

## Annex 2: Additional information on chapter 3

### 1.1.1 Annex tables

Table A.2.1: Correspondence table for Agglomeration Areas

Metropolitan Region		approximated by NUTS 2 Region(s) ...	
Wien	AT001MC	Burgenland (AT)	AT11
		Niederösterreich	AT12
		Wien	AT13
Bruxelles / Brussel	BE001MC	Région de Bruxelles-Capitale / Brussels Hoofdstedelijk Gewest	BE10
		Prov. Vlaams-Brabant	BE24
		Prov. Brabant wallon	BE31
Sofia	BG001MC	Yugozapaden	BG41
Lefkosia	CY001MC	Kypros	CY00
Praha	CZ001MC	Praha	CZ01
		Střední Čechy	CZ02
Berlin	DE001MC	Berlin	DE30
		Brandenburg	DE40
Hamburg	DE002M	Hamburg	DE60
		Schleswig-Holstein	DEF0
München	DE003M	Oberbayern	DE21
Köln	DE004M	Köln	DEA2
Frankfurt am Main	DE005M	Darmstadt	DE71
Stuttgart	DE007M	Stuttgart	DE11
Düsseldorf	DE011M	Düsseldorf	DEA1
		Düsseldorf	DEA1
Ruhrgebiet	DE038M	Münster	DEA3
		Arnsberg	DEA5
		Hovedstaden	DK01
København	DK001MC	Sjælland	DK02
		Eesti	EE00
Tallinn	EE001MC	Eesti	EE00
Athina	EL001MC	Attiki	EL30
Madrid	ES001MC	Comunidad de Madrid	ES30
Barcelona	ES002M	Cataluña	ES51
Valencia	ES003M	Comunidad Valenciana	ES52
Sevilla	ES004M	Andalucía	ES61
Málaga - Marbella	ES006M	Andalucía	ES61
Alicante/Alacant - Elche/Elx	ES021M	Comunidad Valenciana	ES52
Helsinki	FI001MC	Helsinki-Uusimaa	FI1B
Paris	FR001MC	Île de France	FR10
Lyon	FR003M	Rhône-Alpes	FRK2
Bordeaux	FR007M	Aquitaine	FRI1
Lille - Dunkerque - Valenciennes	FR009M	Nord-Pas-de-Calais	FRE1
Marseille	FR203M	Provence-Alpes-Côte d'Azur	FRL0
Zagreb	HR001MC	Kontinentalna Hrvatska	HR04
Budapest	HU001MC	Budapest	HU11
Budapest	HU001MC	Pest	HU12

Dublin	IE001MC	Eastern and Midland	IE06		
Roma	IT001MC	Lazio	IT14		
Milano	IT002M	Lombardia	ITC4		
Napoli	IT003M	Campania	ITF3		
Torino	IT004M	Piemonte	ITC1		
Luxembourg	LU001MC	Luxembourg	LU00		
Riga	LV001MC	Latvija	LV00		
Valletta	MT001MC	Malta	MT00		
Amsterdam	NL002MC	Flevoland	NL23		
		Noord-Holland	NL32		
Rotterdam	NL003M	Zuid-Holland	NL33		
Oslo	NO001MC	Oslo og Akershus	NO01		
Warszawa	PL001MC	Warszawski stoleczny	PL91		
Katowice	PL010M	Slaskie	PL22		
Lisboa	PT001MC	Área Metropolitana de Lisboa	PT17		
Porto	PT002M	Norte	PT11		
Bucuresti	RO001MC	Bucuresti - Ilfov	RO32		
Stockholm	SE001MC	Stockholm	SE11		
Göteborg	SE002M	Västsverige	SE23		
Ljubljana	SI001MC	Zahodna Slovenija	SI04		
Bratislava	SK001MC	Bratislavský kraj	SK01		
		Bedfordshire and Hertfordshire	UKH2		
		Essex	UKH3		
		Inner London - West	UKI3		
		Inner London - East	UKI4		
		Outer London - East and North East	UKI5		
		Outer London - South	UKI6		
		Outer London - West and North West	UKI7		
		Berkshire, Buckinghamshire and Oxfordshire	UKJ1		
		Surrey, East and West Sussex	UKJ2		
		Kent	UKJ4		
		West Midlands urban area	UK002M	West Midlands	UKG3
		Leeds	UK003M	West Yorkshire	UKE4
Glasgow	UK004M	West Central Scotland	UKM8		
		Southern Scotland	UKM9		
Liverpool	UK006M	Lancashire	UKD4		
		Merseyside	UKD7		
		Greater Manchester	UKD3		
Manchester	UK008M	Cheshire	UKD6		
		Derbyshire and Nottinghamshire	UKF1		

Source: MISTA team original illustration

Table A.2.2: European Metropolitan Regions (MR): Assignment to the Typologies used

MR-Code	Name	Size	Income level	Function in city hierarchy	Sectoral orientation	location	1 <sup>st</sup> tier Metros
AT001MC	Wien	Large	High-income	Capital	Service-based	EU15	Yes
DE001MC	Berlin	Large	Medium-income	Capital	Service-based	EU15	Yes
DE007M	Stuttgart	Large	High-income	Second tier	Industry-based	EU15	Yes
IT004M	Torino	Large	Medium-income	Second tier	Industry-based	EU15	Yes
LV001MC	Riga	Large	Low-income	Capital	Mixed-based	EU13	Yes
NO001MC	Oslo	Large	High-income	Capital	Service-based	-	Yes
PL001MC	Warszawa	Large	Low-income	Capital	Mixed-based	EU13	Yes
AT002M	Graz	Medium	High-income	Other	Mixed-based	EU15	No
AT003M	Linz	Medium	High-income	Second tier	Industry-based	EU15	No
AT004M	Salzburg	Small	High-income	Other	Mixed-based	EU15	No
AT005M	Innsbruck	Small	High-income	Other	Mixed-based	EU15	No
BE001MC	Bruxelles	Large	High-income	Capital	Service-based	EU15	Yes
BE002M	Antwerpen	Large	High-income	Second tier	Service-based	EU15	No
BE003M	Gent	Medium	High-income	Other	Mixed-based	EU15	No
BE004M	Charleroi	Small	Low-income	Other	Mixed-based	EU15	No
BE005M	Liège	Medium	Medium-income	Second tier	Service-based	EU15	No
BG001MC	Sofia	Large	Low-income	Capital	Mixed-based	EU13	Yes
BG002M	Plovdiv	Medium	Low-income	Second tier	Industry-based	EU13	No
BG003M	Burgas	Small	Low-income	Second tier	Mixed-based	EU13	No
BG004M	Varna	Small	Low-income	Other	Mixed-based	EU13	No
CH001M	Zürich	-	-	Second tier	-	-	No
CH002M	Genève	-	-	Other	-	-	No
CH003M	Basel	-	-	Second tier	Industry-based	-	No
CH004MC	Bern	-	-	Capital	-	-	Yes
CH005M	Lausanne	-	-	Other	-	-	No
CY001MC	Lefkosia	Medium	Low-income	Capital	Service-based	EU13	Yes
CZ001MC	Praha	Large	Low-income	Capital	Industry-based	EU13	Yes
CZ002M	Brno	Large	Low-income	Second tier	Industry-based	EU13	No
CZ003M	Ostrava	Large	Low-income	Second tier	Industry-based	EU13	No
CZ004M	Plzen	Medium	Low-income	Other	Industry-based	EU13	No
DE002M	Hamburg	Large	High-income	Second tier	Mixed-based	EU15	Yes
DE003M	München	Large	High-income	Second tier	Mixed-based	EU15	Yes
DE004M	Köln	Large	High-income	Other	Mixed-based	EU15	Yes
DE005M	Frankfurt	Large	High-income	Second tier	Mixed-based	EU15	Yes
DE008M	Leipzig	Large	Medium-income	Other	Mixed-based	EU15	No
DE009M	Dresden	Large	Medium-income	Other	Industry-based	EU15	No
DE011M	Düsseldorf	Large	High-income	Other	Mixed-based	EU15	Yes
DE012M	Bremen	Large	High-income	Other	Mixed-based	EU15	No
DE013M	Hannover	Large	High-income	Other	Mixed-based	EU15	No
DE014M	Nürnberg	Large	High-income	Other	Industry-based	EU15	No
DE017M	Bielefeld	Small	High-income	Other	Mixed-based	EU15	No
DE018M	Halle	Small	Medium-income	Other	Mixed-based	EU15	No
DE019M	Magdeburg	Small	Medium-income	Other	Mixed-based	EU15	No
DE020M	Wiesbaden	Small	High-income	Other	Mixed-based	EU15	No
DE021M	Göttingen	Small	Medium-income	Other	Industry-based	EU15	No
DE025M	Darmstadt	Small	High-income	Other	Industry-based	EU15	No
DE027M	Freiburg	Medium	Medium-income	Other	Industry-based	EU15	No
DE028M	Regensburg	Small	High-income	Other	Industry-based	EU15	No
DE031M	Schwerin	Small	Low-income	Other	Mixed-based	EU15	No
DE032M	Erfurt	Small	Medium-income	Other	Industry-based	EU15	No
DE033M	Augsburg	Medium	High-income	Other	Industry-based	EU15	No
DE034M	Bonn	Medium	High-income	Other	Service-based	EU15	No

DE035M	Karlsruhe	Medium	High-income	Other	Industry-based	EU15	No
DE036M	Mönchengladbach	Small	Medium-income	Other	Mixed-based	EU15	No
DE037M	Mainz	Small	High-income	Other	Mixed-based	EU15	No
DE038M	Ruhrgebiet	Large	Medium-income	Second tier	Mixed-based	EU15	Yes
DE039M	Kiel	Medium	Medium-income	Other	Service-based	EU15	No
DE040M	Saarbrücken	Medium	High-income	Other	Industry-based	EU15	No
DE042M	Koblenz	Small	High-income	Other	Mixed-based	EU15	No
DE043M	Rostock	Small	Medium-income	Other	Service-based	EU15	No
DE044M	Kaiserslautern	Small	Medium-income	Other	Mixed-based	EU15	No
DE045M	Iserlohn	Small	Medium-income	Other	Industry-based	EU15	No
DE052M	Flensburg	Small	Medium-income	Other	Service-based	EU15	No
DE054M	Konstanz	Small	Medium-income	Other	Industry-based	EU15	No
DE057M	Gießen	Small	Medium-income	Other	Mixed-based	EU15	No
DE059M	Bayreuth	Small	Medium-income	Other	Industry-based	EU15	No
DE061M	Aschaffenburg	Small	High-income	Other	Industry-based	EU15	No
DE064M	Neubrandenburg	Small	Low-income	Other	Mixed-based	EU15	No
DE069M	Rosenheim	Small	Medium-income	Other	Industry-based	EU15	No
DE073M	Offenburg	Small	High-income	Other	Industry-based	EU15	No
DE074M	Görlitz	Small	Low-income	Other	Industry-based	EU15	No
DE077M	Schweinfurt	Small	High-income	Other	Industry-based	EU15	No
DE079M	Wetzlar	Small	Medium-income	Other	Industry-based	EU15	No
DE083M	Braunschweig	Large	High-income	Other	Industry-based	EU15	No
DE084M	Mannheim	Large	High-income	Other	Industry-based	EU15	No
DE504M	Münster	Small	High-income	Other	Service-based	EU15	No
DE507M	Aachen	Medium	Medium-income	Other	Mixed-based	EU15	No
DE510M	Lübeck	Small	Medium-income	Other	Mixed-based	EU15	No
DE513M	Kassel	Small	High-income	Other	Industry-based	EU15	No
DE517M	Osnabrück	Small	Medium-income	Other	Industry-based	EU15	No
DE520M	Oldenburg	Small	Medium-income	Other	Mixed-based	EU15	No
DE522M	Heidelberg	Medium	High-income	Other	Mixed-based	EU15	No
DE523M	Paderborn	Small	Medium-income	Other	Industry-based	EU15	No
DE524M	Würzburg	Small	High-income	Other	Industry-based	EU15	No
DE527M	Bremerhaven	Small	Low-income	Other	Mixed-based	EU15	No
DE529M	Heilbronn	Small	High-income	Other	Industry-based	EU15	No
DE532M	Ulm	Small	High-income	Other	Industry-based	EU15	No
DE533M	Pforzheim	Small	Medium-income	Other	Industry-based	EU15	No
DE534M	Ingolstadt	Small	High-income	Other	Industry-based	EU15	No
DE537M	Reutlingen	Small	High-income	Other	Industry-based	EU15	No
DE540M	Siegen	Small	Medium-income	Other	Industry-based	EU15	No
DE542M	Hildesheim	Small	Low-income	Other	Industry-based	EU15	No
DE544M	Zwickau	Small	Medium-income	Other	Industry-based	EU15	No
DE546M	Wuppertal	Small	High-income	Other	Industry-based	EU15	No

DE548M	Düren	Small	Medium-income	Other	Industry-based	EU15	No
DE549M	Bocholt	Small	Medium-income	Other	Industry-based	EU15	No
DK001MC	København	Large	High-income	Capital	Service-based	EU15	Yes
DK002M	Århus	Medium	High-income	Second tier	Mixed-based	EU15	No
DK003M	Odense	Small	High-income	Second tier	Service-based	EU15	No
DK004M	Aalborg	Medium	High-income	Second tier	Mixed-based	EU15	No
EE001MC	Tallinn	Medium	Low-income	Capital	Industry-based	EU13	Yes
EL001MC	Athina	Large	Low-income	Capital	Service-based	EU15	Yes
EL002M	Thessaloniki	Large	Low-income	Second tier	Service-based	EU15	No
ES001MC	Madrid	Large	Medium-income	Capital	Service-based	EU15	Yes
ES002M	Barcelona	Large	Medium-income	Second tier	Mixed-based	EU15	Yes
ES003M	Valencia	Large	Low-income	Second tier	Mixed-based	EU15	Yes
ES004M	Sevilla	Large	Low-income	Second tier	Service-based	EU15	Yes
ES005M	Zaragoza	Large	Low-income	Other	Industry-based	EU15	No
ES006M	Málaga	Large	Low-income	Other	Service-based	EU15	Yes
ES007M	Murcia/Cartagena	Large	Low-income	Other	Mixed-based	EU15	No
ES008M	Las Palmas	Medium	Low-income	Other	Service-based	EU15	No
ES009M	Valladolid	Small	Low-income	Other	Mixed-based	EU15	No
ES010M	Palma de Mallorca	Medium	Medium-income	Other	Service-based	EU15	No
ES012M	Vitoria/Gasteiz	Small	Medium-income	Other	Industry-based	EU15	No
ES013M	Oviedo/Gijón	Large	Low-income	Other	Mixed-based	EU15	No
ES014M	Pamplona/Iruña	Medium	Medium-income	Other	Industry-based	EU15	No
ES015M	Santander	Medium	Low-income	Other	Mixed-based	EU15	No
ES019M	Bilbao	Large	Medium-income	Other	Mixed-based	EU15	No
ES020M	Córdoba	Medium	Low-income	Other	Mixed-based	EU15	No
ES021M	Alicante	Large	Low-income	Other	Mixed-based	EU15	Yes
ES022M	Vigo	Medium	Low-income	Other	Industry-based	EU15	No
ES025M	Santa Cruz Tenerife	Medium	Low-income	Other	Service-based	EU15	No
ES026M	A Coruña	Large	Low-income	Other	Mixed-based	EU15	No
ES501M	Granada	Medium	Low-income	Other	Service-based	EU15	No
ES510M	Guipúzcoa	Medium	Medium-income	Other	Industry-based	EU15	No
ES522M	Cádiz	Large	Low-income	Other	Service-based	EU15	No
FI001MC	Helsinki	Large	High-income	Capital	Service-based	EU15	Yes
FI002M	Tampere	Small	High-income	Second tier	Industry-based	EU15	No
FI003M	Turku	Small	High-income	Second tier	Mixed-based	EU15	No
FR001MC	Paris	Large	High-income	Capital	Service-based	EU15	Yes
FR003M	Lyon	Large	High-income	Second tier	Service-based	EU15	Yes
FR004M	Toulouse	Large	High-income	Second tier	Service-based	EU15	No
FR006M	Strasbourg	Large	Medium-income	Other	Mixed-based	EU15	No
FR007M	Bordeaux	Large	Medium-income	Second tier	Service-based	EU15	Yes
FR008M	Nantes	Large	Medium-income	Other	Service-based	EU15	No
FR009M	Lille/Dunkerque	Large	Medium-income	Second tier	Service-based	EU15	Yes
FR010M	Montpellier	Large	Medium-income	Other	Service-based	EU15	No
FR011M	Saint-Etienne	Medium	Low-income	Other	Mixed-based	EU15	No
FR013M	Rennes	Large	Medium-income	Other	Service-based	EU15	No
FR014M	Amiens	Medium	Low-income	Other	Mixed-based	EU15	No
FR015M	Rouen/Le Havre	Large	Medium-income	Other	Mixed-based	EU15	No
FR016M	Nancy	Medium	Low-income	Other	Service-based	EU15	No
FR018M	Reims	Medium	Medium-income	Other	Service-based	EU15	No
FR019M	Orléans	Medium	Medium-income	Other	Mixed-based	EU15	No
FR020M	Dijon	Small	Medium-income	Other	Service-based	EU15	No
FR021M	Poitiers	Small	Medium-income	Other	Service-based	EU15	No
FR022M	Clermont-Ferrand	Medium	Medium-income	Other	Mixed-based	EU15	No

FR023M	Caen	Medium	Medium-income	Other	Service-based	EU15	No
FR024M	Limoges	Small	Medium-income	Other	Service-based	EU15	No
FR025M	Besançon	Small	Medium-income	Other	Industry-based	EU15	No
FR026M	Grenoble	Large	Medium-income	Other	Mixed-based	EU15	No
FR030M	Fort-de-France	Small	Low-income	Other	Service-based	EU15	No
FR035M	Tours	Medium	Medium-income	Other	Service-based	EU15	No
FR036M	Angers	Medium	Low-income	Other	Mixed-based	EU15	No
FR037M	Brest	Medium	Low-income	Other	Mixed-based	EU15	No
FR038M	Le Mans	Medium	Medium-income	Other	Mixed-based	EU15	No
FR040M	Mulhouse	Medium	Medium-income	Other	Mixed-based	EU15	No
FR043M	Perpignan	Small	Low-income	Other	Service-based	EU15	No
FR044M	Nîmes	Medium	Low-income	Other	Service-based	EU15	No
FR045M	Pau	Medium	Medium-income	Other	Service-based	EU15	No
FR048M	Annecy/Genève	Medium	Medium-income	Other	Mixed-based	EU15	No
FR203M	Marseille	Large	Medium-income	Second tier	Service-based	EU15	Yes
FR205M	Nice	Large	Medium-income	Other	Service-based	EU15	No
HR001MC	Grad Zagreb	Large	Low-income	Capital	Industry-based	EU13	Yes
HR005M	Split	Small	Low-income	Second tier	Industry-based	EU13	No
HU001MC	Budapest	Large	Low-income	Capital	Mixed-based	EU13	Yes
HU002M	Miskolc	Medium	Low-income	Second tier	Industry-based	EU13	No
HU004M	Pécs	Small	Low-income	Other	Mixed-based	EU13	No
HU005M	Debrecen	Small	Low-income	Other	Mixed-based	EU13	No
HU009M	Székesfehérvár	Small	Low-income	Other	Industry-based	EU13	No
IE001MC	Dublin	Large	High-income	Capital	Service-based	EU15	Yes
IE002M	Cork	Medium	High-income	Second tier	Mixed-based	EU15	No
IT001MC	Roma	Large	High-income	Capital	Service-based	EU15	Yes
IT002M	Milano	Large	High-income	Second tier	Mixed-based	EU15	Yes
IT003M	Napoli	Large	Low-income	Second tier	Mixed-based	EU15	Yes
IT005M	Palermo	Large	Low-income	Other	Service-based	EU15	No
IT006M	Genova	Medium	Medium-income	Other	Service-based	EU15	No
IT007M	Firenze	Large	High-income	Other	Industry-based	EU15	No
IT008M	Bari	Large	Low-income	Other	Mixed-based	EU15	No
IT009M	Bologna	Large	High-income	Other	Industry-based	EU15	No
IT010M	Catania	Large	Low-income	Other	Service-based	EU15	No
IT011M	Venezia	Medium	Medium-income	Other	Mixed-based	EU15	No
IT012M	Verona	Medium	Medium-income	Other	Industry-based	EU15	No
IT022M	Taranto	Medium	Low-income	Other	Mixed-based	EU15	No
IT027M	Cagliari	Medium	Low-income	Other	Service-based	EU15	No
IT028M	Padova	Medium	Medium-income	Other	Industry-based	EU15	No
IT029M	Brescia	Large	Medium-income	Other	Industry-based	EU15	No
IT501M	Messina	Medium	Low-income	Other	Service-based	EU15	No
IT502M	Prato	Small	Medium-income	Other	Industry-based	EU15	No
IT503M	Parma	Small	Medium-income	Other	Industry-based	EU15	No
IT505M	Reggio nell'Emilia	Small	Medium-income	Other	Industry-based	EU15	No
IT511M	Bergamo	Large	Medium-income	Other	Industry-based	EU15	No
LT001MC	Vilnius	Medium	Low-income	Capital	Mixed-based	EU13	Yes
LT002M	Kaunas	Medium	Low-income	Second tier	Industry-based	EU13	No
LU001MC	Luxembourg	Medium	High-income	Capital	Service-based	EU15	Yes
MT001MC	Valletta	Small	Low-income	Capital	Mixed-based	EU13	Yes
NL001M	s' Gravenhage	Large	High-income	Second tier	Service-based	EU15	No
NL002MC	Amsterdam	Large	High-income	Capital	Service-based	EU15	Yes

NL003M	Rotterdam	Large	High-income	Second tier	Service-based	EU15	Yes
NL004M	Utrecht	Large	High-income	Second tier	Service-based	EU15	No
NL005M	Eindhoven	Medium	High-income	Other	Mixed-based	EU15	No
NL006M	Tilburg	Small	Medium-income	Other	Service-based	EU15	No
NL007M	Groningen	Small	High-income	Other	Service-based	EU15	No
NL008M	Enschede	Medium	Medium-income	Other	Mixed-based	EU15	No
NL009M	Arnhem/Nijmegen	Medium	Medium-income	Other	Service-based	EU15	No
NL012M	Breda	Medium	High-income	Other	Mixed-based	EU15	No
NL015M	Leeuwarden	Small	Medium-income	Other	Service-based	EU15	No
NL507M	Leiden	Small	Medium-income	Other	Service-based	EU15	No
NL511M	Zwolle	Small	High-income	Other	Service-based	EU15	No
NO002M	Bergen	Large	High-income	Second tier	Industry-based	-	No
PL002M	Łódź	Large	Low-income	Second tier	Industry-based	EU13	No
PL003M	Kraków	Large	Low-income	Second tier	Industry-based	EU13	No
PL004M	Wrocław	Medium	Low-income	Second tier	Mixed-based	EU13	No
PL005M	Poznan	Large	Low-income	Second tier	Industry-based	EU13	No
PL006M	Gdansk	Large	Low-income	Second tier	Industry-based	EU13	No
PL007M	Szczecin	Small	Low-income	Other	Mixed-based	EU13	No
PL008M	Bydgoszcz/Torún	Medium	Low-income	Other	Industry-based	EU13	No
PL009M	Lublin	Medium	Low-income	Other	Industry-based	EU13	No
PL010M	Katowice	Large	Low-income	Second tier	Industry-based	EU13	Yes
PL011M	Białystok	Small	Low-income	Other	Industry-based	EU13	No
PL012M	Kielce	Medium	Low-income	Other	Industry-based	EU13	No
PL014M	Olsztyn	Medium	Low-income	Other	Industry-based	EU13	No
PL015M	Rzeszów	Medium	Low-income	Other	Industry-based	EU13	No
PL016M	Opole	Medium	Low-income	Other	Industry-based	EU13	No
PL024M	Czestochowa	Small	Low-income	Other	Industry-based	EU13	No
PL025M	Radom	Medium	Low-income	Other	Industry-based	EU13	No
PL506M	Bielsko/Biala	Medium	Low-income	Other	Industry-based	EU13	No
PL514M	Tarnów	Small	Low-income	Other	Industry-based	EU13	No
PT001MC	Lisboa	Large	Low-income	Capital	Service-based	EU15	Yes
PT002M	Porto	Large	Low-income	Second tier	Industry-based	EU15	Yes
PT005M	Coimbra	Small	Low-income	Other	Mixed-based	EU15	No
RO001MC	Bucuresti	Large	Low-income	Capital	Service-based	EU13	Yes
RO002M	Cluj-Napoca	Medium	Low-income	Second tier	Industry-based	EU13	No
RO003M	Timisoara	Medium	Low-income	Second tier	Industry-based	EU13	No
RO004M	Craiova	Medium	Low-income	Second tier	Mixed-based	EU13	No
RO501M	Constanta	Medium	Low-income	Other	Industry-based	EU13	No
RO502M	Iasi	Medium	Low-income	Second tier	Mixed-based	EU13	No
RO503M	Galati	Small	Low-income	Other	Industry-based	EU13	No
RO504M	Brasov	Medium	Low-income	Other	Industry-based	EU13	No
RO505M	Ploiești	Medium	Low-income	Other	Industry-based	EU13	No
SE001MC	Stockholm	Large	High-income	Capital	Service-based	EU15	Yes
SE002M	Göteborg	Large	High-income	Second tier	Mixed-based	EU15	Yes
SE003M	Malmö	Large	High-income	Second tier	Service-based	EU15	No
SE006M	Uppsala	Small	High-income	Other	Service-based	EU15	No
SI001MC	Ljubljana	Small	Medium-income	Capital	Mixed-based	EU13	Yes
SI002M	Maribor	Small	Low-income	Second tier	Industry-based	EU13	No

SK001MC	Bratislava	Medium	High-income	Capital	Mixed-based	EU13	Yes
SK002M	Košice	Medium	Low-income	Second tier	Industry-based	EU13	No
UK001MC	London	Large	High-income	Capital	Service-based	EU15	Yes
UK002M	West Midlands	Large	Medium-income	Second tier	Mixed-based	EU15	Yes
UK003M	Leeds	Large	High-income	Second tier	Service-based	EU15	Yes
UK004M	Glasgow	Large	Medium-income	Second tier	Service-based	EU15	Yes
UK005M	Bradford	Small	Low-income	Other	Mixed-based	EU15	No
UK006M	Liverpool	Large	Medium-income	Second tier	Service-based	EU15	Yes
UK007M	Edinburgh	Medium	High-income	Other	Service-based	EU15	No
UK008M	Manchester	Large	High-income	Second tier	Service-based	EU15	Yes
UK009M	Cardiff	Large	Medium-income	Other	Mixed-based	EU15	No
UK010M	Sheffield	Medium	Medium-income	Other	Service-based	EU15	No
UK011M	Bristol	Large	High-income	Other	Service-based	EU15	No
UK012M	Belfast	Medium	High-income	Other	Service-based	EU15	No
UK013M	Newcastle	Large	Medium-income	Second tier	Service-based	EU15	No
UK014M	Leicester	Large	Medium-income	Other	Mixed-based	EU15	No
UK016M	Aberdeen	Small	High-income	Other	Industry-based	EU15	No
UK017M	Cambridge	Medium	High-income	Other	Service-based	EU15	No
UK018M	Exeter	Medium	Medium-income	Other	Service-based	EU15	No
UK023M	Portsmouth	Medium	Medium-income	Other	Service-based	EU15	No
UK025M	Coventry	Medium	High-income	Other	Mixed-based	EU15	No
UK026M	Kingston	Medium	Medium-income	Other	Mixed-based	EU15	No
UK027M	Stoke-on-Trent	Large	Medium-income	Other	Mixed-based	EU15	No
UK029M	Nottingham	Small	High-income	Other	Service-based	EU15	No
UK501M	Kirklees	Medium	Medium-income	Other	Mixed-based	EU15	No
UK506M	Doncaster	Medium	Low-income	Other	Mixed-based	EU15	No
UK510M	Sunderland	Small	High-income	Other	Industry-based	EU15	No
UK513M	Medway	Small	Medium-income	Other	Service-based	EU15	No
UK515M	Brighton and Hove	Small	High-income	Other	Service-based	EU15	No
UK516M	Plymouth	Small	Medium-income	Other	Mixed-based	EU15	No
UK517M	Swansea	Small	Medium-income	Other	Mixed-based	EU15	No
UK518M	Derby	Small	High-income	Other	Mixed-based	EU15	No
UK520M	Southampton	Medium	High-income	Other	Service-based	EU15	No
UK528M	Northampton	Small	High-income	Other	Service-based	EU15	No
UK539M	Bournemouth	Small	High-income	Other	Service-based	EU15	No
UK546M	Colchester	Small	Medium-income	Other	Service-based	EU15	No
UK550M	Dundee	Small	Medium-income	Other	Service-based	EU15	No
UK553M	Blackburn/Blackpool	Medium	High-income	Other	Mixed-based	EU15	No
UK559M	Middlesbrough	Medium	Medium-income	Other	Service-based	EU15	No
UK560M	Oxford	Medium	High-income	Other	Service-based	EU15	No
UK566M	Norwich	Small	High-income	Other	Service-based	EU15	No
UK568M	Cheshire/Chester	Medium	High-income	Other	Mixed-based	EU15	No
UK569M	Ipswich	Medium	Medium-income	Other	Service-based	EU15	No

Source: MISTA team original illustration.



Table A.2.3: Intra-metropolitan development in industry  
52 European Metro Regions with at least 3 NUTS-3-regions; 1995-2017, in % p.a.

	Employment			GVA at constant prices (2015)		
	1995- 2000	2000- 2008	2008- 2017	1995- 2000	2000- 2008	2008- 2017
<b>Berlin</b>	<b>-3.0</b>	<b>-2.2</b>	<b>+0.5</b>	<b>+0.6</b>	<b>+1.1</b>	<b>+0.8</b>
Metropolitan Core	-4.1	-3.0	+0.3	-1.5	+0.9	+0.0
Wider Metro Region	-0.6	-0.8	+0.8	+8.0	+1.8	+2.8
<b>Stuttgart</b>	<b>+0.4</b>	<b>-0.8</b>	<b>+0.4</b>	<b>+1.9</b>	<b>+1.7</b>	<b>+3.3</b>
Metropolitan Core	+1.8	-1.7	+1.1	+2.1	+1.8	+3.7
Wider Metro Region	+0.0	-0.5	+0.3	+1.8	+1.7	+3.2
<b>Warszawa</b>	<b>-0.7</b>	<b>+5.4</b>	<b>-1.0</b>	<b>+1.0</b>	<b>+3.9</b>	<b>+5.2</b>
Metropolitan Core	-2.2	+3.2	-2.9	-0.6	+3.5	+2.8
Wider Metro Region	+2.0	+8.4	+0.9	+5.0	+4.8	+9.2
<b>Wien</b>	<b>-3.0</b>	<b>-2.0</b>	<b>-0.9</b>	<b>-0.6</b>	<b>+1.1</b>	<b>+0.3</b>
Metropolitan Core	-3.5	-2.7	-1.5	-2.6	+1.0	+0.4
Wider Metro Region	-2.2	-0.9	+0.0	+2.9	+1.3	+0.1
<b>Metro Regions available (52)</b>	<b>-1.8</b>	<b>-1.4</b>	<b>-0.6</b>	<b>+1.0</b>	<b>+0.7</b>	<b>+1.6</b>
Metropolitan Core	-2.4	-1.5	-0.9	-0.1	+1.1	+1.2
Wider Metro Region	-1.4	-1.4	-0.4	+1.8	+0.5	+1.9

Source: ARDECO database (JRC/EC); MISTA team calculations.

Table A.2.4: Components of Industry Employment Change  
4-way-decomposition; by stakeholder cities, 1995-2017; cumulative change in %

	Employment Change (%)	Contribution to Employment Change of .... (percentage points)			
		Productivity growth	"Real" deindustrialisation	Performance of Metro Region	Country growth
1st Metros	-25.2	-49.1	-18.5	+8.2	+34.3
Berlin	-25.1	-42.9	-9.0	-3.2	+30.0
Oslo	-28.9	-62.0	-29.8	+24.0	+38.8
Riga	-14.4	-60.9	-65.3	+19.6	+92.3
Stuttgart	-0.6	-54.7	+15.4	+4.5	+34.1
Torino	-28.2	-15.7	-22.1	-2.4	+12.1
Warszawa	+37.6	-50.7	-35.3	+27.0	+96.6
Wien	-32.6	-40.3	-16.3	-11.4	+35.5

Source: ARDECO database (JRC/EC); ~~WIFO~~ MISTA team calculations.

Table A.2.5 Correspondence table for mapping NACE 3 digit groups to sector types

Sector Type	Nace code	Name
other	B051	Mining of hard coal
other	B052	Mining of lignite
other	B061	Extraction of crude petroleum
other	B062	Extraction of natural gas
other	B071	Mining of iron ores
other	B072	Mining of non
other	B081	Quarrying of stone, sand and clay
other	B089	Mining and quarrying n.e.c.
other	B091	Support activities for petroleum and natural gas extraction
other	B099	Support activities for other mining and quarrying
Low-technology:	C101	Processing and preserving of meat and production of meat products
Low-technology:	C102	Processing and preserving of fish, crustaceans and molluscs
Low-technology:	C103	Processing and preserving of fruit and vegetables
Low-technology:	C104	Manufacture of vegetable and animal oils and fats
Low-technology:	C105	Manufacture of dairy products
Low-technology:	C106	Manufacture of grain mill products, starches and starch products
Low-technology:	C107	Manufacture of bakery and farinaceous products
Low-technology:	C108	Manufacture of other food products
Low-technology:	C109	Manufacture of prepared animal feeds
Low-technology:	C110	Manufacture of beverages
Low-technology:	C120	Manufacture of tobacco products
Low-technology:	C131	Preparation and spinning of textile fibres
Low-technology:	C132	Weaving of textiles
Low-technology:	C133	Finishing of textiles
Low-technology:	C139	Manufacture of other textiles
Low-technology:	C141	Manufacture of wearing apparel, except fur apparel
Low-technology:	C142	Manufacture of articles of fur
Low-technology:	C143	Manufacture of knitted and crocheted apparel
Low-technology:	C151	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery and harness; dressing and dyeing of fur
Low-technology:	C152	Manufacture of footwear
Low-technology:	C161	Sawmilling and planing of wood
Low-technology:	C162	Manufacture of products of wood, cork, straw and plaiting materials
Low-technology:	C171	Manufacture of pulp, paper and paperboard
Low-technology:	C172	Manufacture of articles of paper and paperboard
Medium-low-technology:	C181	Printing and service activities related to printing
Low-technology:	C182	Reproduction of recorded media
Medium-low-technology:	C191	Manufacture of coke oven products
Medium-low-technology:	C192	Manufacture of refined petroleum products
Medium-high-technology:	C201	Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms
Medium-high-technology:	C202	Manufacture of pesticides and other agrochemical products
Medium-high-technology:	C203	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
Medium-high-technology:	C204	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
Medium-high-technology:	C205	Manufacture of other chemical products
Medium-high-technology:	C206	Manufacture of man
High technology	C211	Manufacture of basic pharmaceutical products
High technology	C212	Manufacture of pharmaceutical preparations
Medium-low-technology:	C221	Manufacture of rubber products
Medium-low-technology:	C222	Manufacture of plastics products
Medium-low-technology:	C231	Manufacture of glass and glass products
Medium-low-technology:	C232	Manufacture of refractory products
Medium-low-technology:	C233	Manufacture of clay building materials
Medium-low-technology:	C234	Manufacture of other porcelain and ceramic products
Medium-low-technology:	C235	Manufacture of cement, lime and plaster
Medium-low-technology:	C236	Manufacture of articles of concrete, cement and plaster

Medium-low-technology:	C237	Cutting, shaping and finishing of stone
Medium-low-technology:	C239	Manufacture of abrasive products and non
Medium-low-technology:	C241	Manufacture of basic iron and steel and of ferro
Medium-low-technology:	C242	Manufacture of tubes, pipes, hollow profiles and related fittings, of steel
Medium-low-technology:	C243	Manufacture of other products of first processing of steel
Medium-low-technology:	C244	Manufacture of basic precious and other non
Medium-low-technology:	C245	Casting of metals
Medium-low-technology:	C251	Manufacture of structural metal products
Medium-low-technology:	C252	Manufacture of tanks, reservoirs and containers of metal
Medium-low-technology:	C253	Manufacture of steam generators, except central heating hot water boilers
Medium-high-technology:	C254	Manufacture of weapons and ammunition
Medium-low-technology:	C255	Forging, pressing, stamping and roll
Medium-low-technology:	C256	Treatment and coating of metals; machining
Medium-low-technology:	C257	Manufacture of cutlery, tools and general hardware
Medium-low-technology:	C259	Manufacture of other fabricated metal products
High technology	C261	Manufacture of electronic components and boards
High technology	C262	Manufacture of computers and peripheral equipment
High technology	C263	Manufacture of communication equipment
High technology	C264	Manufacture of consumer electronics
High technology	C265	Manufacture of instruments and appliances for measuring, testing and navigation; watches and clocks
High technology	C266	Manufacture of irradiation, electromedical and electrotherapeutic equipment
High technology	C267	Manufacture of optical instruments and photographic equipment
High technology	C268	Manufacture of magnetic and optical media
Medium-high-technology:	C271	Manufacture of electric motors, generators, transformers and electricity distribution and control apparatus
Medium-high-technology:	C272	Manufacture of batteries and accumulators
Medium-high-technology:	C273	Manufacture of wiring and wiring devices
Medium-high-technology:	C274	Manufacture of electric lighting equipment
Medium-high-technology:	C275	Manufacture of domestic appliances
Medium-high-technology:	C279	Manufacture of other electrical equipment
Medium-high-technology:	C281	Manufacture of general
Medium-high-technology:	C282	Manufacture of other general
Medium-high-technology:	C283	Manufacture of agricultural and forestry machinery
Medium-high-technology:	C284	Manufacture of metal forming machinery and machine tools
Medium-high-technology:	C289	Manufacture of other special
Medium-high-technology:	C291	Manufacture of motor vehicles
Medium-high-technology:	C292	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi
Medium-high-technology:	C293	Manufacture of parts and accessories for motor vehicles
Medium-low-technology:	C301	Building of ships and boats
Medium-high-technology:	C302	Manufacture of railway locomotives and rolling stock
High technology	C303	Manufacture of air and spacecraft and related machinery
Medium-high-technology:	C304	Manufacture of military fighting vehicles

Medium-high-technology:	C309	Manufacture of transport equipment n.e.c.
Low-technology:	C310	Manufacture of furniture
Low-technology:	C321	Manufacture of jewellery, bijouterie and related articles
Low-technology:	C322	Manufacture of musical instruments
Low-technology:	C323	Manufacture of sports goods
Low-technology:	C324	Manufacture of games and toys
Medium-high-technology:	C325	Manufacture of medical and dental instruments and supplies
Low-technology:	C329	Manufacturing n.e.c.
Medium-low-technology:	C331	Repair of fabricated metal products, machinery and equipment
Medium-low-technology:	C332	Installation of industrial machinery and equipment
Utilities	D351	Electric power generation, transmission and distribution
Utilities	D352	Manufacture of gas; distribution of gaseous fuels through mains
Utilities	D353	Steam and air conditioning supply
Utilities	E360	Water collection, treatment and supply
Utilities	E370	Sewerage
Utilities	E381	Waste collection
Utilities	E382	Waste treatment and disposal
Utilities	E383	Materials recovery
Utilities	E390	Remediation activities and other waste management services
Material service	F411	Development of building projects
Material service	F412	Construction of residential and non
Material service	F421	Construction of roads and railways
Material service	F422	Construction of utility projects
Material service	F429	Construction of other civil engineering projects
Material service	F431	Demolition and site preparation
Material service	F432	Electrical, plumbing and other construction installation activities
Material service	F433	Building completion and finishing
Material service	F439	Other specialised construction activities
Material service	G45.1	Sale of motor vehicles
Material service	G45.2	Maintenance and repair of motor vehicles
Material service	G45.3	Sale of motor vehicle parts and accessories
wholesale and storage	G45.4	Sale, maintenance and repair of motorcycles and related parts and accessories
wholesale and storage	G46.1	Wholesale on a fee or contract basis
wholesale and storage	G46.2	Wholesale of agricultural raw materials and live animals
wholesale and storage	G46.3	Wholesale of food, beverages and tobacco
wholesale and storage	G46.4	Wholesale of household goods
wholesale and storage	G46.5	Wholesale of information and communication equipment
wholesale and storage	G46.6	Wholesale of other machinery, equipment and supplies
wholesale and storage	G46.7	Other specialised wholesale
wholesale and storage	G46.9	Non
other	G47.1	Retail sale in non
other	G47.2	Retail sale of food, beverages and tobacco in specialised stores
other	G47.3	Retail sale of automotive fuel in specialised stores
other	G47.4	Retail sale of information and communication equipment in specialised stores
other	G47.5	Retail sale of other household equipment in specialised stores
other	G47.6	Retail sale of cultural and recreation goods in specialised stores
other	G47.7	Retail sale of other goods in specialised stores
other	G47.8	Retail sale via stalls and markets
other	G47.9	Retail trade not in stores, stalls or markets
other	H49.1	Passenger rail transport, interurban
logistics	H49.2	Freight rail transport
logistics	H49.3	Other passenger land transport
logistics	H49.4	Freight transport by road and removal services
logistics	H49.5	Transport via pipeline
logistics	H50.1	Sea and coastal passenger water transport
logistics	H50.2	Sea and coastal freight water transport
logistics	H50.3	Inland passenger water transport
logistics	H50.4	Inland freight water transport
logistics	H51.1	Passenger air transport
logistics	H51.2	Freight air transport and space transport
logistics	H52.1	Warehousing and storage
logistics	H52.2	Support activities for transportation

logistics	H53.1	Postal activities under universal service obligation
logistics	H53.2	Other postal and courier activities
other	I55.1	Hotels and similar accommodation
other	I55.2	Holiday and other short
other	I55.3	Camping grounds, recreational vehicle parks and trailer parks
other	I55.9	Other accommodation
other	I56.1	Restaurants and mobile food service activities
other	I56.2	Event catering and other food service activities
other	I56.3	Beverage serving activities
other	J58.1	Publishing of books, periodicals and other publishing activities
other	J58.2	Software publishing
other	J59.1	Motion picture, video and television programme activities
other	J59.2	Sound recording and music publishing activities
other	J60.1	Radio broadcasting
other	J60.2	Television programming and broadcasting activities
other	J61.1	Wired telecommunications activities
other	J61.2	Wireless telecommunications activities
other	J61.3	Satellite telecommunications activities
other	J61.9	Other telecommunications activities
other	J62.0	Computer programming, consultancy and related activities
other	J63.1	Data processing, hosting and related activities; web portals
other	J63.9	Other information service activities
other	K64.1	Monetary intermediation
other	L68.1	Buying and selling of own real estate
other	L68.2	Renting and operating of own or leased real estate
other	L68.3	Real estate activities on a fee or contract basis
other	M69.1	Legal activities
other	M69.2	Accounting, bookkeeping and auditing activities; tax consultancy
other	M70.1	Activities of head offices
other	M70.2	Management consultancy activities
other	M71.1	Architectural and engineering activities and related technical consultancy
other	M71.2	Technical testing and analysis
other	M72.1	Research and experimental development on natural sciences and engineering
other	M72.2	Research and experimental development on social sciences and humanities
other	M73.1	Advertising
other	M73.2	Market research and public opinion polling
other	M74.1	Specialised design activities
other	M74.2	Photographic activities
other	M74.3	Translation and interpretation activities
other	M74.9	Other professional, scientific and technical activities n.e.c.
other	M75.0	Veterinary activities
other	N77.1	Renting and leasing of motor vehicles
other	N77.2	Renting and leasing of personal and household goods
other	N77.3	Renting and leasing of other machinery, equipment and tangible goods
other	N77.4	Leasing of intellectual property and similar products, except copyrighted works
other	N78.1	Activities of employment placement agencies
other	N78.2	Temporary employment agency activities
other	N78.3	Other human resources provision
other	N79.1	Travel agency and tour operator activities
other	N79.9	Other reservation service and related activities
other	N80.1	Private security activities
other	N80.3	Investigation activities
other	N80.2	Security systems service activities
other	N81.2	Cleaning activities
other	N82.1	Office administrative and support activities
other	N82.9	Business support service activities n.e.c.
Repair	S95.1	Repair of computers and communication equipment
Repair	S95.2	Repair of personal and household goods

### 1.1.2 Technical Supplement: A new 4-way decomposition of industrial employment change – derivation of the components and their interpretation

The project team has developed a new methodology, with which the development of employment in industry in European metropolitan regions can be statistically broken down into the influences of productivity gains, industrial output developments, the performance of the respective location and the overriding national development.

Starting point of our methodology is a two-way decomposition of industrial employment development, developed by Tregenna (2009) and used for an analysis of deindustrialisation at the level of the OECD countries. It's basic idea is that the employment level (L) in a sector i (here: industry) of region j at time t can be seen by definition as the product of the labour intensity (as the inverse of productivity) in this sector ( $\varphi_{ijt}$ ) and its value added level ( $Q_{ijt}$ ):

$$(1) \quad L_{ijt} = \varphi_{ijt} Q_{ijt}; \text{ whereby } \varphi_{ijt} = \frac{L_{ijt}}{Q_{ijt}}.$$

This implies that changes in sectoral (here: industrial) employment can be attributed to effects from changes in sectoral labour intensity (as the inverse of sectoral productivity development; equation 2, first term on the right) and from changes in industrial output (as an indicator for the performance of the sector; equation 2, second term on the right):

$$(2) \quad \Delta L_{ij} = \varphi_{ijt} Q_{ijt} - \varphi_{ijt-h} Q_{ijt-h} = (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{Q_{ijt-h} + Q_{ijt}}{2} \right) + (Q_{ijt} - Q_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right).$$

This approach had to be improved in two essential respects when applied to the analysis of European metro regions:

- Firstly, in a growing economy, an increasing industrial output is not a good indicator of industrial success: rather, an increasing output *share* of the industrial sector would be an indication of industrial prosperity, while an unfavourable development of industry would be reflected in a decrease in this share.
- On the other hand, the performance of the industrial sector at the level of individual metropolitan regions is additionally influenced by the strength of the economic development of the metro economy total (compared to the national environment), but also by the strength of the respective country in an international setting.

Our improved methodology takes these points into account, thus changing the simple approach above (equation 1) into a (more complex) 4-way decomposition:

$$(3) \quad L_{ijt} = \varphi_{ijt} \delta_{ijt} \varepsilon_{jt} Q_t; \text{ whereby } \varphi_{ijt} = \frac{L_{ijt}}{Q_{ijt}}; \delta_{ijt} = \frac{Q_{ijt}}{Q_{jt}}; \varepsilon_{jt} = \frac{Q_{jt}}{Q_t}.$$

Here the sectoral employment level (in industry) in each of the individual metropolitan regions is equal to the product of 4 components:

- The labour intensity (and thus the inverse of labour productivity) in the sector ( $\varphi_{ijt}$ ) as before,
- the share of the industrial sector in metropolitan value added ( $\delta_{ijt}$ ) as an indicator for the performance of industry in the respective metro region,
- the value-added share of the metropolitan region in the economy of the respective country ( $\varepsilon_{jt}$ ) as an expression of the strength of the metro region in a national context, and

- the output ( $Q_t$ ) of the country as a proxy for the strength of the national economy.

Hence, for the decomposition of industrial employment *growth*, 4 (instead of 2) influencing factors must now be considered, which makes the derivation of its components somewhat more complicated due to several cross terms. Based on equation 3 the following relationships can now be derived for the change in sectoral employment

$$\begin{aligned}
\Delta L_{ij} &= \varphi_{ijt} \delta_{ijt} \varepsilon_{jt} Q_t - \varphi_{ijt-1} \delta_{ijt-h} \varepsilon_{jt-h} Q_{t-h} = \\
&= (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} \varepsilon_{jt-h} Q_{t-h} + \delta_{ijt} \varepsilon_{jt} Q_t}{2} \right) + (\delta_{ijt} - \delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} Q_{t-h} + \varepsilon_{jt} Q_t}{2} \right) + \\
&(\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) = \\
&= (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} Q_{t-h} + \varepsilon_{jt} Q_t}{2} \right) + (\delta_{ijt} - \delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} \varepsilon_{jt-h} Q_{t-h} + \varphi_{ijt} \varepsilon_{jt} Q_t}{2} \right) + \\
&(\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) = \\
&= (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\delta_{ijt} - \\
&\delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h} \delta_{ijt-h} Q_{t-h} + \varphi_{ijt} \delta_{ijt} Q_t}{2} \right) + \\
&(Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h} \delta_{ijt-h} + \varphi_{ijt} \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) = \\
&= (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\delta_{ijt} - \\
&\delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h} \delta_{ijt-h} + \varphi_{ijt} \delta_{ijt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + \\
&(Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h} \delta_{ijt-h} \varepsilon_{jt-h} + \varphi_{ijt} \delta_{ijt} \varepsilon_{jt}}{2} \right),
\end{aligned}$$

whereby in each of these breakdowns the components add up to the change in industrial employment but differ a little bit in detail. The decomposition finally used is calculated by averaging the respective components and fulfills the additionality condition.

As a result, the change in industrial employment in each metropolitan region can now be broken down into 4 different effects, which in a normalised form add up to the respective percentage change in industrial employment:

First, we have a "**labour intensity effect**"<sup>1</sup>) of the form

$$\frac{1}{4} \left\{ (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} \varepsilon_{jt-h} Q_{t-h} + \delta_{ijt} \varepsilon_{jt} Q_t}{2} \right) + (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} Q_{t-h} + \varepsilon_{jt} Q_t}{2} \right) + (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\varphi_{ijt} - \varphi_{ijt-h}) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) \right\} =$$

<sup>1</sup> normalizes as:  $18ijt-ijt-hijt-hjt-hQt-h+ijjtQt+ijt-h+ijjt-hQt-h+jtQt2+ijt-h+ijjt-h+jtQt-h+Qt2100Lijt-h$

$$\frac{1}{8}(\varphi_{ijt} - \varphi_{ijt-h}) \left\{ (\delta_{ijt-h}\varepsilon_{jt-h}Q_{t-h} + \delta_{ijt}\varepsilon_{jt}Q_t) + \frac{(\delta_{ijt-h} + \delta_{ijt})(\varepsilon_{jt-h}Q_{t-h} + \varepsilon_{jt}Q_t)}{2} + \frac{(\delta_{ijt-h} + \delta_{ijt})(\varepsilon_{jt-h} + \varepsilon_{jt})(Q_{t-h} + Q_t)}{2} \right\},$$

which, as before, indicates the change in industrial employment that is associated with the change in labour intensity in the sector (and thus the development of industrial productivity),

Second, we have a "**sector share effect**"<sup>2)</sup> of the form

$$\frac{1}{4} \left\{ (\delta_{ijt} - \delta_{ijt-h}) \left( \frac{\varphi_{ijt-h}\varepsilon_{jt-h}Q_{t-h} + \varphi_{ijt}\varepsilon_{jt}Q_t}{2} \right) + (\delta_{ijt} - \delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h}Q_{t-h} + \varepsilon_{jt}Q_t}{2} \right) + (\delta_{ijt} - \delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\delta_{ijt} - \delta_{ijt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) \right\} =$$

$$\frac{1}{8}(\delta_{ijt} - \delta_{ijt-h}) \left\{ (\varphi_{ijt-h}\varepsilon_{jt-h}Q_{t-h} + \varphi_{ijt}\varepsilon_{jt}Q_t) + \frac{(\varphi_{ijt-h} + \varphi_{ijt})(\varepsilon_{jt-h}Q_{t-h} + \varepsilon_{jt}Q_t)}{2} + \frac{(\varphi_{ijt-h} + \varphi_{ijt})(\varepsilon_{jt-h} + \varepsilon_{jt})(Q_{t-h} + Q_t)}{2} \right\},$$

which maps industrial employment evolutions based on changes in the output share of industry in the metro region, i.e. indicating a weak or strong performance of the metropolitan industrial sector,

Third, we have a "**metro share effect**"<sup>3)</sup> of the form

$$\frac{1}{4} \left\{ (\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h}\delta_{ijt-h}Q_{t-h} + \varphi_{ijt}\delta_{ijt}Q_t}{2} \right) + (\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h}\delta_{ijt-h} + \varphi_{ijt}\delta_{ijt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) + (\varepsilon_{jt} - \varepsilon_{jt-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{Q_{t-h} + Q_t}{2} \right) \right\} =$$

$$\frac{1}{8}(\varepsilon_{jt} - \varepsilon_{jt-h}) \left\{ (\varphi_{ijt-h}\delta_{ijt-h}Q_{t-h} + \varphi_{ijt}\delta_{ijt}Q_t) + \frac{(\varphi_{ijt-h}\delta_{ijt-h} + \varphi_{ijt}\delta_{ijt})(Q_{t-h} + Q_t)}{2} + \frac{(\varphi_{ijt-h} + \varphi_{ijt})(\delta_{ijt-h} + \delta_{ijt})(Q_{t-h} + Q_t)}{2} \right\},$$

which measures the change in industrial employment that is related to a change in the share of the metro region in national value added (and thus in the development of the metropolitan economy as a whole),

and finally, there is an "**economic growth effect**"<sup>4)</sup> of the form

$$\frac{1}{4} \left\{ (Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h}\delta_{ijt-h}\varepsilon_{jt-h} + \varphi_{ijt}\delta_{ijt}\varepsilon_{jt}}{2} \right) + (Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h}\delta_{ijt-h} + \varphi_{ijt}\delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) + (Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) + (Q_t - Q_{t-h}) \left( \frac{\varphi_{ijt-h} + \varphi_{ijt}}{2} \right) \left( \frac{\delta_{ijt-h} + \delta_{ijt}}{2} \right) \left( \frac{\varepsilon_{jt-h} + \varepsilon_{jt}}{2} \right) \right\} =$$

<sup>2</sup> normalized as:  $18ijt-ijt-hijt-hjt-hQt-h+ijijtQt+ijt-h+ijijt-hQt-h+jtQt2+ijt-h+ijijt-h+jtQt-h+Qt2100Lijt-h$

<sup>3</sup> normalized as:  $18jt-jt-hijt-hQt-h+ijijtQt+ijt-hijt-h+ijijtQt-h+Qt2+ijt-h+ijijt-h+ijtQt-h+Qt2100Lijt-h$

<sup>4</sup> normalized as:  $18Qt-Qt-hijt-hijt-hjt-h+ijijtjt+ijt-hijt-h+ijijtjt-h+jt2+ijt-h+ijijt-h+ijijt-h+jt2100Lijt-h$



$$\frac{1}{8}(Q_t - Q_{t-h}) \left\{ (\varphi_{ijt-h} \delta_{ijt-h} \varepsilon_{jt-h} + \varphi_{ijt} \delta_{ijt} \varepsilon_{jt}) + \frac{(\varphi_{ijt-h} \delta_{ijt-h} + \varphi_{ijt} \delta_{ijt})(\varepsilon_{jt-h} + \varepsilon_{jt})}{2} + \frac{(\varphi_{ijt-h} + \varphi_{ijt})(\delta_{ijt-h} + \delta_{ijt})(\varepsilon_{jt-h} + \varepsilon_{jt})}{2} \right\}.$$

which results from the value added growth of the larger national economy.