



**Appendix:
Economic Situation Analysis
for the Future Forward Leadership Committee**

APPENDIX A: Benchmark Cluster Definitions..... 1

APPENDIX B: Clusters Present in Region 14

APPENDIX C: Subregional Cluster Gaps 16

APPENDIX D: Filling the Cluster Gaps..... 67

APPENDIX A: Benchmark Cluster Definitions

Metal Working & Industrial Machinery¹

SIC Sector Description

2514	Metal household furniture
2522	Office furniture, except wood
2542	Partitions & fixtures, except wood
2591	Drapery hardware, blinds, & shades
2599	Furniture & fixtures, n.e.c.
3053	Gaskets, packing & sealing devices
3255	Clay refractories
3272	Concrete products, n.e.c.
3274	Lime
3312	Blast furnaces & steel mills
3313	Electrometallurgical products
3315	Steel wire & related products
3316	Cold finishing of steel shapes
3317	Steel pipe & tubes
3321	Gray iron foundries
3322	Malleable iron foundries
3324	Steel investment foundries
3325	Steel foundries, n.e.c.
3398	Metal heat treating
3411	Metal cans
3412	Metal barrels, drums, & pails
3421	Cutlery
3423	Hand & edge tools, n.e.c.
3425	Hand saws & saw blades
3429	Hardware, n.e.c.
3431	Metal sanitary ware
3433	Heating equipment, except electric

3441	Fabricated structural metal
3442	Metal doors, sash, & trim
3443	Fabricated plate work, boiler shops
3444	Sheet metal work
3446	Architectural metal work
3448	Prefabricated metal buildings
3449	Miscellaneous metal work
3451	Screw machine products
3452	Bolts, nuts, rivets, & washers
3462	Iron & steel forgings
3465	Automotive stampings
3466	Crowns & closures
3469	Metal stampings, n.e.c.
3471	Plating & polishing
3479	Metal coating & allied services
3483	Ammunition, except small arms, n.e.c.
3484	Small arms
3489	Ordnance & accessories, n.e.c.
3491	Industrial valves
3492	Fluid power valves & hose fittings
3493	Steel springs, except wire
3494	Valves & pipe fittings, n.e.c.
3495	Wire springs
3496	Miscellaneous fabricated wire products
3498	Fabricated pipe & fittings
3499	Fabricated metal products, n.e.c.
3511	Turbines & turbine generator sets
3519	Internal combustion engines, n.e.c.
3523	Farm machinery & equipment
3524	Lawn & garden equipment
3531	Construction machinery
3532	Mining machinery
3533	Oil field machinery
3534	Elevators & moving stairways
3535	Conveyors & conveying equipment

¹ Source: E. Feser and H. Renski, *High-Tech Clusters in North Carolina, Report prepared for the North Carolina Board of Science and Technology, Office of Economic Development, University of North Carolina, Chapel Hill.*

3536 Hoists, cranes, & monorails
 3537 Industrial trucks & tractors
 3541 Machine tools, metal cutting types
 3542 Machine tools, metal forming types
 3543 Industrial patterns
 3544 Special dies, tools, jigs, & fixtures
 3545 Machine tool accessories
 3546 Power-driven handtools
 3547 Rolling mill machinery
 3548 Welding apparatus
 3549 Metalworking machinery, n.e.c.
 3552 Textile machinery
 3553 Woodworking machinery
 3554 Paper industries machinery
 3555 Printing trades machinery
 3556 Food products machinery
 3559 Special industry machinery, n.e.c.
 3561 Pumps & pumping equipment
 3562 Ball & roller bearings
 3563 Air & gas compressors
 3564 Blowers & fans
 3565 Packaging machinery
 3566 Speed changers, drives, & gears
 3567 Industrial furnaces & ovens
 3568 Power transmission equipment, n.e.c.
 3569 General industrial machinery, n.e.c.
 3581 Automatic merchandising machines
 3582 Commercial laundry equipment
 3585 Refrigeration & heating equipment
 3586 Measuring & dispensing pumps
 3589 Service industry machinery, n.e.c.
 3592 Carburetors, pistons, rings, & valves
 3593 Fluid power cylinders & actuators
 3594 Fluid power pumps & motors
 3599 Industrial & Commercial Machinery, nec
 3612 Transformers
 3613 Switchgear & switchboard apparatus

3621 Motors & generators
 3624 Carbon & graphite products
 3631 Household cooking equipment
 3632 Household refrigerators & freezers
 3633 Household laundry equipment
 3634 Electric housewares & fans
 3639 Household appliances, n.e.c.
 3643 Current-carrying wiring devices
 3644 Noncurrent-carrying wiring devices
 3692 Primary batteries, dry & wet
 3713 Truck & bus bodies
 3714 Motor vehicle parts & accessories
 3715 Truck trailers
 3731 Ship building & repairing
 3732 Boat building & repairing
 3743 Railroad equipment
 3751 Motorcycles, bicycles, & parts
 3795 Tanks & tank components
 3821 Laboratory apparatus & furniture
 3949 Sporting & athletic goods, n.e.c.
 3995 Burial caskets

Packaged Food Products

SIC	Sector Description
2011	Meat packing plants
2013	Sausages & other prepared meats
2015	Poultry & egg processing
2021	Creamery butter
2022	Cheese, natural & processed
2023	Condensed & evaporated milk
2024	Ice cream & frozen desserts
2026	Fluid milk mfg
2032	Canned specialties
2033	Canned fruits & vegetables
2034	Dehydrated fruits, vegetables, & soups

2035 Pickles, sauces, & salad dressings
 2037 Frozen fruit, juice, & vegetable mfg
 2038 Frozen specialties, n.e.c.
 2043 Breakfast cereal mfg
 2044 Rice milling
 2045 Flour mixes & dough mfg from purchased flour
 2051 Bread, cake, & related products
 2052 Commercial bakeries (pt)
 2053 Frozen bakery products, except bread
 2061 Sugarcane mills
 2062 Cane sugar refining
 2063 Beet sugar mfg
 2064 Candy & other confectionery products & chewing gum
 2066 Chocolate & cocoa products
 2067 Chewing Gum
 2068 Roasted nuts & peanut butter mfg (pt)
 2079 Shortening & cooking oils
 2082 Malt beverages
 2084 Wines, brandy, & brandy spirits
 2085 Distilled liquor, except brandy
 2086 Bottled & canned soft drinks
 2091 Canned & cured seafood
 2092 Fresh or frozen seafood
 2095 Coffee & tea mfg (pt)
 2096 Potato chips & similar snacks
 2098 Dry pasta mfg
 2099 Food preparations, n.e.c.
 2676 Sanitary paper products
 2861 Gum & wood chemicals
 3262 Vitreous china food utensils
 3263 Fine earthenware food utensils
 3556 Food products machinery
 3565 Packaging machinery
 3914 Silverware & plated ware

Construction Materials

SIC	Sector Description
2273	Carpets & rugs
2394	Canvas & related products
2421	Sawmills & planing mills, general
2426	Hardwood dimension & flooring mills
2429	Special product sawmills, n.e.c.
2431	Millwork
2434	Wood kitchen cabinets
2435	Hardwood veneer & plywood
2436	Softwood veneer & plywood
2439	Structural wood members, n.e.c.
2452	Prefabricated wood buildings
2491	Wood preserving
2493	Reconstituted wood products
2499	Wood products, n.e.c.
2541	Wood partitions & fixtures
2679	Converted paper products, n.e.c.
2851	Paints & allied products
2951	Asphalt paving mixtures & blocks
2952	Asphalt felts & coatings
3251	Brick & structural clay tile
3253	Ceramic wall & floor tile
3259	Structural clay products, n.e.c.
3261	Vitreous plumbing fixtures
3264	Porcelain electrical supplies
3271	Concrete brick & block
3273	Ready-mixed concrete
3275	Gypsum products
3281	Cut stone & stone products
3291	Abrasive products
3296	Mineral wool
3315	Steel wire & related products
3357	Nonferrous wire drawing & insulating
3425	Hand saws & saw blades
3431	Metal sanitary ware
3432	Plumbing fittings & brass goods

3433	Heating equipment, except electric	2655	Fiber Cans, Tubes & Drums
3442	Metal doors, sash, & trim	2656	Sanitary food containers
3444	Sheet metal work	2657	Folding paperboard boxes
3449	Miscellaneous metal work	2671	Paper - coated & laminated, packaging
3491	Industrial valves	2672	Paper - coated & laminated, n.e.c.
3492	Fluid power valves & hose fittings	2673	Bags - plastics, laminated, & coated
3494	Valves & pipe fittings, n.e.c.	2674	Bags - uncoated paper & multiwall
3495	Wire springs	2675	Die-cut paper & board
3496	Miscellaneous fabricated wire products	2676	Sanitary paper products
3498	Fabricated pipe & fittings	2677	Envelopes
3561	Pumps & pumping equipment	2678	Stationery products
3563	Air & gas compressors	2679	Converted paper products, n.e.c.
3585	Refrigeration & heating equipment	2711	Newspapers
3586	Measuring & dispensing pumps	2721	Periodicals
3613	Switchgear & switchboard apparatus	2731	Book publishing
3634	Electric housewares & fans	2732	Book printing
3639	Household appliances, n.e.c.	2741	Miscellaneous publishing
3643	Current-carrying wiring devices	2752	Commercial printing, lithographic
3644	Noncurrent-carrying wiring devices	2754	Commercial printing, gravure
3645	Residential lighting fixtures	2759	Commercial printing, n.e.c.
3646	Commercial lighting fixtures	2761	Manifold business forms
3647	Vehicular lighting equipment	2771	Greeting cards
3648	Lighting equipment, n.e.c.	2782	Blankbooks & looseleaf binders
3663	Radio & TV communications equipment	2789	Bookbinding & related work
3669	Communications equipment, n.e.c.	2791	Typesetting
3699	Electrical equipment & supplies, n.e.c.	2796	Platemaking services
3799	Transportation equipment, n.e.c.	3275	Gypsum products
3822	Environmental controls	3861	Photographic equipment & supplies
3851	Ophthalmic goods	3953	Marking devices
3991	Brooms & brushes	3955	Carbon paper & inked ribbons
3996	Hard surface floor coverings	3993	Signs & advertising displays
		3999	Manufacturing Industries, nec
		48	Communications
		73	Business services
		80	Health services
		87	Engineering, accounting, research, management, and related services
 Printing & Publishing			
SIC	Sector Description		
2611	Pulp mills		
2652	Setup paperboard boxes		
2653	Corrugated & solid fiber boxes		

Information Tech. & Instruments

SIC	Sector Description
3471	Plating & polishing
3571	Electronic computers
3572	Computer storage devices
3575	Computer terminals
3577	Computer peripheral equipment, n.e.c.
3578	Calculating & accounting equipment
3579	Office machines, n.e.c.
3596	Scales & balances, except laboratory
3625	Relays & industrial controls
3629	Electrical industrial apparatus, n.e.c.
3651	Household audio & video equipment
3661	Telephone & telegraph apparatus
3663	Radio & TV communications equipment
3669	Communications equipment, n.e.c.
3672	Printed circuit boards
3674	Semiconductors & related devices
3675	Electronic capacitors
3676	Electronic resistors
3677	Electronic coils & transformers
3678	Electronic connectors
3679	Electronic components, n.e.c.
3694	Engine electrical equipment
3699	Electrical equipment & supplies, n.e.c.
3728	Aircraft parts & equipment, n.e.c.
3761	Guided missiles & space vehicles
3769	Space vehicle equipment, n.e.c.
3812	Search & navigation equipment
3821	Laboratory apparatus & furniture
3822	Environmental controls
3823	Process control instruments
3824	Fluid meters & counting devices
3825	Instruments to measure electricity
3826	Analytical instruments
3827	Optical instruments & lenses
3829	Measuring & controlling devices, n.e.c.

3841	Surgical & medical instruments
3844	X-ray apparatus & tubes
3845	Electromedical equipment
3861	Photographic equipment & supplies
3873	Watches, clocks, & watchcases
3931	Musical instruments
73	Business services

Chemicals & Plastics

SIC	Sector Description
2087	Flavoring syrup & concentrate mfg
2611	Pulp mills
2621	Paper mills
2631	Paperboard mills
2812	Alkalies & chlorine
2813	Industrial gases
2816	Inorganic pigments
2821	Plastics materials & resins
2822	Synthetic rubber
2823	Cellulosic manmade fibers
2824	Organic fibers, noncellulosic
2841	Soap & other detergents
2842	Polishes & sanitation goods
2843	Surface active agents
2851	Paints & allied products
2865	Cyclic crudes & intermediates
2869	Industrial organic chemicals, n.e.c.
2875	Fertilizers, mixing only
2879	Agricultural chemicals, n.e.c.
2891	Adhesives & sealants
2893	Printing ink
2899	Chemical preparations, n.e.c.
3011	Tires & inner tubes
3061	Mechanical rubber goods
3069	Fabricated rubber products, n.e.c.
3081	Unsupported plastics film & sheet
3082	Unsupported plastics profile shapes

3083	Laminated plastics plate & sheet
3084	Plastics pipe
3085	Plastics bottles
3086	Plastics foam products
3087	Custom compound purchased resins
3088	Plastics plumbing fixtures
3089	Plastics products, n.e.c.
3111	Leather tanning & finishing
3291	Abrasive products
3399	Primary metal products, n.e.c.
3559	Special industry machinery, n.e.c.
3692	Primary batteries, dry & wet
3996	Hard surface floor coverings
80	Health services

Apparel

SIC Sector Description

2211	Weaving mills, cotton
2221	Weaving mills, synthetics
2231	Finishing mills, wool
2241	Narrow fabric mills
2251	Women's hosiery, except socks
2252	Other hosiery & sock mills
2253	Knit outerwear mills
2254	Knit underwear mills
2257	Circular & Weft knit fabric mills
2258	Lace & warp knit fabric mills
2259	Knitting mills, n.e.c.
2261	Finishing plants, cotton
2262	Finishing plants, synthetics
2269	Finishing plants, n.e.c.
2273	Carpets & rugs
2281	Yarn spinning mills
2282	Yarn throwing & winding mills
2284	Thread mills
2296	Tire cord & fabric

2297	Nonwoven fabrics
2298	Cordage & twine
2299	Textile goods, n.e.c.
2311	Men's & boys' suits & coats
2321	Shirts, men's & boys'
2322	Men's & boys' underwear & nightwear
2323	Men's & boys' neckwear
2325	Men's & boys' trousers & slacks
2326	Men's & boys' work clothing
2329	Men's & boys' clothing, n.e.c.
2331	Women's blouses & waists
2335	Women's dresses
2337	Women's suits & coats
2339	Women's outerwear, n.e.c.
2341	Women's & children's underwear
2342	Brassieres & allied garments
2353	Hats, caps, & millinery
2361	Girls' & children's dresses & blouses
2369	Girls' & children's outerwear, n.e.c.
2371	Fur goods
2381	Fabric gloves & mittens
2384	Robes & dressing gowns
2385	Waterproof outer garments
2386	Leather & sheep-lined clothing
2387	Apparel belts
2389	Apparel & accessories, n.e.c.
2395	Pleating & stitching
2397	Schiffli machine embroideries
2824	Organic fibers, noncellulosic
3965	Fasteners, buttons, needles, & pins

Motor Vehicle Mfg

SIC Sector Description

2273	Carpets & rugs
2299	Textile goods, n.e.c.
2396	Automotive & apparel trimmings

2399 Fabricated textile products, n.e.c.
 2531 Public building & related furniture
 2599 Furniture & fixtures, n.e.c.
 2851 Paints & allied products
 2891 Adhesives & sealants
 3011 Tires & inner tubes
 3052 Rubber & plastics hose & belting
 3061 Mechanical rubber goods
 3069 Fabricated rubber products, n.e.c.
 3081 Unsupported plastics film & sheet
 3082 Unsupported plastics profile shapes
 3083 Laminated plastics plate & sheet
 3084 Plastics pipe
 3085 Plastics bottles
 3086 Plastics foam products
 3087 Custom compound purchased resins
 3088 Plastics plumbing fixtures
 3089 Plastics products, n.e.c.
 3142 House slippers
 3211 Flat glass
 3229 Pressed & blown glass, n.e.c.
 3231 Products of purchased glass
 3465 Automotive stampings
 3493 Steel springs, except wire
 3519 Internal combustion engines, n.e.c.
 3524 Lawn & garden equipment
 3585 Refrigeration & heating equipment
 3592 Carburetors, pistons, rings, & valves
 3641 Electric lamps
 3651 Household audio & video equipment
 3694 Engine electrical equipment
 3711 Motor vehicles & car bodies
 3713 Truck & bus bodies
 3714 Motor vehicle parts & accessories
 3715 Truck trailers
 3716 Motor homes

Fabricated Textiles

SIC	Sector Description
2211	Weaving mills, cotton
2221	Weaving mills, synthetics
2231	Finishing mills, wool (pt)
2261	Finishing plants, cotton
2262	Finishing plants, synthetics
2295	Coated fabrics, not rubberized
2311	Men's & boys' suits & coats
2321	Shirts, men's & boys'
2322	Men's & boys' underwear & nightwear
2323	Men's & boys' neckwear
2325	Men's & boys' trousers & slacks
2326	Men's & boys' work clothing
2329	Men's & boys' clothing, n.e.c.
2331	Women's blouses & waists
2335	Women's dresses
2337	Women's suits & coats
2339	Women's outerwear, n.e.c.
2341	Women's & children's underwear
2342	Brassieres & allied garments
2353	Hats, caps, & millinery
2361	Girls' & children's dresses & blouses
2369	Girls' & children's outerwear, n.e.c.
2371	Fur goods
2381	Fabric gloves & mittens
2384	Robes & dressing gowns
2385	Waterproof outer garments
2386	Leather & sheep-lined clothing
2387	Apparel belts
2389	Apparel & accessories, n.e.c.
2391	Curtains & draperies
2392	Housefurnishings, n.e.c.
2393	Textile bags
2394	Canvas & related products
2396	Automotive & apparel trimmings
2399	Fabricated textile products, n.e.c.

2512	Upholstered household furniture
2515	Mattresses & bedsprings
2823	Cellulosic manmade fibers
3021	Rubber & plastics footwear
3052	Rubber & plastics hose & belting
3161	Luggage
3172	Personal leather goods, n.e.c.
3842	Surgical appliances & supplies
3942	Dolls
3965	Fasteners, buttons, needles, & pins
3995	Burial caskets

Stone, Clay & Glass Products

SIC	Sector Description
2873	Nitrogenous fertilizers
2874	Phosphatic fertilizers
2911	Petroleum refining
3011	Tires & inner tubes
3241	Cement, hydraulic
3255	Clay refractories
3261	Vitreous plumbing fixtures
3262	Vitreous china food utensils
3263	Fine earthenware food utensils
3264	Porcelain electrical supplies
3269	Pottery products, n.e.c.
3274	Lime
3295	Minerals, ground or treated
3297	Nonclay refractories
3299	Nonmetallic mineral products, n.e.c.
3629	Electrical industrial apparatus, n.e.c.

Wood Products & Furniture

SIC	Sector Description
2411	Logging
2426	Hardwood dimension & flooring mills

2431	Millwork
2434	Wood kitchen cabinets
2439	Structural wood members, n.e.c.
2441	Nailed wood boxes & shook
2448	Wood pallets & skids
2449	Wood containers, n.e.c.
2451	Mobile homes
2452	Prefabricated wood buildings
2493	Reconstituted wood products
2499	Wood products, n.e.c.
2511	Wood household furniture
2517	Wood TV & radio cabinets
2521	Wood office furniture
2611	Pulp mills
2621	Paper mills
2631	Paperboard mills
2861	Gum & wood chemicals
3792	Travel trailer & campers
3931	Musical instruments

Primary Nonferrous Metals

SIC	Sector Description
3321	Gray iron foundries
3322	Malleable iron foundries
3324	Steel investment foundries
3325	Steel foundries, n.e.c.
3331	Primary copper
3339	Primary nonferrous metals, n.e.c.
3351	Copper rolling & drawing
3356	Nonferrous rolling & drawing, n.e.c.
3363	Aluminum die-castings
3364	Nonferrous die-casting, except aluminum
3365	Aluminum foundries
3366	Copper foundries
3369	Nonferrous foundries, n.e.c.

3399 Primary metal products, n.e.c.
3599 Industrial & Commercial Machinery, nec

Leather Goods

SIC Sector Description

3111 Leather tanning & finishing
3131 Footwear cut stock & findings
3142 House slippers
3143 Men's footwear, except athletic
3144 Women's footwear, except athletic
3149 Footwear, except rubber, n.e.c.
3151 Leather gloves & mittens
3171 Women's handbags & purses
3172 Personal leather goods, n.e.c.
3199 Leather goods, n.e.c.

Tobacco Prod.

SIC Sector Description

2111 Cigarette mfg
2121 Cigars
2131 Chewing & smoking tobacco
2141 Tobacco stemming & redrying

Canned & Bottled Beverages

SIC Sector Description

2046 Wet corn milling
2047 Dog & cat food mfg
2048 Prepared feeds, n.e.c.
2083 Malt
2087 Flavoring syrup & concentrate mfg
2873 Nitrogenous fertilizers
2874 Phosphatic fertilizers

2875 Fertilizers, mixing only
2879 Agricultural chemicals, n.e.c.
3221 Glass containers
3411 Metal cans

Food Oil Mills

SIC Sector Description

2074 Fats & oils refining & blending (pt)
2075 Soybean processing
2076 Vegetable oil mills, n.e.c.
2077 Animal & marine fats & oils
2079 Shortening & cooking oils

Aerospace

SIC Sector Description

3463 Nonferrous forgings
3482 Small arms ammunition
3483 Ammunition, except small arms, n.e.c.
3721 Aircraft
3724 Aircraft engines & engine parts
3728 Aircraft parts & equipment, n.e.c.
3761 Guided missiles & space vehicles
3764 Space propulsion units & parts
3769 Space vehicle equipment, n.e.c.
3812 Search & navigation equipment

Petroleum Products

SIC Sector Description

2895 Carbon black
2911 Petroleum refining
2951 Asphalt paving mixtures & blocks
2952 Asphalt felts & coatings

- 2992 Lubricating oils & greases
- 2999 Products of Petroleum and Coal, nec

Jewelry

- | SIC | Sector Description |
|------------|-------------------------------------|
| 3339 | Primary nonferrous metals, n.e.c. |
| 3911 | Jewelry, precious metal |
| 3915 | Jewelers' materials & lapidary work |
| 3961 | Costume jewelry |

Boat Building

- | SIC | Sector Description |
|------------|-------------------------------------|
| 2892 | Explosives |
| 3511 | Turbines & turbine generator sets |
| 3519 | Internal combustion engines, n.e.c. |
| 3541 | Machine tools, metal cutting types |
| 3543 | Industrial patterns |
| 3732 | Boat building & repairing |

Aluminum

- | SIC | Sector Description |
|------------|--|
| 2819 | Industrial inorganic chemicals, n.e.c. |
| 3334 | Primary aluminum |
| 3353 | Aluminum sheet, plate, & foil |
| 3354 | Aluminum extruded products |
| 3355 | Aluminum rolling & drawing, n.e.c. |
| 3411 | Metal cans |
| 3463 | Nonferrous forgings |
| 3497 | Metal foil & leaf |

Hospitals, Labs, Specialized Medical Services

- | SIC | Sector Description |
|------------|---|
| 2731 | Book publishing |
| 73 | Business services |
| 80 | Health services |
| 87 | Engineering, accounting, research, management, and related services |

Platemaking & Typesetting

- | SIC | Sector Description |
|------------|---------------------------|
| 2791 | Typesetting |
| 2796 | Platemaking services |
| 2893 | Printing ink |
| 3555 | Printing trades machinery |

Securities & Insurance

- | SIC | Sector Description |
|------------|--|
| 62 | Security and commodity brokers, dealers, exchanges, and services |
| 63 | Insurance carriers |
| 65 | Real estate |

Banking & Advertising

- | SIC | Sector Description |
|------------|--|
| 60 | Depository institutions |
| 61 | Nondepository credit institutions |
| 62 | Security and commodity brokers, dealers, exchanges, and services |
| 73 | Business services |

Legal Services

SIC Sector Description

81 Legal services

Transportation, Shipping & Logistics

SIC Sector Description

42 Motor freight transportation and warehousing

43 US Postal Service

44 Water transportation

45 Transportation by air %%

46 Pipelines, except natural gas

47 Transportation services

Pharmaceuticals

SIC Sector Description

2833 Medicinals & botanicals

2834 Pharmaceutical preparations

2835 Diagnostic substances

2836 Biological products, except diagnostic

Benchmark Technology Clusters

Chemicals & Plastics

SIC Sector Description

2812 Alkalies & chlorine

2813 Industrial gases

2816 Inorganic pigments

2821 Plastics materials & resins

2822 Synthetic rubber

2823 Cellulosic manmade fibers

2824 Organic fibers, noncellulosic

2841 Soap & other detergents

2842 Polishes & sanitation goods

2843 Surface active agents

2844 Toilet preparations

2851 Paints & allied products

2865 Cyclic crudes & intermediates

2869 Industrial organic chemicals, n.e.c.

2873 Nitrogenous fertilizers

2874 Phosphatic fertilizers

2875 Fertilizers, mixing only

2879 Agricultural chemicals, n.e.c.

2891 Adhesives & sealants

2893 Printing ink

2899 Chemical preparations, n.e.c.

3559 Special industry machinery, n.e.c.

3624 Carbon & graphite products

3692 Primary batteries, dry & wet

3843 Dental equipment & supplies

80 Health services

Info. Tech & Instruments

SIC Sector Description

3571 Electronic computers

3572 Computer storage devices

3575 Computer terminals

3577 Computer peripheral equipment, n.e.c.

3578 Calculating & accounting equipment

3579 Office machines, n.e.c.

3625 Relays & industrial controls

3629 Electrical industrial apparatus, n.e.c.

3631 Household cooking equipment

3643 Current-carrying wiring devices

3644 Noncurrent-carrying wiring devices

3661 Telephone & telegraph apparatus

3663 Radio & TV communications equipment

3669 Communications equipment, n.e.c.

3672	Printed circuit boards
3674	Semiconductors & related devices
3675	Electronic capacitors
3676	Electronic resistors
3677	Electronic coils & transformers
3678	Electronic connectors
3679	Electronic components, n.e.c.
3694	Engine electrical equipment
3699	Electrical equipment & supplies, n.e.c.
3812	Search & navigation equipment
3821	Laboratory apparatus & furniture
3822	Environmental controls
3823	Process control instruments
3824	Fluid meters & counting devices
3825	Instruments to measure electricity
3826	Analytical instruments
3827	Optical instruments & lenses
3829	Measuring & controlling devices, n.e.c.
3844	X-ray apparatus & tubes
3845	Electromedical equipment
73	Business services

Industrial Mach.

SIC	Sector Description
3511	Turbines & turbine generator sets
3532	Mining machinery
3535	Conveyors & conveying equipment
3536	Hoists, cranes, & monorails
3541	Machine tools, metal cutting types
3542	Machine tools, metal forming types
3546	Power-driven handtools
3547	Rolling mill machinery
3549	Metalworking machinery, n.e.c.
3553	Woodworking machinery
3555	Printing trades machinery
3556	Food products machinery

3559	Special industry machinery, n.e.c.
3561	Pumps & pumping equipment
3563	Air & gas compressors
3564	Blowers & fans
3565	Packaging machinery
3612	Transformers
3621	Motors & generators

Motor Vehicle Mfg

SIC	Sector Description
2851	Paints & allied products
2893	Printing ink
3519	Internal combustion engines, n.e.c.
3531	Construction machinery
3534	Elevators & moving stairways
3537	Industrial trucks & tractors
3548	Welding apparatus
3641	Electric lamps
3645	Residential lighting fixtures
3646	Commercial lighting fixtures
3647	Vehicular lighting equipment
3648	Lighting equipment, n.e.c.
3651	Household audio & video equipment
3691	Storage batteries
3694	Engine electrical equipment
3711	Motor vehicles & car bodies
3713	Truck & bus bodies
3714	Motor vehicle parts & accessories
3715	Truck trailers

Aerospace

SIC	Sector Description
3544	Special dies, tools, jigs, & fixtures
3545	Machine tool accessories

3721	Aircraft
3724	Aircraft engines & engine parts
3728	Aircraft parts & equipment, n.e.c.
3761	Guided missiles & space vehicles
3764	Space propulsion units & parts
3769	Space vehicle equipment, n.e.c.

Household Appliances

SIC	Sector Description
3632	Household refrigerators & freezers
3633	Household laundry equipment
3635	Household vacuum cleaners
3639	Household appliances, n.e.c.
3716	Motor homes

Communications Services & Software

SIC	Sector Description
48	Communications
73	Business services
87	Engineering, accounting, research, management, and related services

Pharmaceuticals & Medical Tech.

SIC	Sector Description
2833	Medicinals & botanicals
2834	Pharmaceutical preparations
2835	Diagnostic substances
2836	Biological products, except diagnostic
3634	Electric housewares & fans
3841	Surgical & medical instruments
3842	Surgical appliances & supplies
87	Engineering, accounting, research, management, and related service

APPENDIX B: Clusters Present in the Region

Benchmark Clusters Present in Region

Cluster Name	Employment	% Private	Annual %	LQ	Avg. Wage
	2001	Emp. 2001	Change 1990-01	2001	2001
1 Fabricated Textiles	33,340	10.3	-3.3	12.21	27,132
2 Apparel	25,645	7.9	-5.3	10.34	25,636
3 Leather Goods	1,015	0.3	-5.7	6.73	28,448
4 Wood Products & Furniture	14,790	4.5	-1.7	5.91	25,564
5 Construction Materials	20,658	6.4	3.0	3.38	34,748
6 Pharmaceuticals	2,307	0.7	-2.3	3.00	32,949
7 Chemicals & Plastics *	8,462	2.6	1.5	1.86	30,432
8 Legal Services	4,247	1.3	5.8	1.70	26,809
9 Motor Vehicle Manufacturing	11,536	3.5	2.6	1.58	31,847
10 Metal Working & Industrial Machinery	19,073	2.7	5.9	1.47	33,452
11 Packaged Food Products	5,473	1.7	-0.8	1.35	25,575
12 Tobacco Products	113	0.0	na	1.31	24,254
13 Platemaking & Typesetting	207	0.1	-11.9	0.98	38,075
14 Printing & Publishing	44,336	13.6	3.8	0.60	30,465
15 Transportation, Shipping & Logistics	9,062	2.8	1.3	0.77	30,036
16 Boat Building	375	0.1	-1.9	0.71	37,640
17 Canned & Bottled Beverages	306	0.1	3.7	0.65	32,439
18 Hospitals, Labs, Specialized Medical Services	38,028	11.7	4.8	0.59	29,943
19 Stone, Clay & Glass Products	416	0.1	-6.6	0.58	21,452
20 Primary Nonferrous Metals	7,817	2.4	7.8	4.86	43,733
21 Banking & Advertising	14,405	4.4	4.9	0.44	24,448
22 Information Technology & Instruments	12,215	3.8	4.6	0.40	21,626
23 Aluminum	119	0.0	54.4	0.27	37,686
24 Securities & Insurance	1,962	0.6	1.9	0.21	30,451
25 Aerospace	84	0.0	4.3	0.05	31,995
26 Jewelry	3	0.0	na	0.02	10,056
27 Petroleum Products	2	0.0	-6.1	0.01	54,610
28 Food Oil Mills	0	0.0	na	0.00	na
29 Travel & Tourism	15,154	4.7	3.7	0.65	21,017
Total Private Employment	325,268		1.0		26,709

Technology Clusters Present in Region

Cluster Name	Employment	% Private	Annual %	LQ	Avg. Wage
	2001	Emp. 2001	Change 1990-01	2001	2001
1 Chemicals & Plastics	28,218	8.7	3.8	0.86	34,045
2 Information Technology & Instruments	12,847	3.9	4.0	0.44	21,802
3 Industrial Machinery	2,176	0.7	-2.1	1.62	33,991
4 Motor Vehicle Mfg	4,291	1.3	6.7	1.14	38,187
5 Aerospace	313	0.1	-1.4	0.17	30,844
6 Household Appliances	0	0.0	na	0.00	na
7 Communications Services & Software	13,158	4.0	5.9	0.35	22,972
8 Pharmaceuticals & Medical Technology	5,094	1.6	0.2	0.50	33,209

APPENDIX C: Subregional Cluster Gaps

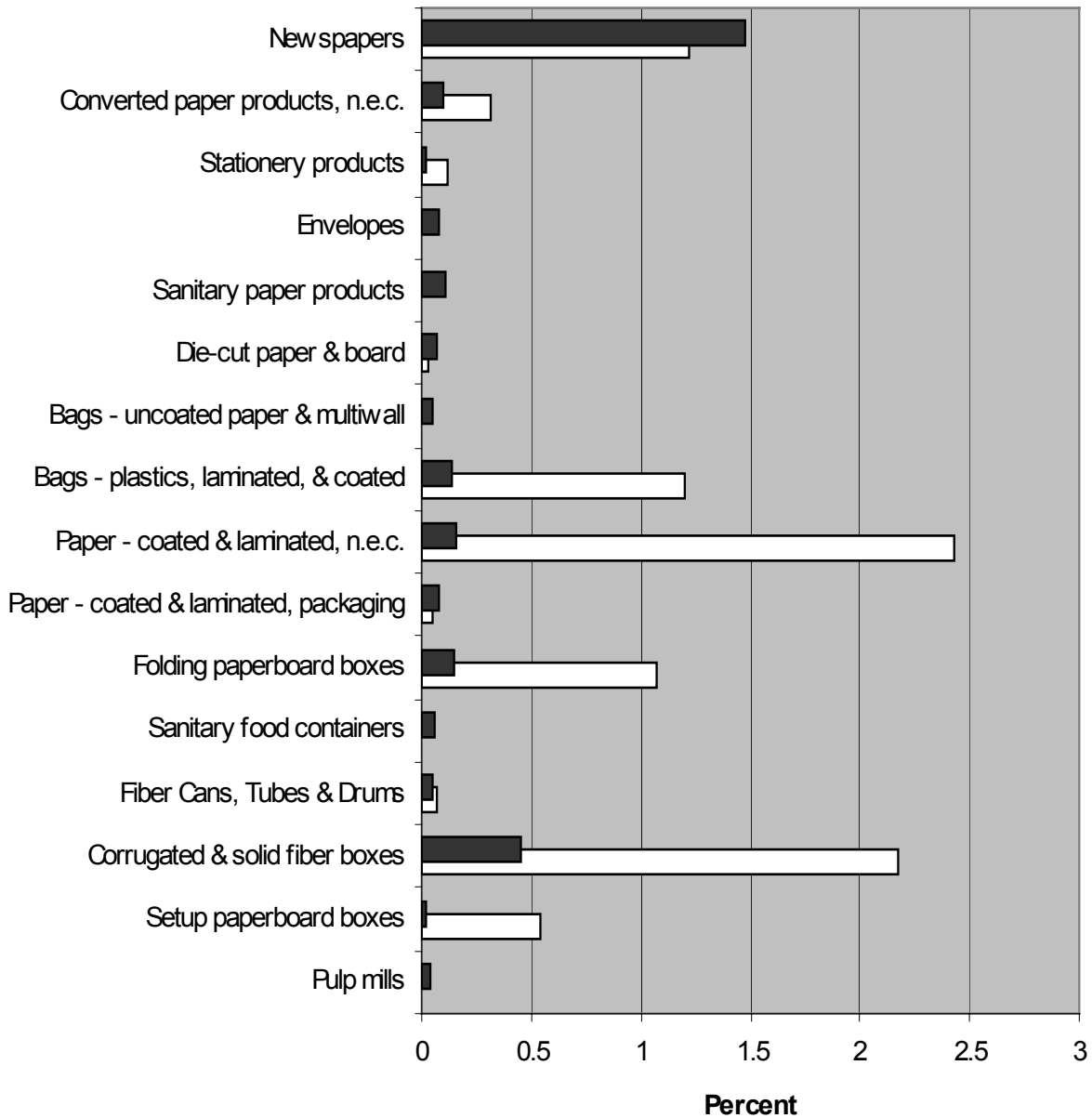
Western Piedmont Subregion Target & Expansion Clusters

Cluster Name	Employment	% Private	Annual %	LQ	Avg. Wage
	2001	Emp. 2001	Change 1990-01	2001	2001
EC Printing & Publishing	27,340	12.8	3.1	0.57	31,152
EC Hospitals, Labs, Specialized Medical Services	23,169	10.9	4.1	0.55	30,621
HT Chemicals & Plastics	17,732	8.3	3.2	0.82	34,589
R&E Construction Materials	17,047	8	4	1.75	35,419
R&E Metal Working & Indus. Mach.	10,824	5.1	1.4	1.27	30,913
EC Travel & Tourism	9,632	4.5	1.9	0.49	20,920
R&E Primary Nonferrous Metals	7,589	3.6	8.2	7.19	44,075
R&E Motor Vehicle Mfg	7,356	3.4	2.7	1.54	30,427
HT Pharmaceuticals & Medical Tech.	1,435	0.7	3.1	0.22	35,954
Private Sector Total	213,461		0.7		27,523

Note:

EC= Emerging Cluster; R&E= Retention & Expansion Candidate (existing cluster); HT=High Tech Cluster

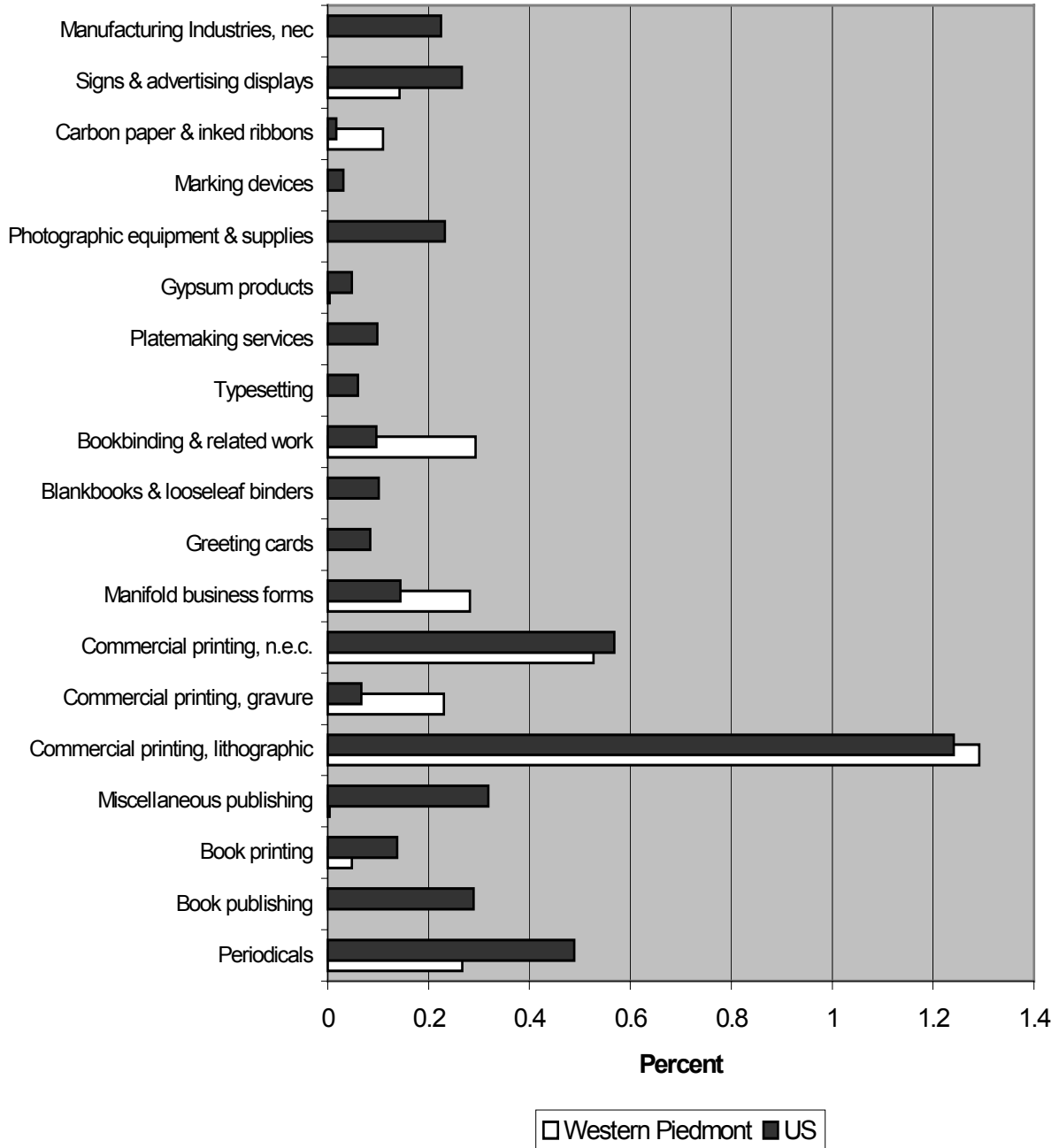
Western Piedmont Cluster Shares: Printing & Publishing



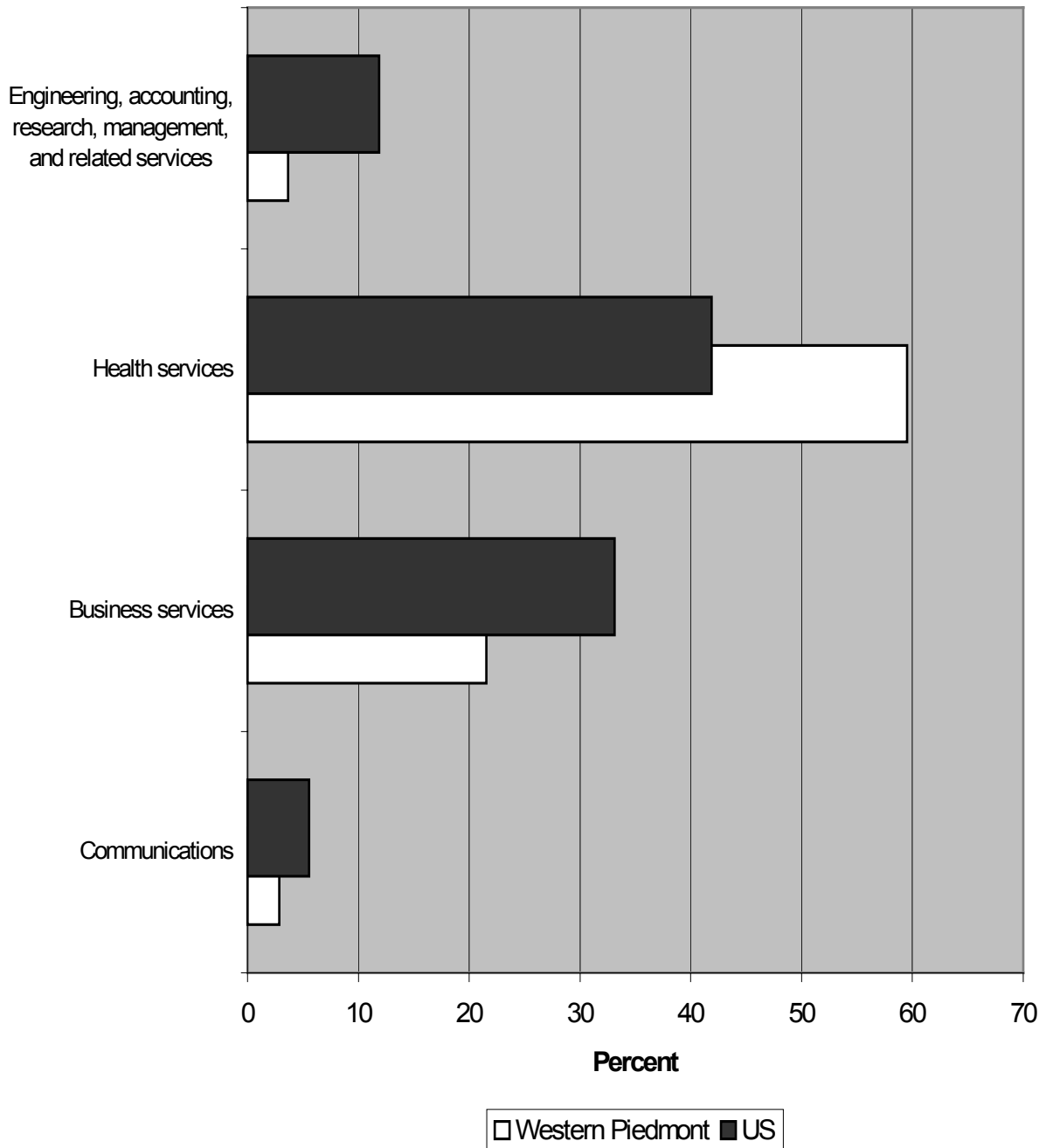
27,340 employees

□ Western Piedmont ■ US

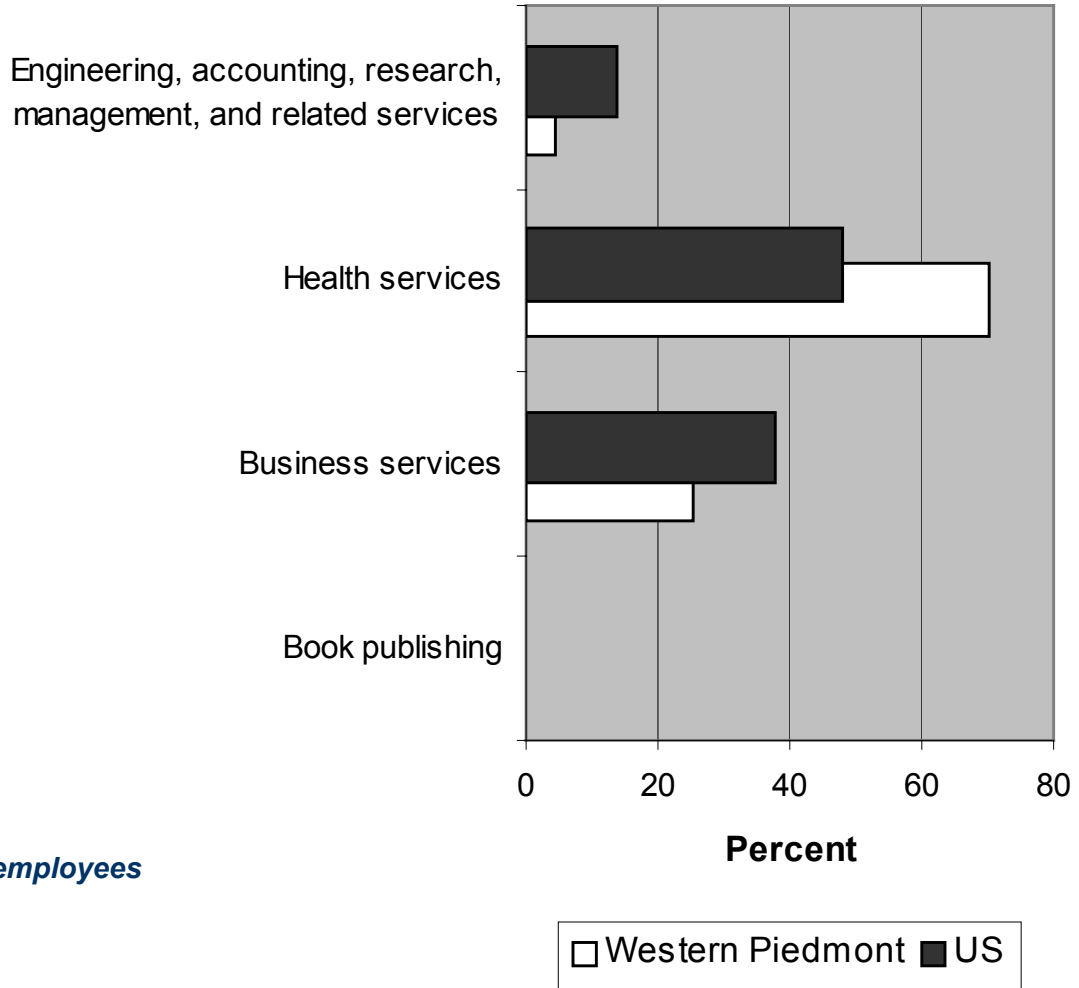
Western Piedmont Cluster Shares: Printing & Publishing (cont.)



Western Piedmont Cluster Shares: Printing & Publishing (cont.)

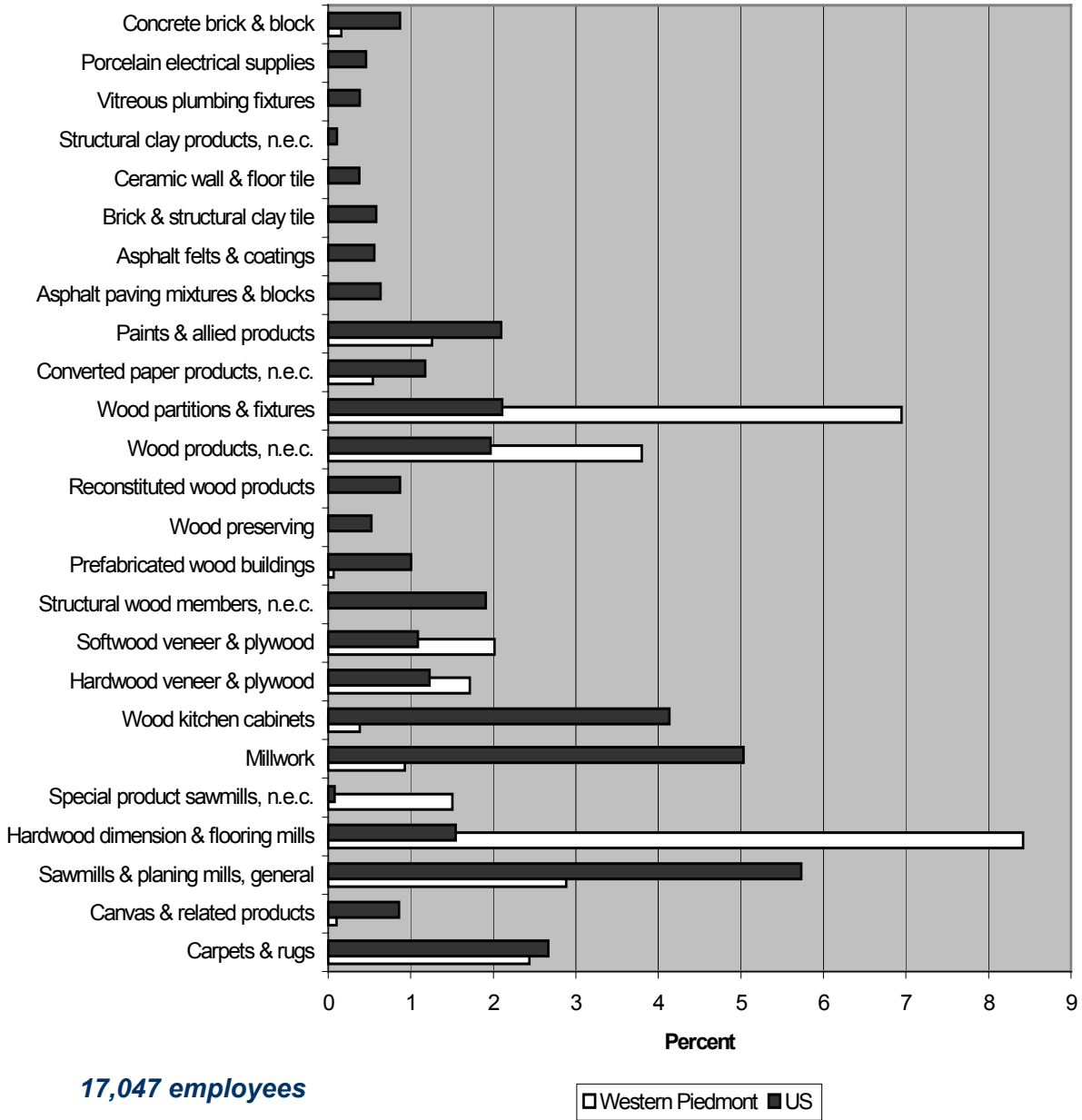


Western Piedmont Cluster Shares: Hospitals, Labs & Medical Services

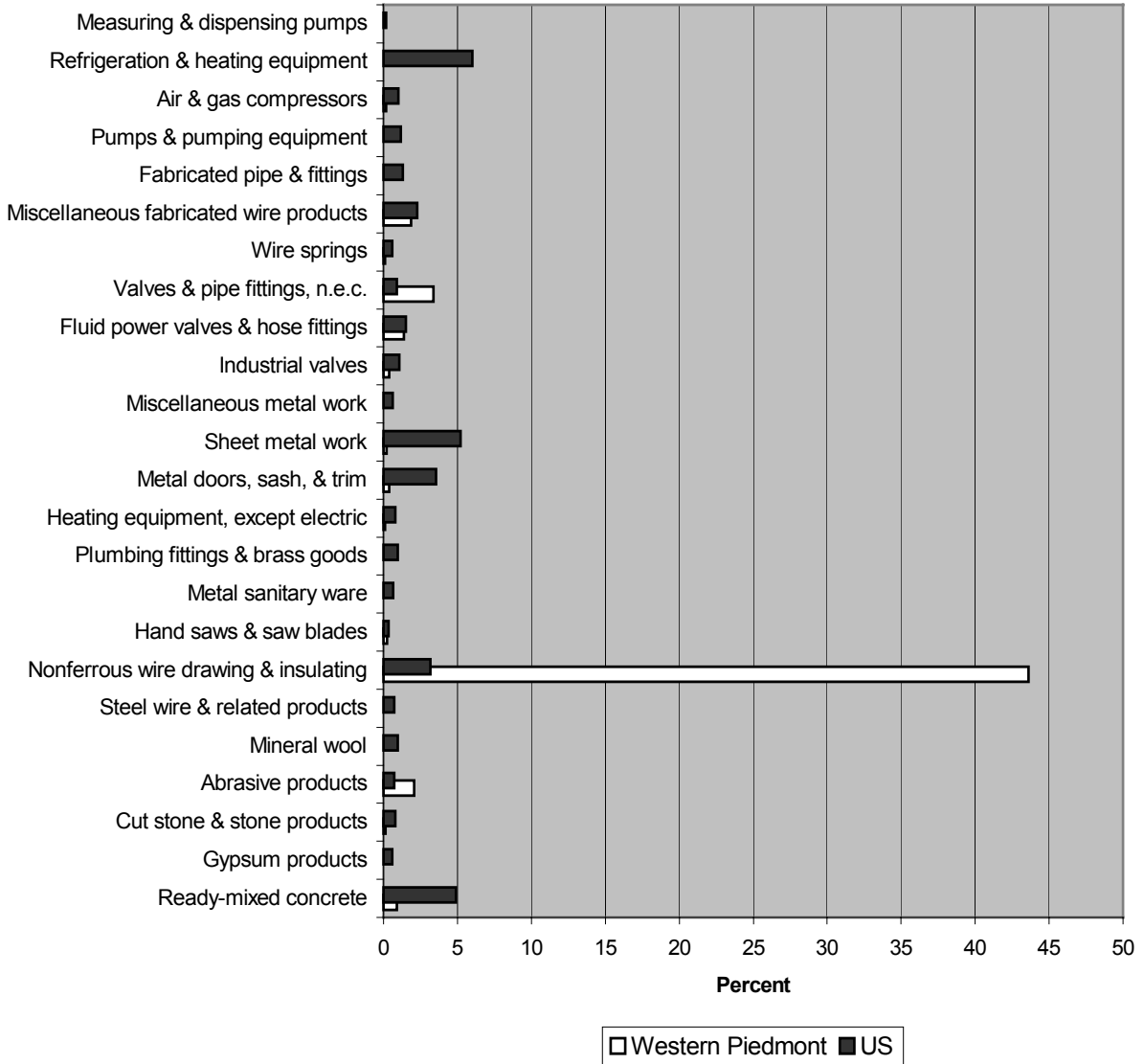


23,169 employees

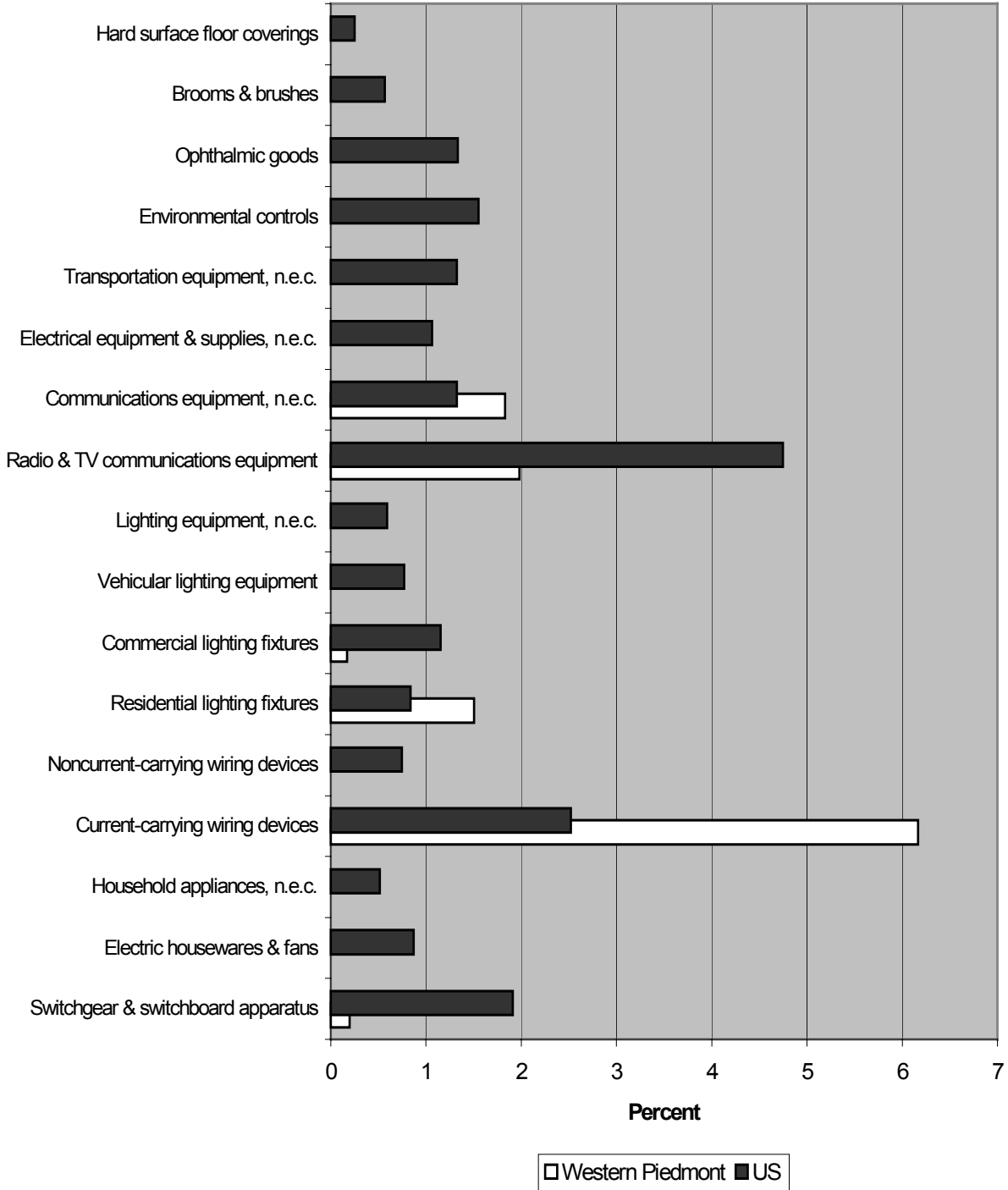
Western Piedmont Cluster Shares: Construction Materials



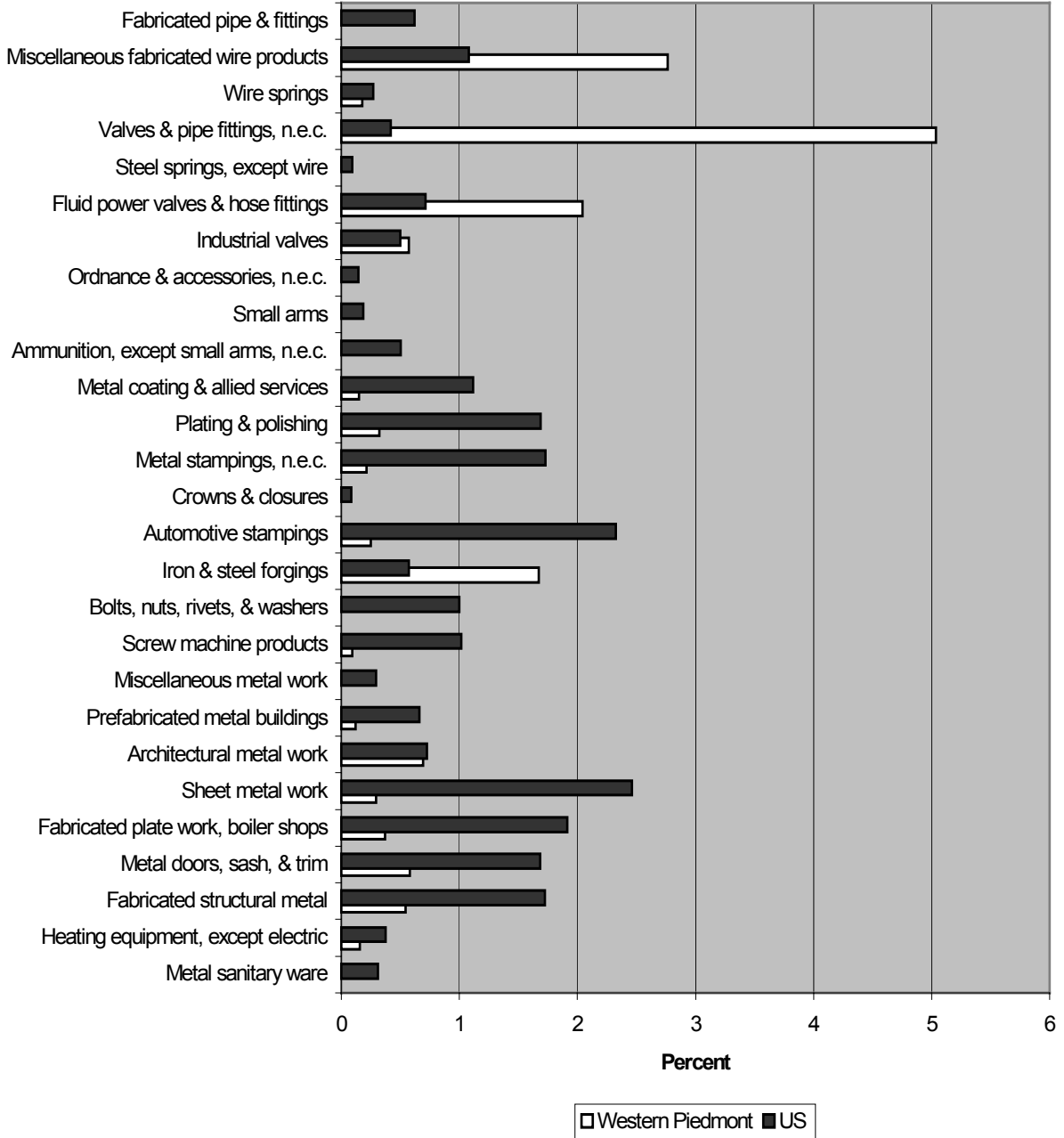
Western Piedmont Cluster Shares: Construction Materials (cont.)



Western Piedmont Cluster Shares: Construction Materials (cont.)

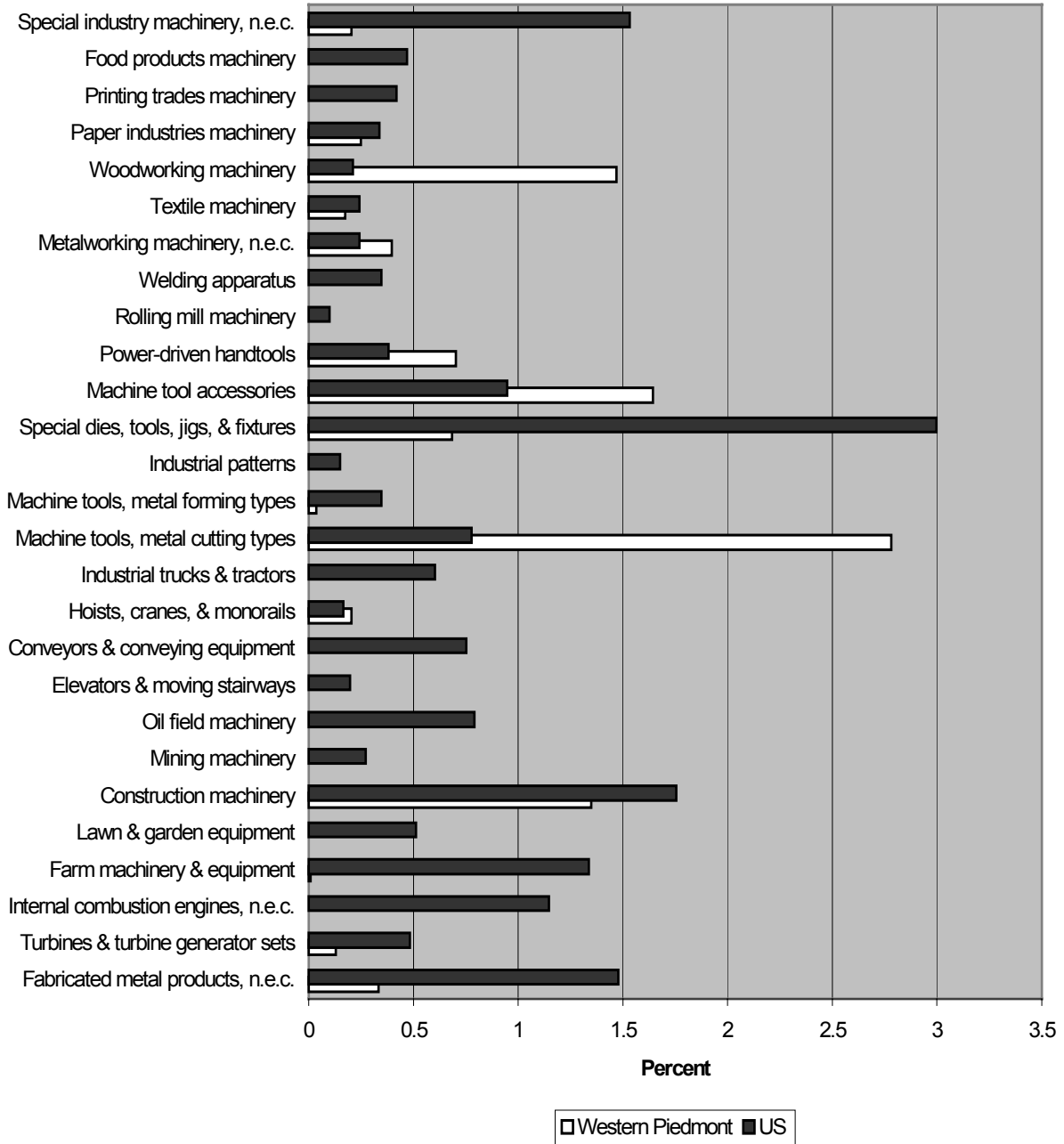


Western Piedmont Cluster Shares: Metal Working & Industrial Machinery (cont.)

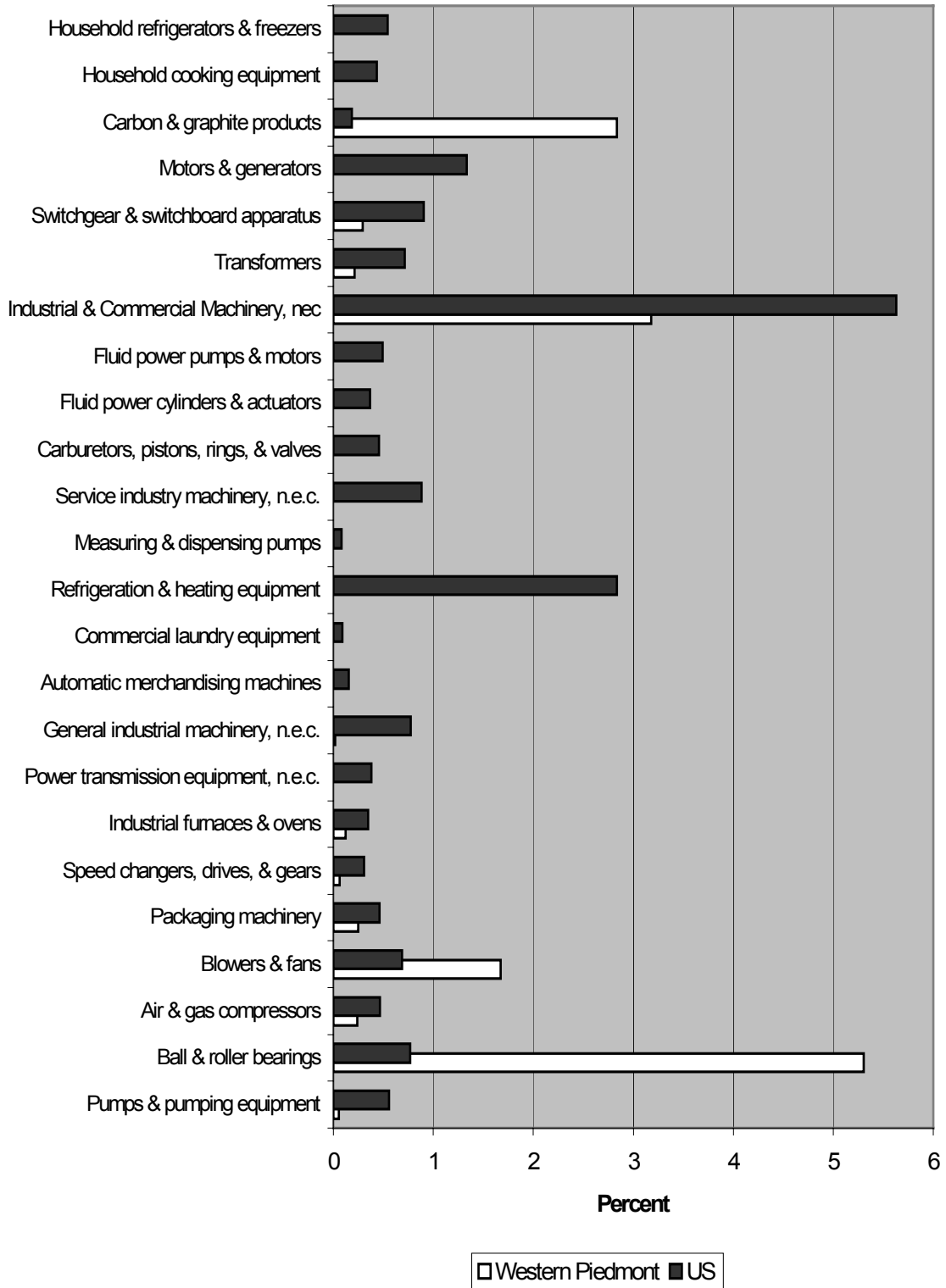


10,824 employees

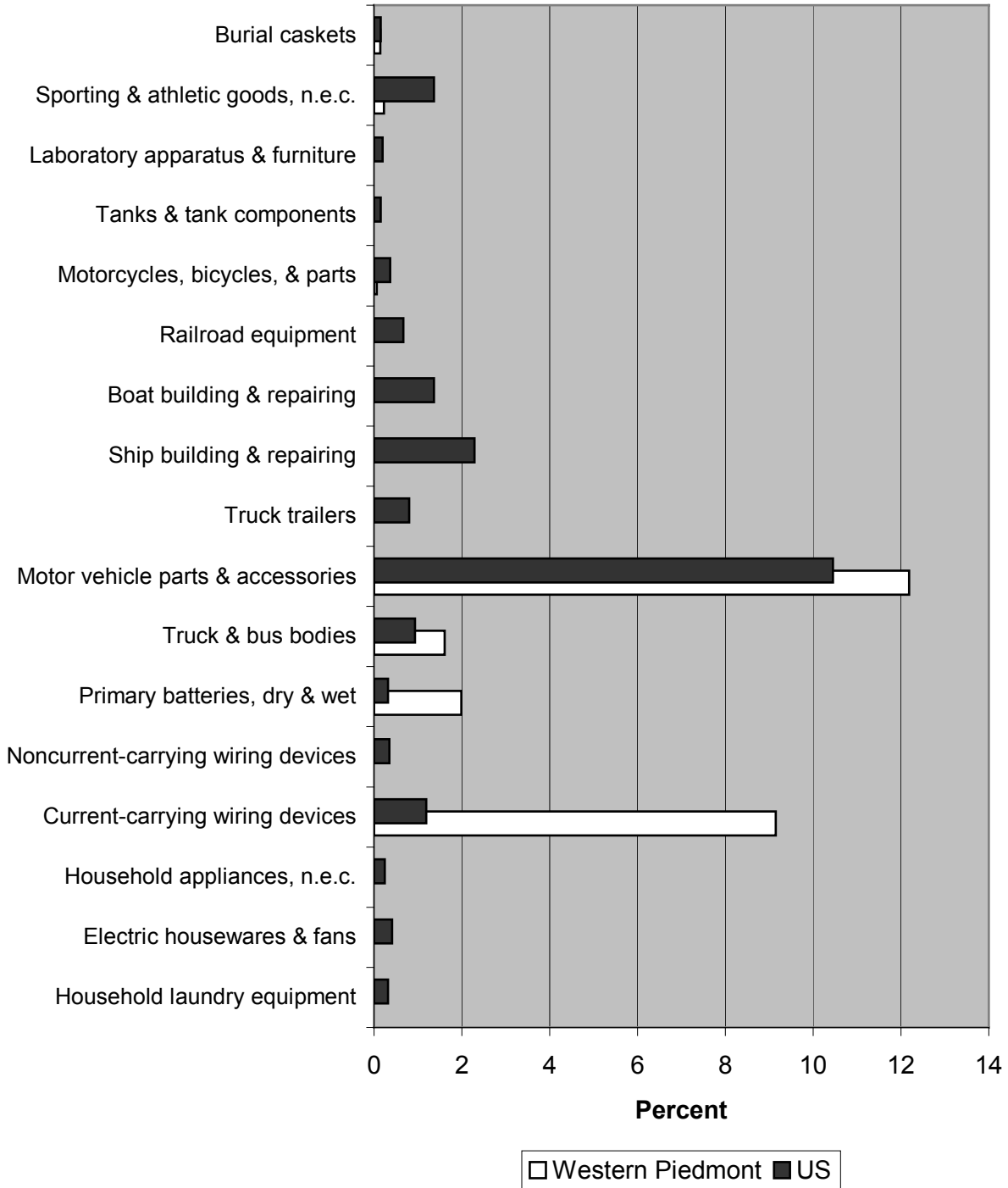
Western Piedmont Cluster Shares: Metal Working & Industrial Machinery (cont.)



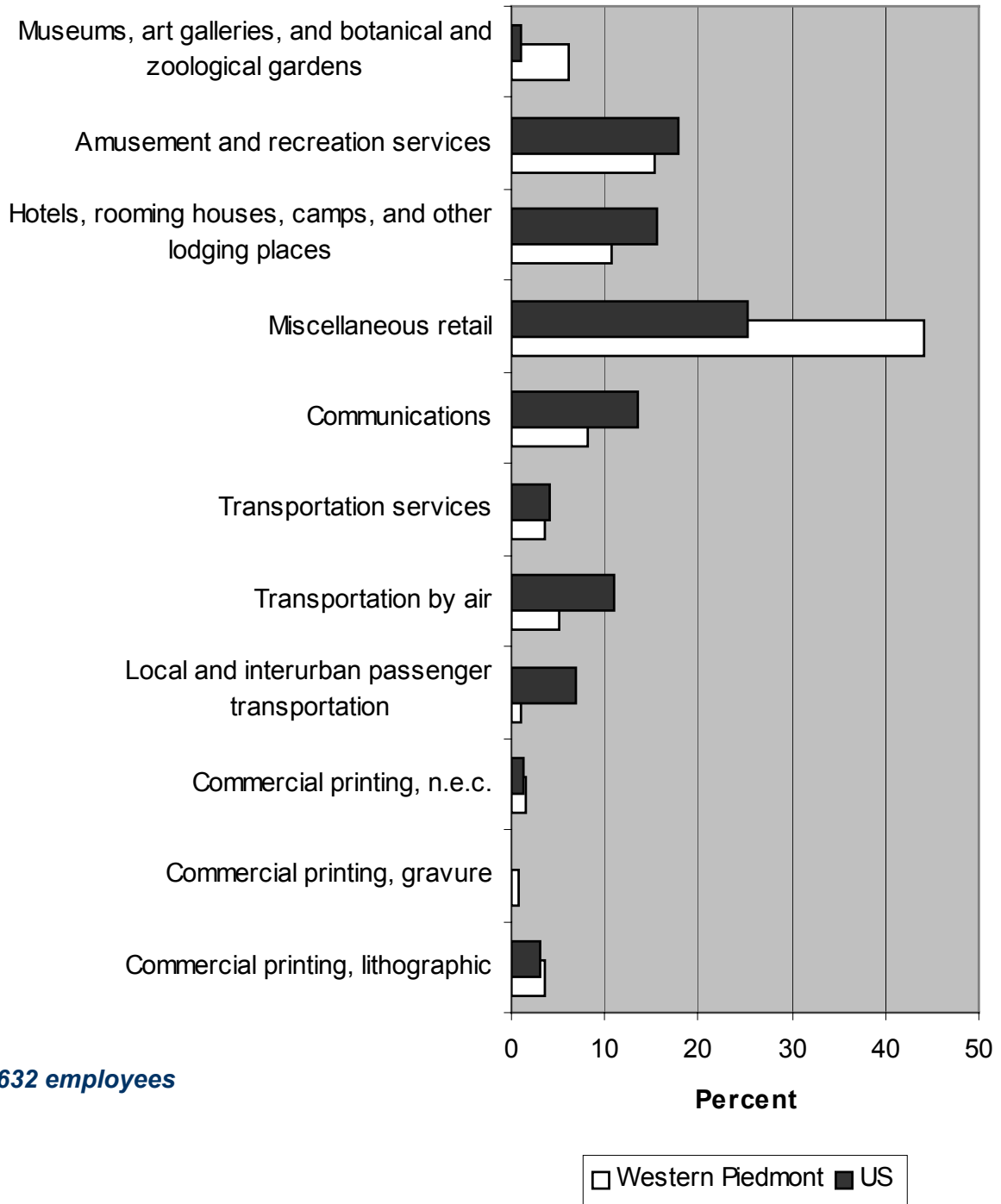
**Western Piedmont Cluster Shares:
Metal Working & Industrial Machinery (cont.)**



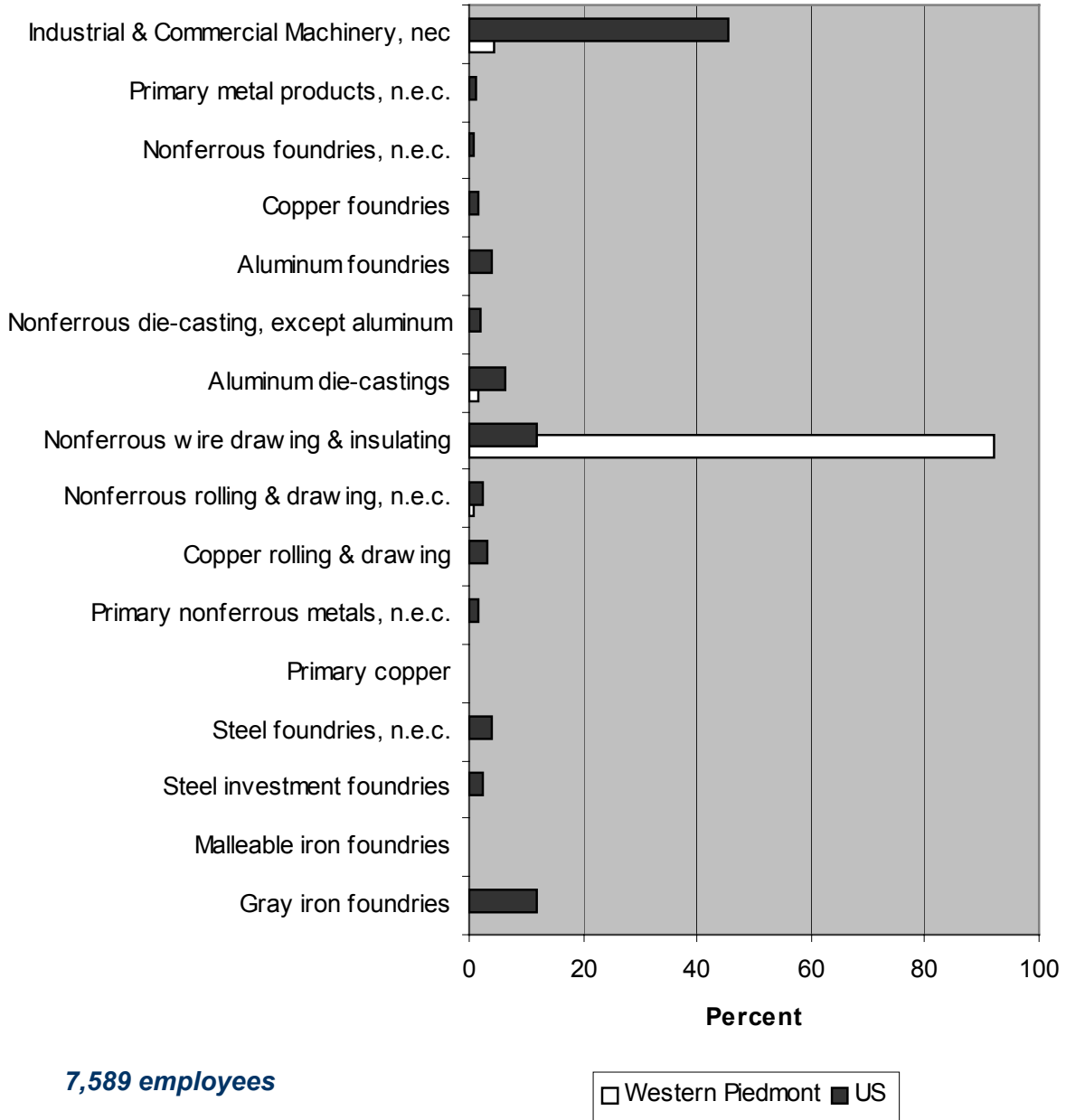
**Western Piedmont Cluster Shares: Metal Working & Industrial Machinery
(cont.)**



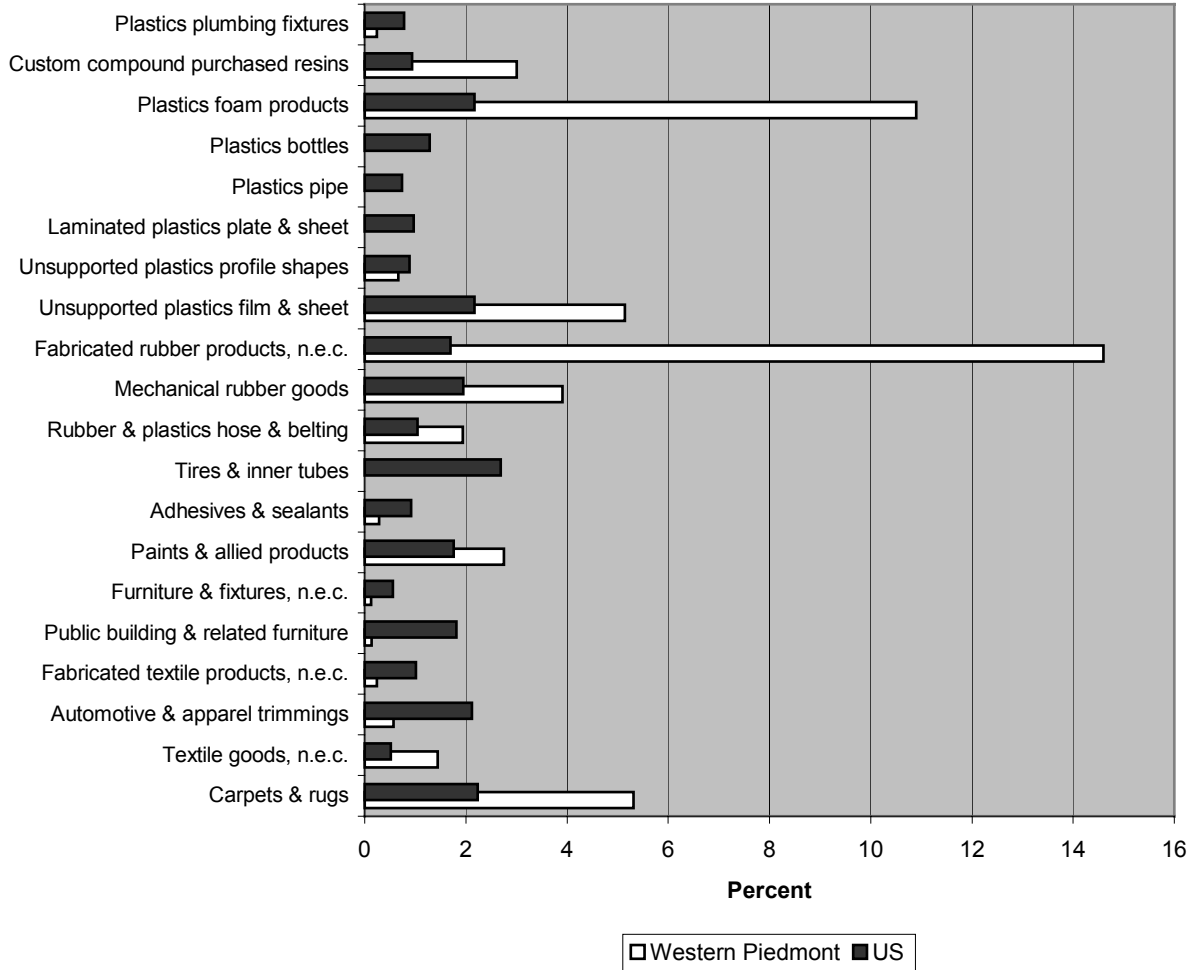
Western Piedmont Cluster Shares: Travel & Tourism



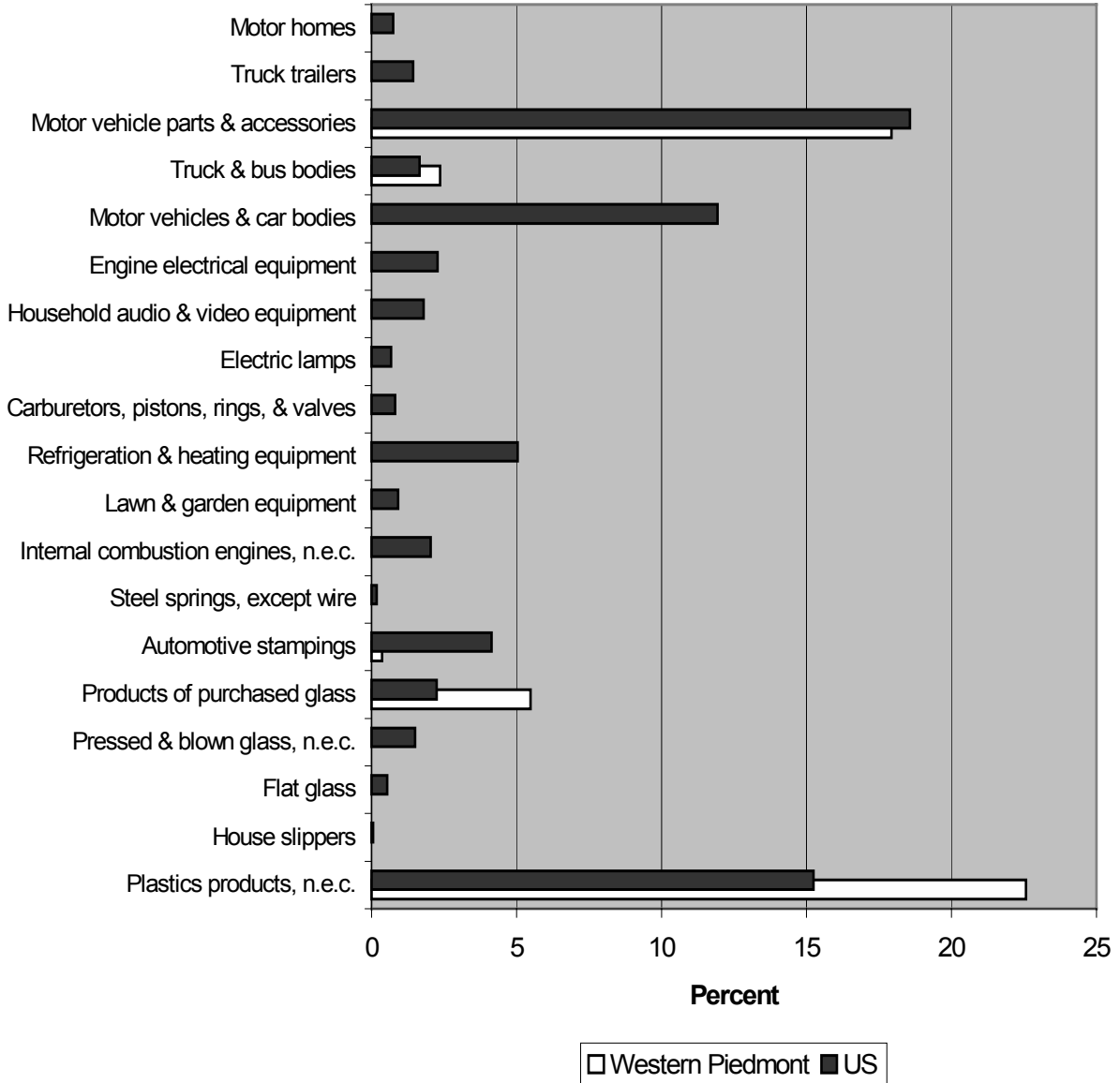
Western Piedmont Cluster Shares: Primary Nonferrous Metals



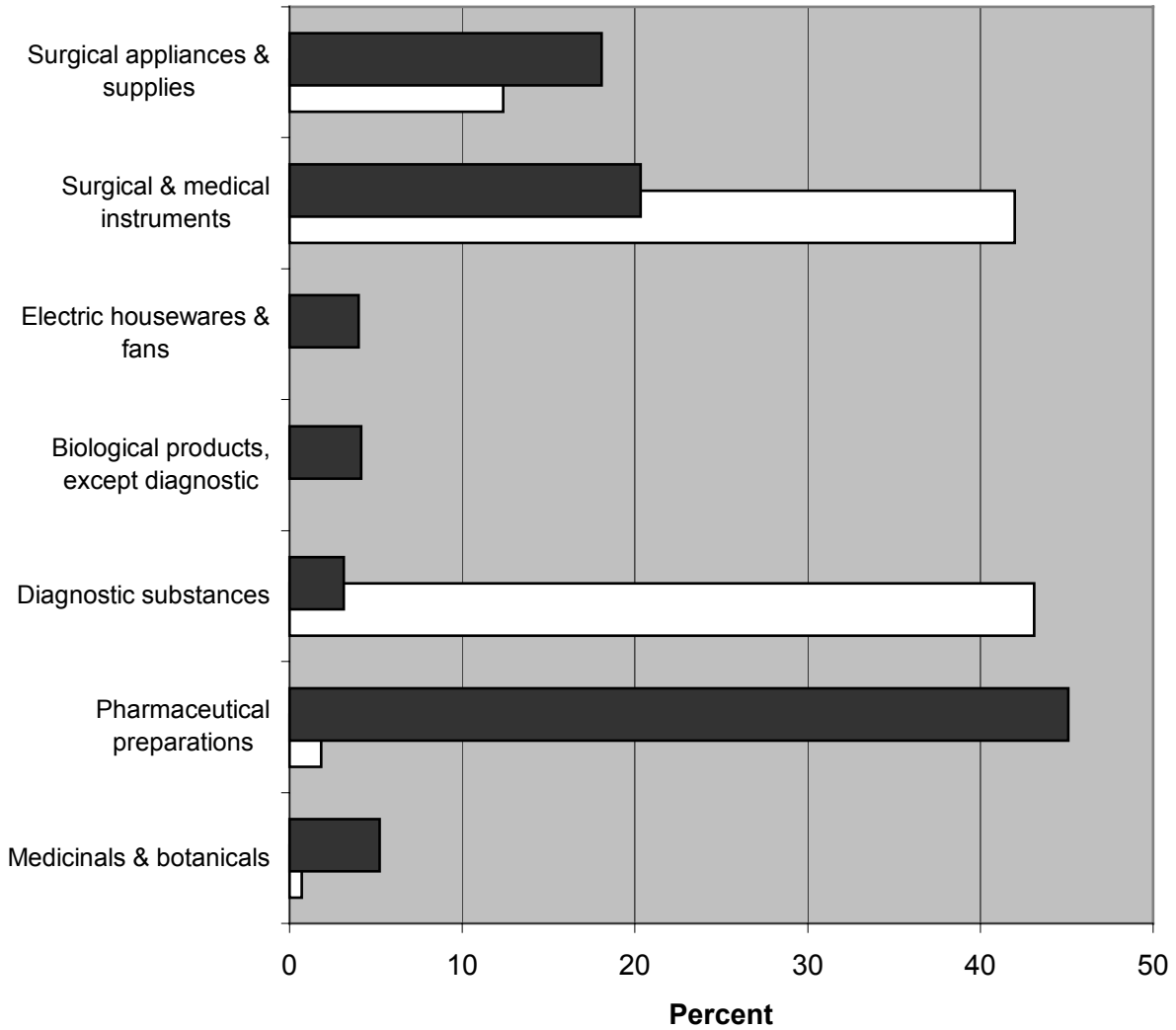
Western Piedmont Cluster Shares: Motor Vehicles



Western Piedmont Cluster Shares: Motor Vehicles (cont.)



Western Piedmont Cluster Shares: Pharmaceuticals



1,435 employees

□ Western Piedmont ■ US

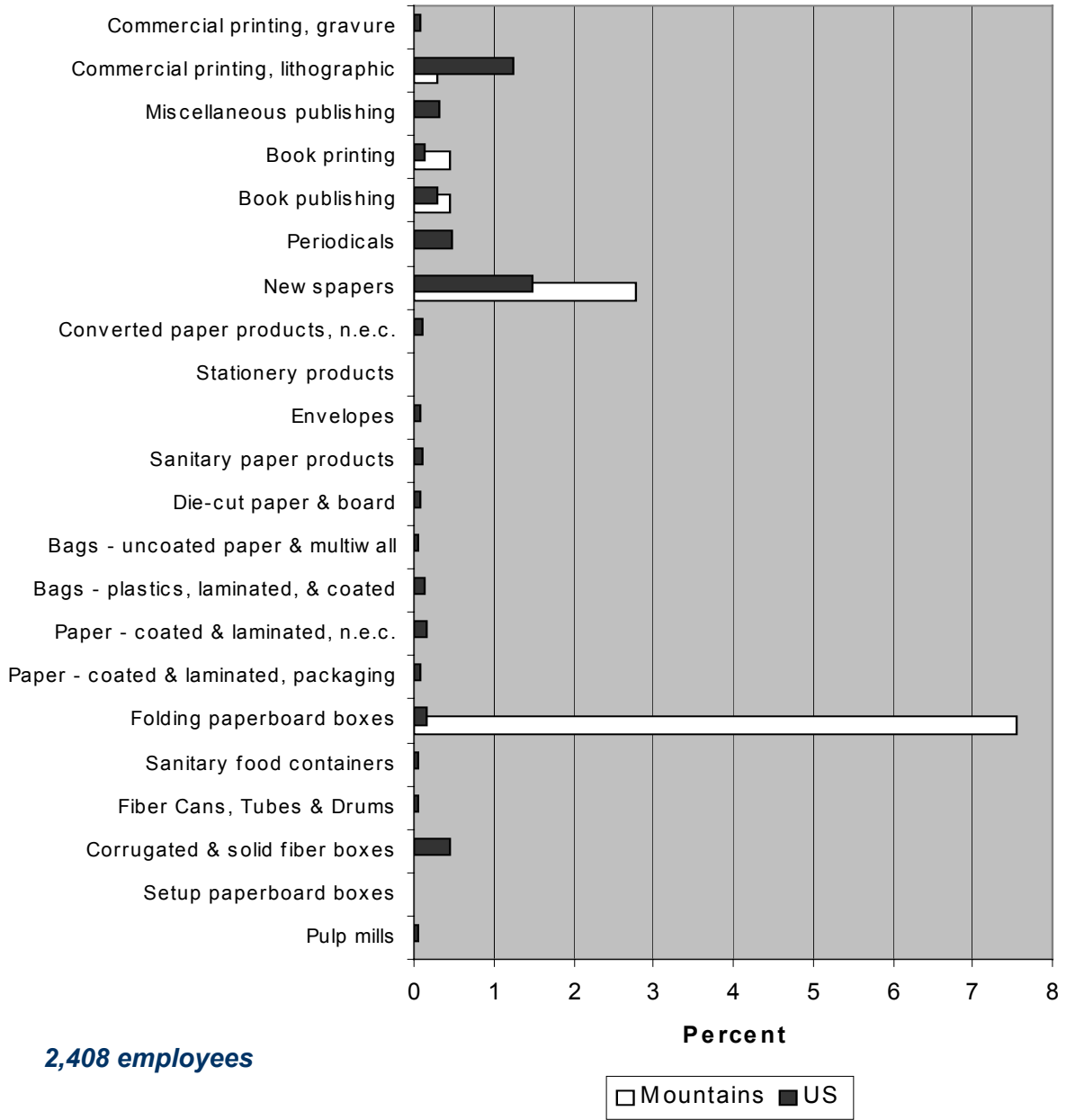
Mountain Subregion Target & Expansion Clusters

Cluster Name	Employment	% Private	Annual %	LQ	Avg. Wage
	2001	Emp. 2001	Change 1990-01	2001	2001
EC Printing & Publishing	2,408	8.9	2.4	0.4	27,327
HT Pharmaceuticals & Medical Tech.	2,021	7.5	-3.3	2.44	31,728
EC Hospitals, Labs, Specialized Medical Services	2,016	7.4	2.9	0.38	26,613
EC Travel & Tourism	1,972	7.3	1.6	0.8	20,793
R&E Construction Materials	1,925	7.1	1.8	1.58	30,979
HT Chemicals & Plastics	1,693	6.2	2.4	0.63	27,335
R&E Motor Vehicle Mfg	1,098	4.1	0.7	1.84	27,087
R&E Metal Working & Indus. Mach.	588	2.2	6.6	0.55	28,503
R&E Primary Nonferrous Metals	D	D	D	D	D
Private Sector Total	27,100		0.60%		23,848

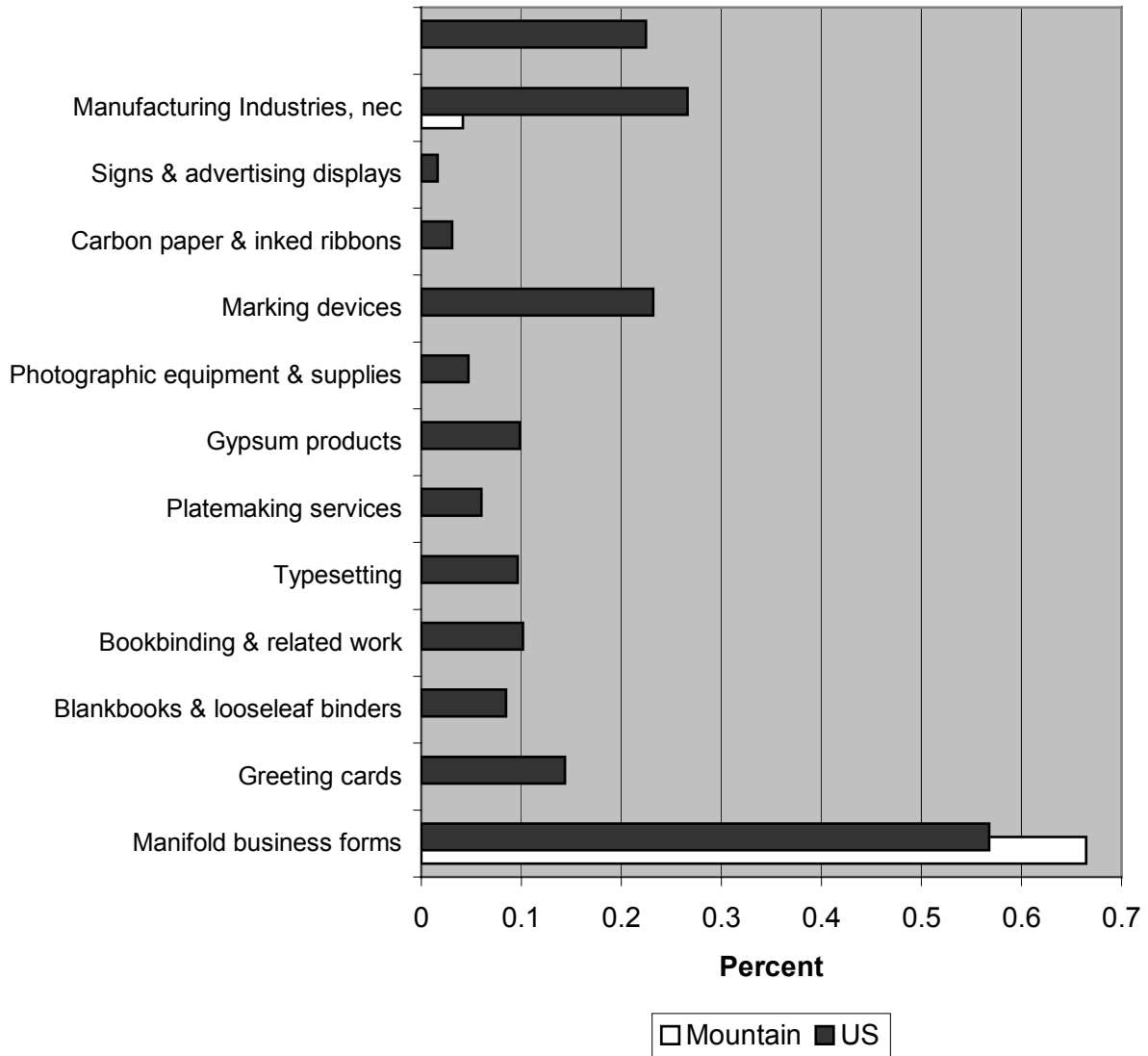
Note:

EC= Emerging Cluster; R&E= Retention & Expansion Candidate (existing cluster); HT=High Tech Cluster

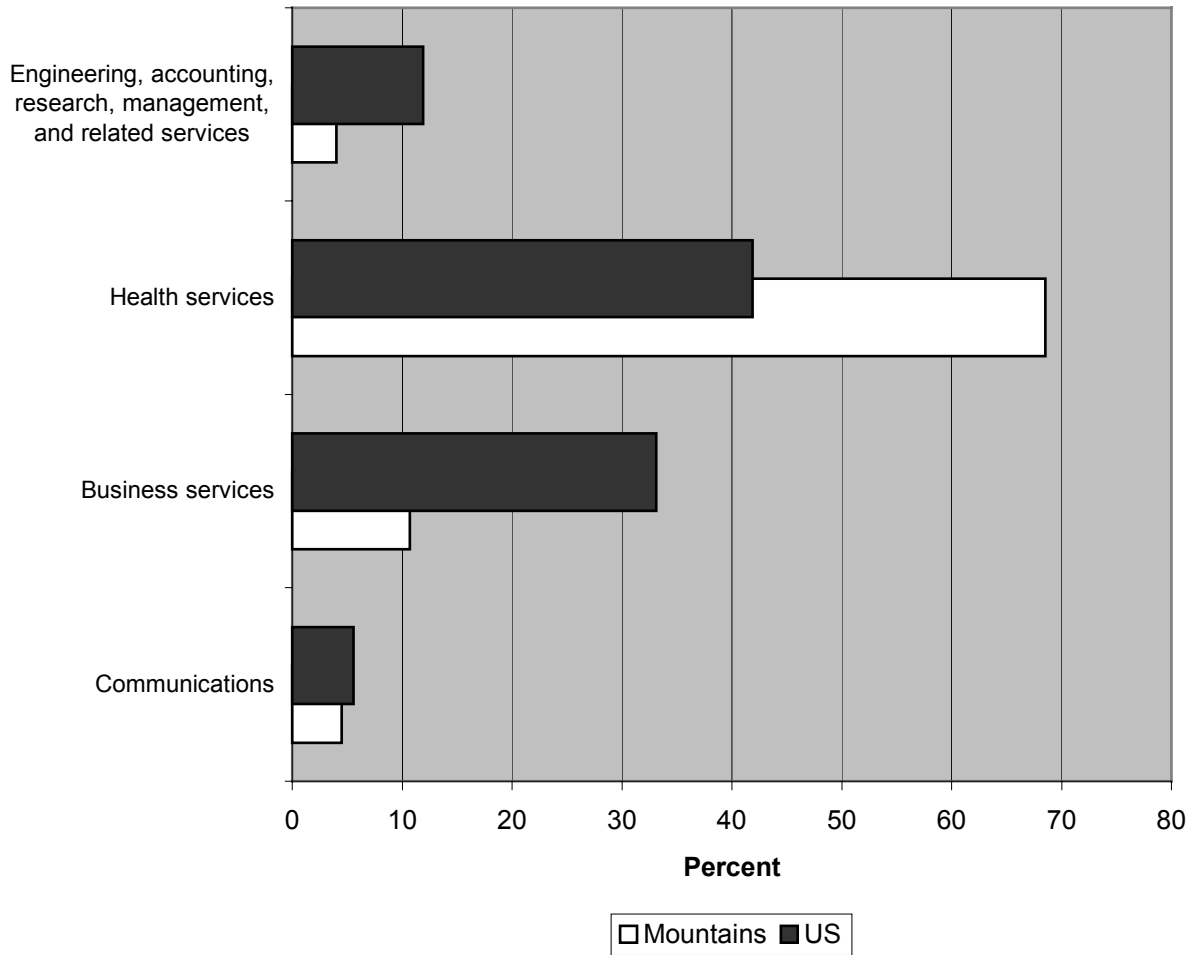
Mountain Cluster Shares: Printing & Publishing



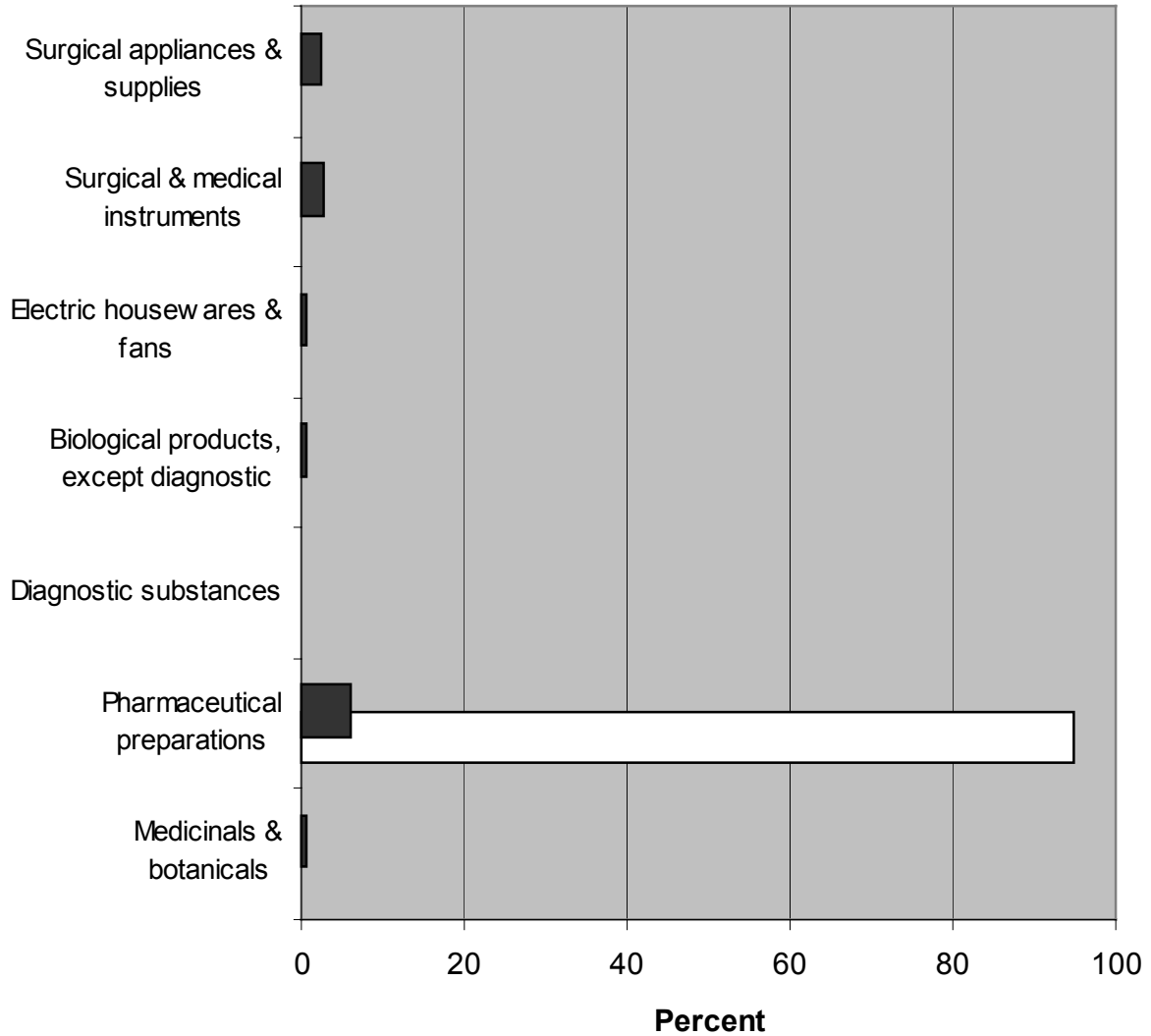
Moutain Cluster Shares: Printing & Publishing (cont.)



Mountain Cluster Shares: Printing & Publishing (cont.)



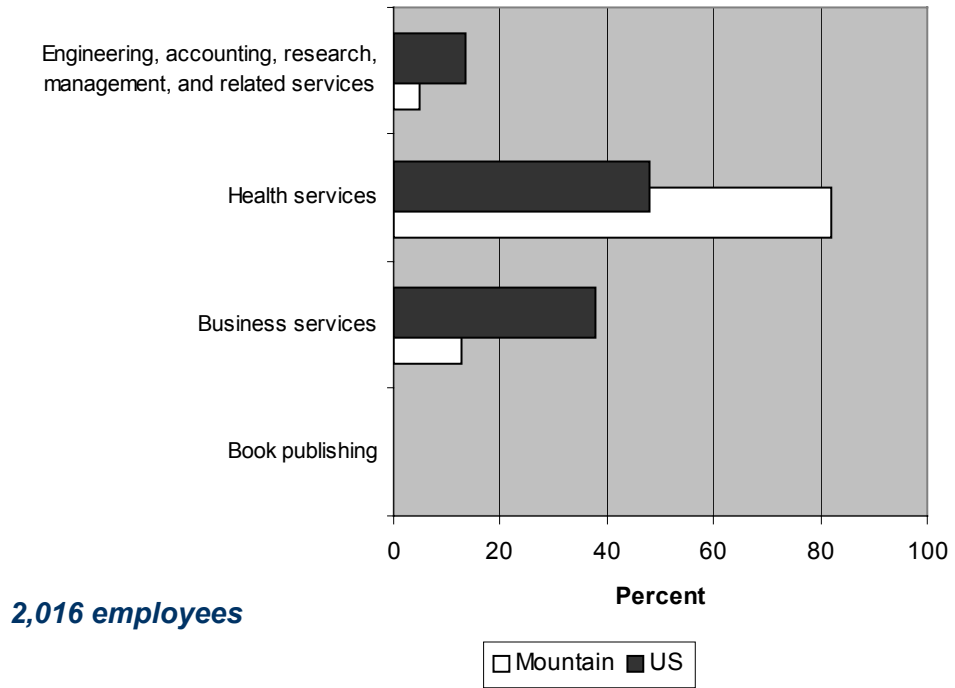
Mountain Cluster Shares: Phamaceuticals & Medical Technology



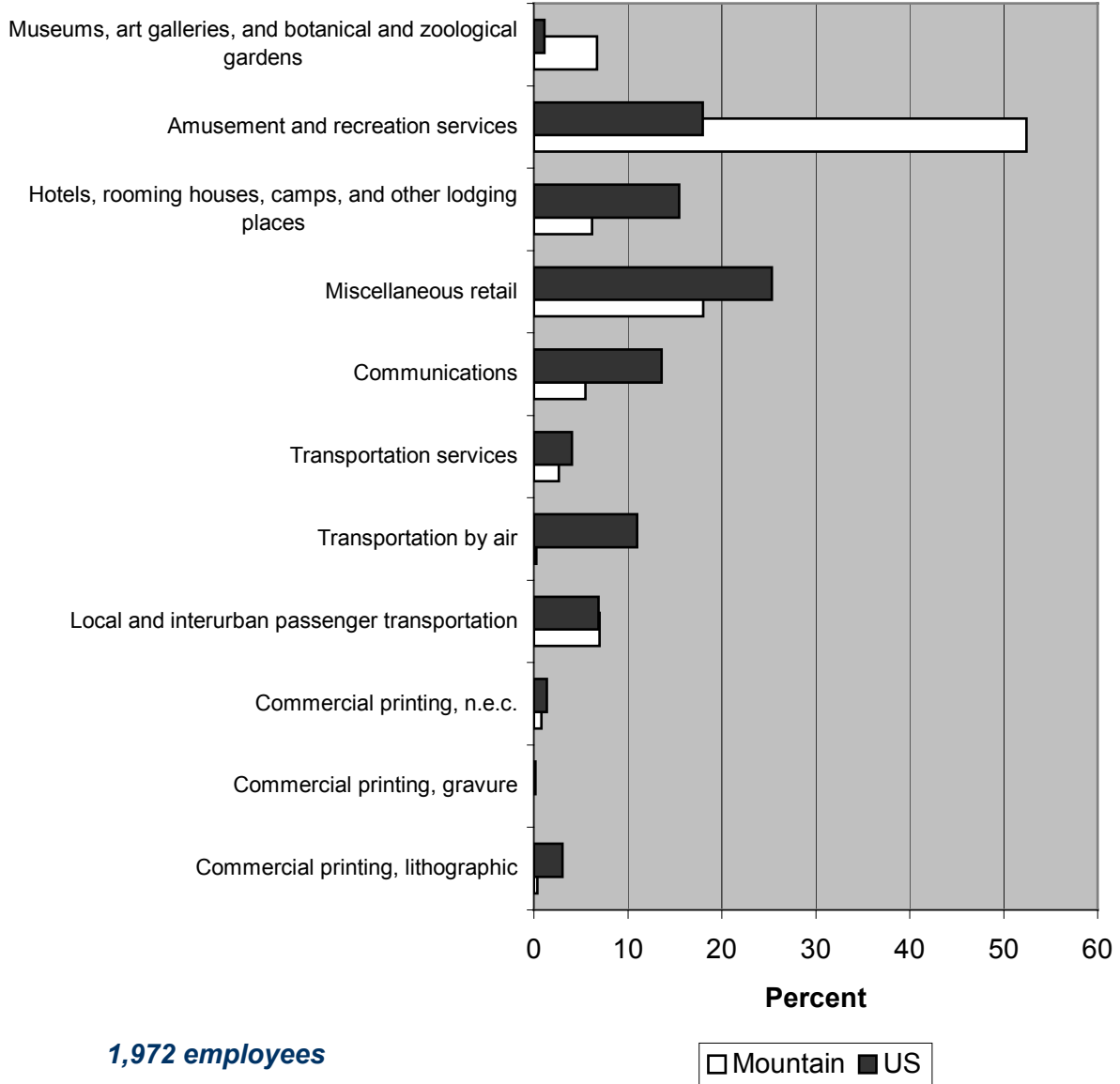
2,021 employees

□ Mountain ■ US

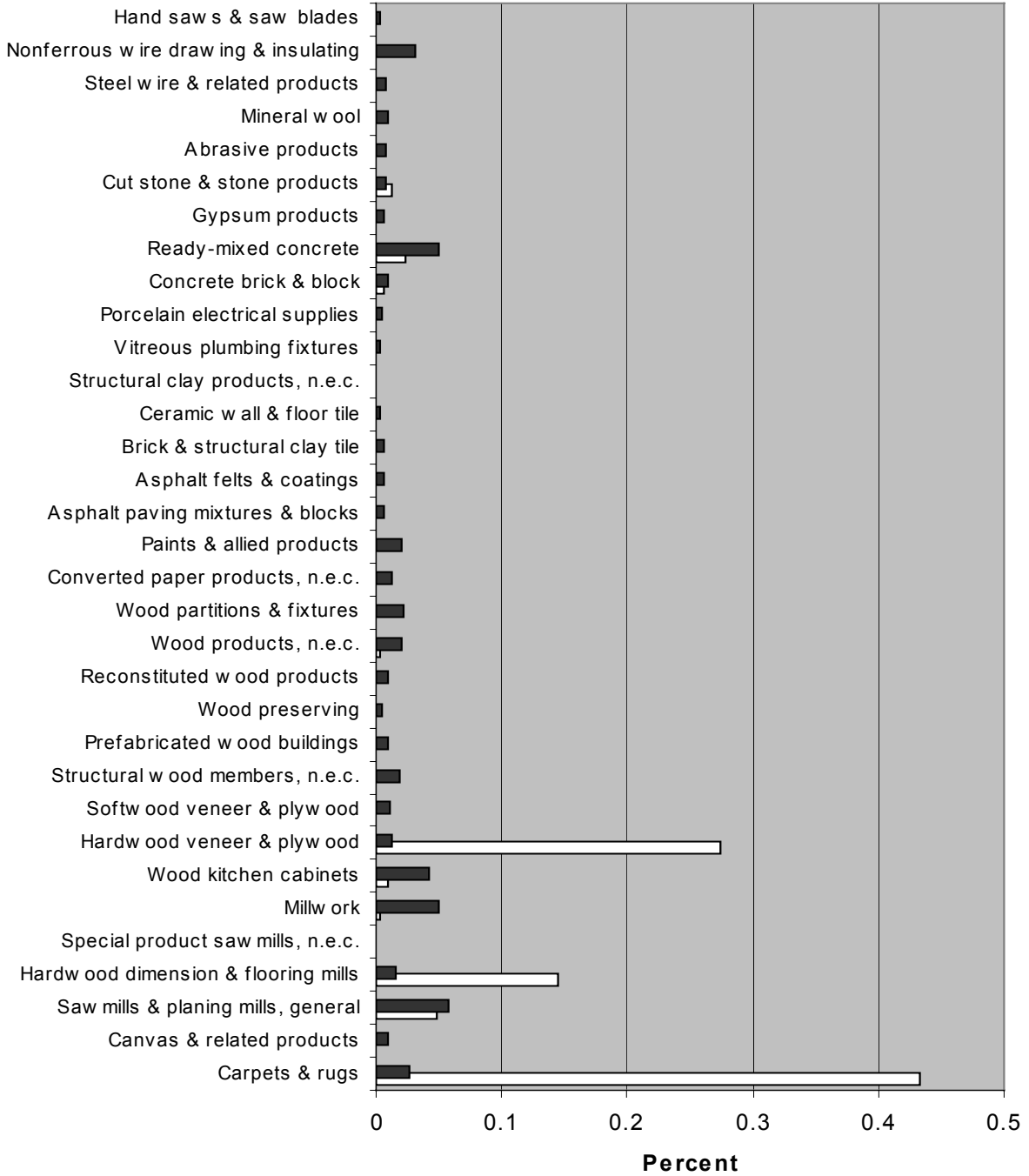
Mountain Cluster Shares: Hospitals, Labs & Medical Services



Mountain Cluster Shares: Travel & Tourism



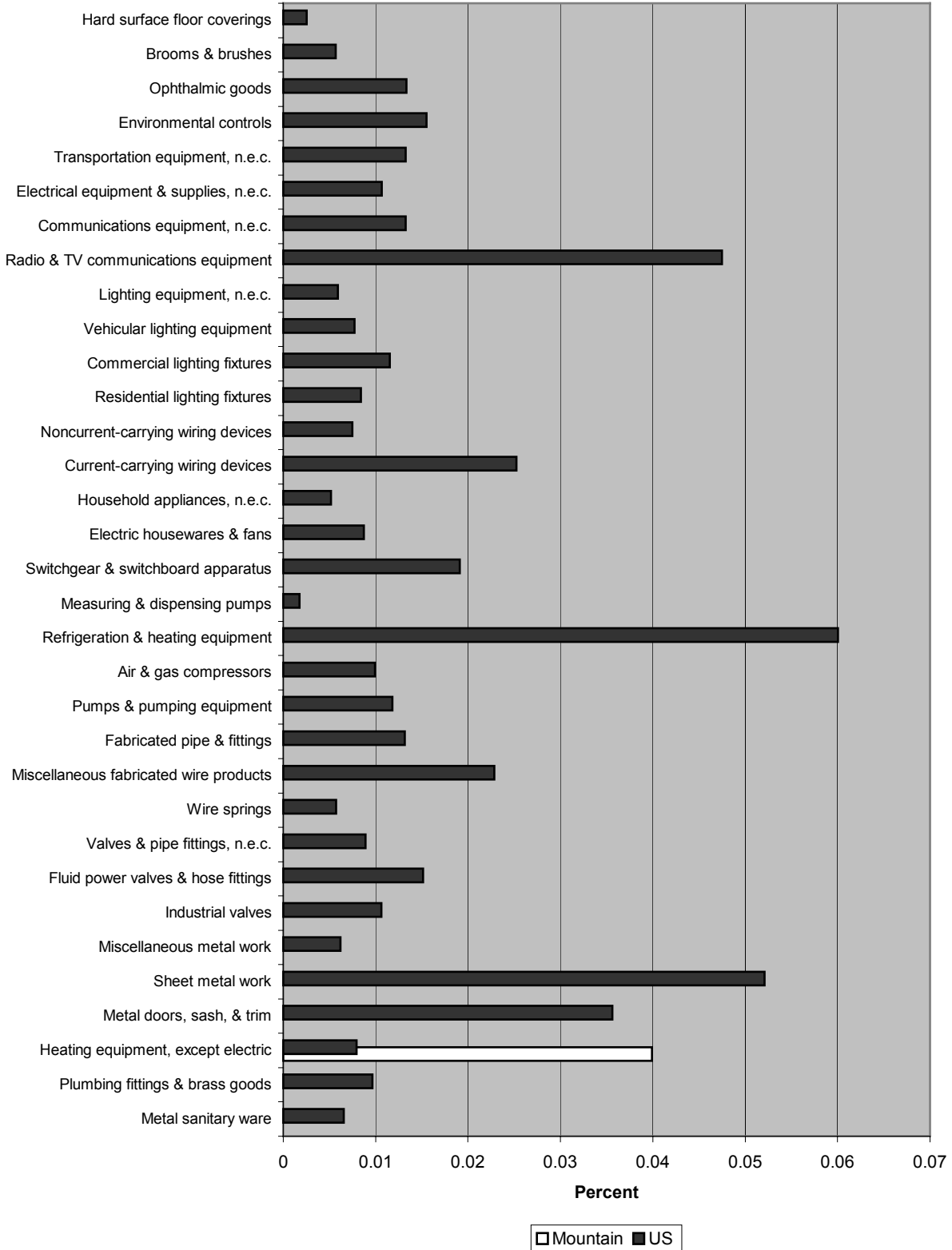
Mountain Cluster Shares: Construction Materials



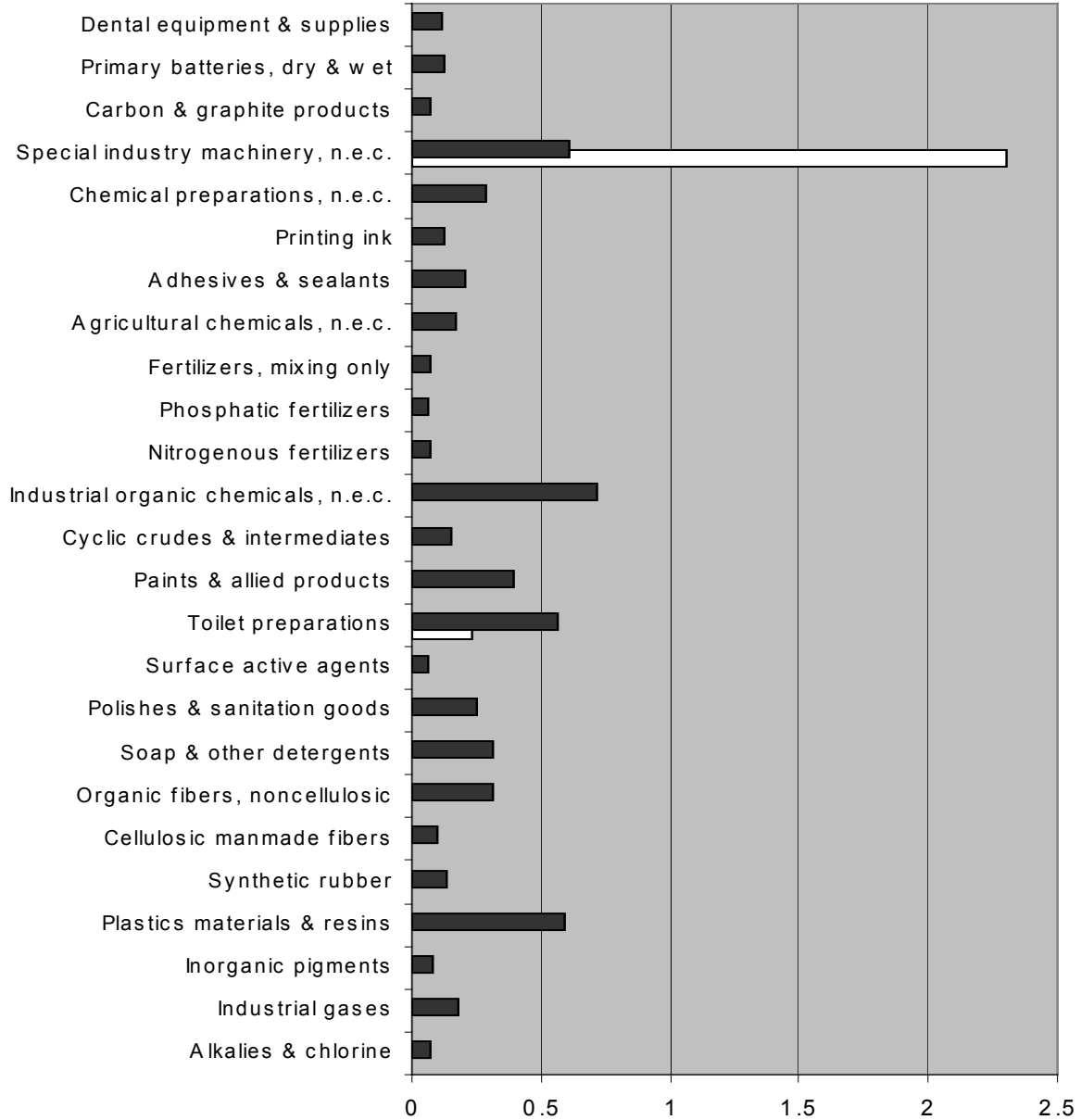
1,925 employees

□ Mountain ■ US

Mountain Cluster Shares: Construction Materials (cont.)



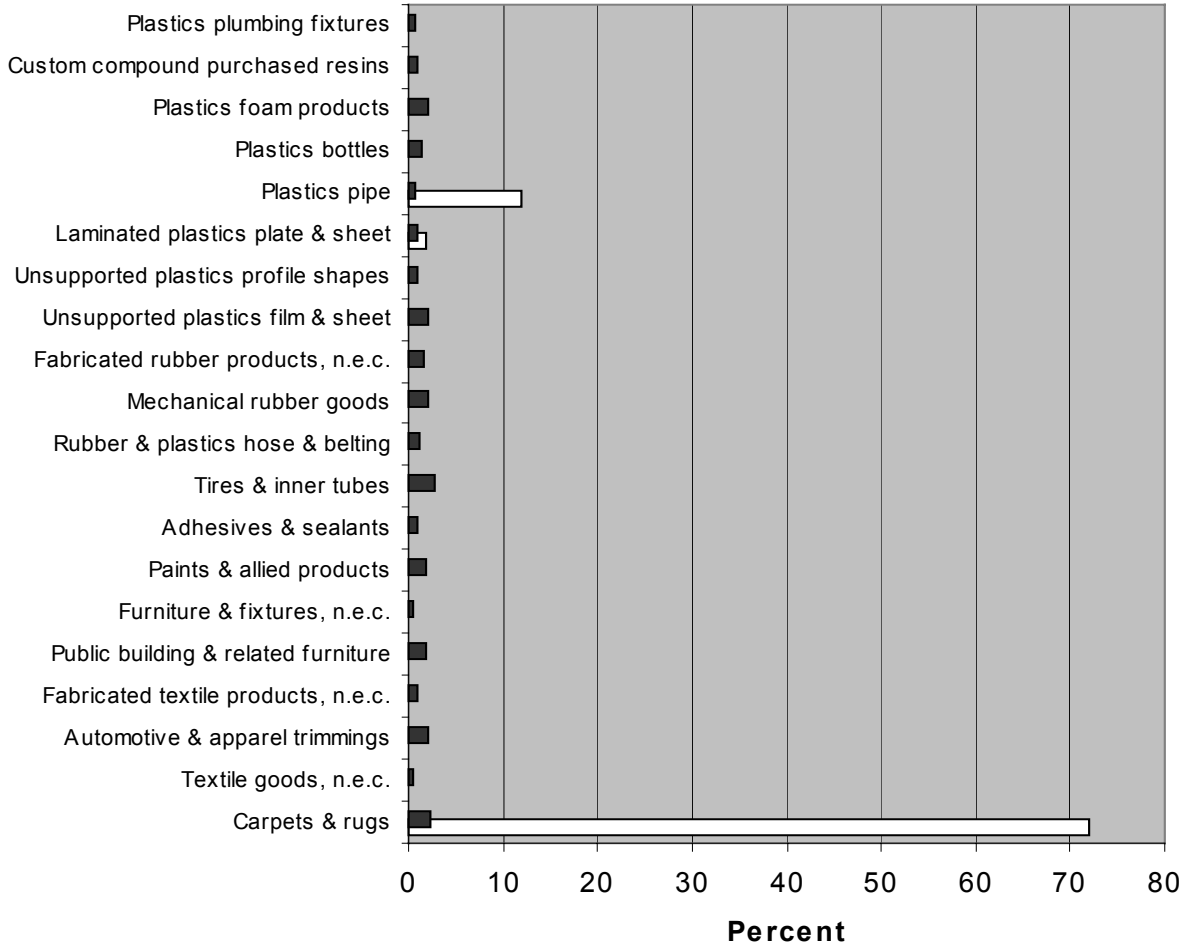
Mountain Cluster Shares: Chemicals & Plastics



1,693 employees

□ Mountain ■ US

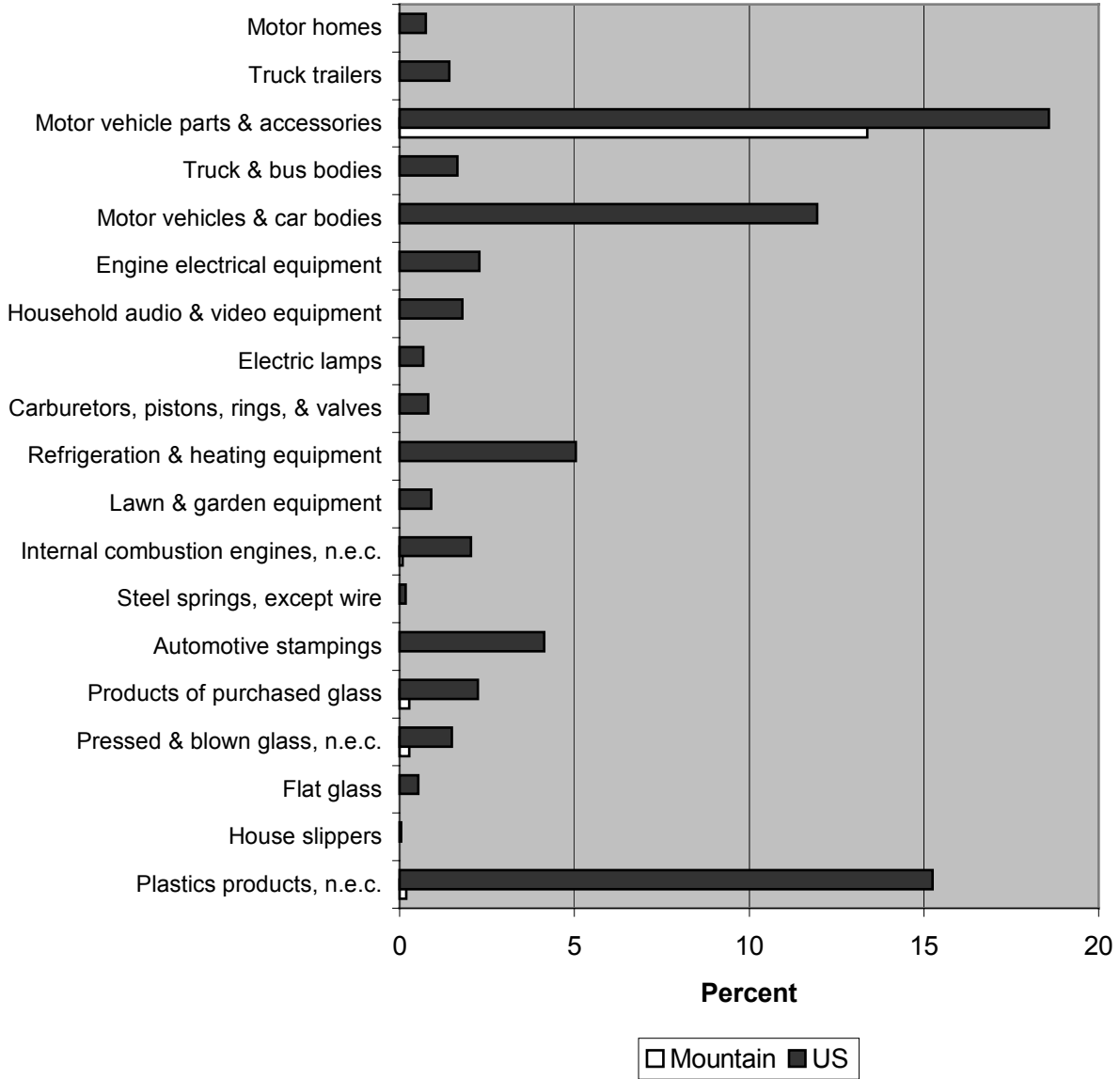
Mountain Cluster Shares: Motor Vehicles



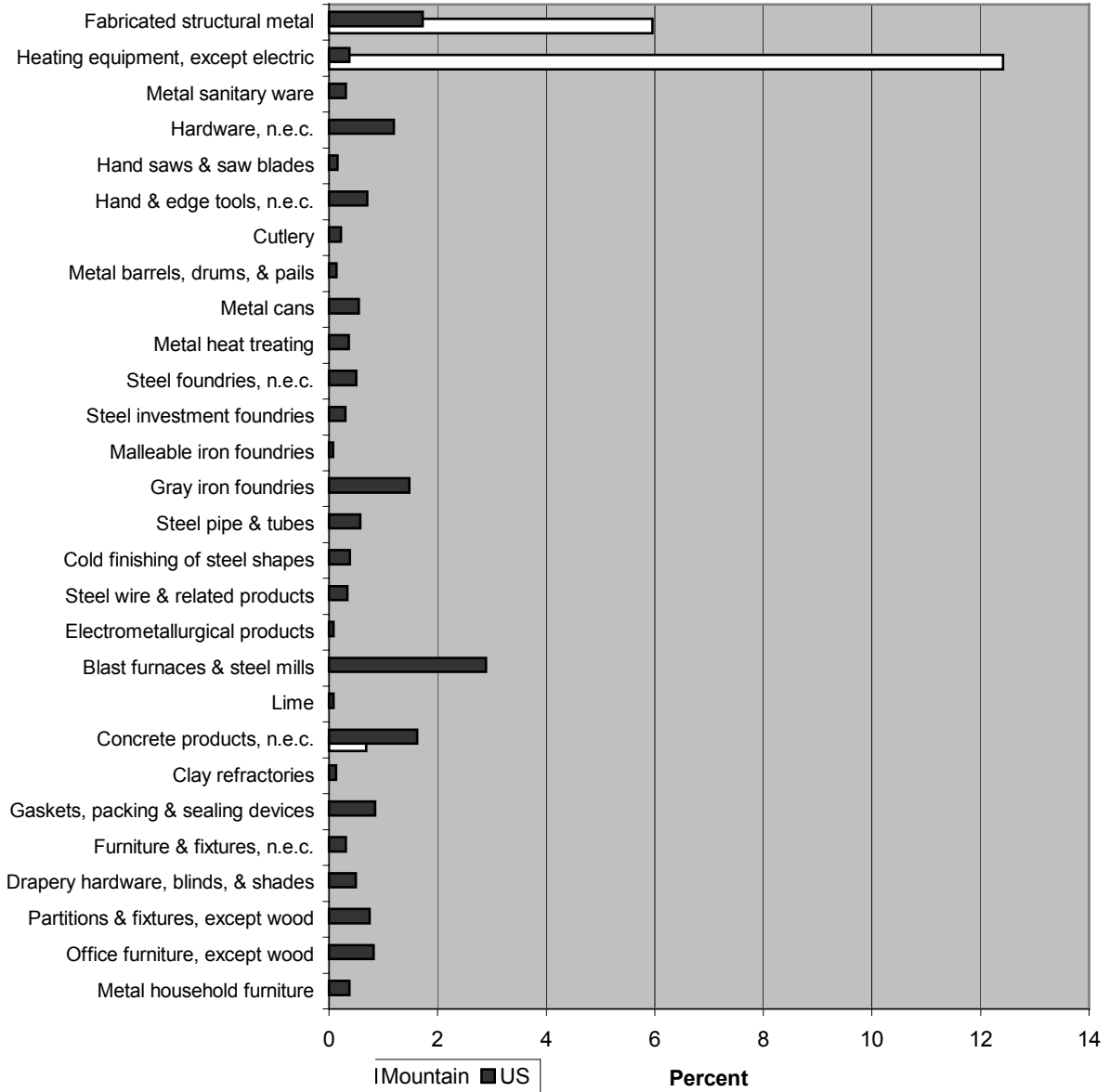
1,098 employees

□ Mountain ■ US

Mountain Cluster Shares: Motor Vehicles (cont.)

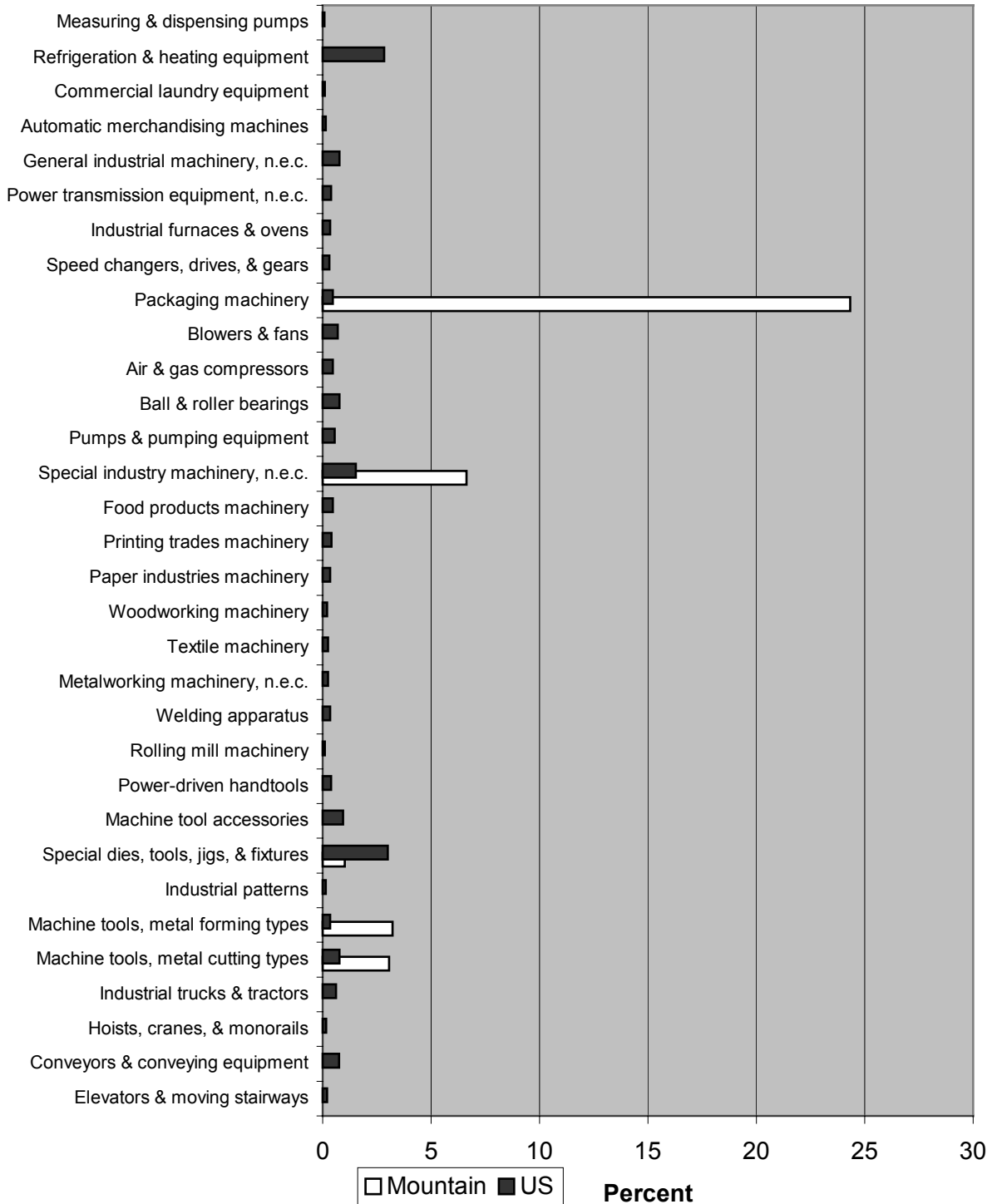


Mountain Cluster Shares: Metal Work & Industrial Machinery

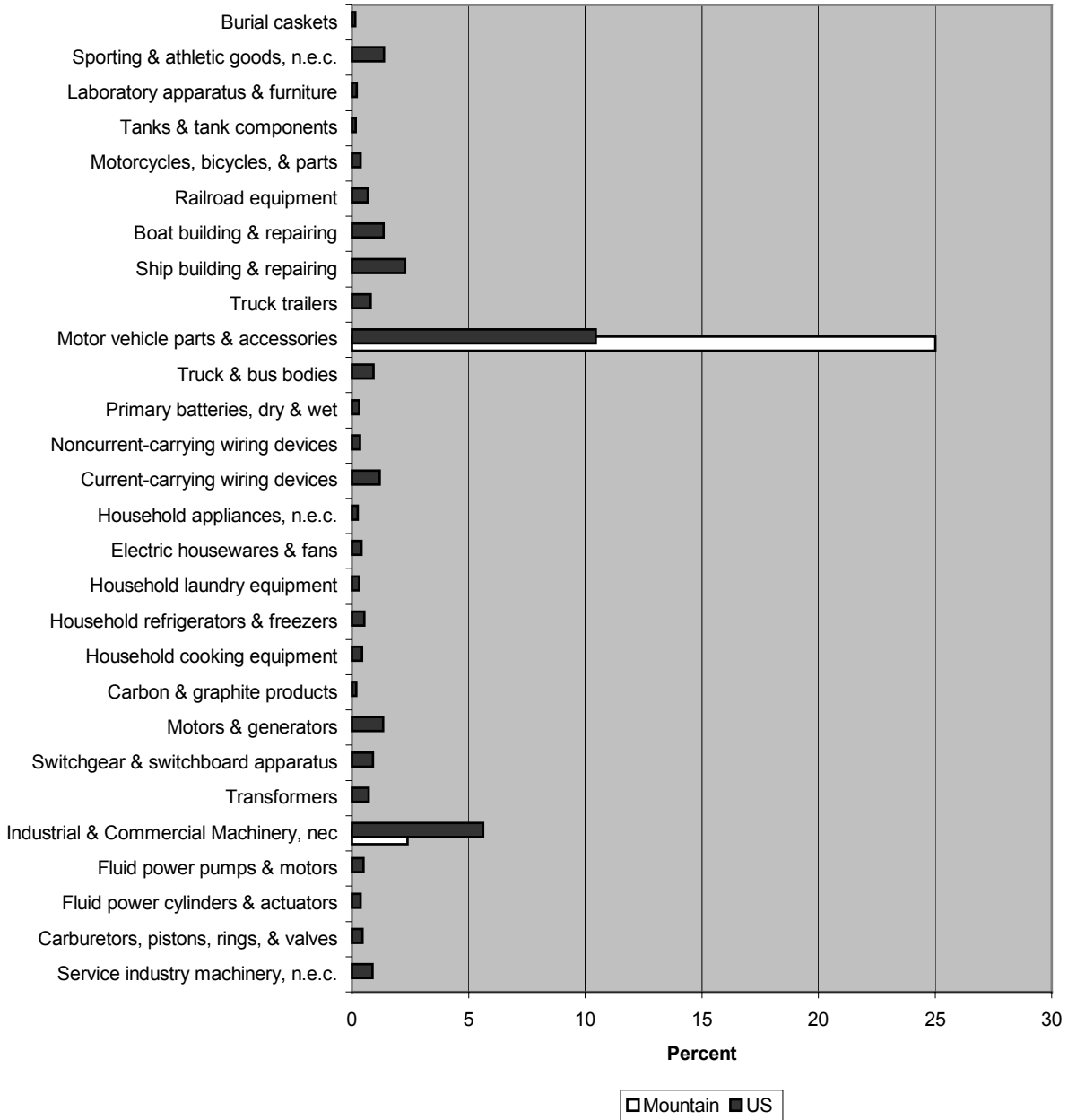


598 employees

**Mountain Cluster Shares: Metal Work & Industrial Machinery
(cont.)**



Mountain Cluster Shares: Metal Work & Industrial Machinery (cont.)



Mountain Cluster Shares: Primary Nonferrous Metals



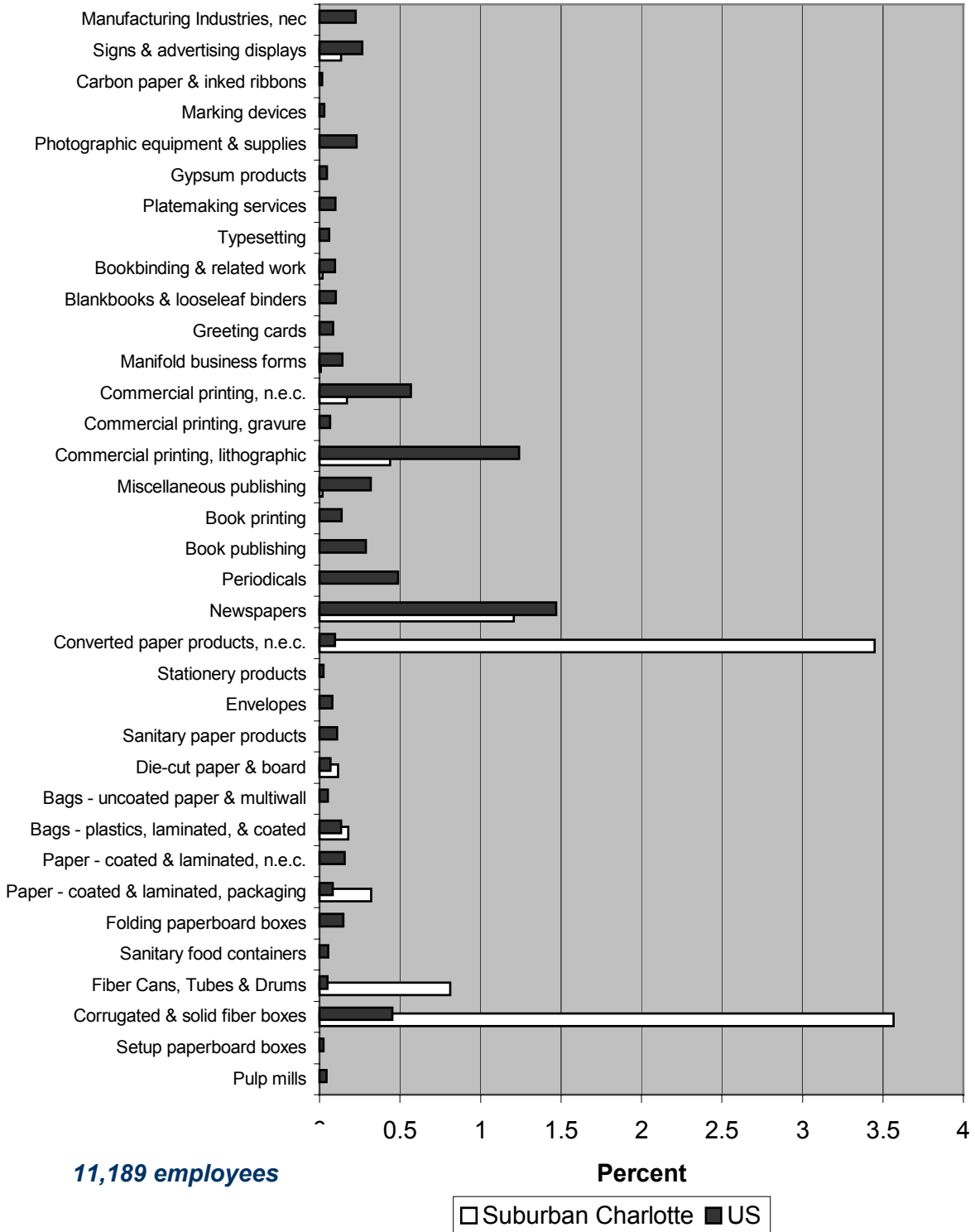
Suburban Charlotte Subregion Target & Expansion Clusters

Cluster Name	Employment	% Private	Annual %	LQ	Avg. Wage
	2001	Emp. 2001	Change 1990-01	2001	2001
EC Printing & Publishing	11,189	15.7	5.5	0.74	29,613
EC Hospitals, Labs, Specialized Medical Services	9,735	13.7	6.7	0.74	29,122
R&E Metal Working & Indus. Mach.	7,435	10.5	4.9	2.8	37,822
HT Chemicals & Plastics	6,671	9.4	5.2	0.99	34,660
EC Travel & Tourism	4,261	6	7.7	0.69	28,890
R&E Construction Materials	3,332	4.7	1.2	1.09	34,756
R&E Motor Vehicle Mfg	3,064	4.3	3.1	2.05	36,992
HT Pharmaceuticals & Medical Tech.	1,095	1.5	3.4	0.53	37,642
EC Primary Nonferrous Metals	D	D	D	D	D
Private Sector Total	69,125		2.3		25,826

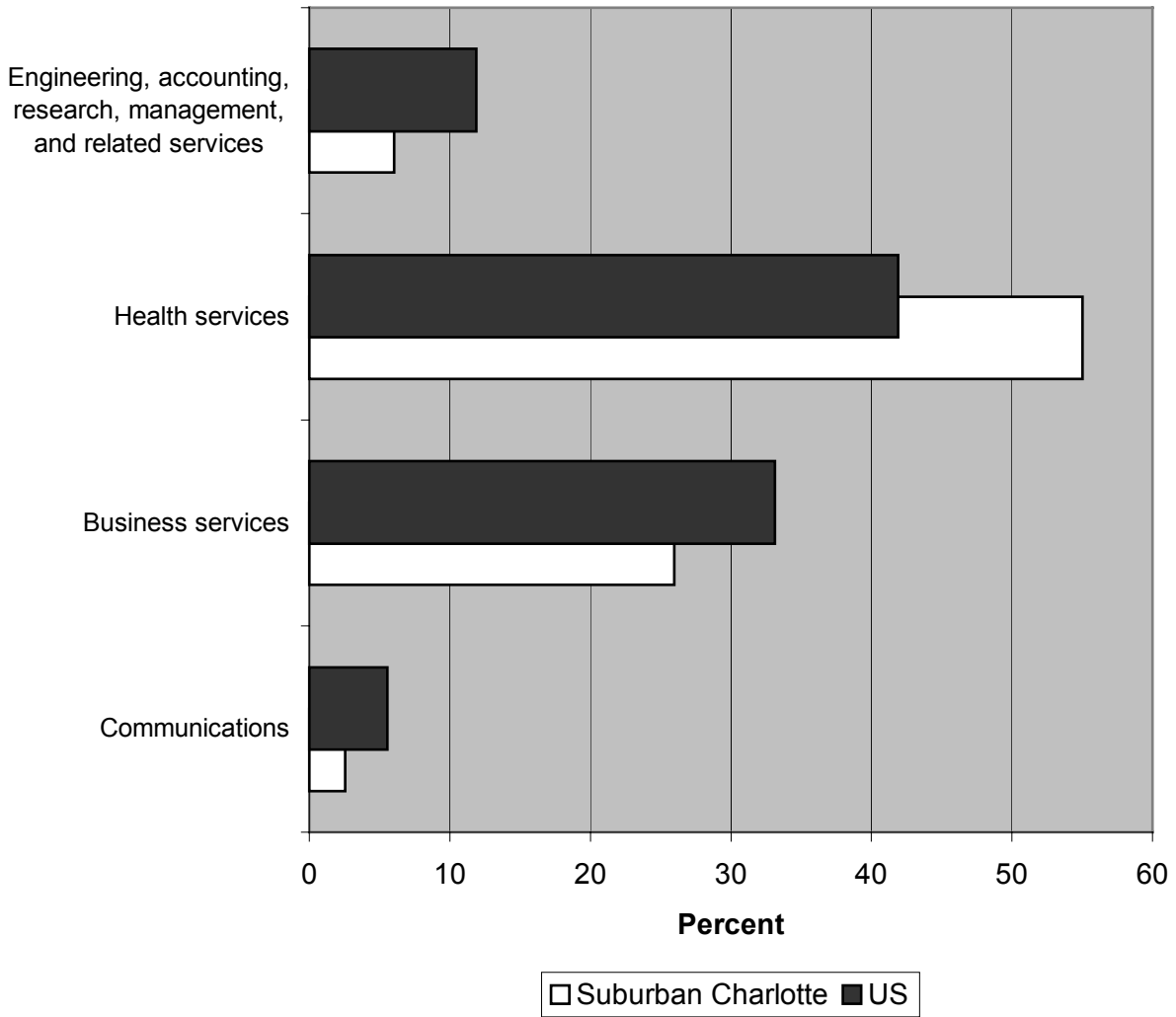
Note:

EC= Emerging Cluster; R&E= Retention & Expansion Candidate (existing cluster); HT=High Tech Cluster

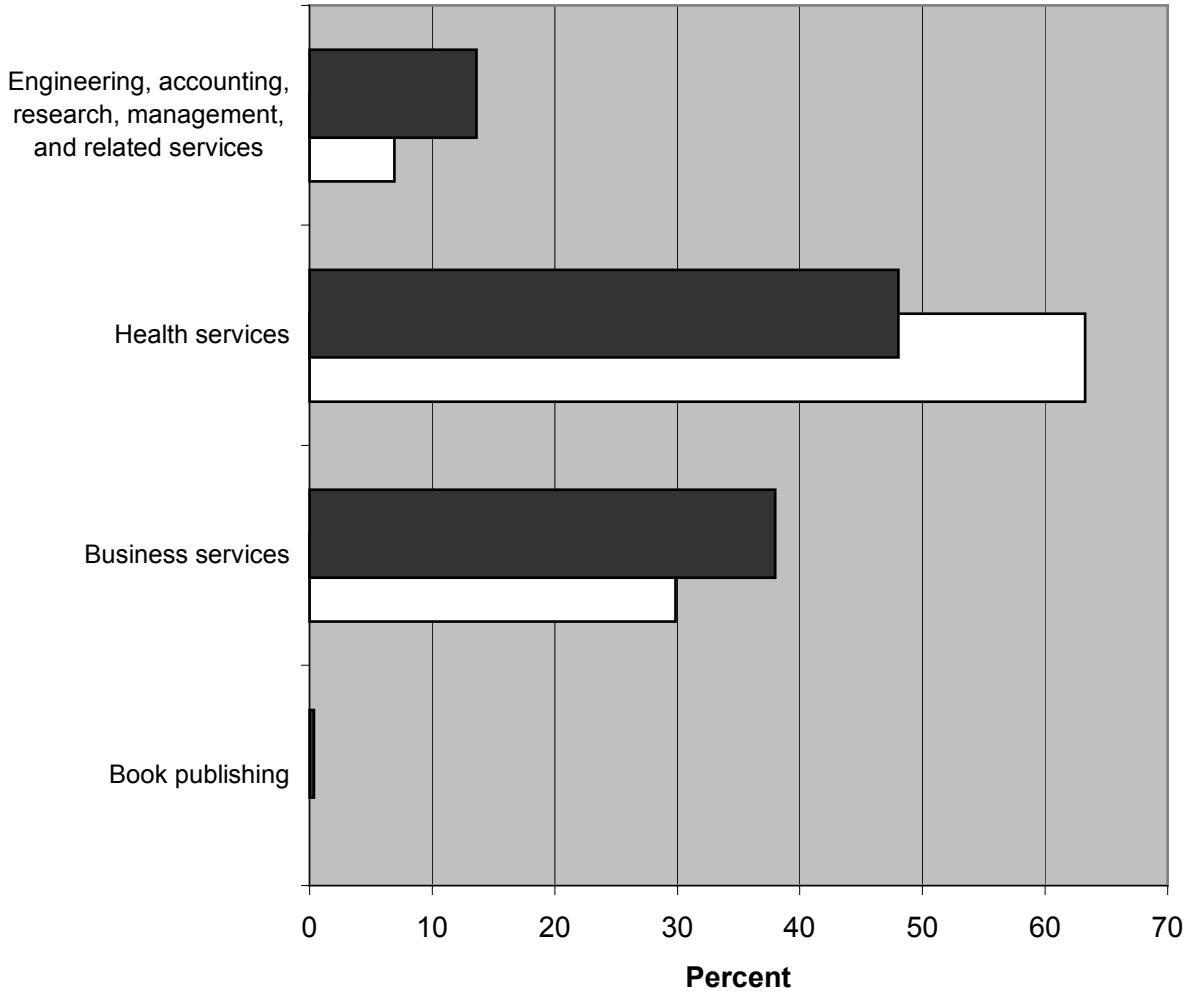
Suburban Charlotte Cluster Shares: Printing & Publishing



**Suburban Charlotte Cluster Shares: Printing & Publishing
(cont.)**



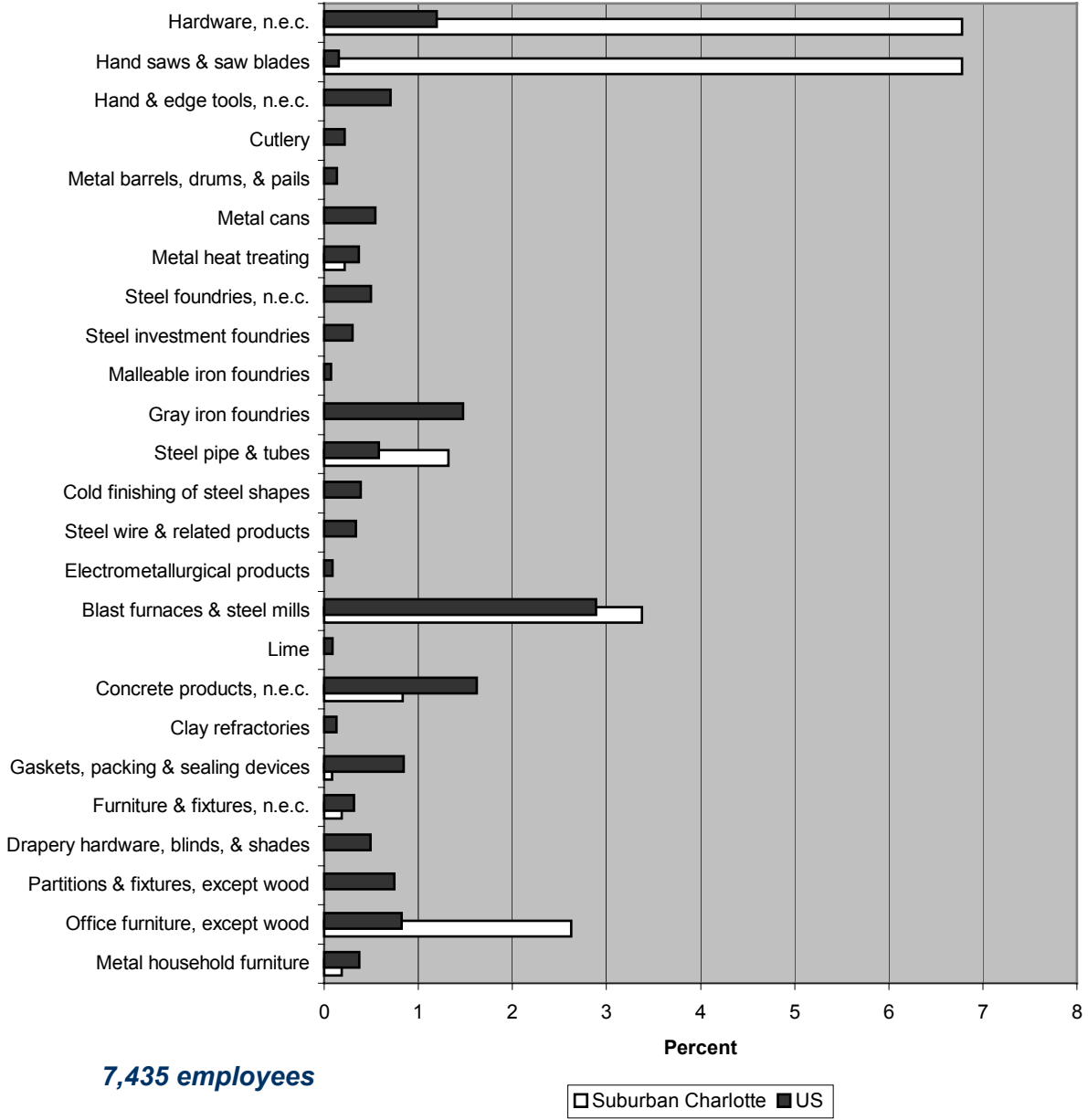
**Suburban Charlotte Cluster Shares: Hospitals, Labs,
Specialized Medical Services**



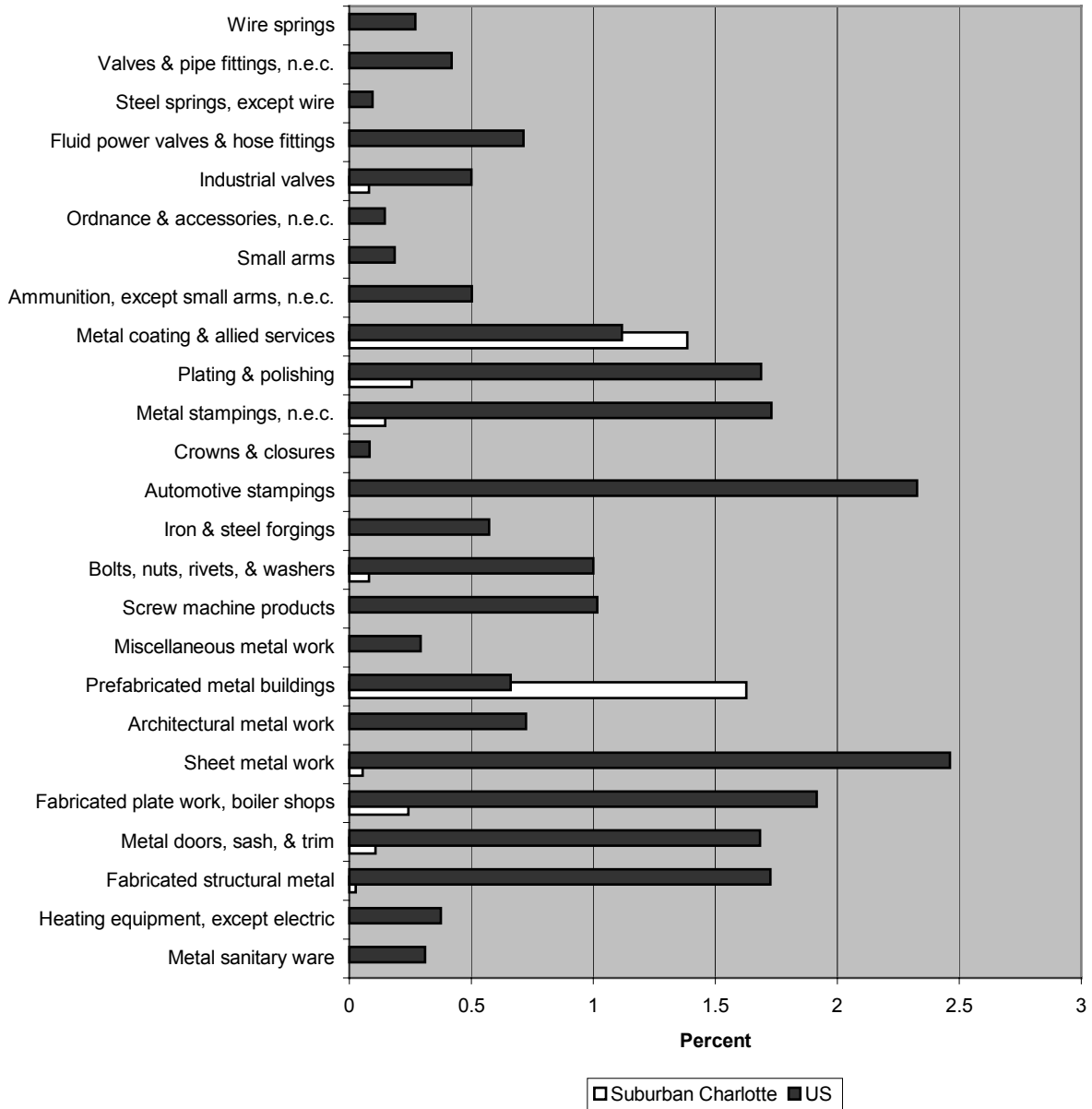
9,735 employees

□ Suburban Charlotte ■ US

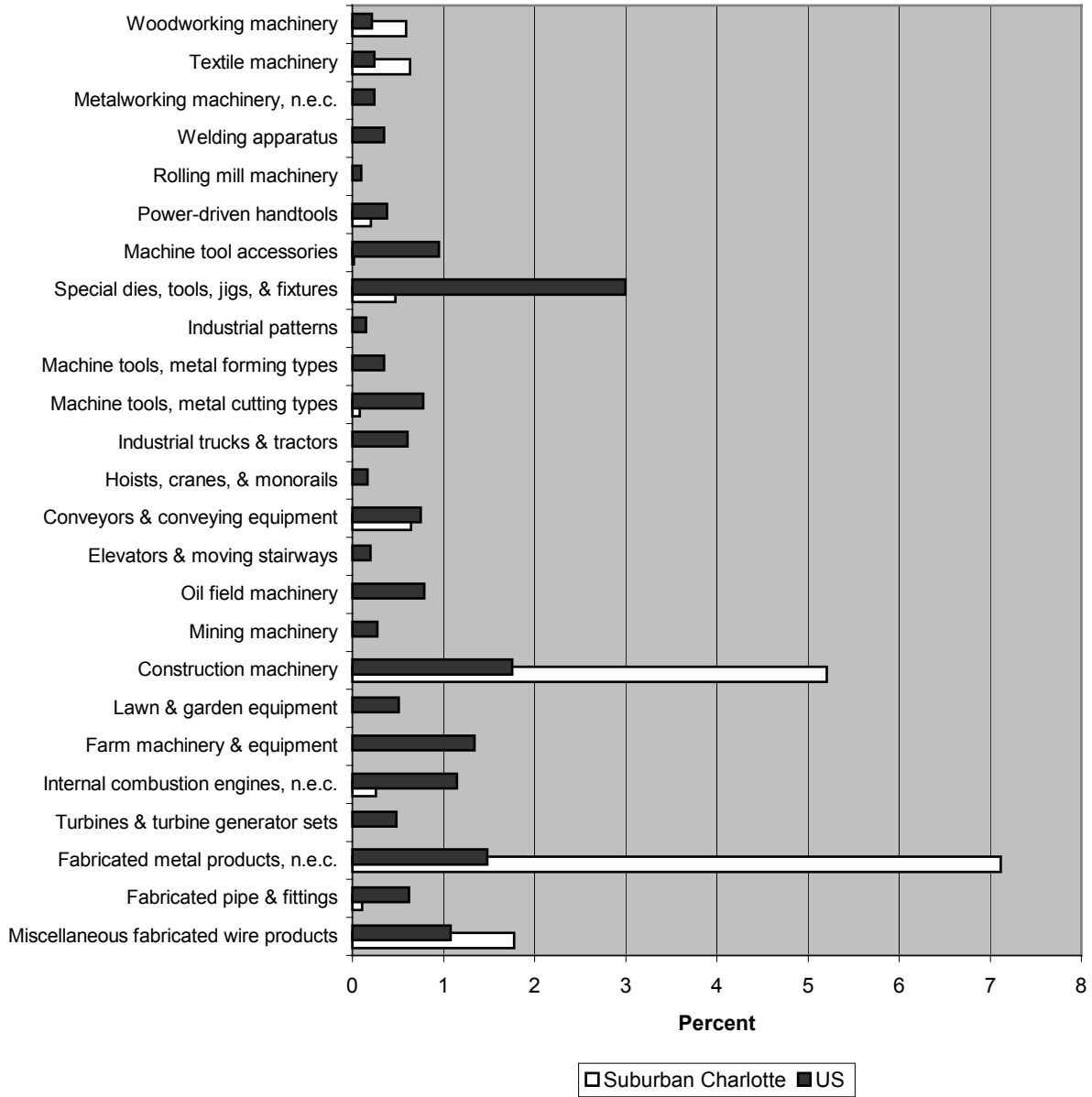
Suburban Charlotte Cluster Shares: Metal Working & Industrial Machinery



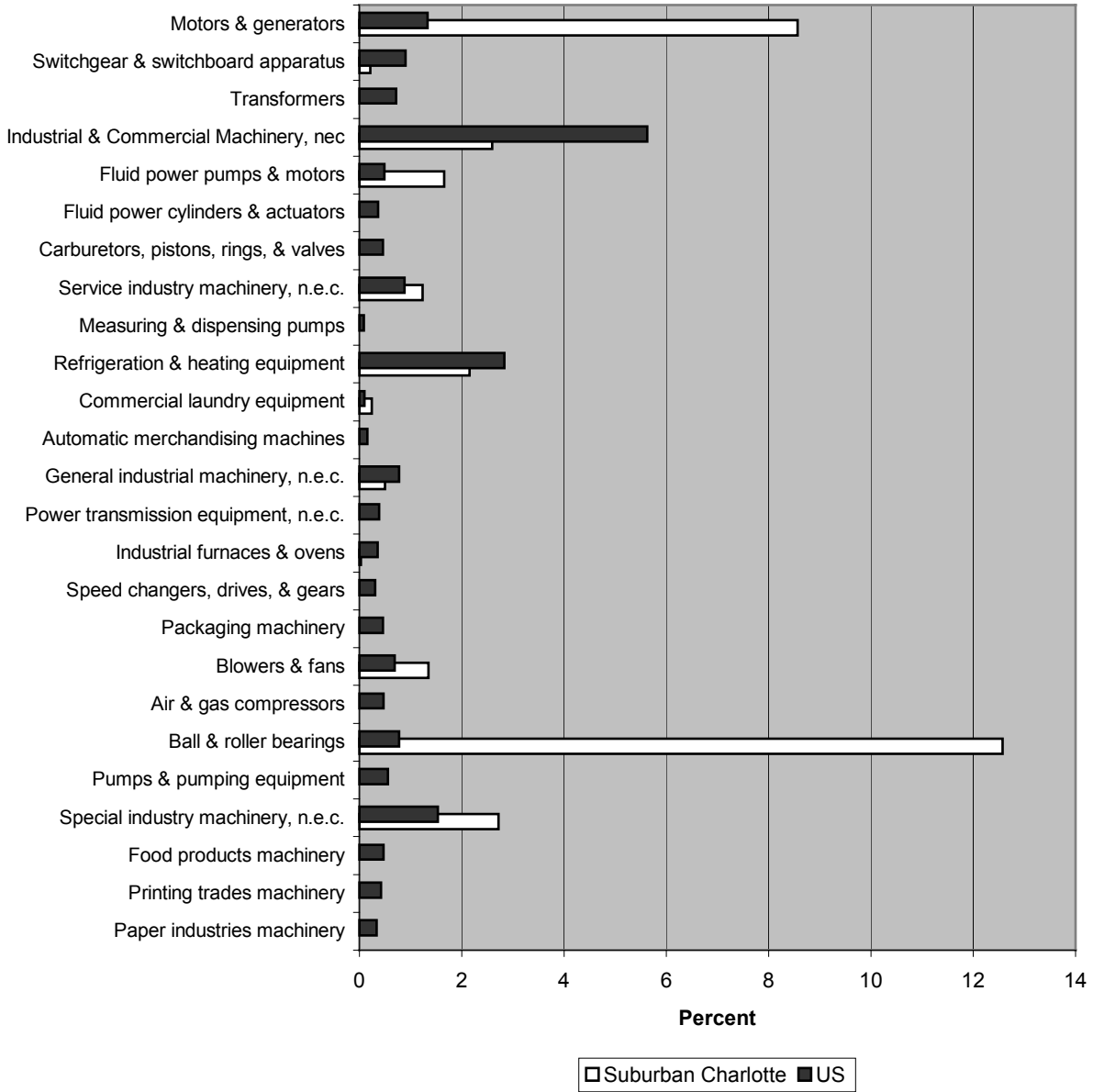
Suburban Charlotte Cluster Shares: Metal Working & Industrial Machinery (cont.)



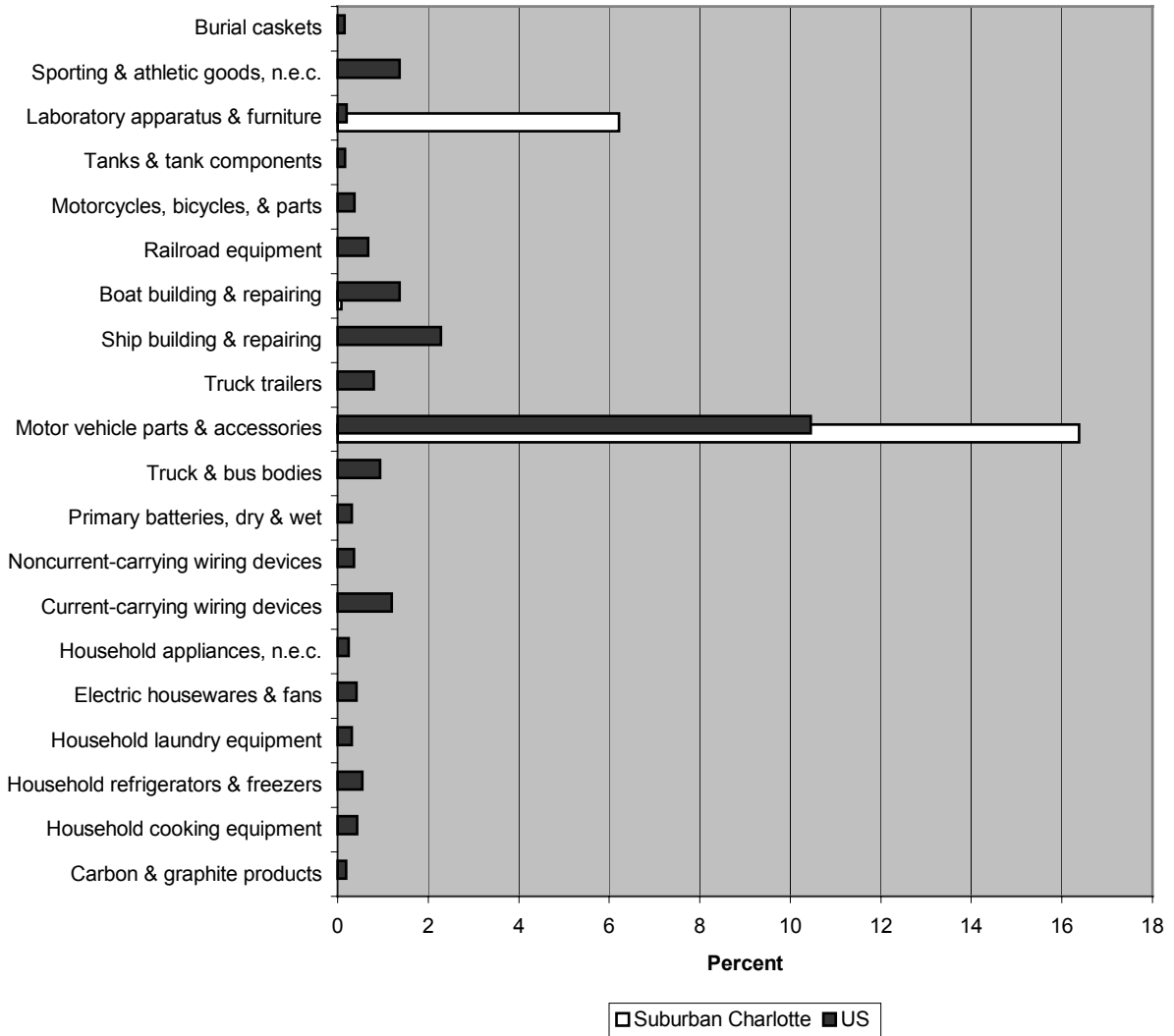
**Suburban Charlotte Cluster Shares: Metal Working & Industrial Machinery
(cont.)**



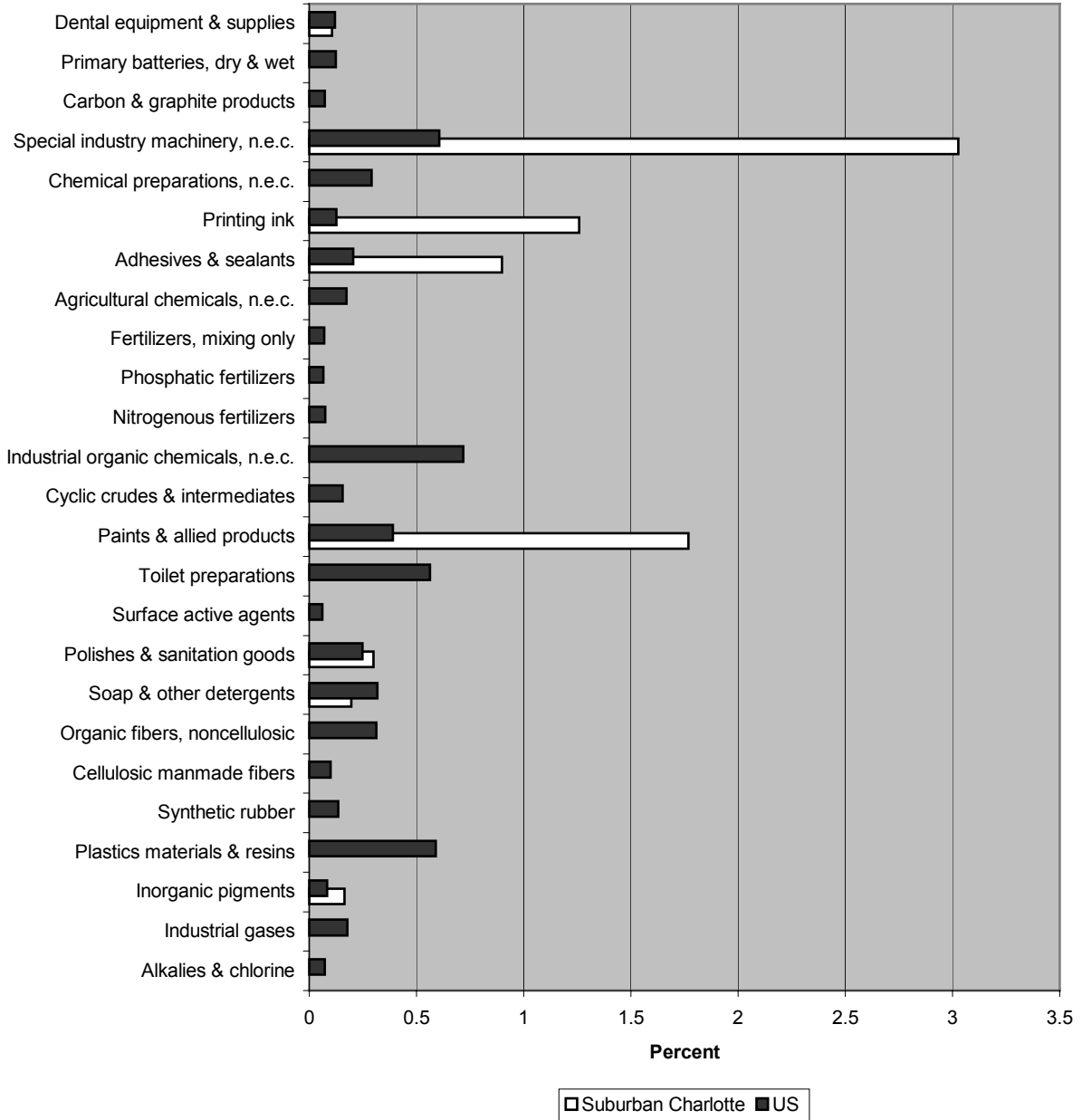
Suburban Charlotte Cluster Shares: Metal Working & Industrial Machinery
(cont.)



**Suburban Charlotte Cluster Shares: Metal Working & Industrial Machinery
(cont.)**

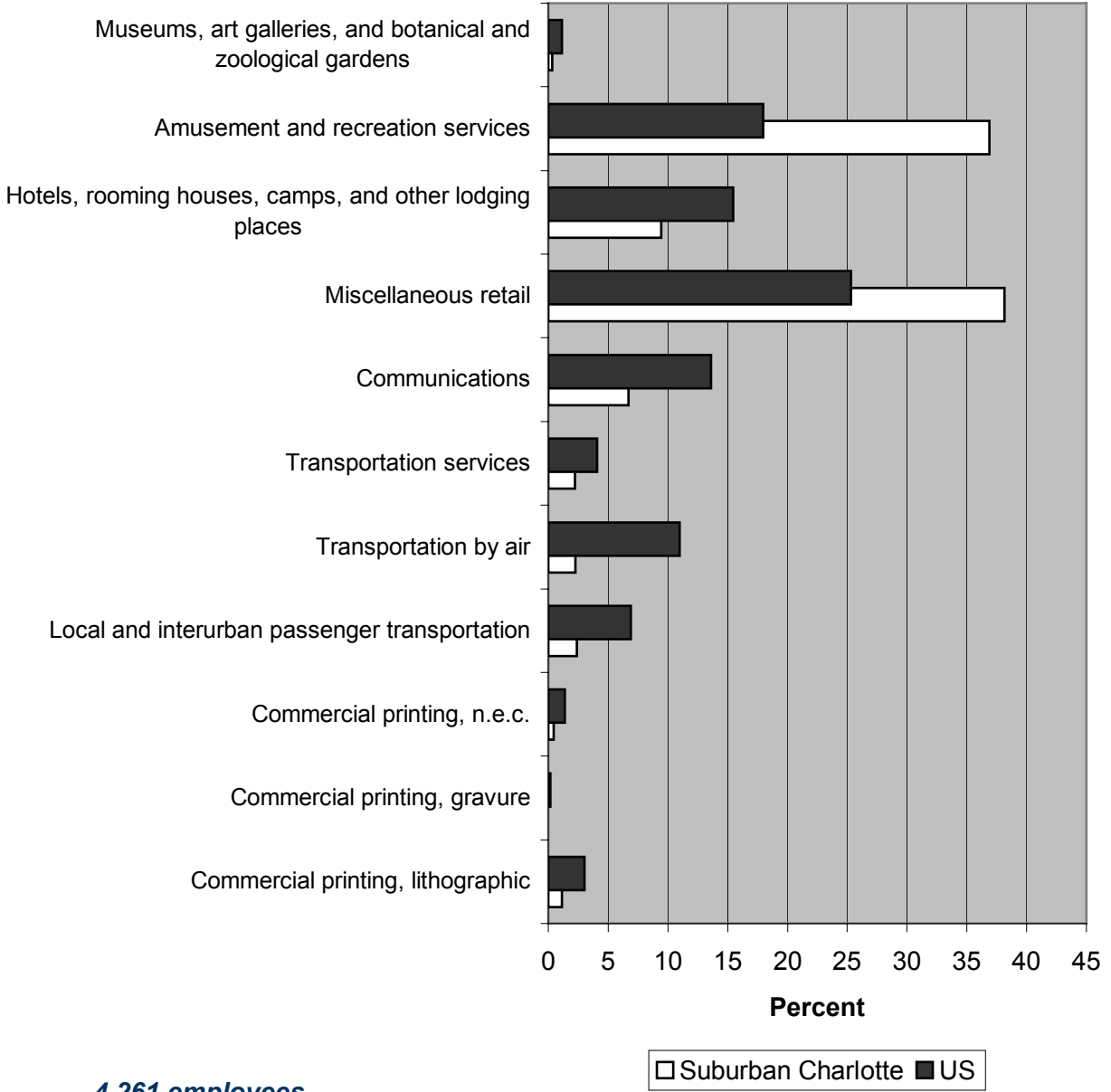


Suburban Charlotte Cluster Shares: Chemicals & Plastics

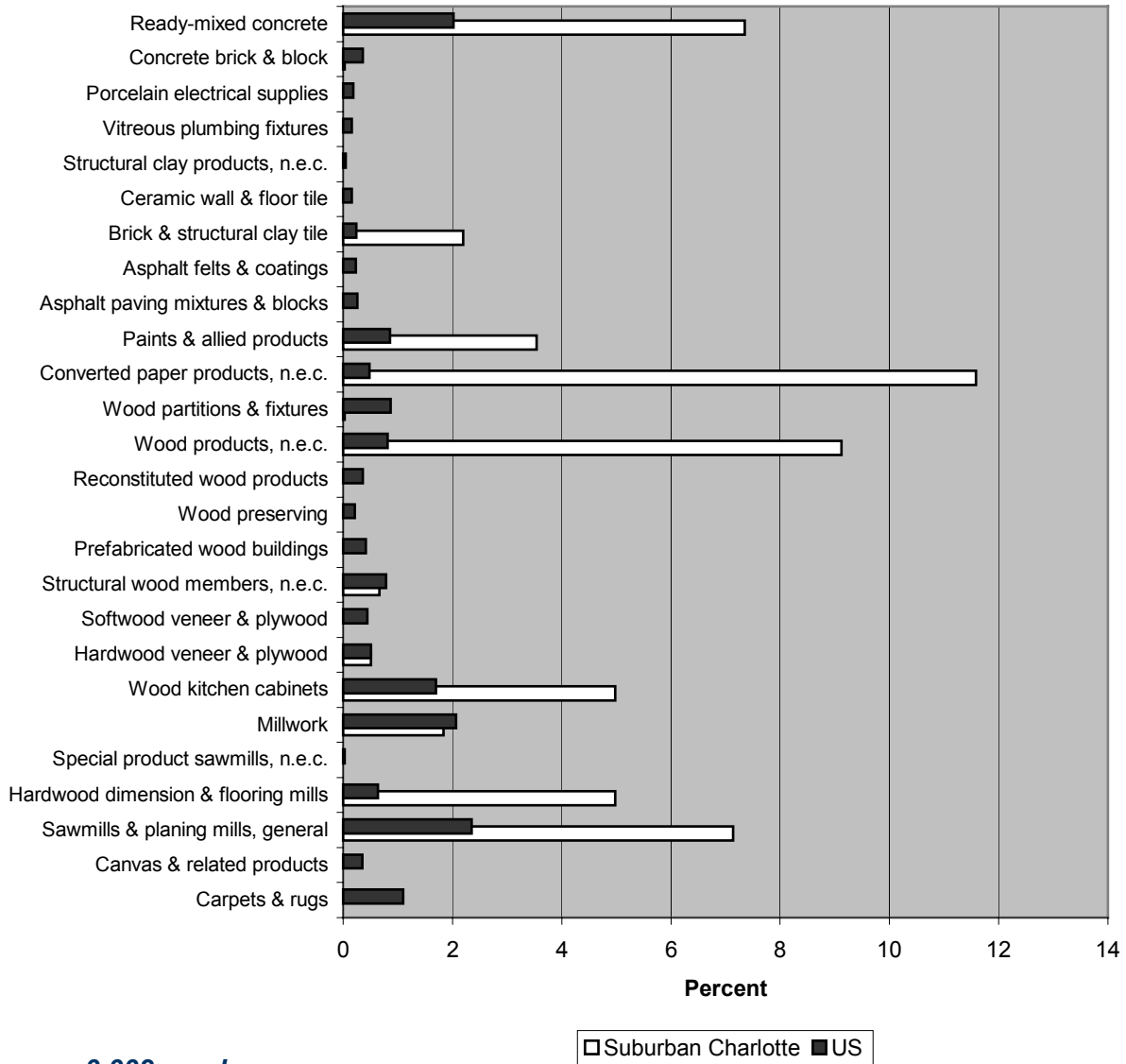


6,671 employees

Suburban Charlotte Cluster Shares: Travel & Tourism

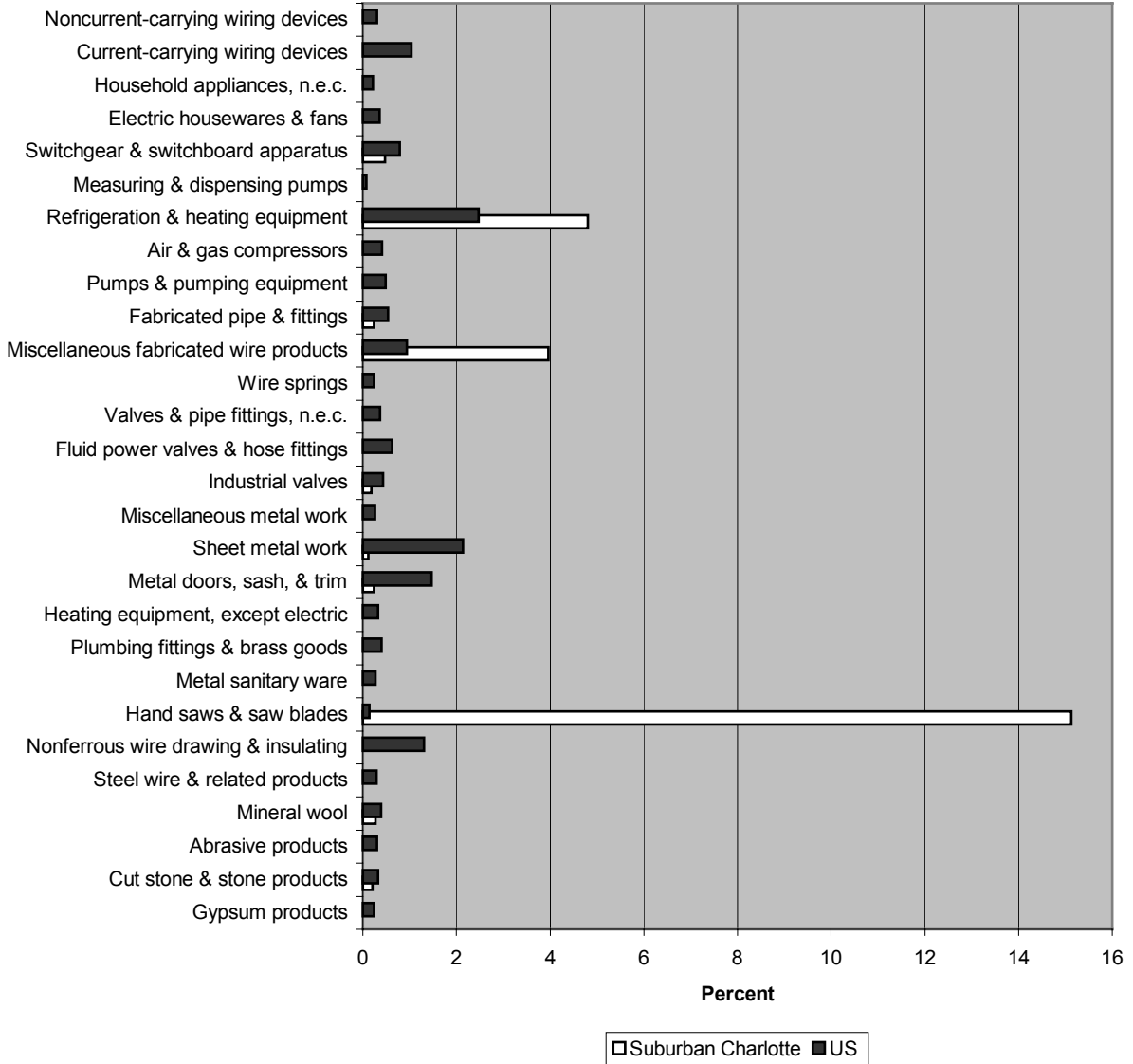


Suburban Charlotte Cluster Shares: Construction Materials

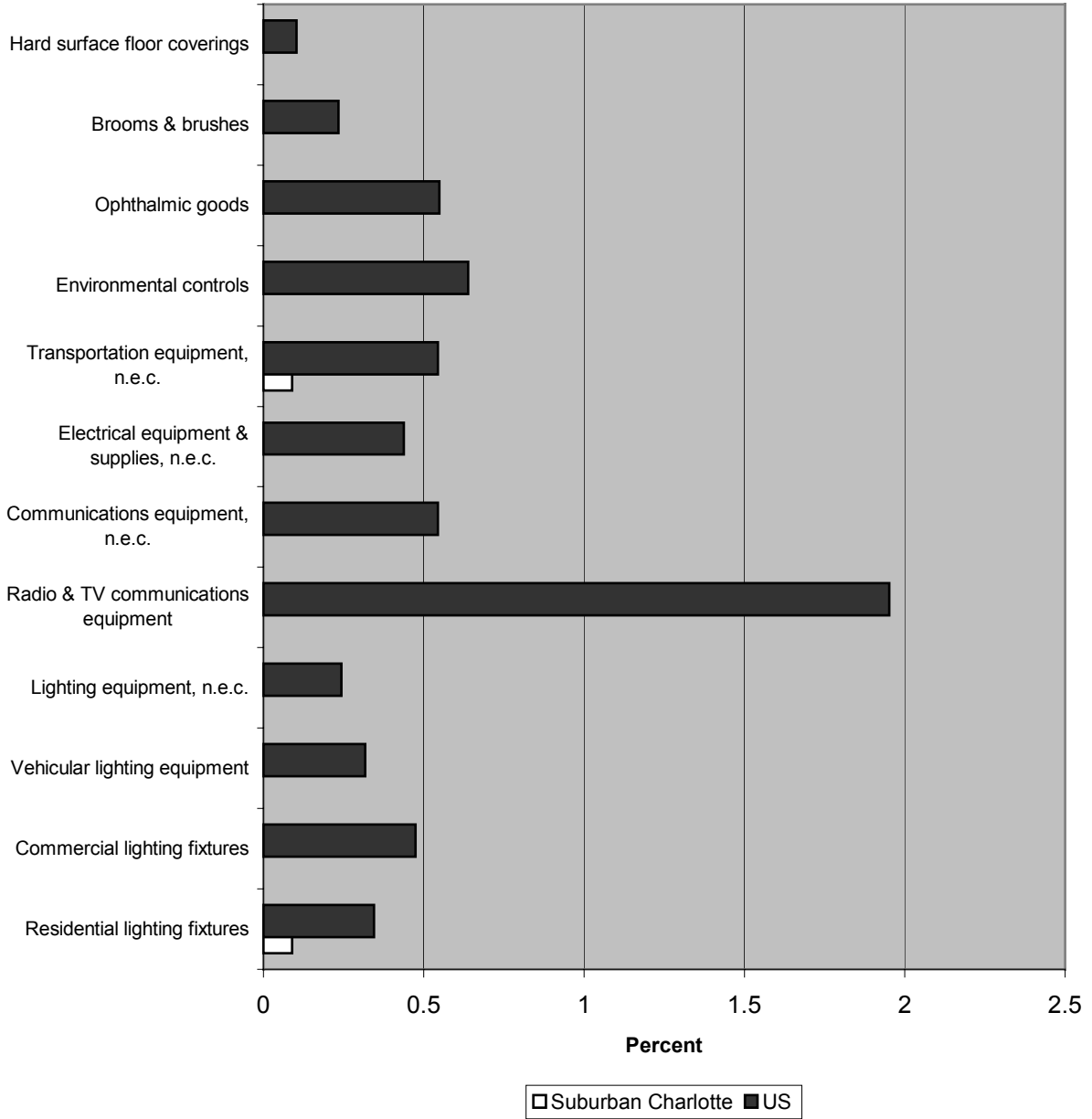


3,332 employees

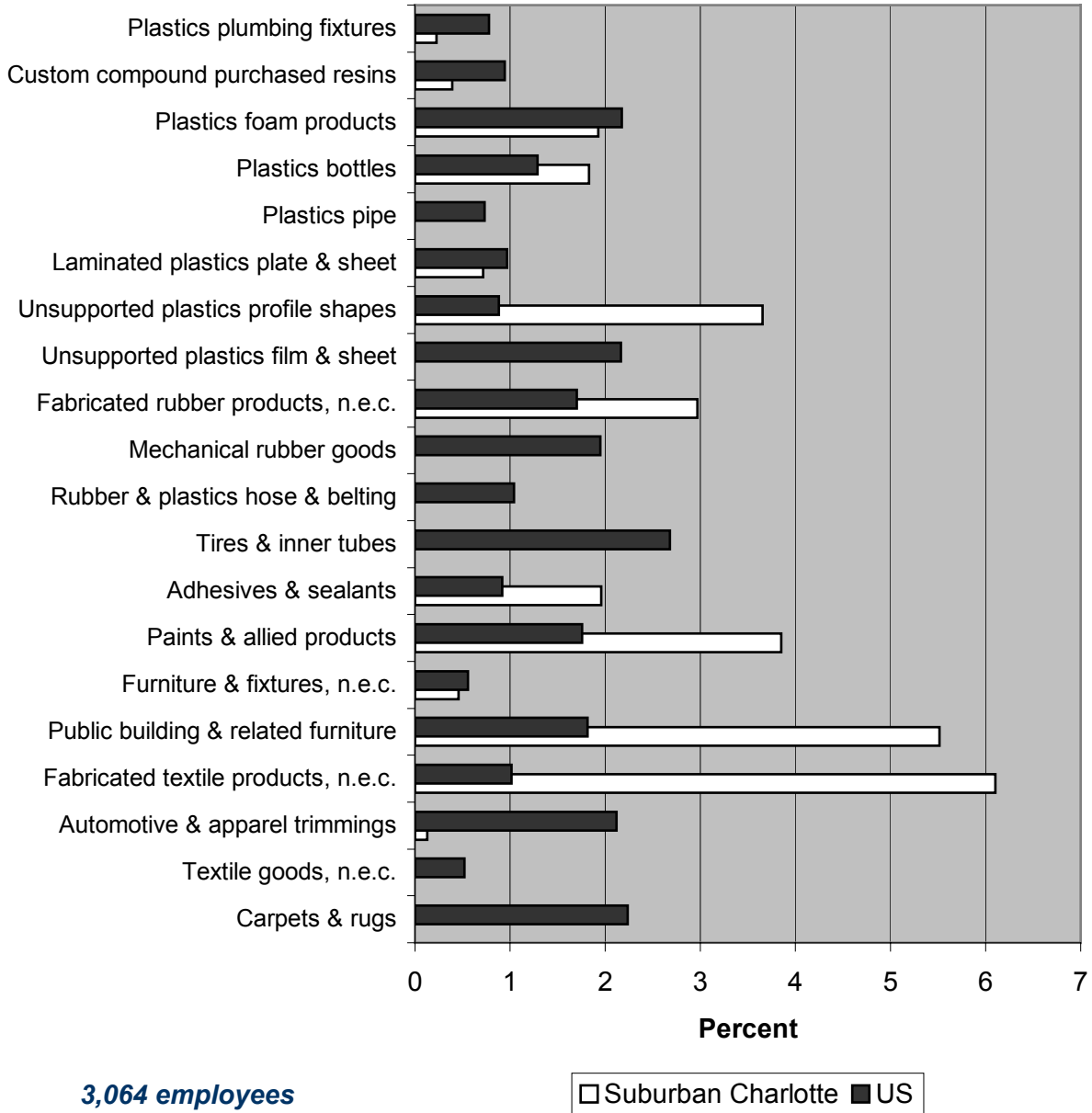
Suburban Charlotte Cluster Shares: Construction Materials (cont.)



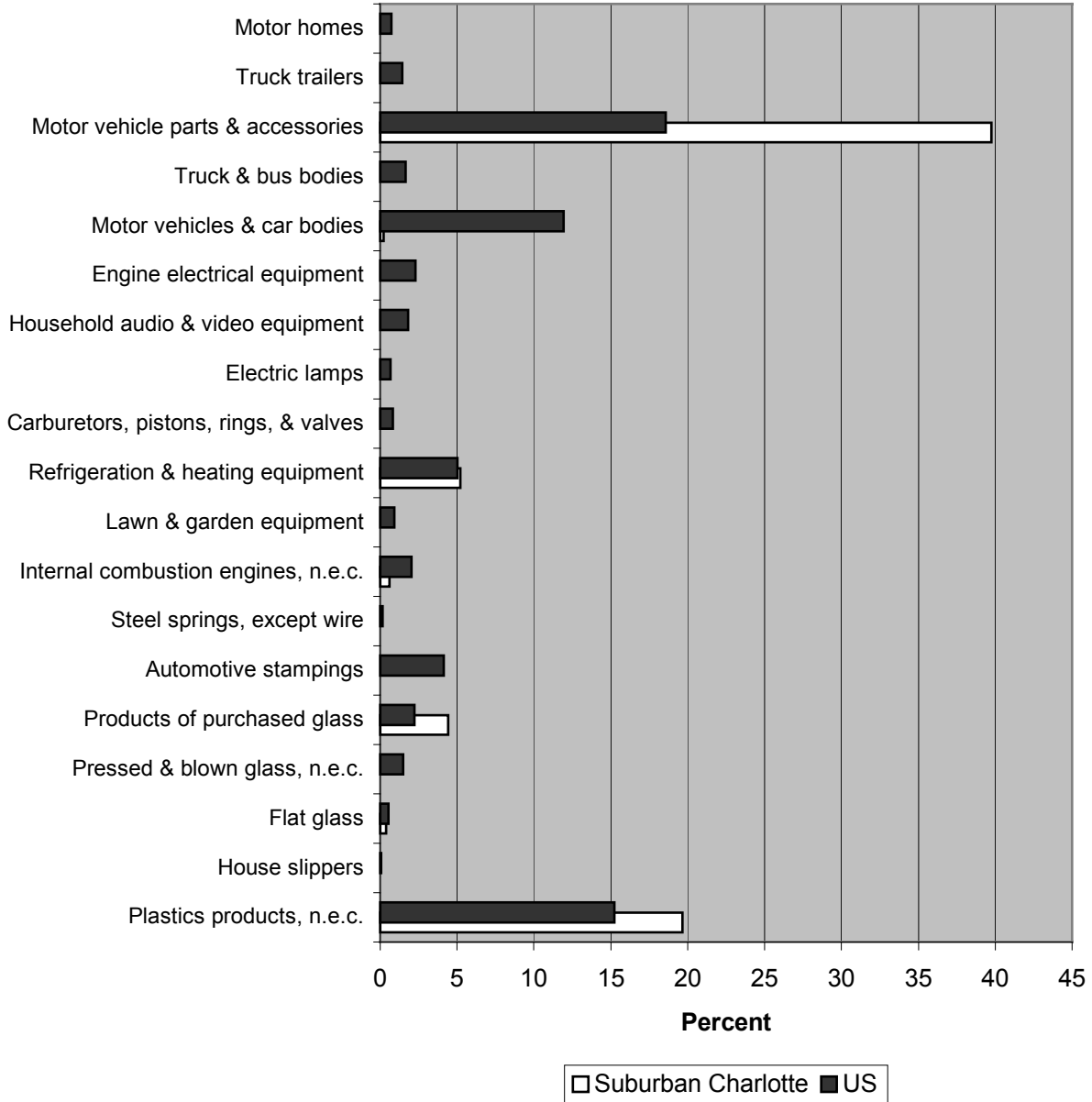
Suburban Charlotte Cluster Shares: Construction Materials (cont.)



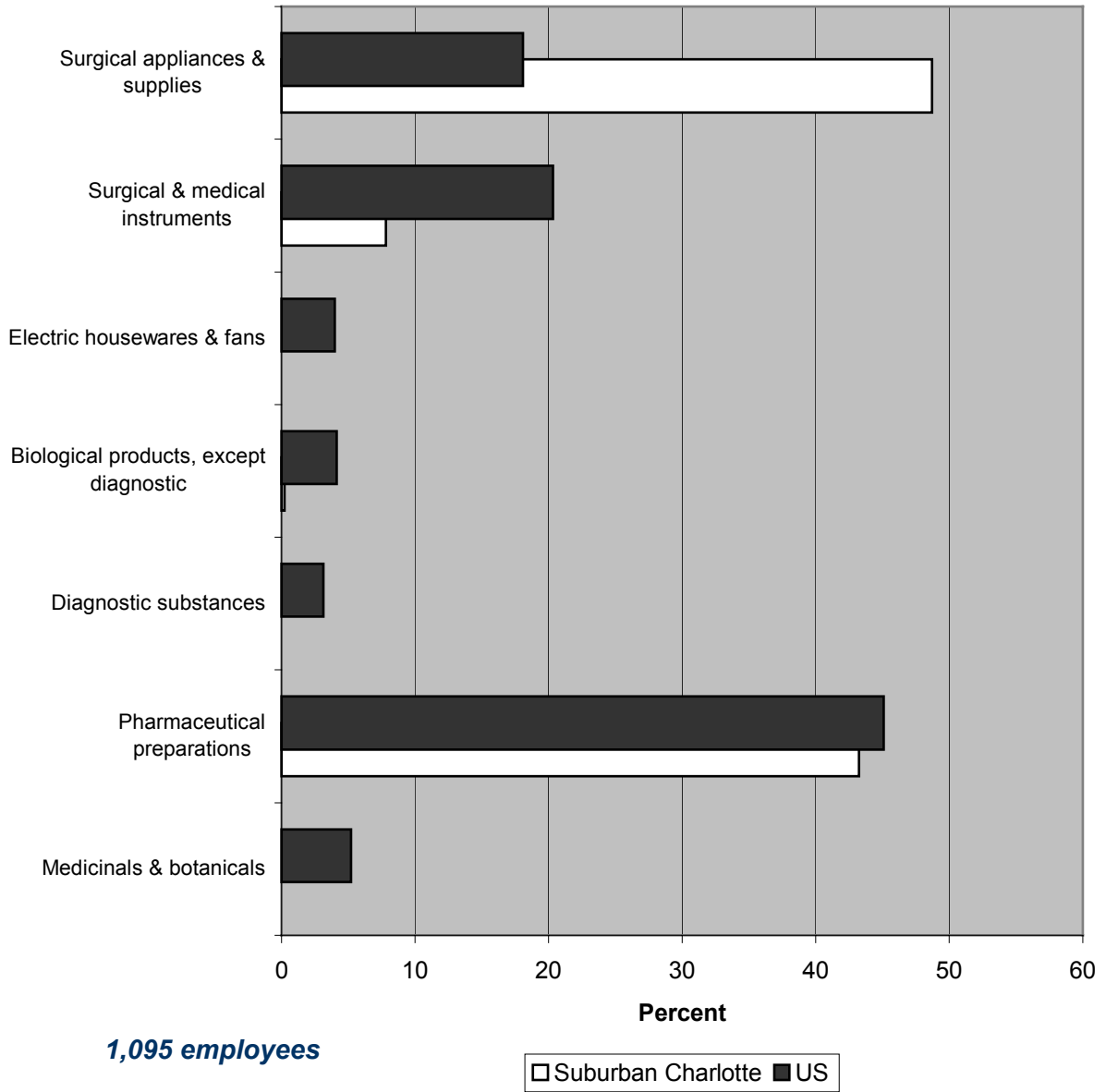
Suburban Charlotte Cluster Shares: Motor Vehicles



Suburban Charlotte Cluster Shares: Motor Vehicles (cont.)



**Suburban Charlotte Cluster Shares: Pharmaceuticals & Medical
Technology**



APPENDIX D: Filling the Cluster Gaps

Potential Target Industries and Related Clusters

SIC	Target Industry	Related Cluster (s)
2431	Millwork	Construction Materials
2434	Wood kitchen cabinets	Construction Materials
2439	Structural wood members, nec	Construction Materials
2452	Prefabricated wood buildings	Construction Materials
2491	Wood preserving	Construction Materials
2493	Reconstituted wood products	Construction Materials
2656	Sanitary food containers	Printing & Publishing
2676	Sanitary paper products	Printing & Publishing
2677	Envelopes	Printing & Publishing
2721	Periodicals	Printing & Publishing
2731	Book publishing	Printing & Publishing
2732	Book printing	Printing & Publishing
2741	Misc. publishing	Printing & Publishing
2782	Blankbooks & looseleaf binders	Printing & Publishing
2812	Alkalies & chlorine	Chemicals & Plastics
2813	Industrial gases	Chemicals & Plastics
2816	Inorganic pigments	Chemicals & Plastics
2821	Plastics materials & resins	Chemicals & Plastics
2833	Medicinals and botanicals	Pharmaceuticals
2836	Biological products, except diagnostic	Pharmaceuticals
2842	Polishes & sanitation goods	Chemicals & Plastics
2865	Cyclic crudes & intermediaries	Chemicals & Plastics
2869	Industrial chemicals, nec	Chemicals & Plastics
2873	Nitrogenous fertilizers	Chemicals & Plastics
2874	Phosphatic fertilizers	Chemicals & Plastics
2875	Fertilizers, mixing only	Chemicals & Plastics
2879	Agricultural chemicals	Chemicals & Plastics
2899	Chemical preparations, nec	Chemicals & Plastics
2951	Asphalt paving mixtures & blocks	Construction Materials
2952	Asphalt felts & coatings	Construction Materials
3253	Ceramic wall & floor tile	Construction Materials
3261	Vitreous plumbing fixtures	Construction Materials
SIC	Target Industry	Related Cluster(s)

3264	Porcelain electrical supplies	Construction Materials
3273	Ready mix concrete	Construction Materials
3315	Steel wire & related products	Construction Materials
3421	Sawmills & planing mills, general	Construction Materials
3431	Metal sanitary ware	Construction Materials, Metal Working & Industrial Mach.
3441	Fabricated structural metal	Metal Working & Industrial Mach.
3442	Metal doors, sash & trim	Construction Materials, Metal Working & Industrial Mach.
3443	Fabricated plate work, boiler shops	Metal Working & Industrial Mach.
3444	Sheet metal work	Construction Materials, Metal Working & Industrial Mach.
3449	Misc. metal work	Construction Materials
3465	Automotive stampings	Metal Working & Industrial Mach., Motor Vehicles
3469	Metal stampings, nec	Metal Working & Industrial Mach.
3471	Plating & polishing	Metal Working & Industrial Mach.
3495	Wire springs	Construction Materials
3498	Fabricated pipe & fittings	Construction Materials, Metal Working & Industrial Mach.
3511	Turbines & turbine generator sets	Metal Working & Industrial Mach.
3519	Internal combustion engines, nec.	Motor Vehicles, Metal Working & Industrial Mach.
3523	Farm machinery & equipment	Metal Working & Industrial Mach.
3524	Lawn & garden equipment	Metal Working & Industrial Mach.
3534	Elevators & moving stairways	Motor Vehicles, Metal Working & Industrial Mach.
3537	Industrial trucks and tractors	Motor Vehicles
3542	Machine tools, metal forming types	Metal Working & Industrial Mach.
3544	Special dies, tools, jigs & fixtures	Metal Working & Industrial Mach.
3548	Welding apparatus	Motor Vehicles
3561	Pumps & pumping equipment	Construction Materials, Metal Working & Industrial Mach.
3566	Speed changers, drives & gears	Metal Working & Industrial Mach.
3561	Pumps & pumping equipment	Construction Materials, Metal Working & Industrial Mach.
3566	Speed changers, drives & gears	Metal Working & Industrial Mach.
3567	Industrial furnaces & ovens	Metal Working & Industrial Mach.
3568	Power transmission equipment, nec	Metal Working & Industrial Mach.
3569	General industrial machinery	Metal Working & Industrial Mach.
3585	Refrigeration & heating equipment	Metal Working & Industrial Mach.
3592	Carburetors, pistons, rings & valves	Metal Working & Industrial Mach, .Motor Vehicles
3593	Fluid power cylinders & actuators	Metal Working & Industrial Mach.
3594	Fluid power pumps & motors	Metal Working & Industrial Mach.
3599	Industrial & commercial machinery, nec	Metal Working & Industrial Mach, .Primary nonferrous metals
3612	Transformers	Metal Working & Industrial Mach.
SIC	Target Industry	Related Cluster

3613	Switch gear & switchboard apparatus	Metal Working & Industrial Mach.
3632	Household refrigerators and freezers	Metal Working & Industrial Mach.
3634	Electric housewares & fans	Metal Working & Industrial Mach.
3634	Electric housewares & fans	Pharmaceuticals, Motor Vehicles
3641	Electric lamps	Motor Vehicles
3644	Noncurrent-carrying wiring devices	Construction Materials
3646	Commercial lighting fixtures	Motor Vehicles
3647	Vehicular lighting equipment	Construction Materials, Motor Vehicles
3648	Lighting equipment, nec	Construction Materials, Motor Vehicles
3651	Household audio & video equipment	Motor Vehicles, Metal Working & Industrial Mach.
3663	Radio & TV communications equipment	Construction Materials
3691	Storage batteries	Motor Vehicles
3694	Engine & electrical equipment	Motor Vehicles
3699	Electrical equipment & supplies, nec	Construction Materials
3711	Motor vehicles & car bodies	Motor Vehicles
3715	Truck trailers	Motor Vehicles
3799	Transportation equipment, nec	Construction Materials, Motor Vehicles
3822	Environmental controls	Construction Materials
3841	Surgical & medical instruments	Pharmaceuticals
3842	Surgical appliances & supplies	Pharmaceuticals
3843	Dental equipment & supplies	Chemicals & Plastics
3996	Hard surface floor coverings	Chemicals & Plastics, Construction Materials
3999	Manufacturing industries, nec	Printing & Publishing
3842	Surgical appliances & supplies	Pharmaceuticals
3843	Dental equipment & supplies	Chemicals & Plastics
3996	Hard surface floor coverings	Chemicals & Plastics, Construction Materials
3999	Manufacturing industries, nec	Printing & Publishing
41	Local & interurban transportation	Travel & Tourism
45	Transportation by air	Travel & Tourism
48	Communication	Travel & Tourism, Printing & Publishing
73	Business services	Printing & Publishing, Hospitals, Labs, Medical Services
87	Engineering, accounting and management services	Printing & Publishing, Hospitals, Labs, Medical Services