	0.00
..Energy	-0.00	-1.99	-0.02	-1.23	-0.01	-0.01	-0.00	-0.02	-0.03	-0.04	-0.00	-0.00	-0.00	-0.01	0.00
..Materials	-0.17	0.42	0.59	0.09	-0.47	0.06	0.02	0.09	0.08	0.12	0.00	0.00	-0.00	0.02	0.00
...Outsourcing	-1.43	-0.47	-0.67	-0.17	-0.51	-0.10	-0.03	-0.18	-0.11	-0.18	-0.00	-0.01	-0.01	-0.05	0.00
...Insourcing	1.25	0.89	1.26	0.27	0.04	0.16	0.05	0.27	0.19	0.31	0.00	0.01	0.01	0.08	0.00
..Services	-0.01	-0.05	-0.03	-0.07	-0.06	-0.02	0.01	-0.32	-5.21	0.06	-0.00	-0.01	0.00	-0.15	0.00
...Outsourcing	-0.03	-0.08	-0.06	-0.12	-0.10	-0.14	-0.15	-0.45	-6.50	-0.83	-0.00	-0.02	-0.00	-0.25	0.00
...Insourcing	0.02	0.03	0.03	0.06	0.04	0.12	0.16	0.13	1.28	0.89	0.00	0.01	0.00	0.10	0.00
Final demand	2.01	2.85	1.19	4.44	0.85	-0.28	3.46	2.01	8.89	1.12	-2.29	1.81	5.59	0.63	1.50
.Final domestic demand	0.33	-0.95	0.71	1.04	0.44	-0.60	3.30	0.10	4.38	0.50	-2.41	1.78	5.58	0.46	1.50
.Final export demand	1.69	3.80	0.49	3.40	0.41	0.32	0.16	1.91	4.50	0.62	0.12	0.03	0.02	0.18	0.00
Total	2.15	-2.89	-2.35	-11.14	-1.49	0.80	0.24	-1.47	-2.40	3.91	0.76	3.99	3.09	0.39	7.09

Table 4: Average relative changes per year in per cent by CPA 1-digit products

	AtB	C	D	E	F	G	H	I	J	K	L	M	N	O	P
								1995-2000							
Labour input coefficients	-68406	-337	-37525	-799	-7805	-11686	-6396	-11223	-5102	3567	994	-9077	7350	-386	406
Domestic Leontief inverse	-3810	176	-4014	-973	569	1110	-510	2838	-3297	4622	607	57	2265	-106	0
.Input coefficients	-2651	358	-99	-738	1234	1223	-371	1703	-451	5183	303	82	2259	526	0
..Domestic share matrix	-1159	-182	-3915	-235	-665	-114	-139	1135	-2846	-561	303	-25	5	-632	0
..Energy	-8	-148	-114	-152	-12	-44	-6	-51	-13	-47	-0	-1	-0	-7	0
..Materials	-1130	-34	-3816	-78	-610	-377	-54	-438	-126	-353	-1	-13	-10	-53	0
...Outsourcing	-5227	-84	-6570	-111	-658	-641	-90	-633	-206	-592	-2	-21	-33	-100	0
...Insourcing	4097	50	2754	33	48	264	36	196	80	239	1	8	23	47	0
..Services	-21	0	15	-5	-44	307	-79	1624	-2707	-161	304	-10	16	-572	0
...Outsourcing	-59	-3	-189	-25	-112	-209	-217	-288	-2791	-1165	-1	-22	-2	-635	0
...Insourcing	39	3	204	21	68	516	138	1912	85	1004	306	11	18	63	0
Final demand	7799	278	27894	1129	6321	15256	5847	11432	8041	12391	2613	2929	2442	4963	13
.Final domestic demand	2537	110	-3353	485	4497	8796	5192	4363	1459	4260	2591	2783	2388	3980	13
.Final export demand	5261	168	31247	644	1824	6460	654	7068	6582	8131	23	147	54	983	0
Total	-64417	117	-13645	-643	-914	4680	-1059	3046	-358	20579	4213	-6091	12056	4471	419
								2000-2003							
Labour input coefficients	121	-400	-24072	-6343	-6566	6442	-7697	-8696	1566	-1731	6865	4071	-4829	-365	324
Domestic Leontief inverse	86	-35	1324	1585	-82	-497	756	262	-13929	10168	213	-33	-2519	-18	0
.Input coefficients	376	88	-2158	1953	1454	-663	702	873	-8271	9731	217	-22	-2515	194	0
..Domestic share matrix	-290	-122	3482	-368	-1536	166	53	-610	-5658	438	-3	-11	-4	-211	0
..Energy	-5	-151	-148	-376	-24	-56	-9	-54	-30	-117	-1	-4	-0	-11	0
..Materials	-269	32	3803	28	-1331	350	44	219	85	373	3	9	-4	37	0
...Outsourcing	-2201	-35	-4299	-53	-1457	-548	-62	-431	-123	-550	-5	-10	-28	-83	0
...Insourcing	1932	67	8103	82	126	897	105	650	208	923	8	19	24	120	0
..Services	-16	-3	-173	-20	-181	-128	19	-775	-5712	181	-5	-16	1	-238	0
...Outsourcing	-53	-6	-369	-37	-281	-762	-322	-1099	-7118	-2524	-11	-41	-6	-397	0
...Insourcing	37	2	196	17	100	634	341	324	1406	2705	5	25	7	159	0
Final demand	3103	216	7664	1356	2425	-1549	7461	4863	9734	3397	-5319	3366	16429	1011	87
.Final domestic demand	501	-72	4542	317	1247	-3284	7119	243	4800	1525	-5589	3315	16384	730	87
.Final export demand	2602	288	3122	1038	1179	1735	342	4621	4935	1872	270	52	45	281	0
Total	3311	-218	-15084	-3403	-4223	4396	520	-3570	-2628	11835	1759	7405	9082	628	411

Table 5: Absolute average change per year by CPA 1-digit

it was imports of services in the financial sector. The positive employment effect in the transport sector was caused by an increase in the share of domestic service activities.

In the second subperiod the trends are again somewhat different: The manufacturing sector (D) now shows positive effects (mainly due to insourcing of material inputs) whereas the transport sector (I) now turns to negative employment effects due to outsourcing. The employment losses in financial intermediation (J) become even larger in this subperiod.

4.4 Results by educational intensity of using products

In this section we summarize the results by aggregating the employment effects according to the educational intensities of products. For this we apply the taxonomy provided in Peneder (2007). Products are ranked according to educational intensities and grouped into seven categories. The results are presented in Tables 6 and 7 in relative and absolute terms (average per year), respectively. We again focus on the effects of outsourcing, i.e. the changes in the domestic share matrix, in the discussion below. In relative terms (Table 6) the most important negative effects are found in the high educational intensive products [2] with -1.18 and -1.52 per cent in the first and second subperiods, respectively. The second strongest effect is found in the low educational intensive industry [6], but this effect is much lower, with -0.52 per cent. It is further interesting to note that the average annual effects became stronger in the period 2000-2003 compared to the period 1995-2000 in the more educational intensive products (groups [1] and [2]) whereas in the other product classes the employment effects became less severe or even turned positive. With respect to the components of changes in the domestic share matrix, it is striking that in the high educational intensive product groups outsourcing of service activities mainly contributes to the negative employment effect whereas for the less educational intensive groups outsourcing of material inputs is the most important factor. This corresponds to the results above, as service activities are clas-

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	[1]	[2]	[3]	[4]	[5]	[6]	[7]
				1995-2000			
Labour input coefficients	-3.96	-1.48	0.23	-3.73	-3.16	-3.08	-10.11
Domestic Leontief inverse	0.18	0.19	0.44	0.50	-0.04	-0.28	-0.61
.Input coefficients	0.33	1.37	0.60	0.44	0.08	0.19	-0.40
.Domestic share matrix	-0.16	-1.18	-0.16	0.06	-0.12	-0.47	-0.21
..Energy	-0.00	-0.02	-0.01	-0.07	-0.01	-0.01	-0.00
..Materials	-0.03	-0.17	-0.07	-0.16	-0.17	-0.46	-0.20
...Outsourcing	-0.05	-0.29	-0.17	-0.39	-0.27	-0.58	-0.75
...Insourcing	0.02	0.12	0.10	0.24	0.09	0.12	0.55
..Services	-0.12	-0.99	-0.08	0.29	0.06	-0.01	-0.01
...Outsourcing	-0.16	-1.45	-0.15	-0.12	-0.03	-0.03	-0.04
...Insourcing	0.03	0.45	0.07	0.41	0.09	0.02	0.02
Final demand	2.49	6.84	2.20	5.45	3.35	1.93	2.06
.Final domestic demand	1.85	1.06	1.35	1.28	1.52	0.30	0.99
.Final export demand	0.64	5.79	0.85	4.17	1.83	1.63	1.07
Total	-1.30	5.55	2.87	2.23	0.16	-1.43	-8.66
				2000-2003			
Labour input coefficients	2.93	1.39	-0.35	-3.83	-0.05	-2.84	-2.31
Domestic Leontief inverse	0.26	-1.95	-0.15	1.58	-1.08	0.12	-0.16
.Input coefficients	0.52	-0.43	-0.18	1.35	-1.21	0.32	0.05
.Domestic share matrix	-0.27	-1.52	0.04	0.23	0.13	-0.20	-0.21
..Energy	-0.01	-0.04	-0.01	-0.12	-0.01	-0.01	-0.00
..Materials	0.04	0.12	0.11	0.45	0.26	-0.15	-0.20
...Outsourcing	-0.04	-0.19	-0.07	-0.22	-0.15	-0.57	-0.73
...Insourcing	0.07	0.32	0.19	0.66	0.41	0.42	0.53
..Services	-0.29	-1.61	-0.07	-0.10	-0.13	-0.04	-0.00
...Outsourcing	-0.35	-2.99	-0.11	-0.27	-0.16	-0.07	-0.09
...Insourcing	0.06	1.39	0.04	0.17	0.03	0.03	0.09
Final demand	2.26	3.47	1.70	1.12	0.31	1.11	2.58
.Final domestic demand	1.81	1.57	1.70	0.34	-0.34	0.28	1.81
.Final export demand	0.45	1.90	0.00	0.78	0.65	0.83	0.76
Total	5.44	2.91	1.21	-1.12	-0.82	-1.61	0.11

Note: 1 = very high; 2 = high; 3=med-high; 4 = intermediate; 5 = med-low; 6 = low;
    7 = very low; see Peneder (2007).

Table 6: Relative average change per year in per cent by educational intensity

sified as higher educational intensive than, for example, manufacturing activities (see Peneder, 2007). With respect to absolute magnitudes (see Table 7), however, one can see that in the first subperiod 1995-2000 the effects in the less educational intensive products were stronger (about -5000 FTE in categories (6) and (7) compared to -2900 FTE in the two most educational intensive product groups). In the second subperiod this pattern was turned around with negative effects of about -4500 FTE in the first two most educational intensive and only -2000 FTE in the least educational intensive product categories. Further, there were positive effects of more than 2000 FTE in the medium educational intensive categories.

5   Conclusions

In this paper we argued that input-output analysis can contribute additional insights in the discussion on the employment effects of international outsourcing of products and services. Compared to the literature which relies on regressing a measure of employment change on a measure of outsourcing, input-output analysis is able to provide insights into direct and indirect effects of outsourcing and to trace employment changes to outsourcing strategies of particular products (or industries).

The main contribution of this paper is to investigate the employment effects of outsourcing in an input-output framework by decomposing the effects introducing a domestic share matrix and tracing the changes in employment levels and patterns to inputs of energy, materials and service products. Further, we paid attention to the educational intensities of the imported intermediate products as well as the using products. Finally, employment effects can also be differentiated by groups of workers according to educational attainment categories.

Let us, however, also mention some caveats of the approach. The main limitation probably is that the decomposition approach taken here does not take into account induced effects of outsourcing due to increased cost competitiveness or changes in relative prices. Whereas the first aspect means that the employment

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
				1995-2000			
Labour input coefficients	-9532	-3188	1617	-18740	-16237	-19645	-80702
Domestic Leontief inverse	422	410	3060	2520	-202	-1808	-4869
.Input coefficients	799	2955	4142	2235	404	1189	-3161
.Domestic share matrix	-376	-2545	-1082	285	-606	-2997	-1708
..Energy	-9	-44	-77	-371	-50	-35	-17
..Materials	-72	-363	-484	-784	-882	-2916	-1593
...Outsourcing	-112	-615	-1211	-1978	-1369	-3679	-6003
...Insourcing	40	252	727	1195	487	763	4410
..Services	-295	-2137	-521	1440	326	-46	-98
...Outsourcing	-373	-3112	-1008	-607	-151	-178	-289
...Insourcing	78	976	487	2047	477	132	191
Final demand	5992	14729	15224	27421	17246	12312	16422
.Final domestic demand	4445	2273	9329	6443	7828	1896	7887
.Final export demand	1548	12456	5896	20978	9418	10416	8535
Total	-3117	11951	19901	11201	806	-9141	-69148
				2000-2003			
Labour input coefficients	6584	3834	-2772	-21399	-280	-16808	-10469
Domestic Leontief inverse	578	-5370	-1169	8838	-5581	693	-706
.Input coefficients	1178	-1182	-1448	7531	-6250	1892	237
.Domestic share matrix	-600	-4188	279	1307	669	-1199	-943
..Energy	-22	-114	-86	-643	-43	-60	-18
..Materials	83	339	898	2501	1367	-890	-919
...Outsourcing	-80	-533	-587	-1208	-767	-3402	-3309
...Insourcing	162	872	1486	3709	2134	2512	2390
..Services	-660	-4413	-534	-551	-655	-249	-6
...Outsourcing	-789	-8228	-855	-1517	-819	-426	-392
...Insourcing	129	3815	322	966	164	177	386
Final demand	5076	9534	13518	6284	1587	6580	11666
.Final domestic demand	4072	4318	13485	1919	-1786	1646	8211
.Final export demand	1004	5216	33	4365	3373	4934	3455
Total	12238	7999	9578	-6278	-4274	-9535	491

Note: 1 = very high; 2 = high; 3=med-high; 4 = intermediate; 5 = med-low; 6 = low; 7 = very low;

see Peneder (2007).

Table 7: Absolute average change per year by educational intensity

effects of outsourcing could be overestimated (as higher competitiveness means more sales and thus higher output and employment), the implied employment effects of relative price changes are unclear. Second, while we have accounted for changes in the imports of intermediate inputs and the exports of final goods, we could not calculate employment effects of exports of intermediates and imports of final goods separately mainly due to data constraints. Still, one should note that exports of intermediates are included in total exports and changes in final demand imports are reflected in domestic demand for final products. Additional to these challenges a comparative analysis including more countries would be an interesting way forward in future research.

A Notation

We define the following vectors (all of length n):

$\mathbf{q} = (q_i)$ production

$\mathbf{m} = (m_i)$ imports

$\mathbf{f} = (f_i)$ final demand (including consumption, capital formation and exports)

$\mathbf{c} = (c_i)$ final consumption

$\mathbf{g} = (g_i)$ gross capital formation

$\mathbf{h} = (h_i)$ final demand, excluding exports

$\mathbf{x} = (x_i)$ exports

$\mathbf{z} = (z_i)$ intermediate demand

$\mathbf{p} = (p_i)$ intermediate demand for domestic goods

For final demand and its categories we make a distinction between domestic and import variables. E.g., we denote by $\mathbf{f}_d$ the final demand for domestic goods and by $\mathbf{m}_f$ the imports into final demand, correspondingly for the categories of final demand. $\mathbf{m}_p$ denotes intermediate demand for imported goods. The following relationships hold:

$$\mathbf{f} = \mathbf{c} + \mathbf{g} + \mathbf{x} = \mathbf{h} + \mathbf{x}$$

$$\mathbf{q} = \mathbf{p} + \mathbf{f}_d$$

$$\mathbf{z} = \mathbf{p} + \mathbf{m}_p$$

$$\mathbf{f} = \mathbf{f}_d + \mathbf{m}_f$$

$$\mathbf{m} = \mathbf{m}_f + \mathbf{m}_p$$

We define the following matrices in the conventional way:

$\mathbf{Z} = (z_{ij})$ matrix of intermediate input flows

$\mathbf{P} = (p_{ij})$ matrix of intermediate input flows of domestic goods

$\mathbf{M} = (m_{ij})$ matrix of intermediate imports

$\mathbf{A} = (a_{ij}) = (z_{ij}/q_j)$ matrix of technical input coefficients

$\mathbf{A}_d = (a_{ij}^d) = (p_{ij}/q_j)$ matrix of domestic input coefficients

$\mathbf{A}_m = (a_{ij}^m) = (m_{ij}/q_j)$ matrix of import input coefficients

$\mathbf{L} = (\mathbf{I} - \mathbf{A})^{-1} = (l_{ij})$ Leontief inverse matrix

$\mathbf{L}_d = (\mathbf{I} - \mathbf{A}_d)^{-1} = (l_{ij}^d)$ Leontief inverse matrix for domestic production

$\mathbf{D}_A = (a_{ij}^d/a_{ij}) = (p_{ij}/z_{ij})$ domestic share matrix

B   Correspondences

CPA	Description
AtB	Agriculture, hunting and forestry
C	Mining and quarrying
D	Manufacturing
E	Electricity, gas and water supply
F	Construction
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants
I	Transport, storage and communication
J	Financial intermediation
K	Real estate, renting and business activities
L	Public administration and defence; compulsory social security
M	Education
N	Health and social work
O	Other community, social and personal service activities
P	Private households with employed persons

Table B.1: List of 1 digit CPA

CPA	Description	1-digit	Taxonomy[1]	EMS[2]
01	Products of agriculture, hunting, forestry. Fishing	AtB	7	M
10	Coal and lignite; peat	C	4	E
11	Crude petroleum, natural gas, metal ores	C	4	E
14	Other mining and quarrying products	C	4	M
15	Food products and beverages	D	6	M
16	Tobacco products	D	6	M
17	Textiles	D	7	M
18	Wearing apparel; furs	D	7	M
19	Leather and leather products	D	7	M
20	Wood and products of wood	D	7	M
21	Pulp, paper and paper products	D	4	M
22	Printed matter and recorded media	D	4	M
23	Coke, refined petroleum products	D	3	E
24	Chemicals, chemical products	D	3	M
25	Rubber and plastic products	D	5	M
26	Other non-metallic mineral products	D	6	M
27	Basic metals	D	6	M
28	Fabricated metal products	D	6	M
29	Machinery and equipment n.e.c.	D	4	M
30	Office machinery and computers	D	2	M
31	Electrical machinery and apparatus	D	4	M
32	Radio, TV and communication equipment	D	3	M
33	Med., precision, opt. instruments; watches, clocks	D	3	M
34	Motor vehicles, trailers and semi-trailers	D	4	M
35	Other transport equipment	D	3	M
36	Furniture; other manufactured goods n.e.c.	D	5	M
37	Recovered secondary raw materials	D	5	M
40	Electrical energy, gas, steam and hot water	E	4	E
41	Water; distribution services of water	E	4	M
45	Construction work	F	6	M
50	Trade and repair services of motor vehicles etc.	G	6	S
51	Wholesale and comm. trade serv., ex. of motor vehicles	G	4	S
52	Retail trade serv., repair serv., exept of motor vehicles	G	5	S
55	Hotel and restaurant services	H	7	S
60	Land transport and transport via pipeline services	I	5	S
61	Water transport services	I	5	S
62	Air transport services	I	3	S
63	Supporting transport services; travel agency services	I	4	S
64	Post and telecommunication services	I	4	S
65	Financial intermediation services (ex. insurance serv.)	J	2	S
66	Insurance and pension funding services	J	3	S
67	Services auxiliary to financial intermediation	J	3	S
70	Real estate services	K	4	S
71	Renting services of machinery and equipment	K	4	S
72	Computer and related services	K	1	S
73	Research and development services	K	1	S
74	Other business services	K	2	S
75	Public administration services etc.	L	3	S
80	Education services	M	1	S
85	Health and social work services	N	3	S
90	Sewage and refuse disposal services etc.	O	3	S
91	Membership organisation services n.e.c.	O	3	S
92	Recreational, cultural and sporting services	O	3	S
93	Other services	O	3	S
95	Private households with employed persons	P	7	S

Notes:
[1] 1 = very high; 2 = high; 3=med-high; 4 = intermediate; 5 = med-low; 6 = low; 7 = very low; see Peneder (2007).
[2] Energy, Materials and Services; see Timmer et al. (2007).

Table B.2: Correspondences

C Tables

CPA	$\mathbf{b}$	$\mathbf{L}_d$	$\mathbf{A}$	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	-342028	-19051	-13255	-5796	-42	-5651	-104	38993	12687	26306	-322086
10	-302	-525	-270	-255	-240	-15	0	498	403	96	-329
11	-973	664	1200	-535	-497	-40	1	322	77	245	14
14	-413	743	861	-118	-2	-116	-1	569	68	501	899
15	-27982	-7156	-2807	-4348	-12	-4290	-46	-1938	-16699	14760	-37076
16	-348	0	0	0	0	0	0	218	86	132	-130
17	-6524	-1375	-823	-552	-2	-549	-2	3190	1075	2115	-4708
18	-8077	100	-45	145	-4	126	23	-228	427	-655	-8205
19	-3498	220	-61	281	-0	283	-1	1162	-530	1692	-2117
20	-13430	-1688	232	-1920	-7	-1904	-9	9694	-251	9946	-5424
21	-4450	-1037	118	-1155	-3	-1131	-21	4412	546	3866	-1075
22	-14621	356	13	343	-18	464	-102	11914	3649	8266	-2351
23	-1911	17	368	-351	-313	-41	3	569	228	341	-1325
24	-9115	-1541	94	-1635	-13	-1619	-2	8840	289	8552	-1816
25	-2648	-901	406	-1307	-10	-1306	8	7652	165	7486	4103
26	-4019	-1846	-1	-1846	-7	-1834	-5	3615	-1149	4764	-2251
27	-3879	-5564	-1158	-4406	-5	-4402	1	10839	328	10512	1397
28	-19140	-1534	-649	-885	-69	-839	23	15999	2131	13868	-4675
29	-14419	2399	638	1761	-73	1820	13	17505	-4616	22121	5485
30	-1468	34	29	4	-0	3	1	1787	81	1706	353
31	-18156	-1986	1105	-3091	-26	-3104	39	12532	-215	12747	-7610
32	-8037	-1454	1183	-2637	-1	-2774	138	5520	-1230	6750	-3972
33	-3085	2511	207	2304	-2	2301	5	1173	-1103	2277	600
34	-8878	585	81	503	-0	503	0	13708	227	13481	5414
35	-603	140	-33	173	-0	168	5	1635	-656	2291	1172
36	-12268	-1089	-49	-1040	-5	-1038	3	9391	450	8941	-3966
37	-1070	743	661	83	-0	83	0	281	6	275	-46
40	-5486	-4467	-3325	-1142	-757	-371	-14	5037	2019	3018	-4916
41	1489	-397	-366	-31	-2	-21	-8	608	408	201	1700
45	-39023	2846	6172	-3326	-58	-3049	-219	31606	22486	9120	-4571
50	-3832	4213	4389	-176	-26	-166	15	1221	2298	-1077	1601
51	-26873	1069	1959	-889	-159	-1414	684	36925	8036	28889	11121
52	-27724	266	-231	497	-35	-306	837	38135	33646	4489	10677
55	-31982	-2548	-1853	-695	-29	-271	-396	29233	25962	3270	-5297
60	-37301	7	1271	-1264	-200	-1839	774	30791	4937	25855	-6503
61	-175	-38	-40	2	-1	-5	7	-20	-61	41	-233
62	-1090	436	353	83	-4	-29	116	2451	1861	590	1798
63	-2290	-333	42	-375	-28	-113	-234	6224	3967	2257	3601
64	-15260	14116	6886	7230	-25	-203	7458	17711	11113	6598	16567
65	-17645	-17854	-5353	-12502	-51	-528	-11922	34359	4832	29527	-1140
66	-5748	-399	851	-1250	-12	-77	-1161	4377	2013	2364	-1770
67	-2116	1767	2246	-479	-3	-24	-451	1467	448	1019	1118
70	16179	195	332	-137	-14	-65	-58	6606	5608	998	22980
71	754	1219	1902	-683	-12	-113	-558	2531	925	1607	4504
72	20	3273	3681	-408	-30	-249	-129	12248	8312	3937	15541
73	-2291	-1448	-97	-1350	-9	-45	-1296	3067	-1	3068	-672
74	3172	19870	20096	-226	-171	-1292	1237	37500	6454	31046	60542
75	4968	3034	1517	1517	-0	-5	1522	13066	12953	113	21067
80	-45386	286	409	-123	-7	-65	-51	14647	13913	734	-30453
85	36750	11324	11296	27	-1	-51	80	12208	11939	269	60282
90	852	-1646	-1396	-250	-19	-158	-73	4418	2810	1608	3623
91	204	-143	-91	-53	-3	-33	-17	3992	3558	434	4052
92	-891	633	3478	-2845	-9	-56	-2781	10313	7659	2654	10055
93	-2095	625	638	-13	-2	-19	8	6094	5875	219	4623
95	2030	0	0	0	0	0	0	67	67	0	2097

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.1: Absolute changes, 1995-2000

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	-68406	-3810	-2651	-1159	-8	-1130	-21	7799	2537	5261	-64417
10	-60	-105	-54	-51	-48	-3	0	100	81	19	-66
11	-195	133	240	-107	-99	-8	0	64	15	49	3
14	-83	149	172	-24	-0	-23	-0	114	14	100	180
15	-5596	-1431	-561	-870	-2	-858	-9	-388	-3340	2952	-7415
16	-70	0	0	0	0	0	0	44	17	26	-26
17	-1305	-275	-165	-110	-0	-110	-0	638	215	423	-942
18	-1615	20	-9	29	-1	25	5	-46	85	-131	-1641
19	-700	44	-12	56	-0	57	-0	232	-106	338	-423
20	-2686	-338	46	-384	-1	-381	-2	1939	-50	1989	-1085
21	-890	-207	24	-231	-1	-226	-4	882	109	773	-215
22	-2924	71	3	69	-4	93	-20	2383	730	1653	-470
23	-382	3	74	-70	-63	-8	1	114	46	68	-265
24	-1823	-308	19	-327	-3	-324	-0	1768	58	1710	-363
25	-530	-180	81	-261	-2	-261	2	1530	33	1497	821
26	-804	-369	-0	-369	-1	-367	-1	723	-230	953	-450
27	-776	-1113	-232	-881	-1	-880	0	2168	66	2102	279
28	-3828	-307	-130	-177	-14	-168	5	3200	426	2774	-935
29	-2884	480	128	352	-15	364	3	3501	-923	4424	1097
30	-294	7	6	1	-0	1	0	357	16	341	71
31	-3631	-397	221	-618	-5	-621	8	2506	-43	2549	-1522
32	-1607	-291	237	-527	-0	-555	28	1104	-246	1350	-794
33	-617	502	41	461	-0	460	1	235	-221	455	120
34	-1776	117	16	101	-0	101	0	2742	45	2696	1083
35	-121	28	-7	35	-0	34	1	327	-131	458	234
36	-2454	-218	-10	-208	-1	-208	1	1878	90	1788	-793
37	-214	149	132	17	-0	17	0	56	1	55	-9
40	-1097	-893	-665	-228	-151	-74	-3	1007	404	604	-983
41	298	-79	-73	-6	-0	-4	-2	122	82	40	340
45	-7805	569	1234	-665	-12	-610	-44	6321	4497	1824	-914
50	-766	843	878	-35	-5	-33	3	244	460	-215	320
51	-5375	214	392	-178	-32	-283	137	7385	1607	5778	2224
52	-5545	53	-46	99	-7	-61	167	7627	6729	898	2135
55	-6396	-510	-371	-139	-6	-54	-79	5847	5192	654	-1059
60	-7460	1	254	-253	-40	-368	155	6158	987	5171	-1301
61	-35	-8	-8	0	-0	-1	1	-4	-12	8	-47
62	-218	87	71	17	-1	-6	23	490	372	118	360
63	-458	-67	8	-75	-6	-23	-47	1245	793	451	720
64	-3052	2823	1377	1446	-5	-41	1492	3542	2223	1320	3313
65	-3529	-3571	-1071	-2500	-10	-106	-2384	6872	966	5905	-228
66	-1150	-80	170	-250	-2	-15	-232	875	403	473	-354
67	-423	353	449	-96	-1	-5	-90	293	90	204	224
70	3236	39	66	-27	-3	-13	-12	1321	1122	200	4596
71	151	244	380	-137	-2	-23	-112	506	185	321	901
72	4	655	736	-82	-6	-50	-26	2450	1662	787	3108
73	-458	-290	-19	-270	-2	-9	-259	613	-0	614	-134
74	634	3974	4019	-45	-34	-258	247	7500	1291	6209	12108
75	994	607	303	303	-0	-1	304	2613	2591	23	4213
80	-9077	57	82	-25	-1	-13	-10	2929	2783	147	-6091
85	7350	2265	2259	5	-0	-10	16	2442	2388	54	12056
90	170	-329	-279	-50	-4	-32	-15	884	562	322	725
91	41	-29	-18	-11	-1	-7	-3	798	712	87	810
92	-178	127	696	-569	-2	-11	-556	2063	1532	531	2011
93	-419	125	128	-3	-0	-4	2	1219	1175	44	925
95	406	0	0	0	0	0	0	13	13	0	419

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.2: Absolute changes per year, 1995-2000

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	-14.36	-0.80	-0.56	-0.24	-0.00	-0.24	-0.00	1.64	0.53	1.10	-13.53
10	-9.24	-16.09	-8.28	-7.81	-7.36	-0.47	0.01	15.26	12.34	2.93	-10.08
11	-12.78	8.73	15.77	-7.04	-6.53	-0.52	0.01	4.24	1.01	3.22	0.18
14	-1.72	3.09	3.58	-0.49	-0.01	-0.48	-0.00	2.37	0.28	2.09	3.74
15	-3.90	-1.00	-0.39	-0.61	-0.00	-0.60	-0.01	-0.27	-2.32	2.05	-5.16
16	-7.74	0.00	0.00	0.00	0.00	0.00	0.00	4.85	1.90	2.94	-2.89
17	-5.54	-1.17	-0.70	-0.47	-0.00	-0.47	-0.00	2.71	0.91	1.80	-4.00
18	-7.46	0.09	-0.04	0.13	-0.00	0.12	0.02	-0.21	0.39	-0.61	-7.58
19	-8.08	0.51	-0.14	0.65	-0.00	0.65	-0.00	2.68	-1.22	3.91	-4.89
20	-6.20	-0.78	0.11	-0.89	-0.00	-0.88	-0.00	4.48	-0.12	4.59	-2.51
21	-4.98	-1.16	0.13	-1.29	-0.00	-1.27	-0.02	4.94	0.61	4.33	-1.20
22	-9.10	0.22	0.01	0.21	-0.01	0.29	-0.06	7.41	2.27	5.14	-1.46
23	-14.98	0.13	2.88	-2.75	-2.45	-0.32	0.02	4.46	1.79	2.67	-10.39
24	-7.52	-1.27	0.08	-1.35	-0.01	-1.34	-0.00	7.30	0.24	7.06	-1.50
25	-2.15	-0.73	0.33	-1.06	-0.01	-1.06	0.01	6.20	0.13	6.07	3.33
26	-2.17	-0.99	-0.00	-0.99	-0.00	-0.99	-0.00	1.95	-0.62	2.57	-1.21
27	-2.66	-3.81	-0.79	-3.02	-0.00	-3.01	0.00	7.42	0.22	7.20	0.96
28	-5.71	-0.46	-0.19	-0.26	-0.02	-0.25	0.01	4.78	0.64	4.14	-1.40
29	-3.94	0.65	0.17	0.48	-0.02	0.50	0.00	4.78	-1.26	6.04	1.50
30	-64.37	1.48	1.29	0.19	-0.00	0.15	0.04	78.37	3.54	74.83	15.48
31	-9.12	-1.00	0.55	-1.55	-0.01	-1.56	0.02	6.29	-0.11	6.40	-3.82
32	-7.40	-1.34	1.09	-2.43	-0.00	-2.56	0.13	5.08	-1.13	6.22	-3.66
33	-3.88	3.16	0.26	2.90	-0.00	2.90	0.01	1.48	-1.39	2.87	0.76
34	-8.63	0.57	0.08	0.49	-0.00	0.49	0.00	13.32	0.22	13.10	5.26
35	-2.52	0.58	-0.14	0.72	-0.00	0.70	0.02	6.84	-2.74	9.58	4.90
36	-4.38	-0.39	-0.02	-0.37	-0.00	-0.37	0.00	3.36	0.16	3.20	-1.42
37	-24.64	17.11	15.21	1.90	-0.00	1.90	0.00	6.47	0.14	6.33	-1.06
40	-3.53	-2.87	-2.14	-0.73	-0.49	-0.24	-0.01	3.24	1.30	1.94	-3.16
41	11.21	-2.99	-2.76	-0.24	-0.02	-0.16	-0.06	4.58	3.07	1.51	12.80
45	-2.70	0.20	0.43	-0.23	-0.00	-0.21	-0.02	2.19	1.56	0.63	-0.32
50	-1.08	1.19	1.24	-0.05	-0.01	-0.05	0.00	0.34	0.65	-0.30	0.45
51	-3.13	0.12	0.23	-0.10	-0.02	-0.16	0.08	4.30	0.94	3.36	1.29
52	-1.96	0.02	-0.02	0.04	-0.00	-0.02	0.06	2.69	2.38	0.32	0.75
55	-2.89	-0.23	-0.17	-0.06	-0.00	-0.02	-0.04	2.64	2.35	0.30	-0.48
60	-5.00	0.00	0.17	-0.17	-0.03	-0.25	0.10	4.13	0.66	3.47	-0.87
61	-6.24	-1.35	-1.41	0.05	-0.03	-0.18	0.26	-0.70	-2.17	1.47	-8.29
62	-4.03	1.61	1.31	0.31	-0.01	-0.11	0.43	9.06	6.88	2.18	6.64
63	-1.76	-0.26	0.03	-0.29	-0.02	-0.09	-0.18	4.78	3.05	1.73	2.77
64	-6.62	6.12	2.99	3.14	-0.01	-0.09	3.24	7.68	4.82	2.86	7.19
65	-4.77	-4.83	-1.45	-3.38	-0.01	-0.14	-3.23	9.30	1.31	7.99	-0.31
66	-3.68	-0.26	0.54	-0.80	-0.01	-0.05	-0.74	2.80	1.29	1.51	-1.13
67	-6.86	5.73	7.28	-1.55	-0.01	-0.08	-1.46	4.75	1.45	3.30	3.62
70	13.58	0.16	0.28	-0.11	-0.01	-0.05	-0.05	5.55	4.71	0.84	19.29
71	1.44	2.32	3.62	-1.30	-0.02	-0.22	-1.06	4.82	1.76	3.06	8.58
72	0.02	3.72	4.18	-0.46	-0.03	-0.28	-0.15	13.91	9.44	4.47	17.65
73	-6.88	-4.35	-0.29	-4.05	-0.03	-0.14	-3.89	9.21	-0.00	9.21	-2.02
74	0.45	2.82	2.85	-0.03	-0.02	-0.18	0.18	5.33	0.92	4.41	8.60
75	0.47	0.29	0.14	0.14	-0.00	-0.00	0.14	1.24	1.23	0.01	2.00
80	-4.20	0.03	0.04	-0.01	-0.00	-0.01	-0.00	1.35	1.29	0.07	-2.82
85	3.15	0.97	0.97	0.00	-0.00	-0.00	0.01	1.05	1.02	0.02	5.16
90	0.86	-1.66	-1.41	-0.25	-0.02	-0.16	-0.07	4.45	2.83	1.62	3.65
91	0.12	-0.08	-0.05	-0.03	-0.00	-0.02	-0.01	2.31	2.06	0.25	2.35
92	-0.44	0.31	1.70	-1.39	-0.00	-0.03	-1.36	5.05	3.75	1.30	4.92
93	-1.00	0.30	0.30	-0.01	-0.00	-0.01	0.00	2.91	2.81	0.10	2.21
95	10.98	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.36	0.00	11.34

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.3: Relative changes per year, 1995-2000

CPA	$\mathbf{b}$	$\mathbf{L}_d$	$\mathbf{A}$	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	364	258	1128	-869	-15	-807	-48	9310	1503	7807	9932
10	6	341	354	-13	-13	1	-1	-369	-442	73	-22
11	-395	-404	31	-436	-438	5	-3	666	65	600	-134
14	-810	-41	-123	82	-2	90	-7	351	162	189	-500
15	-17100	-6320	-2933	-3387	-6	-3351	-29	8749	441	8309	-14671
16	-33	20	4	17	0	17	0	82	-205	287	69
17	-2850	264	-348	611	-1	618	-5	-2242	-789	-1452	-4828
18	-1075	-1764	-379	-1384	-1	-1378	-5	268	267	1	-2571
19	-275	-469	164	-633	-0	-632	-1	578	83	496	-166
20	-5451	-2674	-1962	-712	-9	-688	-16	4440	1953	2486	-3686
21	1712	-1806	-1085	-721	-2	-682	-37	-79	-195	116	-173
22	-4745	130	432	-302	-15	-71	-217	1839	232	1607	-2776
23	70	-318	-129	-189	-189	2	-2	55	39	15	-193
24	311	340	-12	352	-9	372	-11	-72	985	-1057	579
25	-2413	3749	740	3009	-11	3050	-30	-2526	-382	-2144	-1190
26	-3659	2797	1641	1156	-7	1190	-27	-1408	-1489	81	-2270
27	-2209	295	-617	912	-4	922	-6	1997	403	1594	83
28	-7357	1233	-1005	2237	-63	2355	-54	5997	7251	-1253	-126
29	-6495	1915	-38	1953	-96	2068	-19	5848	4739	1109	1268
30	-460	-9	-7	-2	-0	-2	-0	417	354	63	-51
31	-7241	2660	-148	2808	-20	2852	-24	158	608	-449	-4423
32	3877	1024	-1	1025	-0	1026	-1	-6020	-780	-5240	-1120
33	-3957	1433	57	1376	-4	1380	-1	2816	2065	751	293
34	-4623	2041	82	1959	-1	1960	-1	18	215	-198	-2564
35	-3100	-241	2	-243	-0	-244	1	3229	814	2415	-112
36	-4821	-295	-882	586	-5	628	-36	-1184	-2984	1800	-6300
37	-323	-35	-53	18	-0	18	-0	31	2	29	-327
40	-18524	4579	5678	-1100	-1126	73	-46	3910	845	3064	-10036
41	-506	176	180	-4	-2	12	-14	158	106	51	-172
45	-19698	-246	4361	-4608	-72	-3992	-544	7276	3740	3536	-12669
50	-367	4299	4225	74	-29	189	-86	-2952	-5201	2249	980
51	-2910	17815	16266	1549	-124	922	751	572	-3032	3604	15477
52	22604	-23606	-22480	-1125	-16	-62	-1047	-2268	-1618	-649	-3269
55	-23090	2267	2107	160	-28	131	57	22384	21357	1027	1561
60	-15954	3447	3936	-489	-97	467	-859	10712	-375	11087	-1795
61	67	-2	-12	10	-0	1	9	-5	-2	-3	60
62	-1355	362	323	39	-3	15	28	208	137	71	-784
63	-722	420	1399	-979	-32	40	-987	1842	696	1146	1539
64	-8123	-3440	-3029	-411	-31	134	-514	1832	271	1561	-9730
65	13872	-42647	-26541	-16106	-77	219	-16248	25228	11781	13447	-3548
66	-7098	-568	-82	-485	-10	25	-500	2825	1942	883	-4841
67	-2074	1429	1810	-381	-4	11	-388	1150	677	474	505
70	-6570	2265	2336	-70	-18	51	-103	1126	793	332	-3179
71	-4251	-138	255	-394	-11	47	-430	980	692	288	-3410
72	6061	3180	3700	-520	-53	200	-667	2640	2280	361	11881
73	1477	-1349	-101	-1247	-3	21	-1265	2489	-9	2497	2617
74	-1909	26546	23003	3543	-266	800	3010	2958	819	2138	27595
75	20594	640	650	-10	-2	8	-15	-15956	-16766	810	5278
80	12214	-98	-65	-32	-11	26	-47	10099	9944	155	22215
85	-14487	-7556	-7544	-12	-1	-13	3	49288	49153	134	27245
90	-669	1184	1251	-67	-18	74	-123	933	591	341	1448
91	-2183	249	261	-12	-3	18	-27	-1410	-1489	79	-3344
92	3750	-1166	-621	-545	-8	7	-545	150	-254	404	2733
93	-1994	-319	-309	-10	-3	13	-21	3359	3340	19	1046
95	971	0	0	0	0	0	0	261	261	0	1232

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.4: Absolute changes, 2000-2003

CPA	$\mathbf{b}$	$\mathbf{L}_d$	$\mathbf{A}$	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	121	86	376	-290	-5	-269	-16	3103	501	2602	3311
10	2	114	118	-4	-4	0	-0	-123	-147	24	-7
11	-132	-135	10	-135	-146	2	-1	222	22	200	-45
14	-270	-14	-41	27	-1	30	-2	117	54	63	-167
15	-5700	-2107	-978	-1129	-2	-1117	-10	2916	147	2770	-4890
16	-11	7	1	6	0	6	0	27	-68	96	23
17	-950	88	-116	204	-0	206	-2	-747	-263	-484	-1609
18	-358	-588	-126	-461	-0	-459	-2	89	89	0	-857
19	-92	-156	55	-211	-0	-211	-0	193	28	165	-55
20	-1817	-891	-654	-237	-3	-229	-5	1480	651	829	-1229
21	571	-602	-362	-240	-1	-227	-12	-26	-65	39	-58
22	-1582	43	144	-101	-5	-24	-72	613	77	536	-925
23	23	-106	-43	-63	-63	1	-1	18	13	5	-64
24	104	113	-4	117	-3	124	-4	-24	328	-352	193
25	-804	1250	247	1003	-4	1017	-10	-842	-127	-715	-397
26	-1220	932	547	385	-2	397	-9	-469	-496	27	-757
27	-736	98	-206	304	-1	307	-2	666	134	531	28
28	-2452	411	-335	746	-21	785	-18	1999	2417	-418	-42
29	-2165	638	-13	651	-32	689	-6	1949	1580	370	423
30	-153	-3	-2	-1	-0	-1	-0	139	118	21	-17
31	-2414	887	-49	936	-7	951	-8	53	203	-150	-1474
32	1292	341	-0	342	-0	342	-0	-2007	-260	-1747	-373
33	-1319	478	19	459	-1	460	-0	939	688	250	98
34	-1541	680	27	653	-0	653	-0	6	72	-66	-855
35	-1033	-80	1	-81	-0	-81	0	1076	271	805	-37
36	-1607	-98	-294	195	-2	209	-12	-395	-995	600	-2100
37	-108	-12	-18	6	-0	6	-0	10	1	10	-109
40	-6175	1526	1893	-367	-375	24	-15	1303	282	1021	-3345
41	-169	59	60	-1	-1	4	-5	53	35	17	-57
45	-6566	-82	1454	-1536	-24	-1331	-181	2425	1247	1179	-4223
50	-122	1433	1408	25	-10	63	-29	-984	-1734	750	327
51	-970	5938	5422	516	-41	307	250	191	-1011	1201	5159
52	7535	-7869	-7493	-375	-5	-21	-349	-756	-539	-216	-1090
55	-7697	756	702	53	-9	44	19	7461	7119	342	520
60	-5318	1149	1312	-163	-32	156	-286	3571	-125	3696	-598
61	22	-1	-4	3	-0	0	3	-2	-1	-1	20
62	-452	121	108	13	-1	5	9	69	46	24	-261
63	-241	140	466	-326	-11	13	-329	614	232	382	513
64	-2708	-1147	-1010	-137	-10	45	-171	611	90	520	-3243
65	4624	-14216	-8847	-5369	-26	73	-5416	8409	3927	4482	-1183
66	-2366	-189	-27	-162	-3	8	-167	942	647	294	-1614
67	-691	476	603	-127	-1	4	-129	383	226	158	168
70	-2190	755	779	-23	-6	17	-34	375	264	111	-1060
71	-1417	-46	85	-131	-4	16	-143	327	231	96	-1137
72	2020	1060	1233	-173	-18	67	-222	880	760	120	3960
73	492	-450	-34	-416	-1	7	-422	830	-3	832	872
74	-636	8849	7668	1181	-89	267	1003	986	273	713	9198
75	6865	213	217	-3	-1	3	-5	-5319	-5589	270	1759
80	4071	-33	-22	-11	-4	9	-16	3366	3315	52	7405
85	-4829	-2519	-2515	-4	-0	-4	1	16429	16384	45	9082
90	-223	395	417	-22	-6	25	-41	311	197	114	483
91	-728	83	87	-4	-1	6	-9	-470	-496	26	-1115
92	1250	-389	-207	-182	-3	2	-182	50	-85	135	911
93	-665	-106	-103	-3	-1	4	-7	1120	1113	6	349
95	324	0	0	0	0	0	0	87	87	0	411

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.5: Absolute changes per year, 2000-2003

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,s}$	$\mathbf{D}_{A,m}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	0.08	0.06	0.24	-0.19	-0.00	-0.17	-0.01	2.01	0.33	1.69	2.15
10	0.64	35.12	36.47	-1.35	-1.31	0.06	-0.10	-37.99	-45.51	7.52	-2.23
11	-8.58	-8.78	0.68	-9.46	-9.51	0.11	-0.06	14.46	1.42	13.03	-2.90
14	-4.73	-0.24	-0.72	0.48	-0.01	0.53	-0.04	2.05	0.95	1.11	-2.92
15	-5.35	-1.98	-0.92	-1.06	-0.00	-1.05	-0.01	2.74	0.14	2.60	-4.59
16	-1.44	0.88	0.16	0.72	0.00	0.72	0.00	3.56	-8.88	12.43	3.00
17	-5.05	0.47	-0.62	1.08	-0.00	1.09	-0.01	-3.97	-1.40	-2.57	-8.55
18	-2.67	-4.37	-0.94	-3.43	-0.00	-3.42	-0.01	0.66	0.66	0.00	-6.38
19	-1.40	-2.39	0.84	-3.22	-0.00	-3.22	-0.00	2.95	0.42	2.52	-0.84
20	-4.80	-2.35	-1.73	-0.63	-0.01	-0.61	-0.01	3.91	1.72	2.19	-3.24
21	3.40	-3.59	-2.15	-1.43	-0.00	-1.36	-0.07	-0.16	-0.39	0.23	-0.34
22	-5.31	0.15	0.48	-0.34	-0.02	-0.08	-0.24	2.06	0.26	1.80	-3.11
23	1.91	-8.64	-3.51	-5.13	-5.14	0.06	-0.05	1.48	1.07	0.42	-5.24
24	0.46	0.51	-0.02	0.52	-0.01	0.55	-0.02	-0.11	1.46	-1.57	0.86
25	-2.79	4.34	0.86	3.48	-0.01	3.53	-0.04	-2.93	-0.44	-2.48	-1.38
26	-3.50	2.67	1.57	1.10	-0.01	1.14	-0.03	-1.35	-1.42	0.08	-2.17
27	-2.41	0.32	-0.67	0.99	-0.00	1.00	-0.01	2.17	0.44	1.74	0.09
28	-3.93	0.66	-0.54	1.20	-0.03	1.26	-0.03	3.21	3.88	-0.67	-0.07
29	-2.75	0.81	-0.02	0.83	-0.04	0.88	-0.01	2.48	2.01	0.47	0.54
30	-18.93	-0.35	-0.27	-0.08	-0.00	-0.08	-0.00	17.19	14.61	2.59	-2.10
31	-7.49	2.75	-0.15	2.91	-0.02	2.95	-0.02	0.16	0.63	-0.47	-4.58
32	7.28	1.92	-0.00	1.93	-0.00	1.93	-0.00	-11.31	-1.47	-9.85	-2.10
33	-8.00	2.90	0.12	2.78	-0.01	2.79	-0.00	5.69	4.18	1.52	0.59
34	-5.93	2.62	0.11	2.51	-0.00	2.51	-0.00	0.02	0.28	-0.25	-3.29
35	-17.35	-1.35	0.01	-1.36	-0.00	-1.36	0.01	18.08	4.56	13.52	-0.62
36	-3.09	-0.19	-0.57	0.38	-0.00	0.40	-0.02	-0.76	-1.91	1.15	-4.04
37	-13.09	-1.44	-2.15	0.71	-0.00	0.73	-0.01	1.27	0.08	1.18	-13.26
40	-23.57	5.83	7.22	-1.40	-1.43	0.09	-0.06	4.97	1.08	3.90	-12.77
41	-3.87	1.35	1.38	-0.03	-0.02	0.09	-0.11	1.21	0.81	0.39	-1.32
45	-2.31	-0.03	0.51	-0.54	-0.01	-0.47	-0.06	0.85	0.44	0.41	-1.49
50	-0.17	1.97	1.94	0.03	-0.01	0.09	-0.04	-1.36	-2.39	1.03	0.45
51	-0.53	3.25	2.96	0.28	-0.02	0.17	0.14	0.10	-0.55	0.66	2.82
52	2.57	-2.68	-2.55	-0.13	-0.00	-0.01	-0.12	-0.26	-0.18	-0.07	-0.37
55	-3.57	0.35	0.33	0.02	-0.00	0.02	0.01	3.46	3.30	0.16	0.24
60	-3.73	0.81	0.92	-0.11	-0.02	0.11	-0.20	2.50	-0.09	2.59	-0.42
61	6.76	-0.16	-1.17	1.01	-0.04	0.12	0.93	-0.53	-0.25	-0.29	6.07
62	-6.26	1.67	1.49	0.18	-0.02	0.07	0.13	0.96	0.63	0.33	-3.63
63	-0.81	0.47	1.57	-1.10	-0.04	0.04	-1.11	2.07	0.78	1.29	1.73
64	-4.32	-1.83	-1.61	-0.22	-0.02	0.07	-0.27	0.97	0.14	0.83	-5.18
65	6.35	-19.54	-12.16	-7.38	-0.04	0.10	-7.44	11.56	5.40	6.16	-1.63
66	-8.02	-0.64	-0.09	-0.55	-0.01	0.03	-0.57	3.19	2.20	1.00	-5.47
67	-9.48	6.53	8.28	-1.74	-0.02	0.05	-1.77	5.26	3.09	2.17	2.31
70	-4.68	1.61	1.66	-0.05	-0.01	0.04	-0.07	0.80	0.56	0.24	-2.26
71	-9.44	-0.31	0.57	-0.87	-0.02	0.11	-0.96	2.18	1.54	0.64	-7.57
72	6.09	3.20	3.72	-0.52	-0.05	0.20	-0.67	2.66	2.29	0.36	11.95
73	8.22	-7.51	-0.56	-6.94	-0.02	0.12	-7.04	13.85	-0.05	13.90	14.57
74	-0.32	4.39	3.81	0.59	-0.04	0.13	0.50	0.49	0.14	0.35	4.57
75	2.96	0.09	0.09	-0.00	-0.00	0.00	-0.00	-2.29	-2.41	0.12	0.76
80	2.19	-0.02	-0.01	-0.01	-0.00	0.00	-0.01	1.81	1.78	0.03	3.99
85	-1.64	-0.86	-0.86	-0.00	-0.00	-0.00	0.00	5.59	5.58	0.02	3.09
90	-0.95	1.68	1.78	-0.10	-0.03	0.10	-0.17	1.33	0.84	0.48	2.06
91	-1.89	0.22	0.23	-0.01	-0.00	0.02	-0.02	-1.22	-1.29	0.07	-2.89
92	2.46	-0.76	-0.41	-0.36	-0.01	0.00	-0.36	0.10	-0.17	0.26	1.79
93	-1.43	-0.23	-0.22	-0.01	-0.00	0.01	-0.01	2.41	2.39	0.01	0.75
95	5.59	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.50	0.00	7.09

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.6: Relative changes per year, 2000-2003

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	-39727	-1982	-1382	-600	-4	-585	-11	4042	1306	2737	-37667
10	-49	-25	-13	-12	-11	-1	0	25	20	5	-49
11	-131	26	46	-20	-18	-2	0	13	3	10	-92
14	-337	42	48	-6	-0	-6	-0	32	3	28	-263
15	-2401	-422	-166	-256	-1	-253	-3	-114	-986	871	-2937
16	-35	0	0	0	0	0	0	15	6	9	-20
17	-400	-162	-97	-65	-0	-65	-0	376	127	249	-187
18	-1050	9	-4	12	-0	11	2	-20	37	-56	-1061
19	-97	20	-6	26	-0	26	-0	106	-48	154	28
20	-439	-99	14	-113	-0	-112	-1	568	-15	583	30
21	-367	-58	7	-65	-0	-64	-1	249	31	218	-176
22	-1045	13	0	13	-1	17	-4	454	139	315	-578
23	34	0	5	-5	-5	-1	0	8	3	5	42
24	-573	-56	3	-59	-0	-58	-0	321	10	311	-308
25	-1293	-67	31	-97	-1	-97	1	576	13	563	-784
26	-400	-113	-0	-113	-0	-112	-0	222	-70	292	-292
27	-305	-258	-54	-204	-0	-204	0	505	15	490	-58
28	-1369	-70	-30	-40	-3	-38	1	737	98	639	-703
29	-916	88	23	65	-3	67	0	645	-170	815	-183
30	-40	1	1	0	-0	0	0	50	2	48	11
31	-1785	-118	66	-184	-2	-185	2	752	-13	764	-1151
32	-971	-68	55	-123	-0	-129	6	262	-59	321	-777
33	-340	102	8	94	-0	94	0	48	-45	93	-190
34	-619	19	3	16	-0	16	0	452	7	445	-148
35	-20	3	-1	4	-0	4	0	38	-15	53	21
36	-1435	-57	-2	-55	-0	-55	0	498	24	474	-994
37	6	15	13	2	-0	2	0	6	0	6	26
40	-370	-82	-61	-21	-14	-7	-0	95	38	57	-358
41	71	-4	-4	-0	-0	-0	-0	6	4	2	73
45	-1574	139	301	-162	-3	-149	-11	1541	1096	445	106
50	-1176	154	161	-6	-1	-6	1	44	84	-40	-977
51	-2470	33	61	-27	-5	-43	21	1139	248	892	-1298
52	-4106	11	-9	20	-1	-13	34	1566	1382	184	-2529
55	-4148	-169	-123	-46	-2	-18	-26	1941	1724	218	-2375
60	-2469	0	55	-55	-9	-80	34	1350	217	1134	-1119
61	33	-2	-2	0	-0	-0	0	-1	-2	2	31
62	-121	4	4	1	-0	-0	1	26	19	6	-91
63	-544	-15	2	-17	-1	-5	-11	292	186	106	-267
64	-1169	691	337	354	-1	-10	365	868	545	323	390
65	-1848	-313	-89	-224	-1	-10	-213	659	92	567	-1503
66	-699	-13	27	-39	-0	-2	-37	139	64	75	-572
67	-53	22	28	-6	-0	-0	-6	18	5	13	-13
70	376	15	25	-10	-1	-5	-4	501	425	76	892
71	-544	76	118	-42	-1	-7	-34	158	58	101	-310
72	-556	51	58	-6	-0	-4	-2	198	135	63	-307
73	-26	-41	-3	-38	-0	-1	-36	86	-0	86	19
74	-2233	705	713	-8	-6	-46	44	1335	229	1106	-193
75	-3983	95	47	47	-0	-0	48	411	408	3	-3477
80	-2438	5	7	-2	-0	-1	-1	244	231	12	-2189
85	-4349	439	438	1	-0	-2	3	473	463	10	-3437
90	-339	-111	-95	-17	-1	-11	-5	301	192	110	-149
91	-293	-3	-2	-1	-0	-1	-0	85	76	9	-211
92	-573	15	84	-69	-0	-1	-67	253	187	65	-305
93	-385	36	37	-1	-0	-1	0	351	338	13	1
95	177	0	0	0	0	0	0	8	8	0	185

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.7: Absolute changes per year for low educated, 1995-2000

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	-5224	34	150	-115	-2	-107	-6	1236	201	1036	-3953
10	0	0	0	0	0	0	0	0	0	0	0
11	0	0	-0	-0	-0	0	-0	0	0	0	0
14	162	-2	-7	5	-0	5	-0	21	10	11	181
15	-2697	-550	-255	-295	-1	-292	-3	763	39	724	-2484
16	14	2	0	2	0	2	0	9	-23	32	25
17	-910	54	-71	125	-0	126	-1	-458	-161	-297	-1314
18	-106	-215	-46	-169	-0	-168	-1	33	33	0	-289
19	-500	-69	24	-93	-0	-93	-0	85	12	73	-483
20	-685	-280	-205	-74	-1	-72	-2	464	204	260	-501
21	217	-162	-97	-65	-0	-61	-3	-7	-18	10	48
22	-604	6	18	-12	-1	-3	-9	75	10	65	-523
23	-18	-19	-8	-12	-12	0	-0	3	2	1	-34
24	389	20	-1	21	-1	22	-1	-4	57	-62	405
25	-286	331	65	266	-1	270	-3	-223	-34	-190	-178
26	-943	251	147	104	-1	107	-2	-126	-134	7	-818
27	-517	20	-42	62	-0	63	-0	136	28	109	-361
28	-460	86	-70	156	-4	165	-4	419	507	-88	46
29	-596	106	-2	108	-5	115	-1	324	263	61	-166
30	-9	-0	-0	-0	-0	-0	-0	23	20	4	14
31	-1042	190	-11	201	-1	204	-2	11	43	-32	-841
32	-149	40	-0	40	-0	40	-0	-234	-30	-203	-343
33	-121	85	3	81	-0	82	-0	167	122	44	131
34	123	98	4	94	-0	94	-0	1	10	-9	222
35	-99	-9	0	-10	-0	-10	0	127	32	95	18
36	-968	-20	-60	40	-0	43	-2	-81	-204	123	-1069
37	-10	-3	-4	1	-0	1	-0	3	0	2	-10
40	-479	97	120	-23	-24	2	-1	83	18	65	-300
41	-117	3	3	-0	-0	0	-0	3	2	1	-112
45	-6882	-17	318	-335	-5	-291	-39	531	273	258	-6368
50	1786	263	259	4	-2	12	-5	-181	-319	138	1868
51	-2210	671	612	58	-5	35	28	21	-115	136	-1519
52	4081	-1515	-1442	-72	-1	-4	-67	-146	-104	-42	2420
55	-2386	232	216	16	-3	13	6	2290	2185	105	136
60	-2586	215	246	-30	-6	29	-54	669	-23	692	-1702
61	-35	-0	-1	1	-0	0	1	-0	-0	-0	-35
62	44	2	2	0	-0	0	0	1	1	0	47
63	-1017	20	68	-47	-2	2	-48	90	34	56	-907
64	-1122	-241	-212	-29	-2	9	-36	129	19	110	-1234
65	632	-663	-413	-249	-1	3	-251	374	175	199	343
66	-408	-20	-3	-17	-0	1	-17	99	68	31	-329
67	21	29	37	-8	-0	0	-8	23	14	10	74
70	-735	248	256	-8	-2	6	-11	123	87	36	-364
71	-379	-9	16	-25	-1	3	-27	62	44	18	-326
72	166	33	38	-5	-1	2	-7	27	23	4	226
73	-243	-41	-3	-38	-0	1	-39	76	-0	76	-207
74	1935	1402	1215	187	-14	42	158	155	43	112	3492
75	-2094	20	20	-0	-0	0	-0	-494	-519	25	-2568
80	484	-2	-1	-1	-0	1	-1	207	204	3	689
85	-2015	-344	-343	-1	-0	-1	0	2241	2235	6	-118
90	-701	101	107	-6	-2	6	-10	80	51	29	-519
91	-387	6	6	-0	-0	0	-1	-34	-36	2	-415
92	535	-41	-22	-19	-0	0	-19	5	-9	14	500
93	-446	-28	-27	-1	-0	1	-2	295	294	2	-179
95	-11	0	0	0	0	0	0	44	44	0	33

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.8: Absolute changes per year for low educated, 2000-2003

CPA	$\mathbf{b}$	$\mathbf{L}_d$	$\mathbf{A}$	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	-30510	-1732	-1205	-527	-4	-514	-9	3547	1155	2391	-28695
10	40	-53	-27	-26	-24	-2	0	48	40	9	35
11	-116	93	169	-76	-70	-6	0	45	11	34	23
14	109	96	111	-15	-0	-15	-0	74	9	65	279
15	-5418	-915	-359	-556	-2	-549	-6	-247	-2138	1890	-6581
16	-34	0	0	0	0	0	0	29	11	17	-6
17	-971	-103	-62	-42	-0	-41	-0	240	81	159	-834
18	-774	10	-4	14	-0	12	2	-23	42	-65	-787
19	-705	22	-6	28	-0	28	-0	115	-52	167	-568
20	-2600	-229	31	-260	-1	-258	-1	1318	-34	1352	-1510
21	-539	-138	16	-154	-0	-150	-3	586	73	514	-91
22	-1854	51	2	49	-3	67	-15	1709	523	1186	-94
23	-129	2	40	-38	-34	-4	0	62	25	37	-66
24	-1459	-217	13	-230	-2	-228	-0	1244	41	1204	-431
25	333	-105	47	-152	-1	-151	1	883	19	864	1111
26	-732	-236	-0	-236	-1	-234	-1	462	-147	609	-505
27	-589	-787	-164	-623	-1	-623	0	1534	46	1488	158
28	-3416	-214	-91	-124	-10	-117	3	2242	298	1943	-1388
29	-3301	354	94	260	-11	269	2	2590	-683	3274	-356
30	-275	5	5	1	-0	1	0	291	13	278	22
31	-1643	-243	135	-378	-3	-380	5	1530	-26	1556	-356
32	-697	-174	142	-315	-0	-331	16	657	-146	804	-214
33	-476	336	28	309	-0	308	1	157	-148	305	18
34	-1648	88	12	76	-0	76	0	2076	34	2042	517
35	-146	24	-6	29	-0	28	1	278	-111	389	155
36	-2147	-147	-7	-140	-1	-140	0	1268	61	1207	-1026
37	-220	134	119	15	-0	15	0	50	1	49	-36
40	-1418	-687	-512	-176	-117	-57	-2	779	312	467	-1327
41	205	-60	-55	-5	-0	-3	-1	92	62	30	237
45	-9713	402	871	-470	-8	-431	-31	4469	3179	1289	-4842
50	-1204	635	662	-27	-4	-25	2	184	346	-163	-386
51	-4331	165	303	-137	-25	-219	106	5709	1242	4466	1543
52	-3103	40	-35	74	-5	-46	125	5686	5017	669	2622
55	-3626	-325	-236	-89	-4	-35	-50	3725	3309	417	-225
60	-6586	1	188	-187	-30	-272	115	4565	732	3833	-2020
61	-68	-6	-6	0	-0	-1	1	-3	-10	7	-78
62	-281	66	54	13	-1	-4	18	374	284	90	159
63	-140	-44	5	-49	-4	-15	-31	815	519	295	632
64	-2377	1995	973	1022	-3	-29	1054	2503	1571	933	2121
65	-2056	-2764	-831	-1933	-8	-82	-1844	5294	745	4549	474
66	-562	-61	129	-190	-2	-12	-177	665	306	359	42
67	-324	299	380	-81	-1	-4	-76	248	76	172	224
70	2290	21	36	-15	-2	-7	-6	727	617	110	3039
71	648	160	250	-90	-2	-15	-74	331	121	210	1139
72	-162	404	454	-50	-4	-31	-16	1514	1027	486	1756
73	-186	-104	-7	-97	-1	-3	-93	221	-0	221	-69
74	167	2266	2292	-26	-19	-147	141	4277	736	3541	6710
75	2170	431	216	216	-0	-1	216	1857	1841	16	4458
80	-5103	21	30	-9	-0	-5	-4	1052	999	53	-4030
85	7325	1360	1357	3	-0	-6	10	1466	1434	32	10151
90	377	-191	-162	-29	-2	-18	-8	510	324	186	696
91	89	-17	-11	-6	-0	-4	-2	478	426	52	551
92	80	75	412	-337	-1	-7	-329	1220	906	314	1375
93	-1086	81	83	-2	-0	-2	1	790	762	28	-215
95	208	0	0	0	0	0	0	5	5	0	213

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.9: Absolute changes per year for medium educated, 1995-2000

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	5349	44	193	-149	-3	-138	-8	1597	257	1340	6990
10	2	114	118	-4	-4	0	-0	-123	-147	24	-7
11	-82	-103	8	-111	-111	1	-1	169	17	153	-16
14	-475	-9	-27	18	-0	20	-1	76	35	41	-408
15	-3198	-1268	-589	-680	-1	-672	-6	1755	88	1667	-2711
16	-60	4	1	3	0	3	0	16	-41	57	-39
17	126	30	-41	71	-0	72	-1	-261	-92	-169	-104
18	-250	-287	-62	-225	-0	-224	-1	44	43	0	-494
19	542	-75	26	-101	-0	-101	-0	92	13	79	560
20	-1151	-555	-407	-148	-2	-143	-3	922	406	516	-784
21	-80	-380	-228	-152	-0	-144	-8	-16	-41	25	-476
22	-1035	32	108	-76	-4	-18	-54	459	58	401	-544
23	11	-76	-31	-45	-45	1	-0	13	9	4	-52
24	-782	71	-2	73	-2	77	-2	-15	205	-220	-726
25	-127	825	163	662	-2	671	-7	-556	-84	-472	143
26	29	613	360	253	-2	261	-6	-309	-327	17	333
27	-434	70	-146	215	-1	218	-1	471	95	376	107
28	-1301	278	-226	504	-14	531	-12	1351	1633	-282	328
29	-2568	433	-9	442	-22	468	-4	1322	1071	251	-813
30	-82	-2	-1	-0	-0	-0	-0	90	76	13	6
31	-1681	583	-32	615	-4	625	-5	35	133	-98	-1064
32	1351	232	0	232	-0	232	-0	-1368	-177	-1191	216
33	-1282	297	12	285	-1	286	-0	584	428	156	-400
34	-941	497	20	477	-0	477	-0	4	52	-48	-440
35	-961	-64	1	-65	-0	-65	0	864	218	646	-162
36	-587	-65	-195	130	-1	139	-8	-262	-660	398	-915
37	-98	-9	-13	4	-0	4	-0	8	1	7	-99
40	-4537	1082	1342	-260	-266	17	-11	924	200	724	-2532
41	38	47	48	-1	-1	3	-4	42	28	14	127
45	1102	-58	1014	-1072	-17	-928	-127	1691	869	821	2734
50	-1322	1012	995	18	-7	45	-20	-695	-1225	530	-1005
51	1791	4694	4286	408	-33	243	198	152	-798	949	6637
52	4379	-5887	-5606	-281	-4	-15	-261	-565	-403	-162	-2073
55	-6507	478	444	34	-6	28	12	4715	4499	216	-1314
60	-1276	859	981	-122	-24	116	-214	2671	-93	2764	2254
61	57	-0	-3	2	-0	0	2	-1	-1	-1	55
62	-101	92	82	10	-1	4	7	53	35	18	44
63	1199	103	343	-241	-8	10	-243	452	171	281	1754
64	-2184	-788	-694	-94	-7	31	-118	420	62	358	-2552
65	2845	-11065	-6885	-4181	-20	57	-4218	6579	3072	3507	-1641
66	-2035	-147	-21	-126	-3	7	-130	733	504	229	-1449
67	-614	408	517	-109	-1	3	-111	329	193	135	123
70	-1698	428	441	-13	-3	10	-19	213	150	63	-1058
71	-1062	-35	65	-100	-3	12	-109	248	175	73	-848
72	1876	665	774	-109	-11	42	-140	552	477	75	3092
73	262	-166	-13	-154	-0	3	-156	306	-1	307	402
74	-813	4994	4327	667	-50	150	566	557	154	402	4737
75	7541	158	161	-3	-1	2	-4	-3953	-4154	201	3746
80	2285	-11	-7	-4	-1	3	-5	1146	1129	18	3420
85	-19751	-1374	-1372	-2	-0	-2	0	8947	8923	25	-12177
90	899	265	281	-15	-4	17	-28	209	133	76	1374
91	-913	49	51	-2	-1	4	-5	-275	-290	15	-1139
92	60	-226	-120	-106	-2	1	-106	29	-49	78	-137
93	59	-66	-63	-2	-1	3	-4	689	685	4	683
95	255	0	0	0	0	0	0	39	39	0	295

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.10: Absolute changes per year for medium educated, 2000-2003

CPA	b	$\mathbf{L}_d$	A	$\mathbf{D}_A$	$\mathbf{D}_{A,e}$	$\mathbf{D}_{A,m}$	$\mathbf{D}_{A,s}$	$\mathbf{f}_d$	$\mathbf{h}_d$	$\mathbf{x}_d$	Total
01	1830	-96	-65	-32	-0	-31	-1	210	77	133	1944
10	-52	-27	-14	-13	-12	-1	0	27	21	5	-52
11	52	14	25	-12	-11	-1	0	7	2	5	72
14	145	11	13	-2	-0	-2	-0	9	1	7	164
15	2223	-94	-37	-57	-0	-56	-1	-26	-216	190	2103
16	0	0	0	0	0	0	0	0	0	0	0
17	67	-9	-6	-4	-0	-4	-0	22	7	14	79
18	209	2	-1	2	-0	2	0	-4	7	-10	207
19	103	2	-1	3	-0	3	-0	12	-5	17	117
20	352	-10	1	-11	-0	-11	-0	53	-1	54	396
21	16	-11	1	-12	-0	-12	-0	47	6	41	52
22	-25	7	0	6	-0	9	-2	220	67	153	202
23	-286	2	28	-26	-23	-3	0	44	17	27	-240
24	209	-36	2	-38	-0	-38	-0	203	7	196	376
25	431	-9	4	-13	-0	-13	0	72	2	70	493
26	328	-20	-0	-20	-0	-20	-0	39	-13	52	347
27	117	-67	-14	-53	-0	-53	0	129	4	125	179
28	957	-22	-9	-13	-1	-12	0	221	30	192	1156
29	1333	37	10	27	-1	28	0	265	-70	335	1636
30	22	0	0	0	-0	0	0	16	1	15	38
31	-204	-36	20	-56	-0	-56	1	225	-4	229	-15
32	61	-49	40	-90	-0	-94	5	185	-41	226	196
33	199	64	5	58	-0	58	0	30	-28	58	293
34	491	10	1	8	-0	8	0	213	4	210	714
35	46	1	-0	1	-0	1	0	11	-4	16	58
36	1129	-14	-1	-13	-0	-13	0	113	5	107	1228
37	0	0	0	0	-0	0	0	0	0	0	0
40	691	-124	-92	-32	-21	-10	-0	134	54	80	701
41	21	-15	-14	-1	-0	-1	-0	24	16	8	29
45	3482	29	62	-33	-1	-30	-2	312	222	90	3822
50	1614	53	56	-2	-0	-2	0	16	29	-13	1683
51	1426	15	28	-13	-2	-21	10	537	117	420	1978
52	1665	2	-2	5	-0	-3	8	375	331	44	2042
55	1377	-16	-12	-4	-0	-2	-3	180	160	20	1541
60	1595	0	11	-10	-2	-15	6	243	38	204	1838
61	0	0	0	0	0	0	0	0	0	0	0
62	184	16	13	3	-0	-1	4	91	69	22	291
63	225	-8	1	-8	-1	-3	-5	138	88	50	356
64	494	137	67	70	-0	-2	73	171	108	64	803
65	375	-494	-151	-343	-1	-14	-327	919	130	789	800
66	111	-6	14	-20	-0	-1	-19	71	33	38	176
67	-47	33	41	-9	-0	-0	-8	27	8	19	13
70	570	3	5	-2	-0	-1	-1	93	79	14	666
71	47	8	12	-5	-0	-1	-4	17	6	10	72
72	722	199	224	-25	-2	-15	-8	738	500	238	1659
73	-246	-145	-10	-135	-1	-5	-129	306	-0	306	-84
74	2701	1003	1014	-12	-9	-65	62	1888	326	1562	5592
75	2807	80	40	40	-0	-0	40	345	342	3	3233
80	-1536	31	45	-14	-1	-7	-6	1633	1552	81	129
85	4374	466	465	1	-0	-2	3	502	491	11	5342
90	132	-27	-23	-4	-0	-3	-1	72	46	26	177
91	244	-8	-5	-3	-0	-2	-1	235	209	25	470
92	314	36	200	-163	-0	-3	-160	590	438	152	940
93	1052	8	8	-0	-0	-0	0	78	76	3	1138
95	21	0	0	0	0	0	0	0	0	0	21

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.11: Absolute changes per year for high educated, 1995-2000

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CPA	**b**	**L**$_d$	**A**	**D**$_A$	**D**$_{A,e}$	**D**$_{A,m}$	**D**$_{A,s}$	**f**$_d$	**h**$_d$	**x**$_d$	Total
01	-4	8	33	-25	-0	-23	-1	270	44	227	274
10	0	0	0	0	0	0	0	0	0	0	0
11	-50	-32	2	-34	-35	0	-0	53	5	48	-29
14	43	-2	-7	5	-0	5	-0	20	9	11	60
15	194	-288	-134	-155	-0	-153	-1	398	20	378	304
16	35	0	0	0	0	0	0	2	-4	6	37
17	-166	3	-4	8	-0	8	-0	-29	-10	-19	-191
18	-2	-86	-18	-67	-0	-67	-0	13	13	0	-75
19	-135	-12	4	-17	-0	-17	-0	15	2	13	-132
20	19	-57	-41	-15	-0	-15	-0	94	41	52	56
21	433	-60	-36	-24	-0	-23	-1	-3	-6	4	370
22	57	5	19	-13	-1	-3	-9	79	10	69	142
23	30	-11	-4	-6	-6	0	-0	2	1	0	21
24	496	23	-1	24	-1	25	-1	-5	66	-70	515
25	-391	93	18	75	-0	76	-1	-63	-10	-53	-361
26	-305	68	40	28	-0	29	-1	-34	-36	2	-271
27	215	9	-18	27	-0	27	-0	58	12	46	282
28	-692	47	-38	85	-2	90	-2	229	277	-48	-416
29	1000	99	-2	101	-5	107	-1	303	246	57	1402
30	-63	-1	-0	-0	-0	-0	-0	26	22	4	-37
31	310	114	-6	120	-1	122	-1	7	26	-19	431
32	90	69	-0	69	-0	69	-0	-405	-53	-353	-246
33	84	96	4	92	-0	92	-0	188	138	50	367
34	-724	86	3	83	-0	83	-0	1	9	-8	-637
35	27	-6	0	-6	-0	-6	0	86	22	64	107
36	-51	-13	-39	26	-0	27	-2	-52	-130	79	-116
37	0	-0	-0	0	-0	0	-0	0	0	0	0
40	-1158	348	431	-84	-86	6	-4	297	64	233	-514
41	-89	9	9	-0	-0	1	-1	8	5	3	-73
45	-786	-7	122	-129	-2	-112	-15	204	105	99	-589
50	-586	157	155	3	-1	7	-3	-108	-190	82	-536
51	-551	574	524	50	-4	30	24	18	-98	116	41
52	-925	-467	-445	-22	-0	-1	-21	-44	-32	-13	-1437
55	1197	46	43	3	-1	3	1	456	435	21	1699
60	-1456	74	85	-10	-2	10	-18	231	-8	239	-1150
61	0	-0	-0	0	-0	0	0	-0	-0	-0	0
62	-394	27	24	3	-0	1	2	15	10	5	-352
63	-422	17	55	-38	-1	2	-39	72	27	45	-334
64	599	-117	-103	-14	-1	5	-18	61	9	52	543
65	1147	-2488	-1549	-939	-4	13	-947	1457	680	776	116
66	77	-22	-3	-19	-0	1	-19	110	75	34	164
67	-99	39	49	-10	-0	0	-10	31	18	13	-29
70	243	79	82	-2	-1	2	-4	39	28	12	362
71	23	-2	4	-7	-0	1	-7	16	11	5	37
72	-21	363	422	-59	-6	23	-76	301	260	41	643
73	473	-243	-18	-224	-1	4	-227	447	-2	449	677
74	-1759	2453	2126	328	-25	74	279	274	76	198	969
75	1418	35	35	-1	-0	0	-1	-871	-916	44	581
80	1302	-19	-13	-6	-2	5	-9	2013	1982	31	3296
85	16937	-801	-800	-1	-0	-1	0	5241	5227	14	21377
90	-422	28	29	-1	-0	2	-3	22	14	8	-372
91	572	28	30	-1	-0	2	-3	-161	-170	9	440
92	655	-122	-65	-57	-1	1	-57	16	-27	42	549
93	-277	-13	-12	-0	-0	1	-1	135	134	1	-155
95	79	0	0	0	0	0	0	3	3	0	82

Note: CPA 01 includes CPA 02 and CPA 05.

Table C.12: Absolute changes per year for high educated, 2000-2003

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