

SUB-INDUSTRIES

- A. NATIONAL PLANNING & COORDINATION
 - B. INPUT SUPPLY
 - C. PRIMARY PRODUCTION
 - D. PROCESSING
 - E. DISTRIBUTION & LOGISTICS
 - F. RETAIL
 - G. EXPORT
 - H. SUPPORT SERVICES
- (Cross-cutting services that support all other stages)

A. NATIONAL PLANNING & COORDINATION

To ensure that crop and horticulture **production meets national demand in both volume and quality**, and **does so predictably across time and regions**, the production **system must be underpinned by centrally planned, enable a series of structured, interdependent coordinated steps that link production to market**. Below is a structured outline of the key steps that must be centrally led or enabled, especially by a national government or coordination body such as a Ministry of Agriculture or Food Security Council.

NATIONAL COORDINATION FRAMEWORK FOR PLANT PRODUCTION

I. DEMAND DETERMINATION AND CREATION (MARKET-LED PLANNING)

1. NATIONAL FOOD CONSUMPTION BASELINE & DEMAND FORECASTING

What to do: Collect data on historical and current consumption of each major crop by region, demographic group, season, and end-use (e.g. direct consumption, processing, animal feed).

Output: A rolling 3–5 year demand forecast by crop and product form (e.g. raw tomatoes, tomato

2. MARKET SEGMENTATION AND BUYER PROFILING

Households (rural, urban), processors, exporters, school feeding programs, hospitals, retailers
Capture demand **by volume, time, quality grade, and location**

3. IMPORT SUBSTITUTION & EXPORT OPPORTUNITY MAPPING

Identify crops with high import bills (e.g. onions, potatoes, garlic, tomato paste)
Map possible **export zones and seasonality** advantages

4. DEMAND CREATION (MARKET ACTIVATION)

Nutrition campaigns, public procurement mandates, agro-tourism and buy-local incentives
Incentivize buyers to shift toward local produce (e.g. school menus using local vegetables)
Input to animal production sector
Input to secondary processing for food & non-food products

II. NATIONAL PRODUCTION PLANNING & RESOURCE MATCHING

5. CROP ZONING AND SPATIAL PLANNING

Match crops to **suitable agro-ecological zones** using soil, climate, water, and risk data
Establish priority crop zones (e.g. maize belt, tomato corridors, citrus belts)

6. PRODUCTION SCHEDULING BY REGION AND SEASON

Plan for **staggered production** to match seasonal demand and reduce gluts
Central calendar for rain-fed vs. irrigated production cycles

7. FARMER TARGETING AND LAND ALLOCATION

Identify suitable farmers or cooperatives for each crop in each region
Allocate land and inputs based on **aggregated market orders and national targets**

III. INPUT AND SUPPORT SYSTEM COORDINATION

8. INPUT SUPPLY PLANNING

Forecast national demand for seeds, fertilizers, irrigation inputs, mechanization
Coordinate procurement and distribution in advance of each growing season

9. CONTRACT FARMING AND OFFTAKE GUARANTEES

Align large buyers (processors, retailers) with producer groups through seasonal contracts
Use forward purchase agreements to guide production volumes and grades

IV. MONITORING, AGGREGATION & MARKET FLOW MANAGEMENT

10. PRODUCTION MONITORING & IN-SEASON ADJUSTMENT

Use satellite data, extension reports, and farmer mobile reporting to track expected yields
Trigger adjustments (e.g. alternative markets, buffer storage) if oversupply or shortfall is detected

11. AGGREGATION AND LOGISTICS PLANNING

Set up **collection hubs and aggregation centers** close to production areas
Plan **cold chain, transport routes**, and regional packhouses in sync with harvest windows

V. STORAGE, PROCESSING & BUFFER STOCK MANAGEMENT

12. POST-HARVEST AND PROCESSING CAPACITY PLANNING

- Match harvest periods with processing facility capacity and storage space
- Use buffer stock strategies for strategic crops (e.g. maize, tomato paste)

VI. FEEDBACK AND COORDINATION INFRASTRUCTURE

13. MARKET INFORMATION SYSTEM (MIS)

- Live dashboards showing prices, volumes, and demand by region
- Two-way communication with producers, buyers, and local governments

14. POLICY AND FINANCIAL INCENTIVES

- Include production planning in **subsidy design, credit distribution, and crop insurance**
- Use policies to **stabilize prices and manage seasonal market distortions**

15. INSTITUTIONAL COORDINATION PLATFORM

- Central steering committee or agri-value chain board
- Brings together ministries (agriculture, trade, finance), private sector, processors, retailers, and farmer

B. INPUT SUPPLY

1. SEED SYSTEMS

- Certified seed production & multiplication
- Seed processing & packaging
- Seed storage infrastructure (cooling, insect-proof)
- Seed treatment and coating services
- Indigenous & open-pollinated seed preservation systems
- Distribution and agro-dealer networks / rural seed retailers

2. WATER & IRRIGATION SYSTEMS

- Borehole drilling and pump installation
- Rainwater harvesting systems
- Drip and sprinkler irrigation equipment
- Solar-powered irrigation systems
- On-farm water storage tanks and canals
- Irrigation layout and design services
- Greenhouse tech, sorting & drying system
- Shade netting, organic inputs, drying units

Ginning, retting, water management

3. SOIL & PLANT DIAGNOSTICS

- Soil testing laboratories and kits
- Plant tissue analysis services
- Remote sensing and crop health monitoring
- Extension-linked mobile advisory apps

4. DIGITAL AGRICULTURE & DECISION TOOLS

- Input access and logistics platforms
- Crop modeling and yield prediction tools
- Input subsidy distribution (e-voucher systems)
- Farmer registration and identity systems

5. TRANSPORT & LOGISTICS FOR INPUTS

- Bulk input warehousing (seed, fertilizer, chemicals)
- Rural delivery and transport networks
- Cold chains for sensitive inputs (biologicals, seeds)
- Input supply chain management systems

6. CLIMATE AND WEATHER SERVICES

- Agro-meteorological stations
- Seasonal forecasting and weather alerts (mobile-based)
- Drought and flood risk maps
- Climate-smart advisory services

7. RESEARCH, DATA, AND ADVISORY SERVICES

- Agronomic advisory platforms (mobile apps, radio, extension)
- Climate and weather data services
- GIS-based land mapping and crop zoning
- Public-private research collaboration platforms

8. FINANCIAL SERVICES

- Input loans (seeds, fertilizer, fuel)
- Input credit (voucher systems, supplier credit)
- Input subsidy programs
- Mechanization finance schemes
- Cooperative input bulk purchasing systems
- Input-linked weather-index crop insurance
- Group purchasing and input-saving schemes

9. AGRO-DEALER AND LOGISTICS NETWORKS

- Local agro-input shops and cooperatives
- Rural stockist delivery services
- Bulk transporters for input delivery

Distribution franchises for national coverage

10. PACKAGING AND LABELING

- Certified labeling for seed, fertilizer, and treatment products
- Tamper-proof and moisture-proof packaging
- Tracking and traceability barcoding systems

11. KNOWLEDGE & EXTENSION SUPPORT

- Crop (cereal, vines, Legumes, Root, Horticulture, medicinal plants, fibre production plants) production manuals and guides
- Regenerative Agriculture practices training & consultancy
- Input-use efficiency training
- Demonstration plots and learning farms
- Agro-dealer training programs

12. REGULATORY AND QUALITY CONTROL

- Seed certification and variety release systems
- Fertilizer and pesticide registration and monitoring
- Standards for machinery safety and calibration
- Licensing of input dealers and service providers

C. PRIMARY PRODUCTION

1. FARM MECHANIZATION & EQUIPMENT

- Tractors and power tillers
- Land preparation tools (ploughs, harrows)
- Planters and seed drills
- Equipment for conservation agriculture (rippers, jab planters)
- Harvesting machinery (combine harvesters and threshers)
- Sprayers (manual, mechanized, drone-based)
- Post-harvest machinery (shellers, dryers)
- Mechanization leasing and repair services

Tools for smallholders (hoes, sickles, sprayers)
Tractor and machinery leasing
Repair and maintenance workshops
Custom hire services (e.g. ploughing, planting, spraying)
UAV/drone-based spraying and scouting services

2. LABOUR AND SERVICES

Seasonal labour contracting agencies
Farm worker training programs (skills development)
Farm management consulting (scheduling, operations)

3. AGRONOMIC AND EXTENSION SUPPORT

Field-based crop scouts
Agronomic consulting (plant health, spacing, fertilization timing)
Digital extension apps (SMS, WhatsApp, satellite-integrated)
Mobile extension agents (e.g. ATV- or bike-based visits)

4. IRRIGATION SYSTEMS SERVICES

Borehole operation and repair services
Water pumping and filtration system technicians
Irrigation scheduling and performance services
Solar irrigation performance monitoring

5. SOIL & PLANT HEALTH (FERTILIZERS & SOIL INPUTS)

Inorganic fertilizers (NPK, uream DAP, lime)
Soil conditioners (lime, gypsum, sulfur compost, biochar)
Organic fertilizer production (manure, compost, green manure)
Biofertilizers
Microbial inoculants (e.g. rhizobia for legumes in rotations)
Micronutrients and foliar sprays
Soil testing services and diagnostics
Precision nutrient advisory tools (apps, maps)

6. CROP PROTECTION & BIOLOGICAL CONTROLS

Chemical pesticides (Herbicides, insecticides, fungicides)
Biopesticides and natural repellants (botanical extracts, neem, pyrethrin)
Integrated pest management (IPM) kits
Integrated pest management (IPM) training
Pheromone traps and pest monitoring tools
Scouting and pest detection services
Rodent and bird deterrent systems
Fumigation services for grain storage

7. DATA & TECHNOLOGY SERVICES

Satellite imagery for crop stage and biomass monitoring
Farm management systems (dashboards, sensors)
Geo-mapping and record-keeping services
Yield estimation platforms

8. ON-FARM LOGISTICS

Farm-to-packhouse transport (tractors, trailers, pickups)
Container and crate rental (for vegetables, fruits)
Field cold-storage units (mobile cold rooms)
Crop aggregation service providers

9. ENERGY AND FUEL SUPPLY

Diesel and petrol for mechanized equipment
Solar-powered irrigation and grain drying
Biogas or renewable energy systems for off-grid farms

10. INSURANCE & RISK SUPPORT

Crop inspection agents (for insurance)
Risk monitoring services (hail, drought, pest outbreaks)
Claim adjustment field teams

11. HARVEST OPERATIONS

Harvest crew mobilization services (team-based)
Crop cutting, bundling, lifting crews
Sorting, grading and packaging support teams (at farm gate)

12. STORAGE & POST-HARVEST INPUTS

Hermetic bags (e.g. PICS bags), silos
Grain moisture meters and dryers
Weighing scales and grading tools
Packaging materials for local and export use

13. COMPLIANCE & CERTIFICATION

Organic or GAP (Good Agricultural Practice) inspection bodies
Traceability system providers (QR code, batch tags)
Third-party audit and monitoring agencies

D. PROCESSING

Food & Beverage (Processing) - Value-added per hectare

1. PRIMARY F&B PROCESSING - Annual Demand (in metric tonnes (MT))

- Fresh-picked, sorted, clean, trimmed and chilled
- Washed, peeled, sliced or sun-dried roots
- Boiled, frozen or chilled fresh-cut products
- Raw, sun-dried chips (potato, cassava)
- Packaged (bagged spinach, morogo bunches)
- Dried
- Bran/by products

2. SECONDARY F&B PROCESSING - Annual Demand (in metric tonnes (MT))

- Milling, fortified flours, mealie-meal blends, flour/starch
- Frozen potato fries, crisps
- Instant mashed potato, dough mixes
- Packaged mixes (e.g. instant meal packs)
- Frozed mixed vegetables
- Hospitality Industry (hotels, restaurants, lodges)
- Baked goods (bread, biscuits, crackers)
- Fermented products (e.g. opaque beer, malted sorhum, ciders, wines, spirits)
- Dried slices, dried powder, flakes
- Dried & canned fruits
- Puree, paste, sauces
- Jams, Jellies, Marmalades, Chutneys, Pickles
- Herbal teas, spice blends
- Juices & Concentrates

3. ANIMAL FEED & LIVESTOCK INDUSTRY Value-added per hectare

- Pelleted feed mixes
- Mineral-enriched supplements
- Feed blocks for drought resilience
- Fish Feed

4. SOIL IMPROVEMENT

5. TEXTILE & APPAREL INDUSTRY

- Spun yarns
- Woven Fabrics
- Eco-textiles for fashion

Garments, clothing, blankets
Upholstery textiles and bed covers
Ropes, twines, mats, bags
Agro-fibre composites for furniture / packaging

6. PHARMACEUTICAL AND NUTRACEUTICAL INDUSTRY

Medicines (capsules, powders, tinctures)
Supplements / immunity boosters
Essential Oils
Extracts
Cosmeceuticals

7. COSMETICS AND PERSONAL CARE INDUSTRY

Cold-pressed oils & butters
Soaps, lotions, creams, lip balms
Hair care
Exfoliants
Natural Dyes
Perfumes

8. BIOENERGY AND BIOCHEMICALS INDUSTRY

Ethanol
Biofuels
Biogas
Biomass briquettes
Bioplastics & bio-based materials

9. CONSTRUCTION AND MATERIALS INDUSTRY

Bio-based insulations
Compressed blocks, bricks and panels
Straw-bale homes
Furniture and fencing materials
Natural fibres for reinforcement

10. PAPER AND PULP INDUSTRY

Paper
Cartons, Trays
Biodegradable seedling pots
Labels, tissues, recycled notebooks
Packaging

11. HORTICULTURE, LANDSCAPING, AND FLORICULTURE

Public & private landscaping
Indoor / outdoor decoration

Event Floral bouquets
Pressed / Dried Flower arts & crafts

12. CHEMICAL AND INDUSTRIAL PROCESSING

Industrial adhesives, lubricants, solvents
Natural dyes & tannins

E. DISTRIBUTION & LOGISTICS

1. Sub-Industries in Distribution & Logistics that Plant Production |

These enable the **movement, handling, and preservation** of crops post-harvest and during transport to market

1. AGGREGATION & PACKING

On-farm and off-farm **collection centers**
Community-level **aggregation hubs**
Mobile and modular **packhouses**
Grading, sorting, and washing stations
Weighbridge and produce certification stations

2. COLD CHAIN AND TEMPERATURE-CONTROLLED LOGISTICS

Cold storage warehouses (short and long-term)
Mobile refrigerated units
Solar-powered cold rooms
Cold chain monitoring (IoT-based sensors)

3. TRANSPORT & HAULAGE

Farm-to-collection **bulk transport** (tractors, small trucks)
Long-haul logistics (refrigerated and dry)
Last-mile distribution (to retailers, processors, and consumers)
Specialized **hazard-sensitive carriers** (for herbs, cut flowers)

4. ROADS AND INFRASTRUCTURE SERVICES

Feeder road maintenance contractors
Rural access road improvement programs

Weigh stations and loading infrastructure

5. HANDLING, PACKAGING & CONTAINERIZATION

Reusable plastic crate (RPC) suppliers
Bulk sack, jute, and box packaging manufacturers
Palletizing and shrink-wrapping services
Biodegradable and retail packaging supply

6. LOGISTICS TECHNOLOGY & COORDINATION

Agri-logistics software platforms
GPS and vehicle tracking services
Inventory and delivery scheduling systems
Aggregator-buyer coordination services

7. LABOUR & OPERATIONAL SUPPORT

Casual labor for loading/unloading
Forklift operators
Packing line supervisors and QC agents

Sub-Industries that the Distribution & Logistics Sector Feeds Into

The logistics segment of plant production **enables downstream industries (including retail and export - prese**

8. Processing & Manufacturing

Agro-processing factories (maize mills, juice plants, chip makers)
Breweries and fermentation plants
Essential oil and extractors
Feed manufacturers and livestock integrators

9. FOOD SAFETY AND TRACEABILITY

National food control laboratories (dependent on sample movement)
Certification agencies (based on logistical transparency)
Customs and phytosanitary inspection units

10. INSTITUTIONAL BUYERS

School feeding programs and caterers
Hospitals, prisons, military food supply
Hospitality (hotels, restaurants)

F. RETAIL

Retail and Wholesale Markets

Urban fresh produce markets
Supermarket distribution centers
Mobile vendor and farm-to-home delivery platforms
Export agents and international buyers

G. EXPORT

Export Logistics & Border Services

Airport and port fresh produce terminals
Freight forwarding companies
Customs clearance agents
Export inspection and packaging firms

H. SUPPORT SERVICES

(Cross-cutting services that support all other stages)

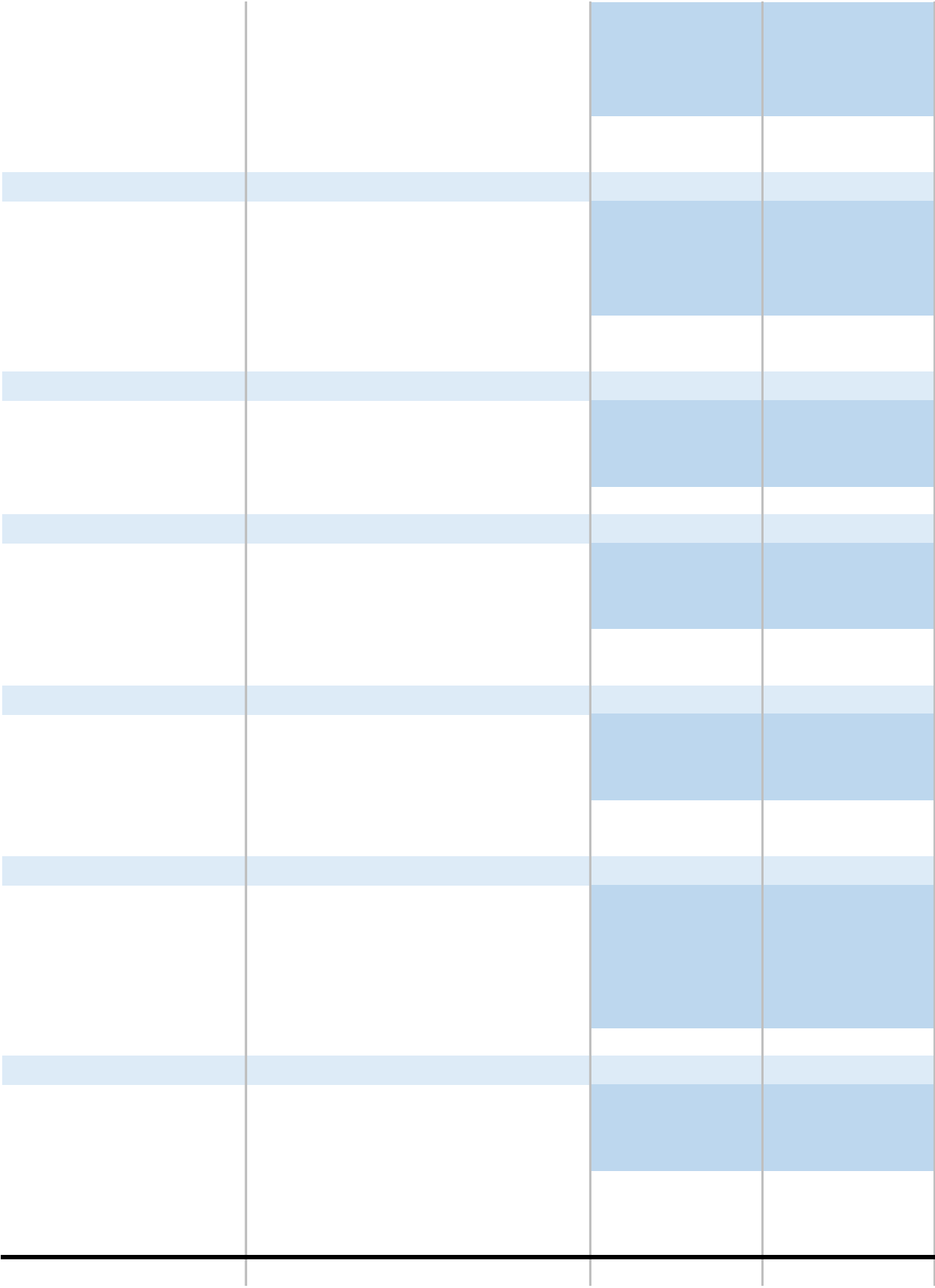
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Integration Opportunities:

- Input bundling services (seed + fertilizer + advice)
- Farmer service platforms (logistics + credit + weather + me
- Public-private input supply partnerships (e.g. for seed mult

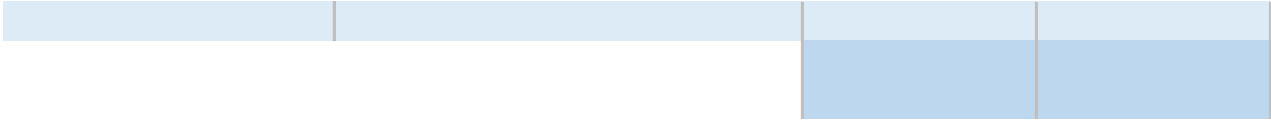
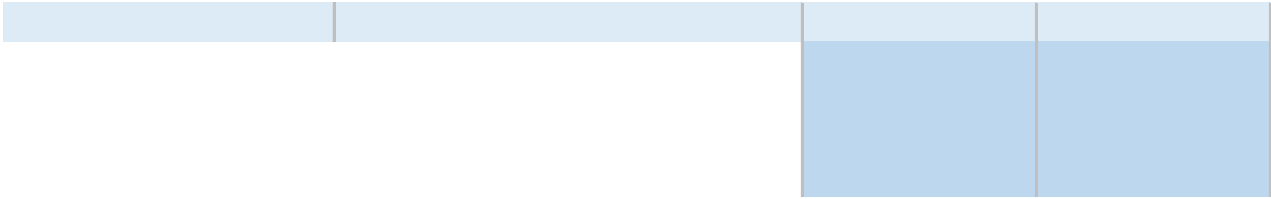
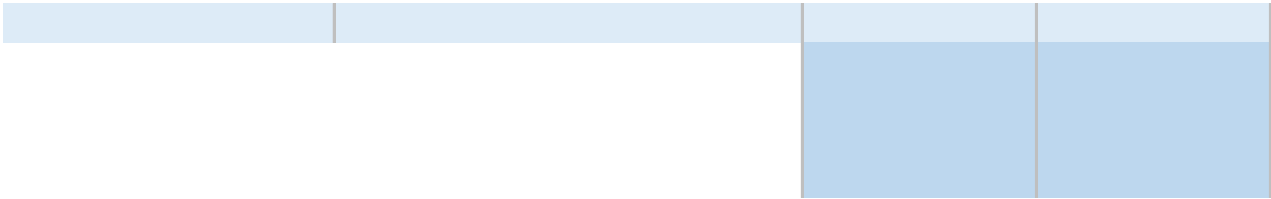
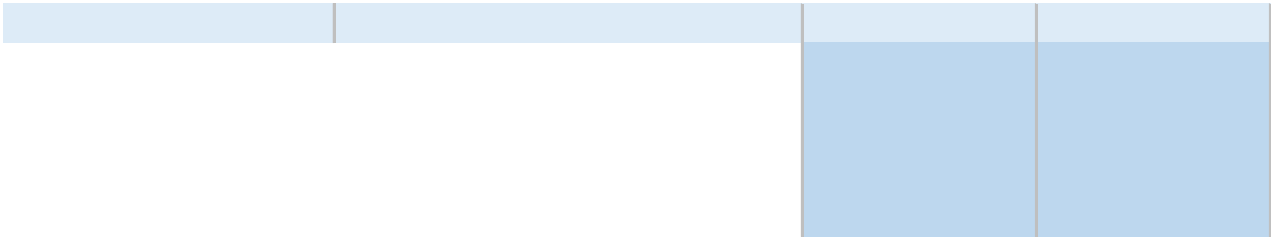
Training on regenerative practices, climate-smart agriculture



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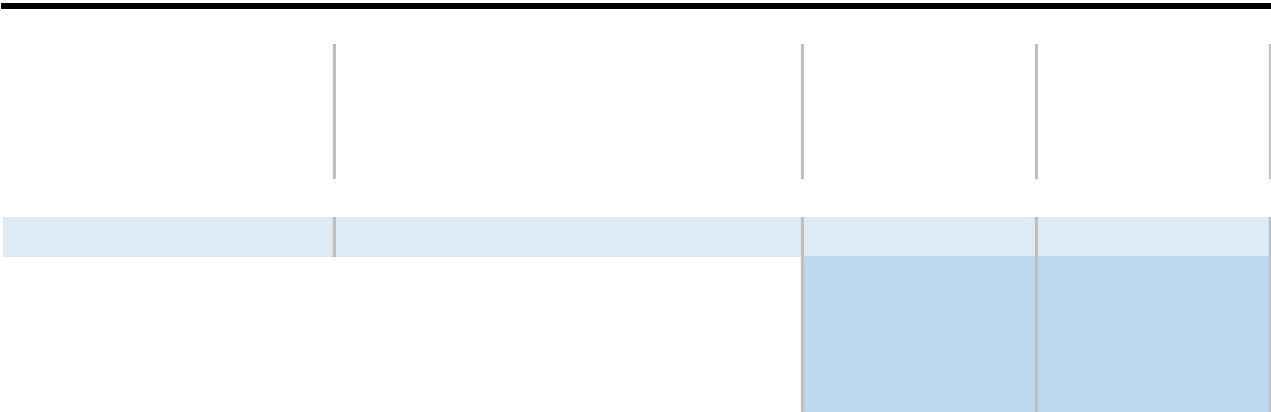
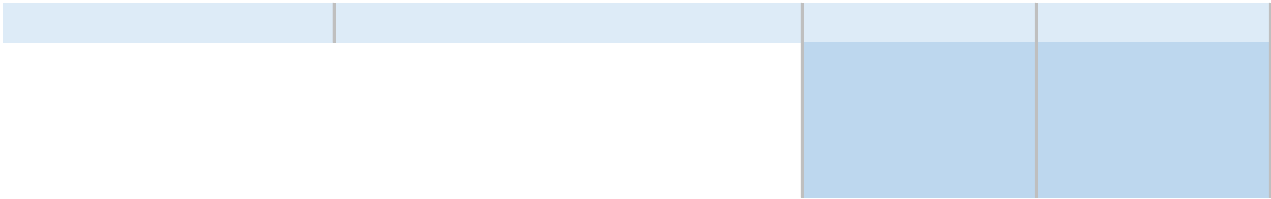
Agri-hubs, cold storage for perishables, packaging innovation			
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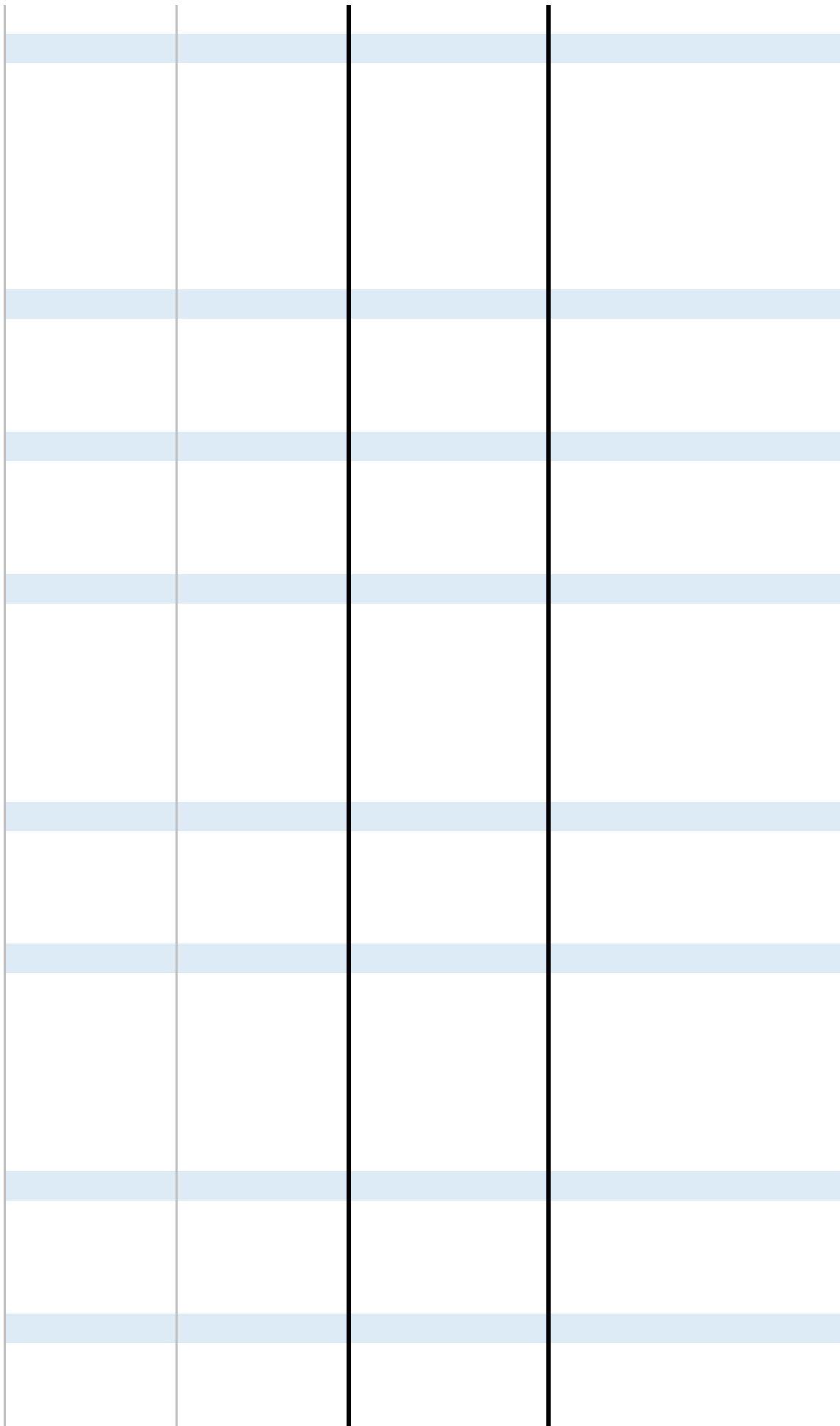
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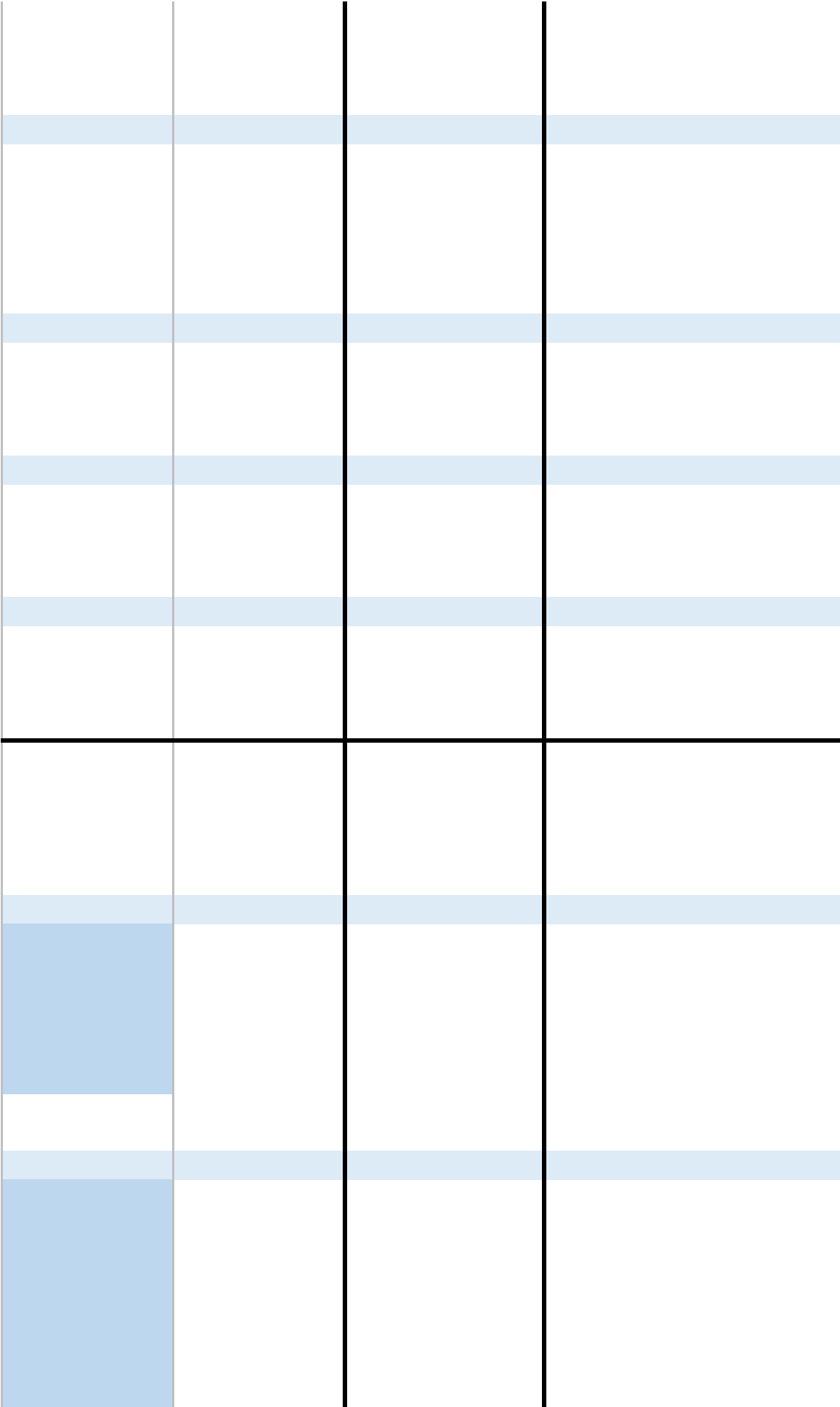
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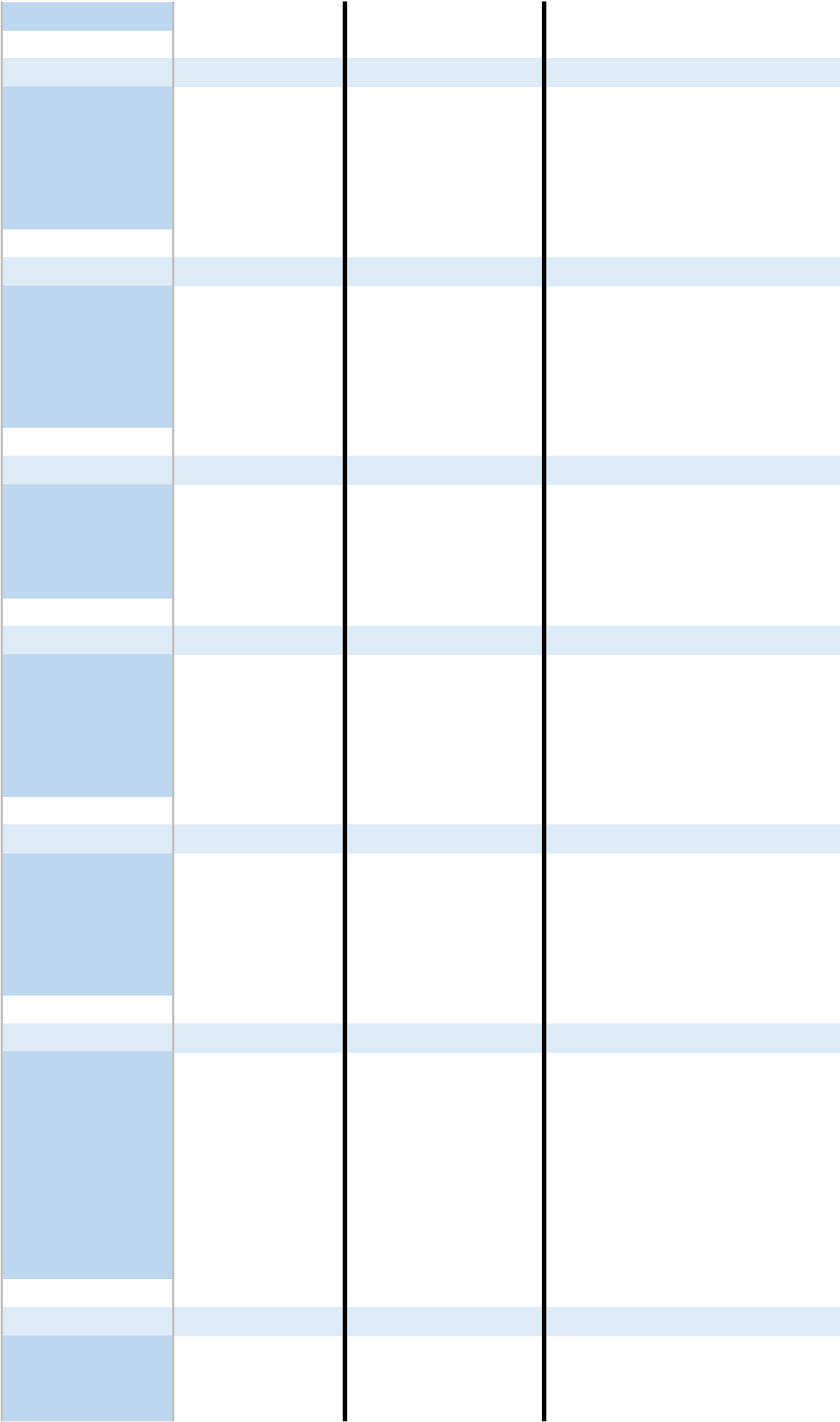
Branding, farmer co-ops, export

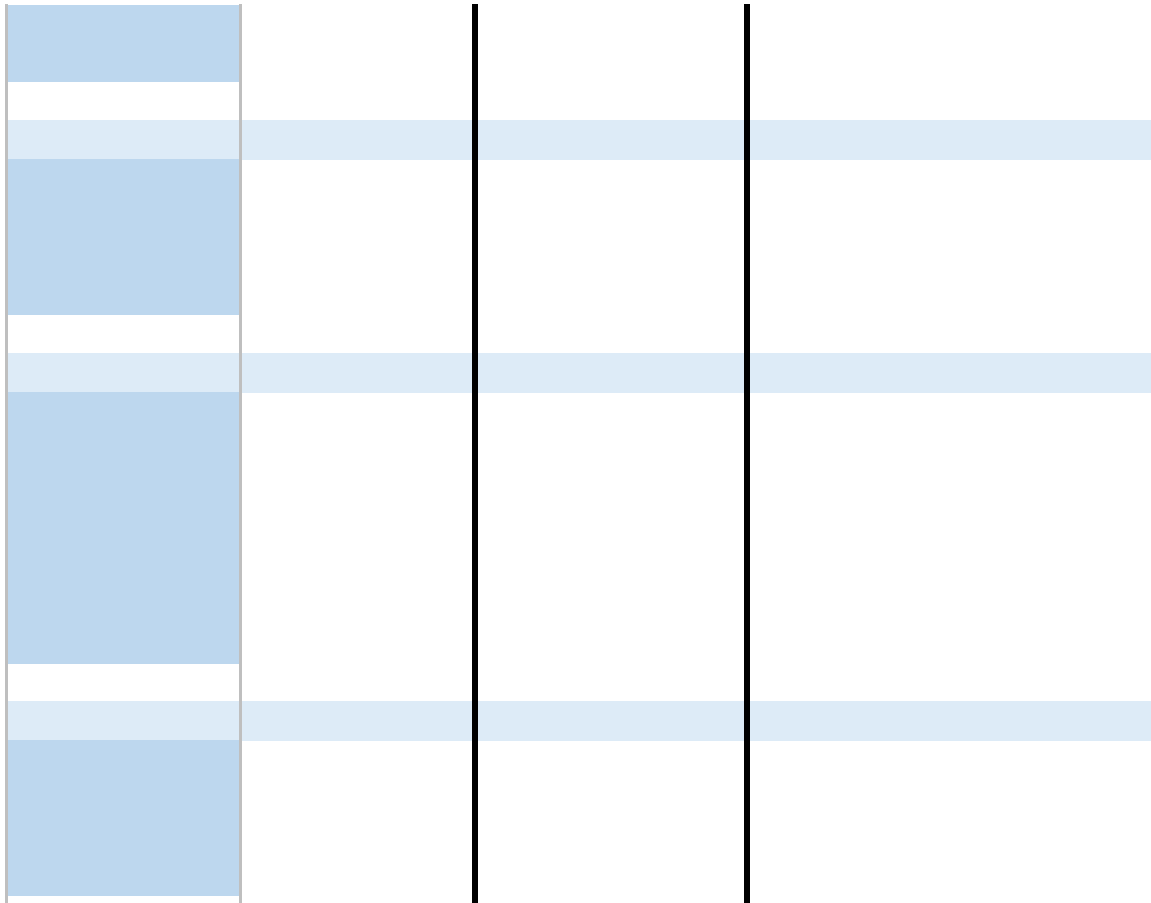


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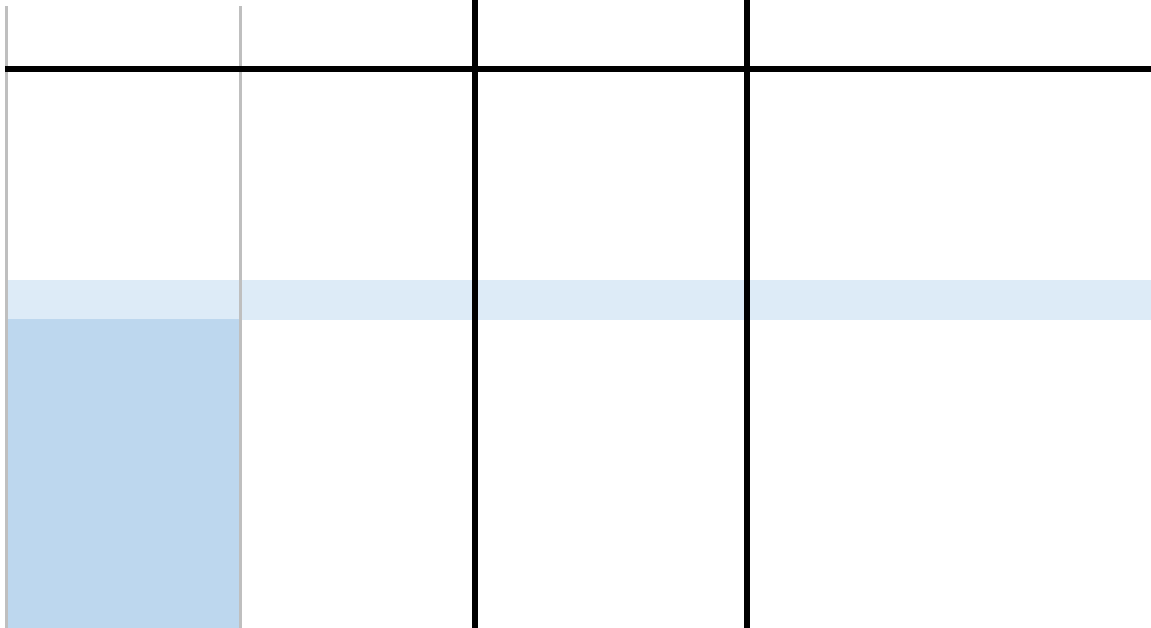


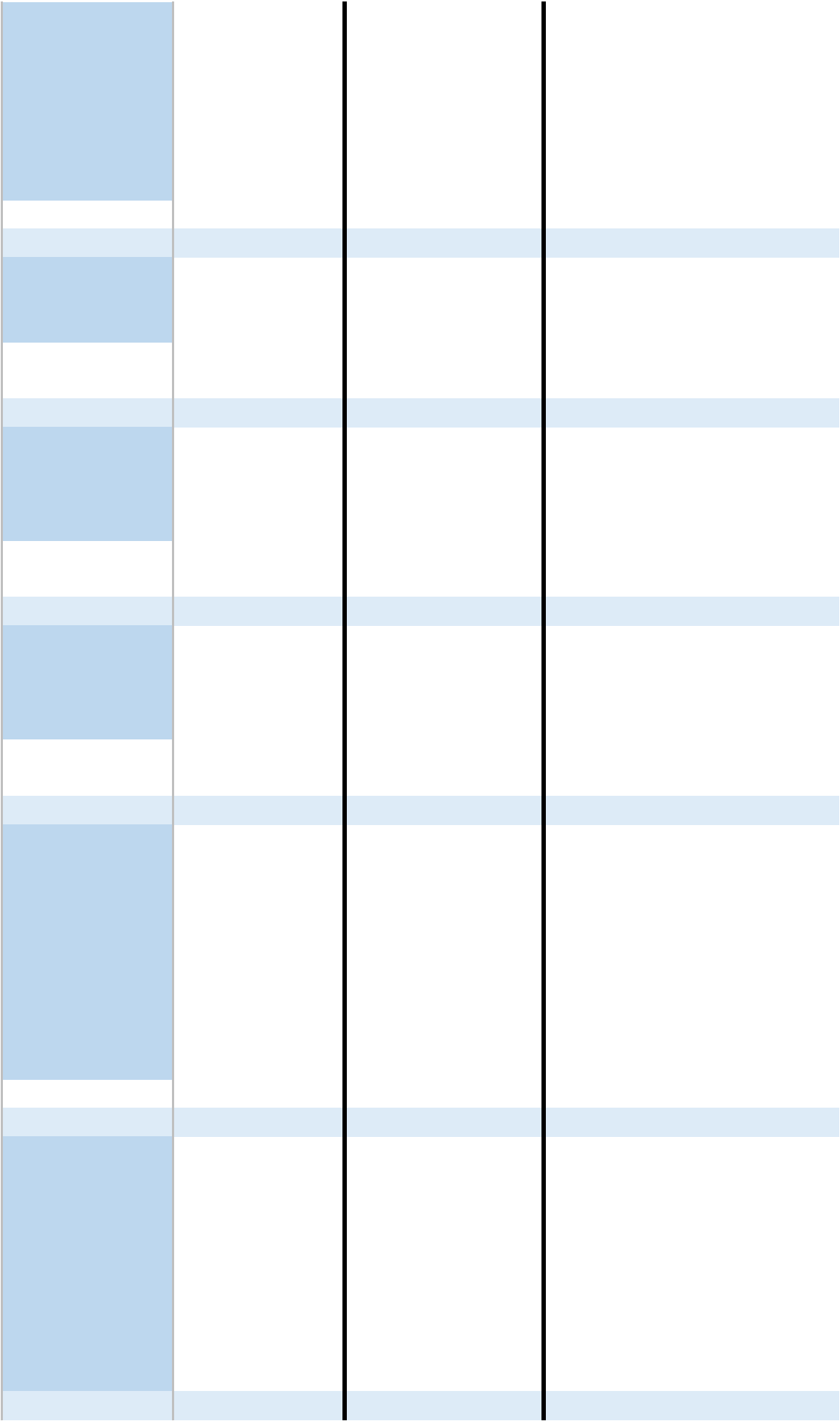


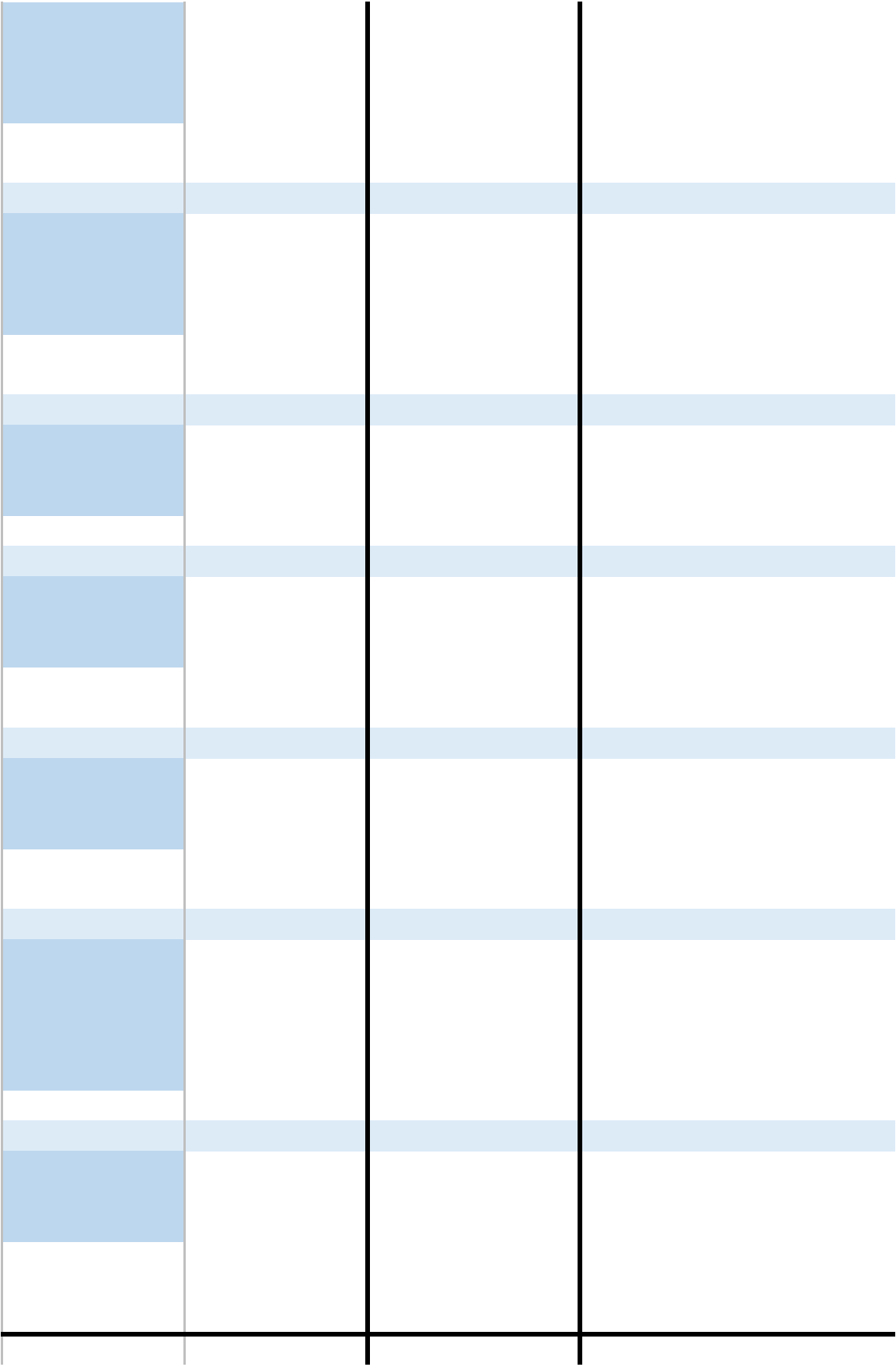


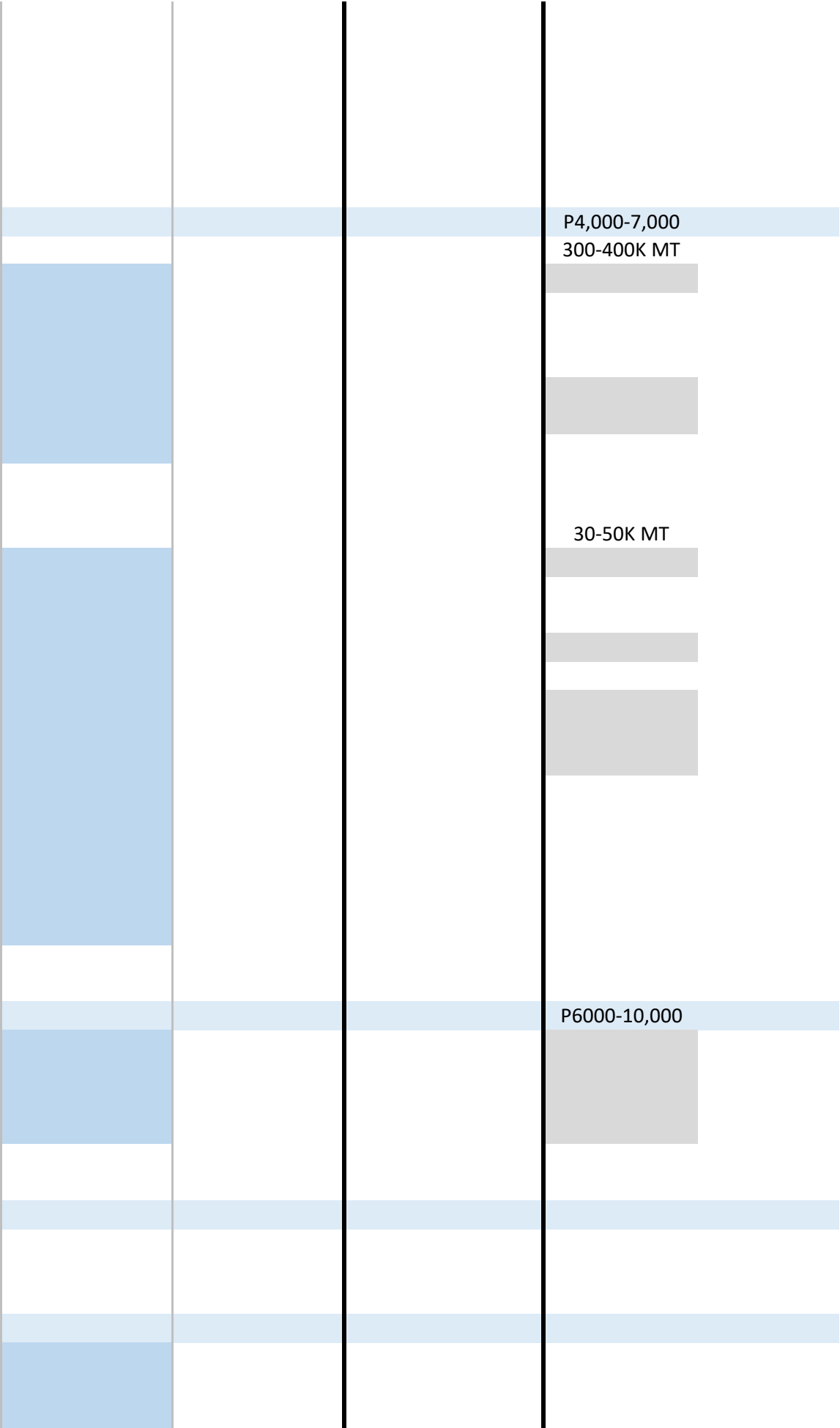
mechanization)

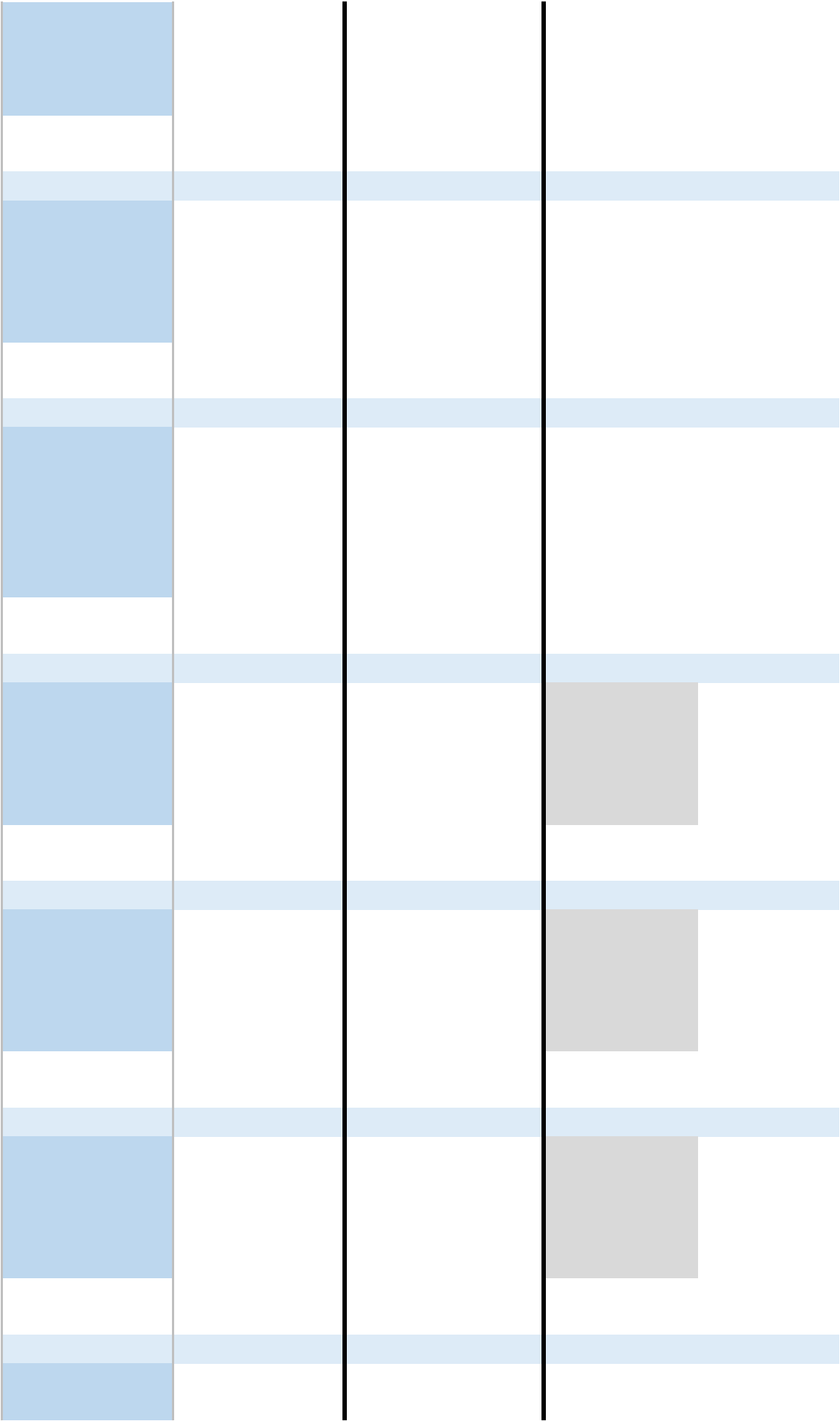
multiplication or input depots)

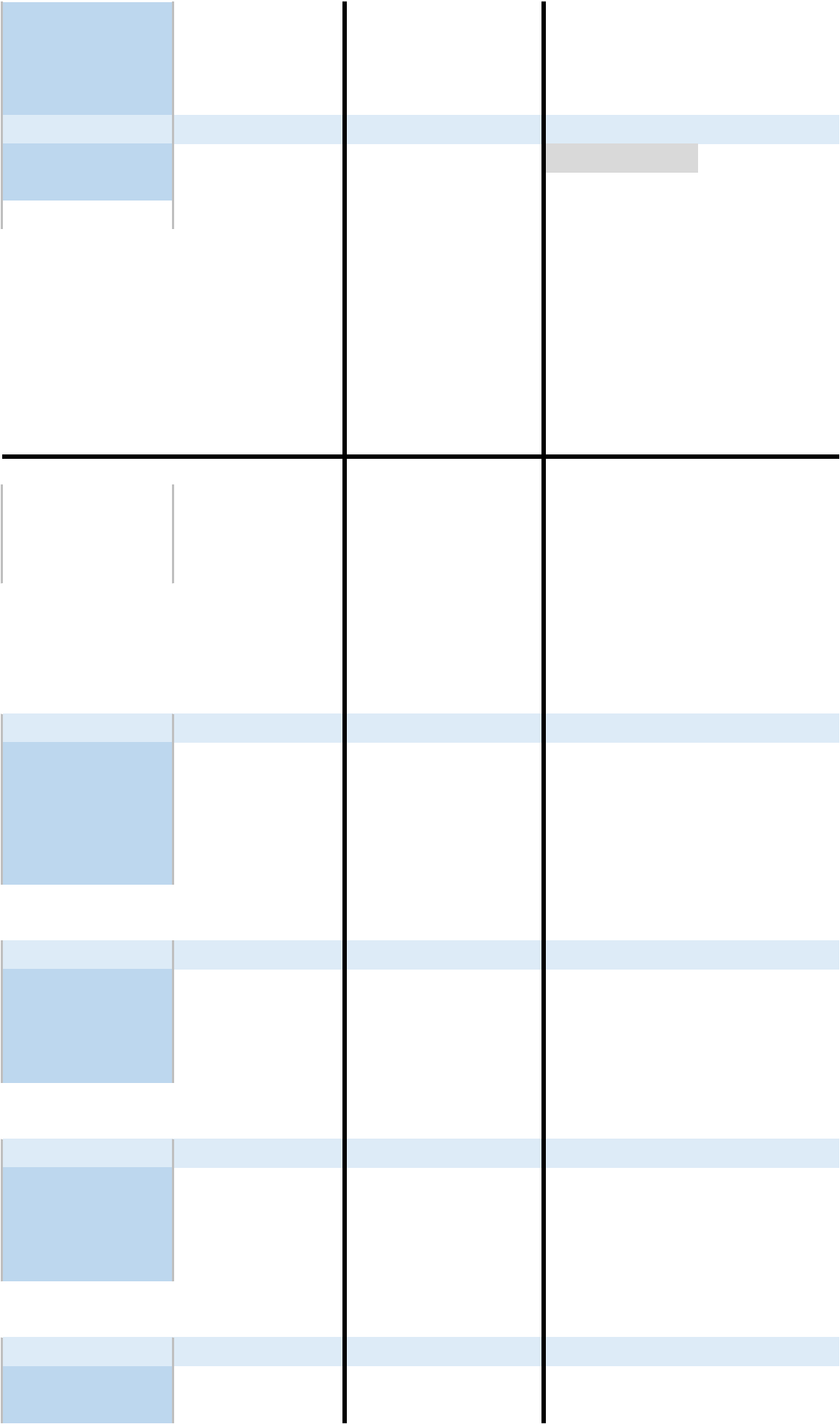


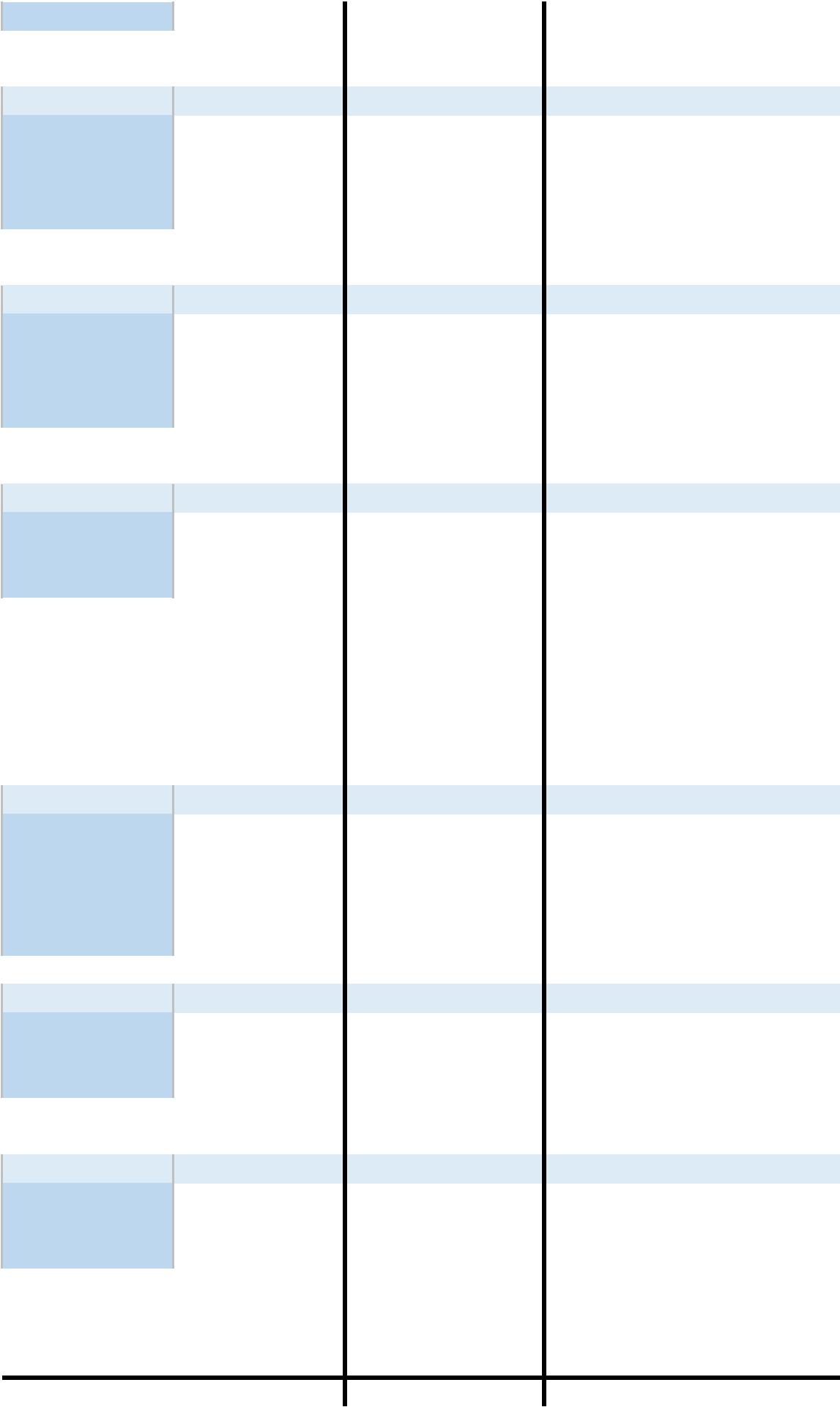


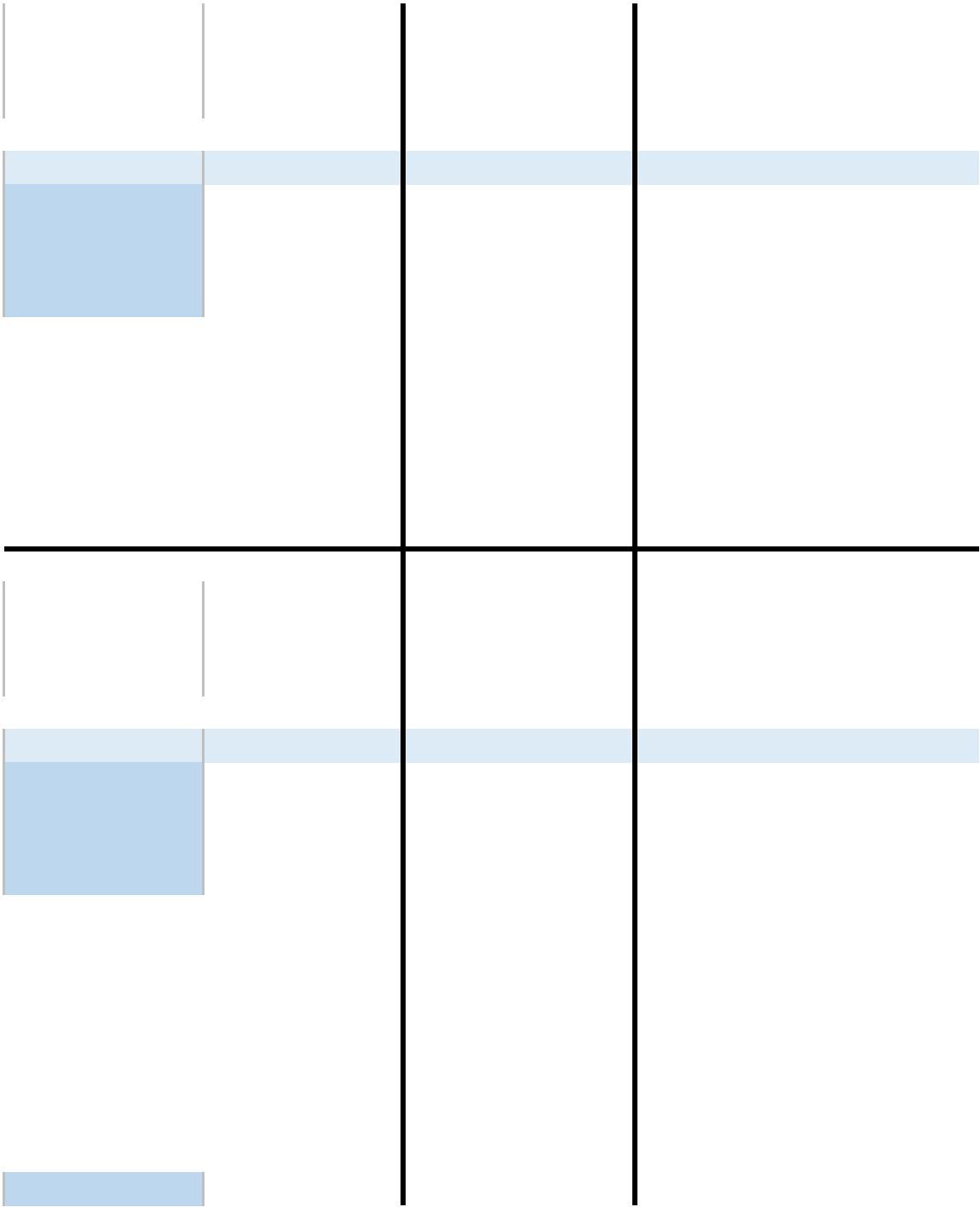




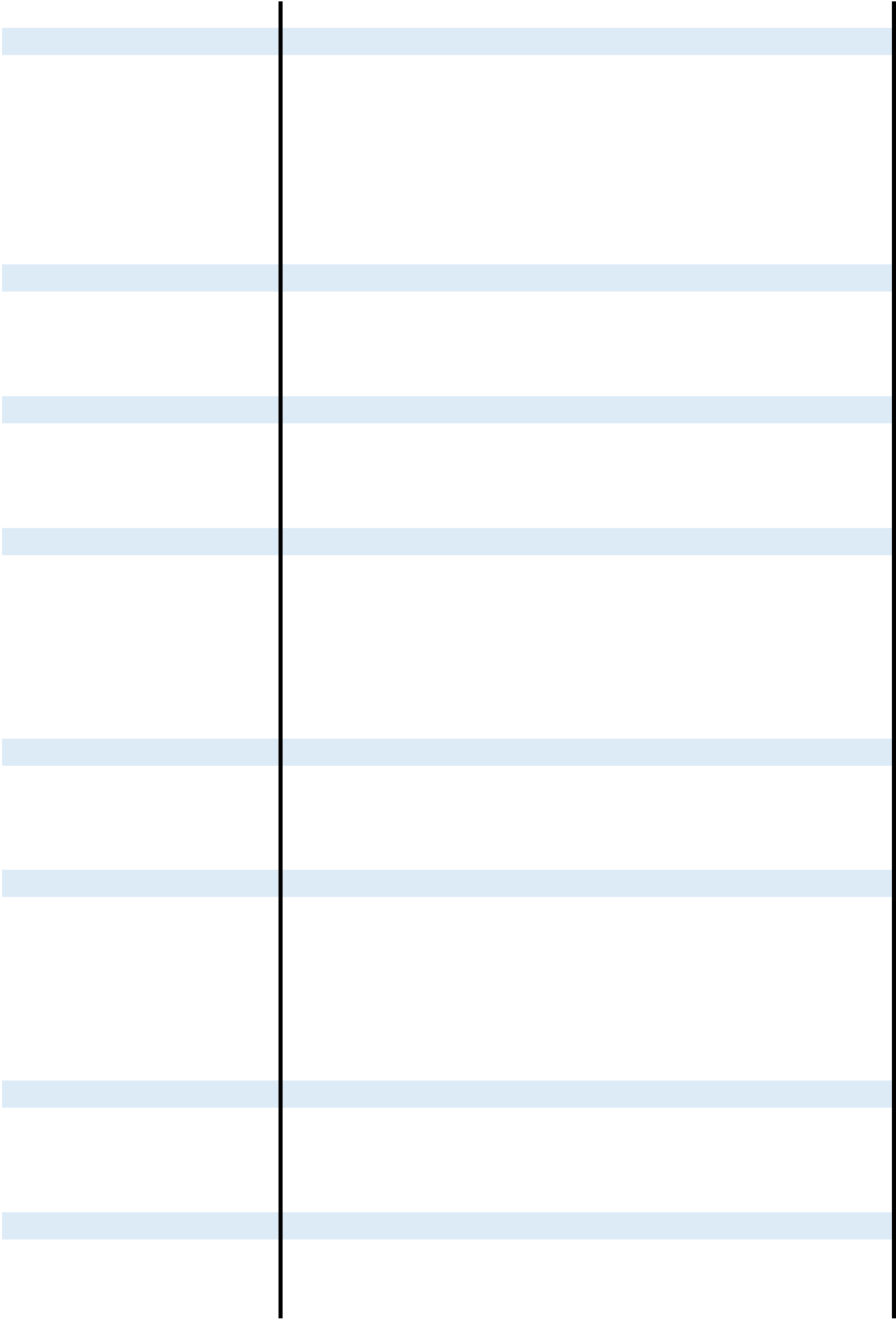


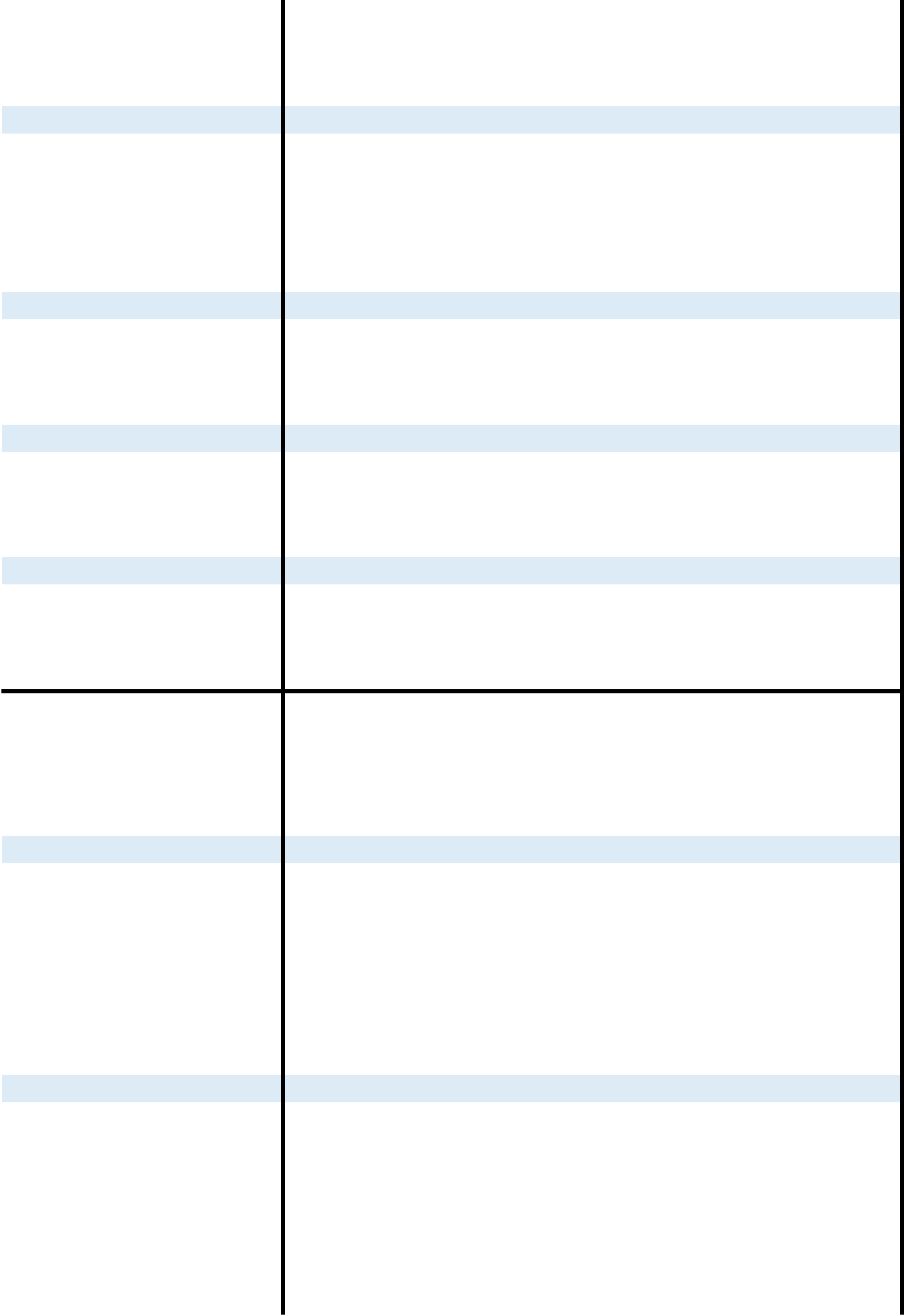


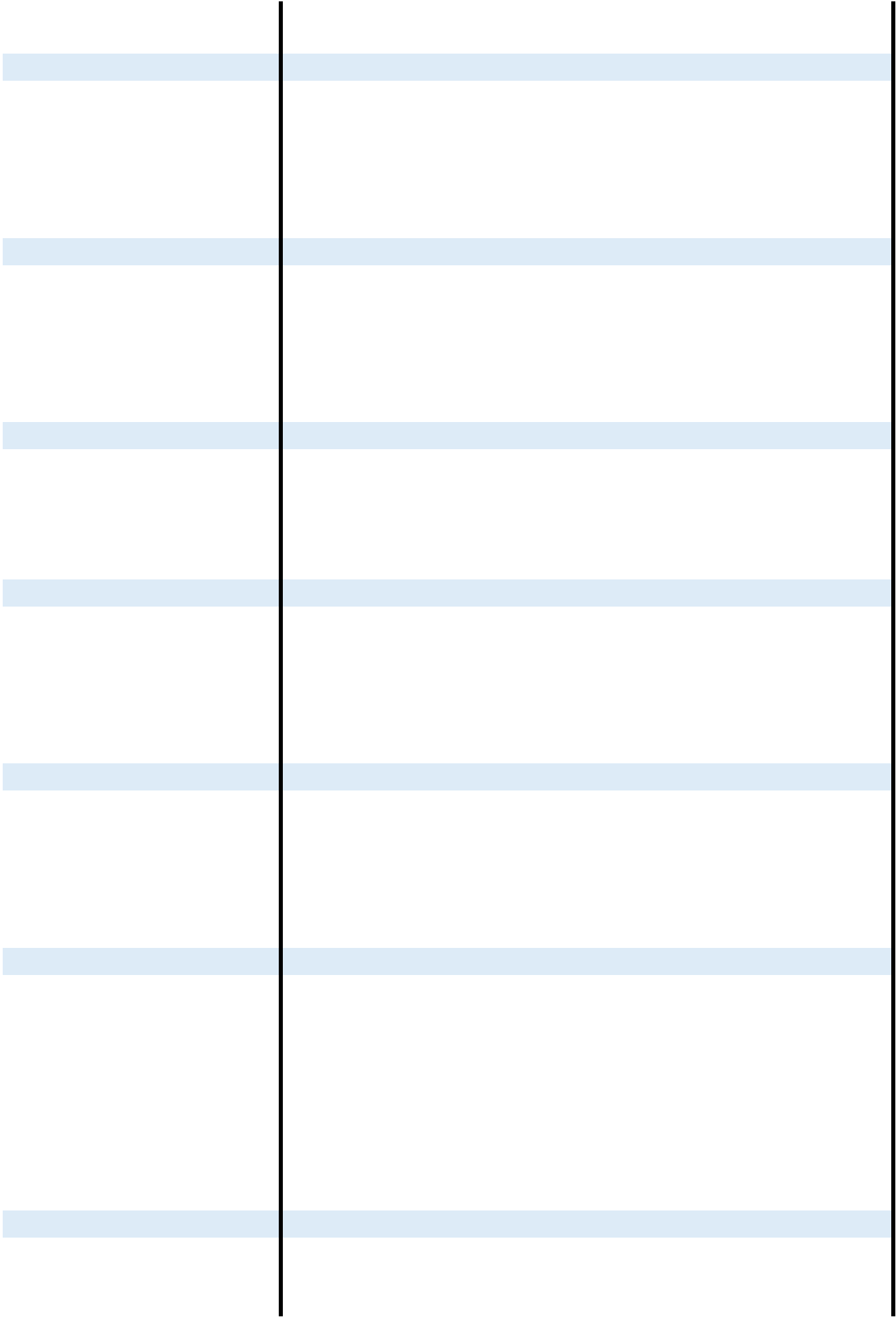


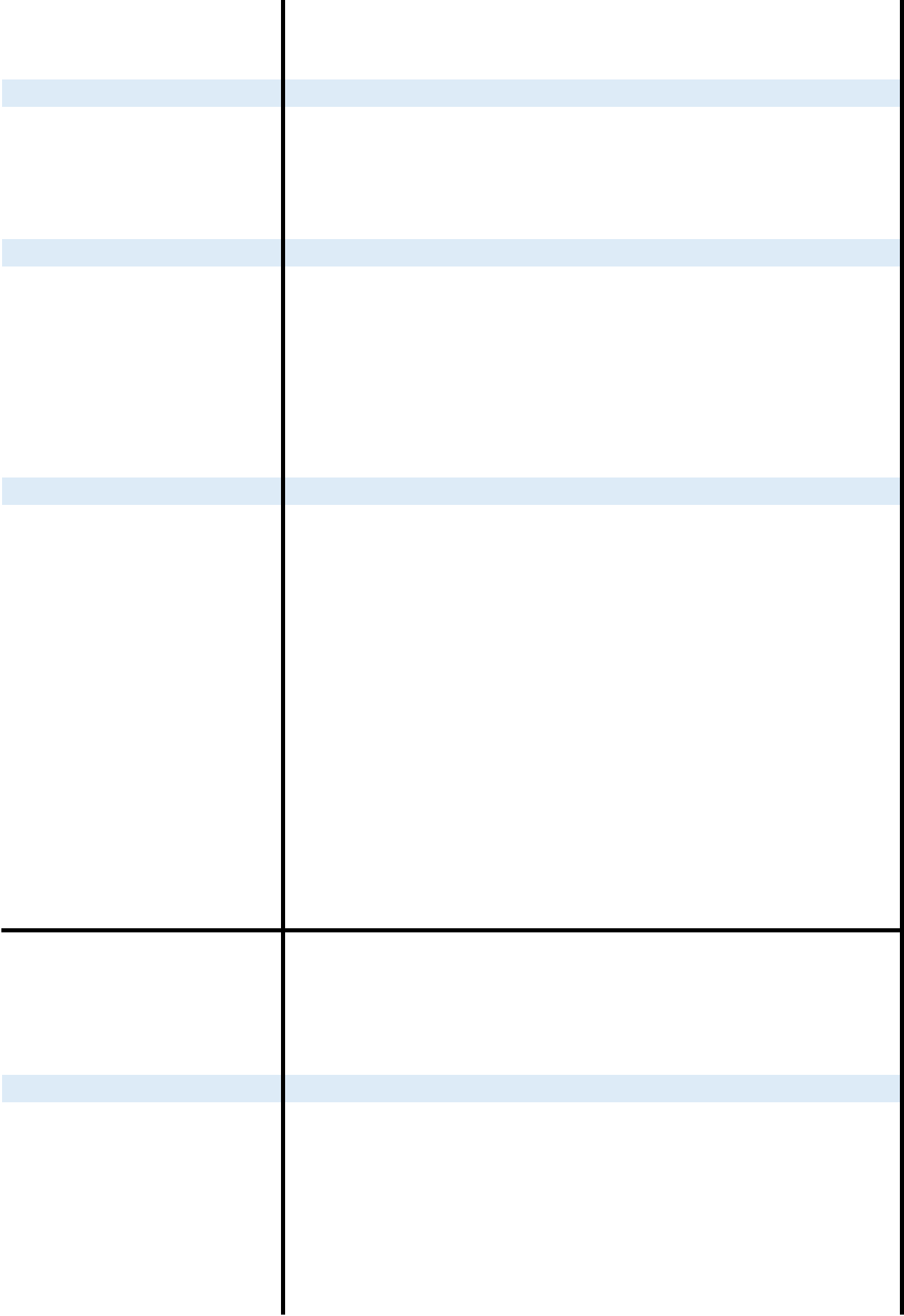


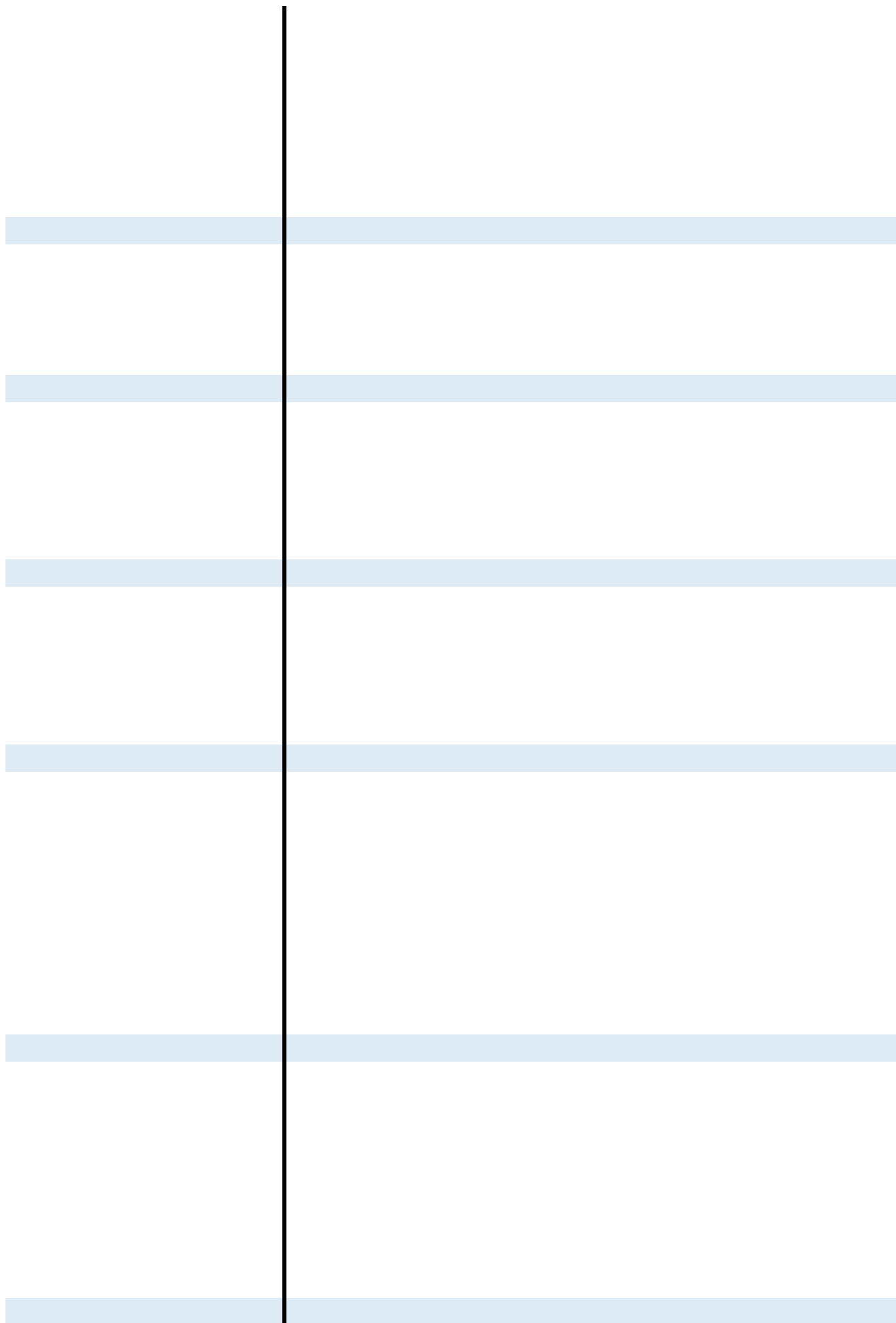
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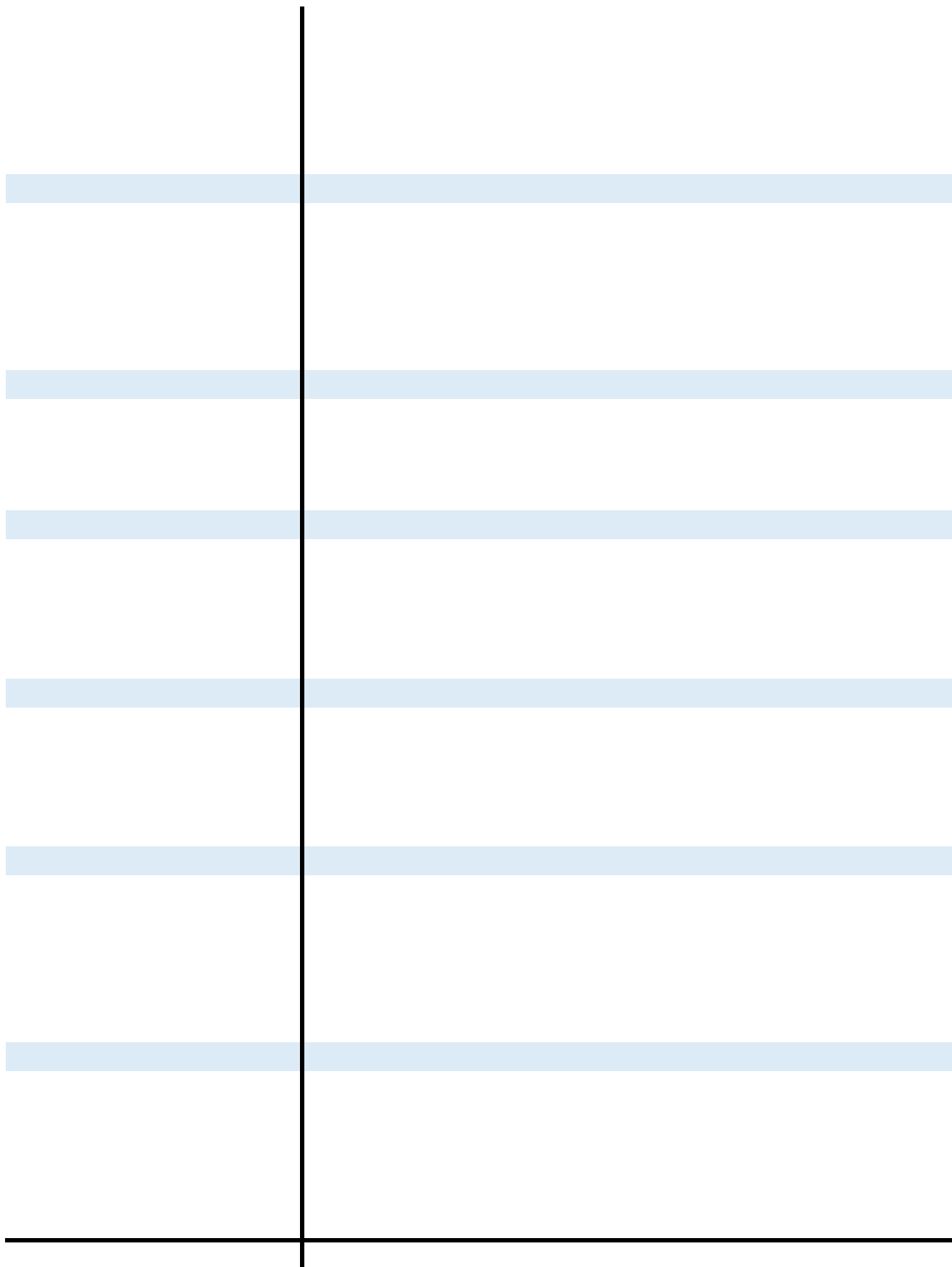


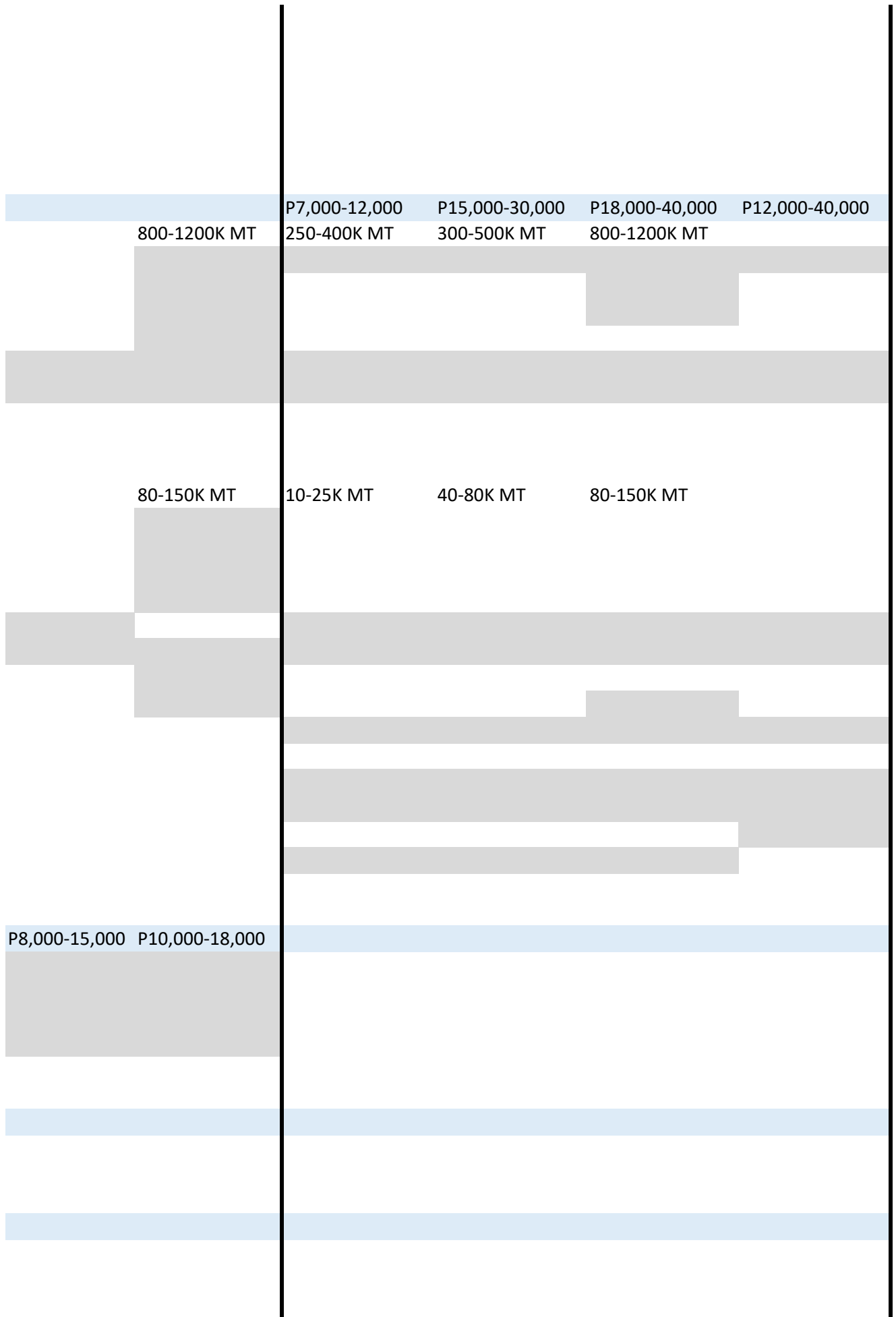


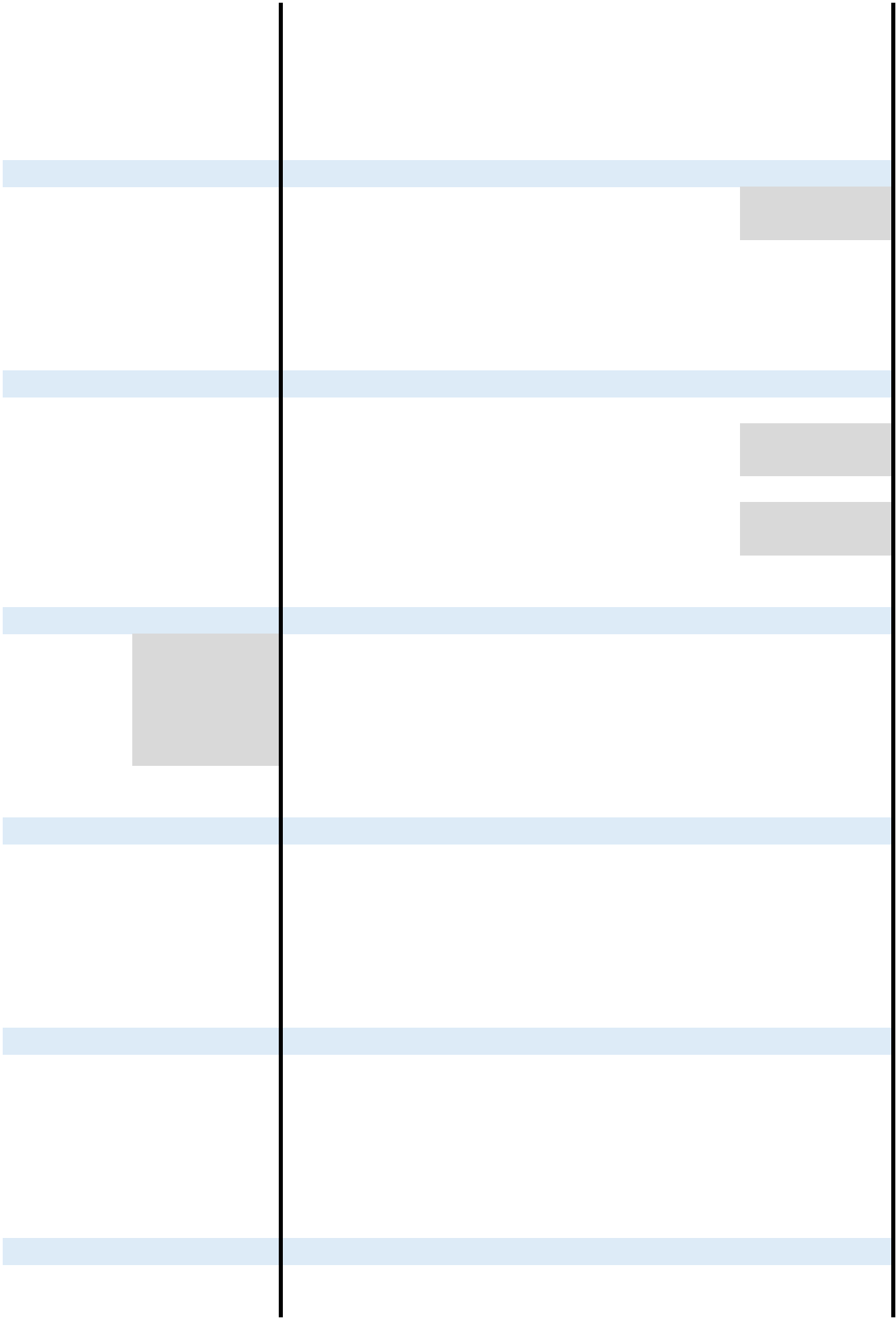


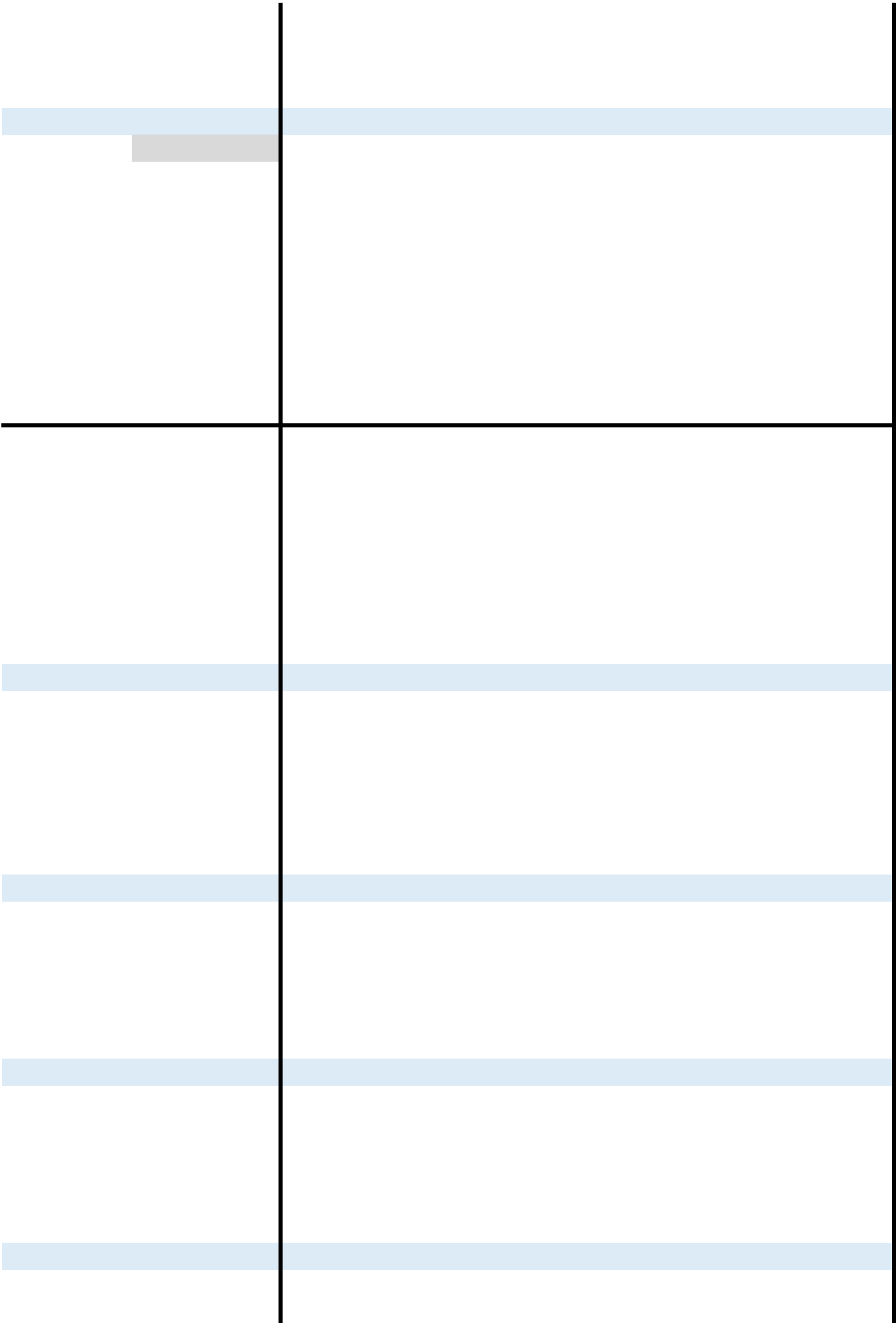


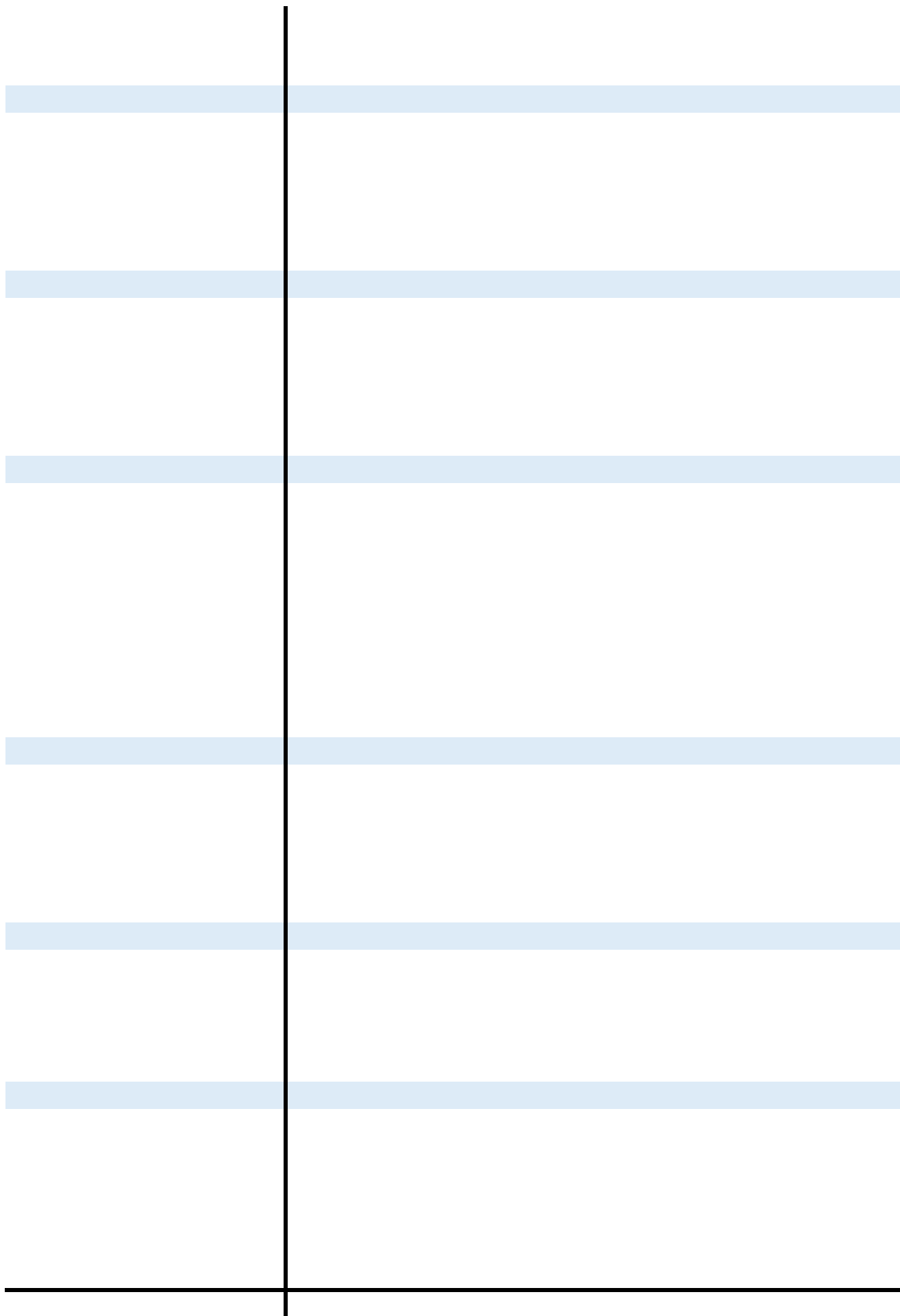


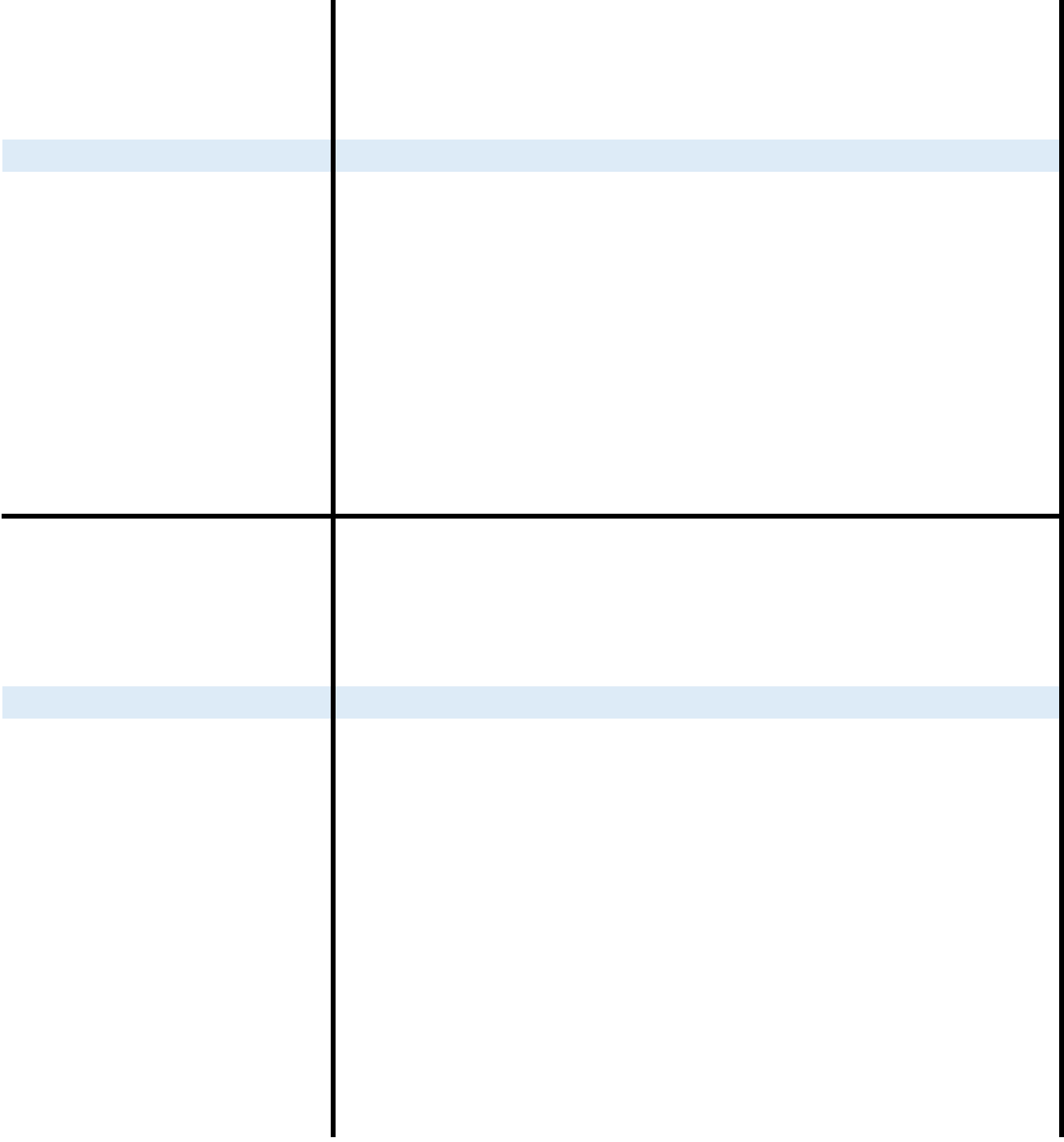




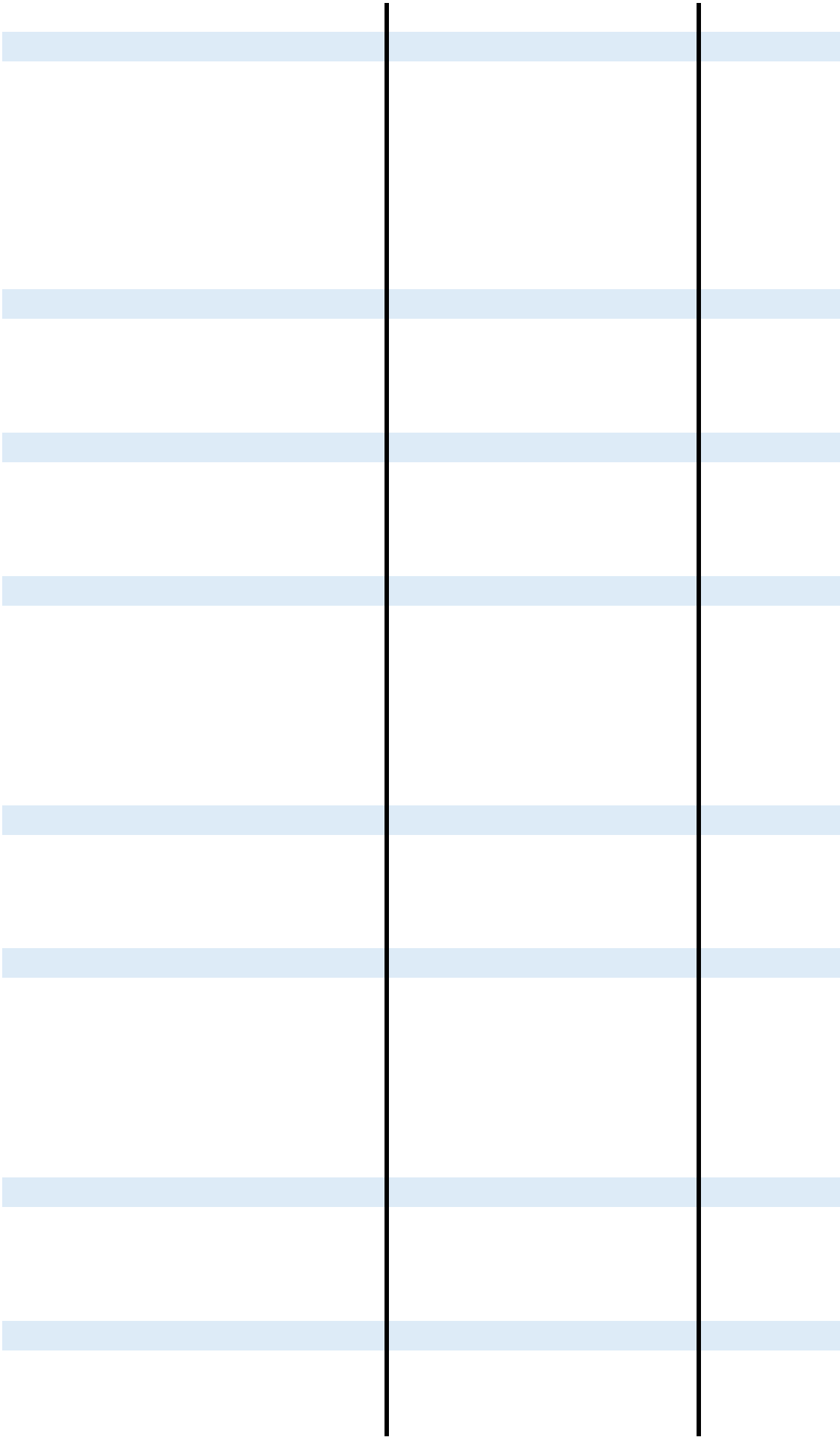


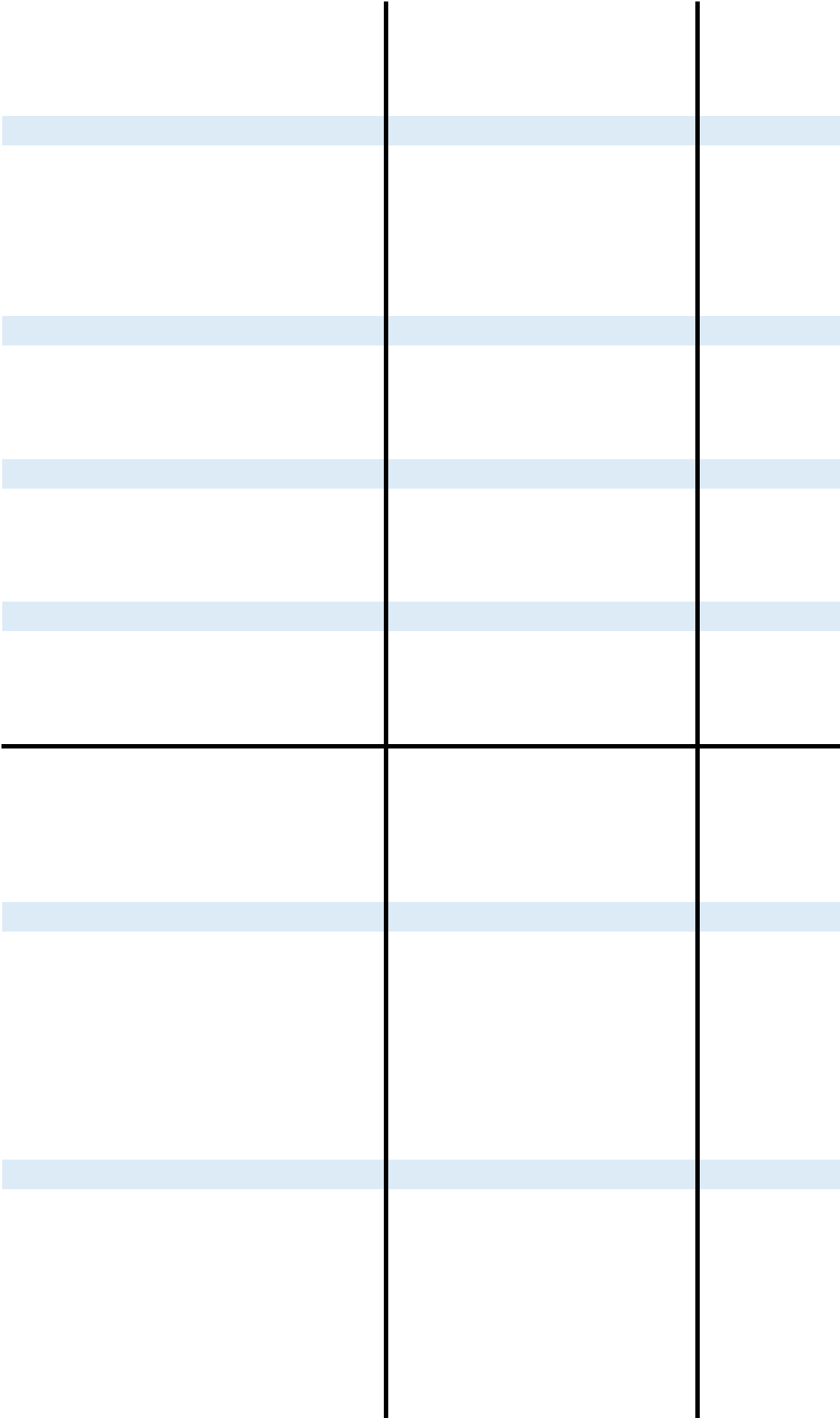


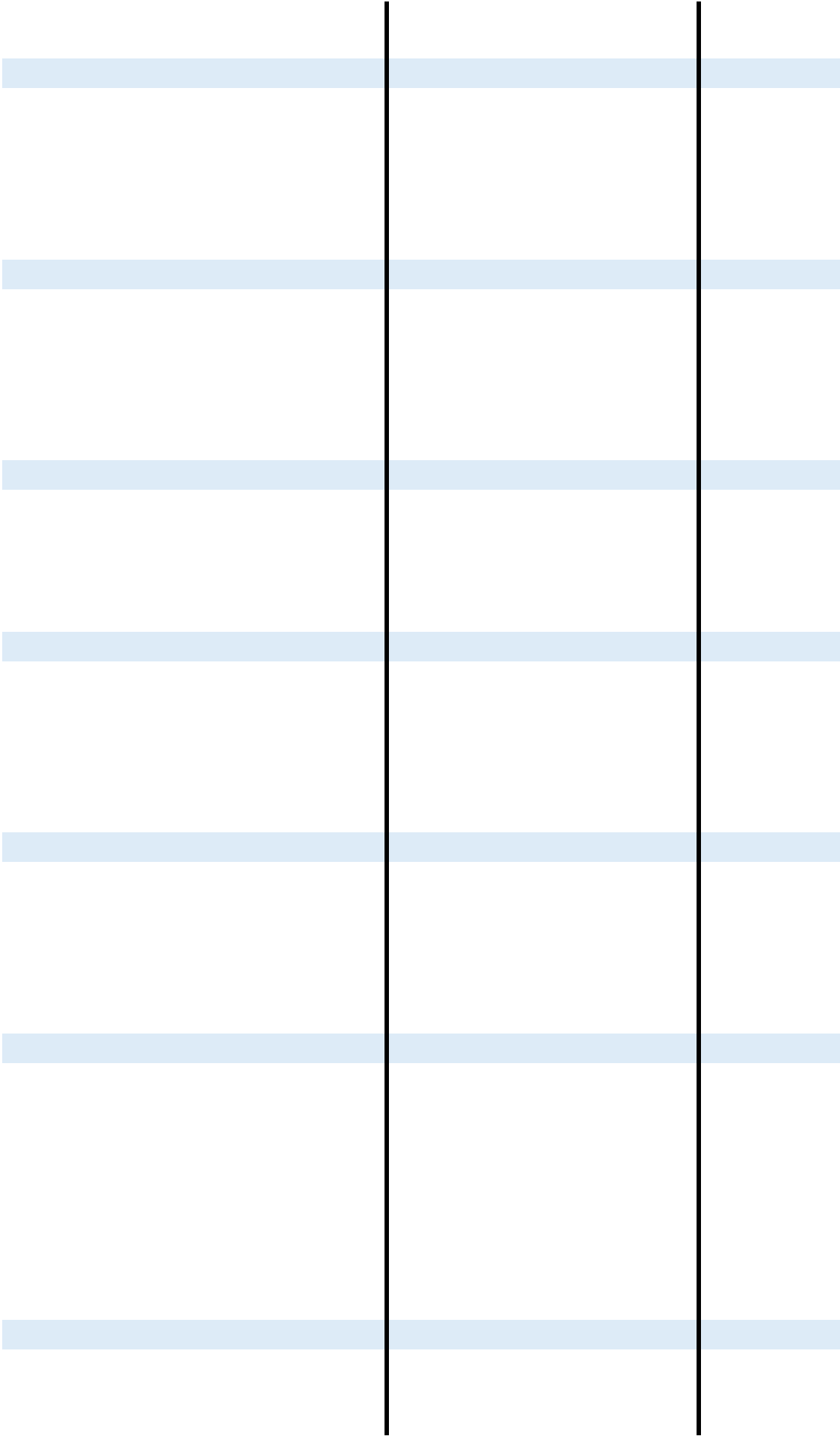


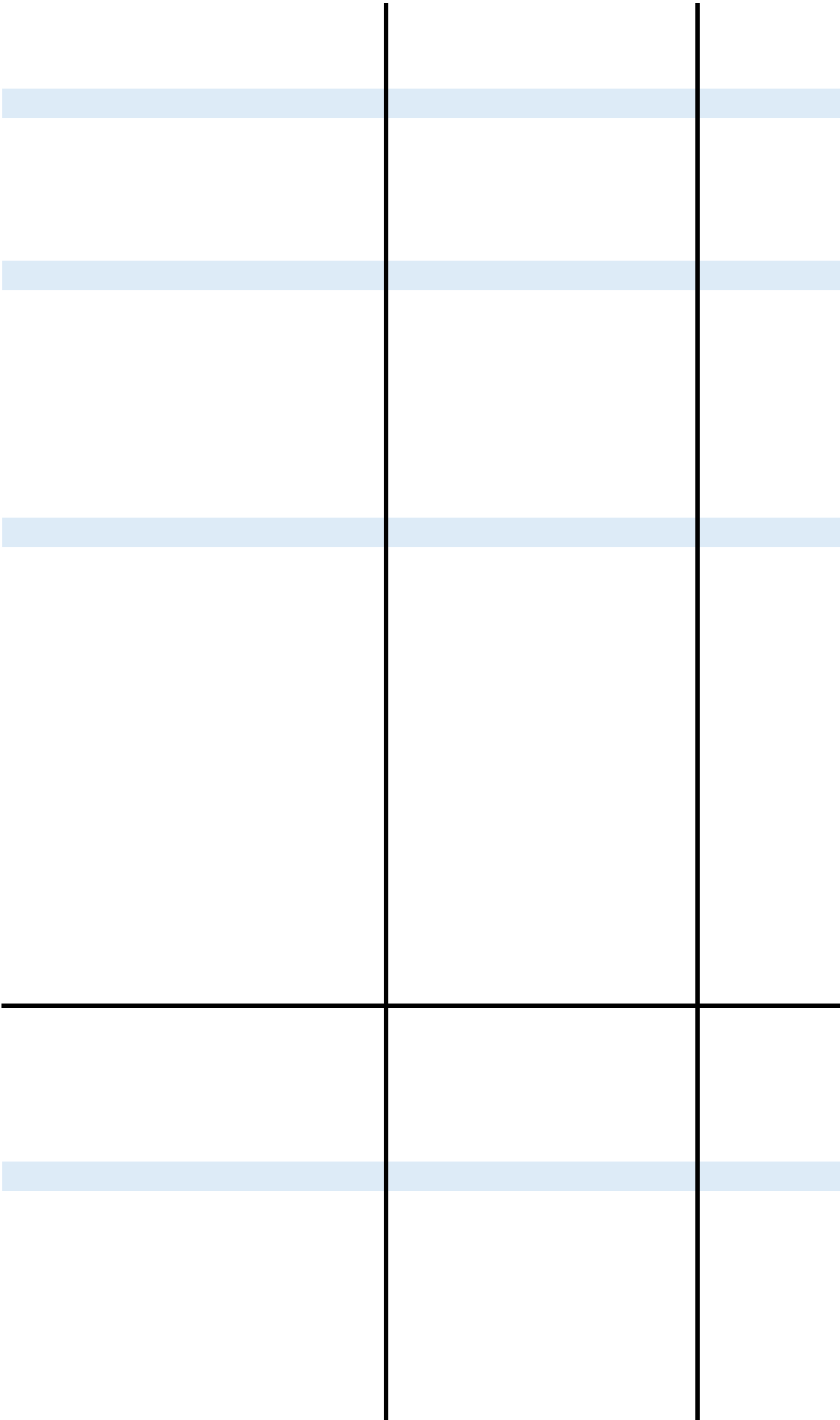


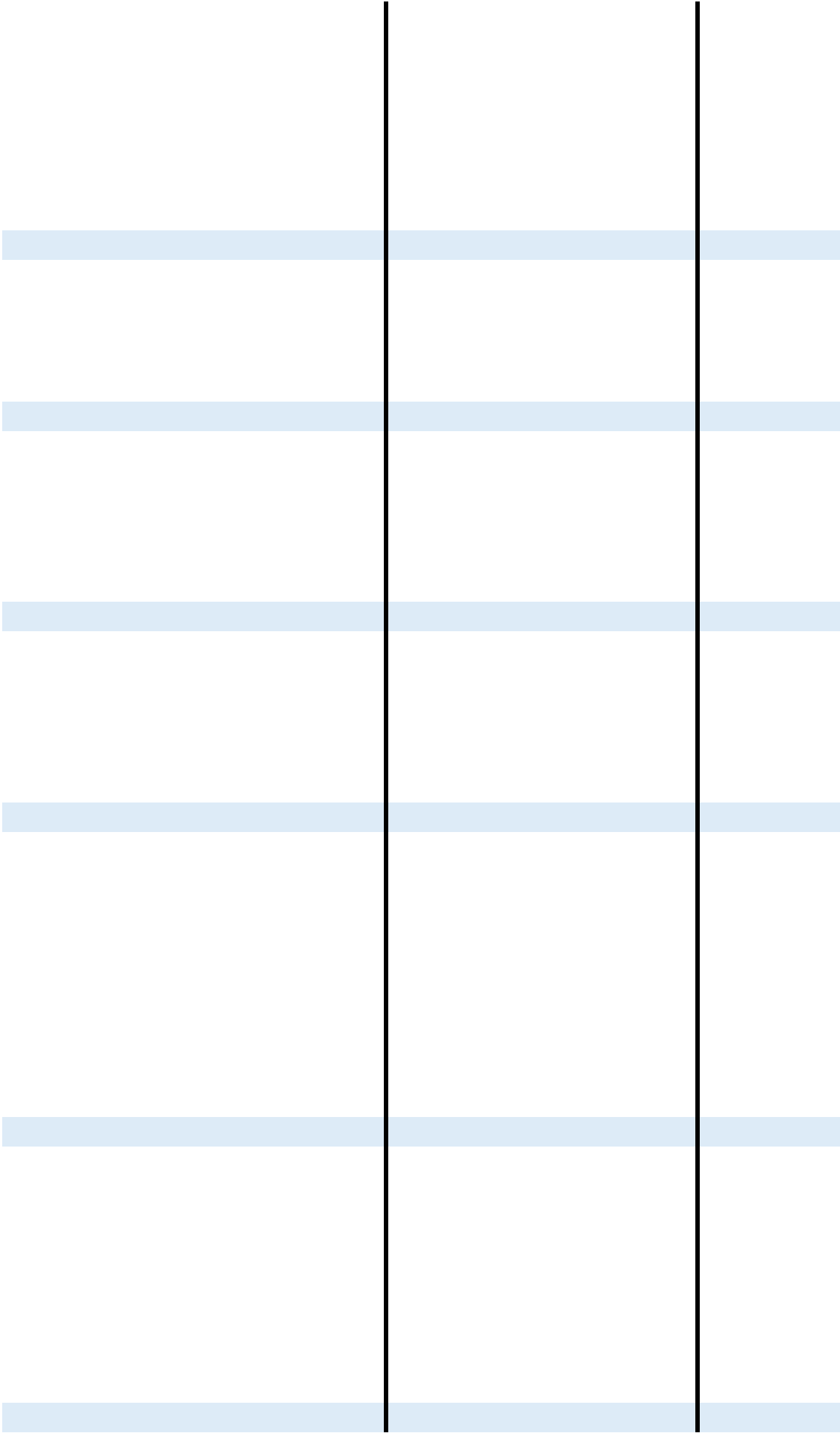
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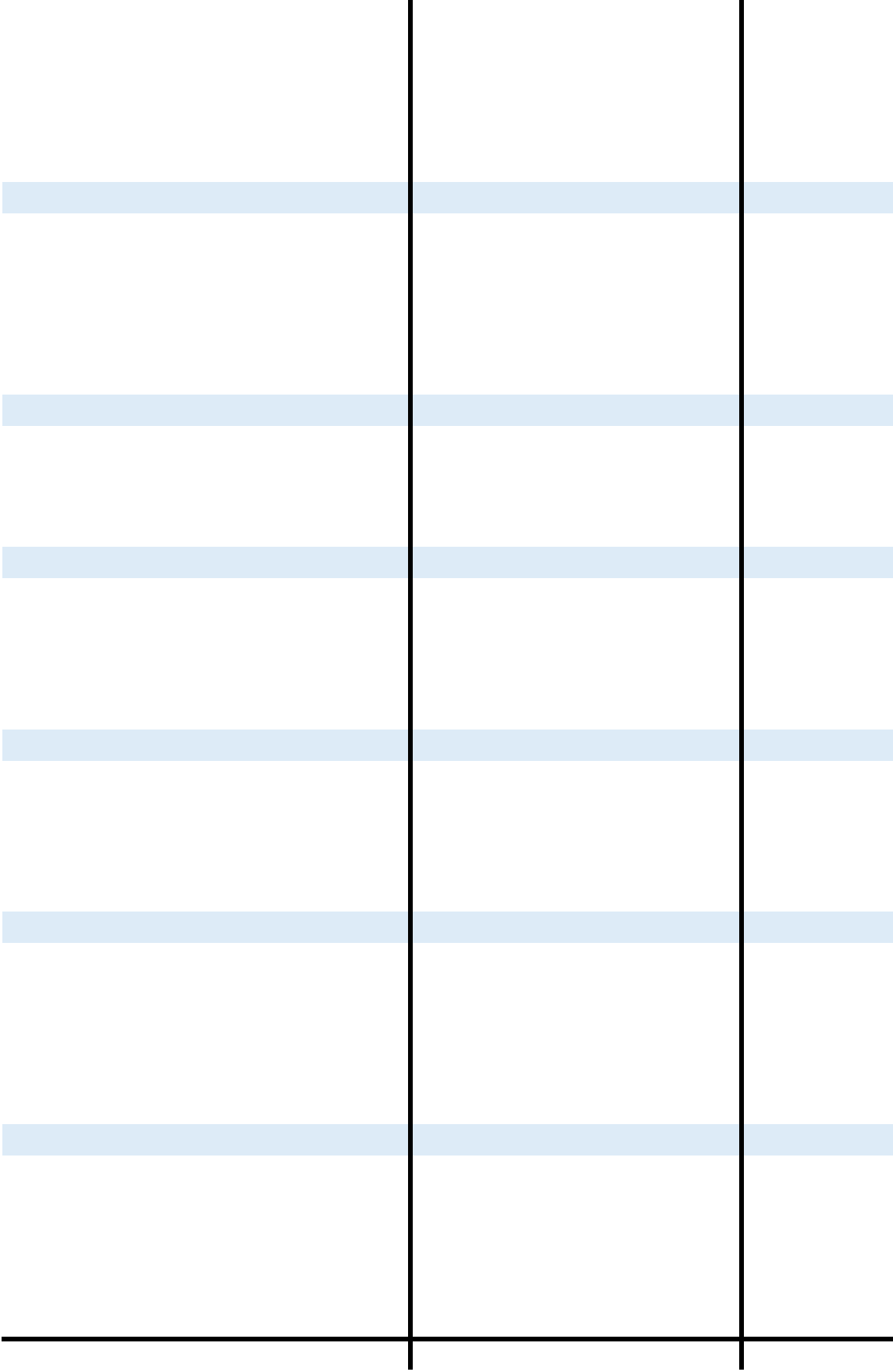










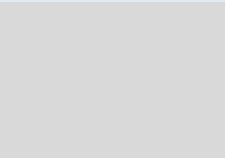


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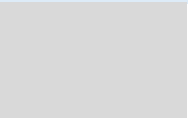
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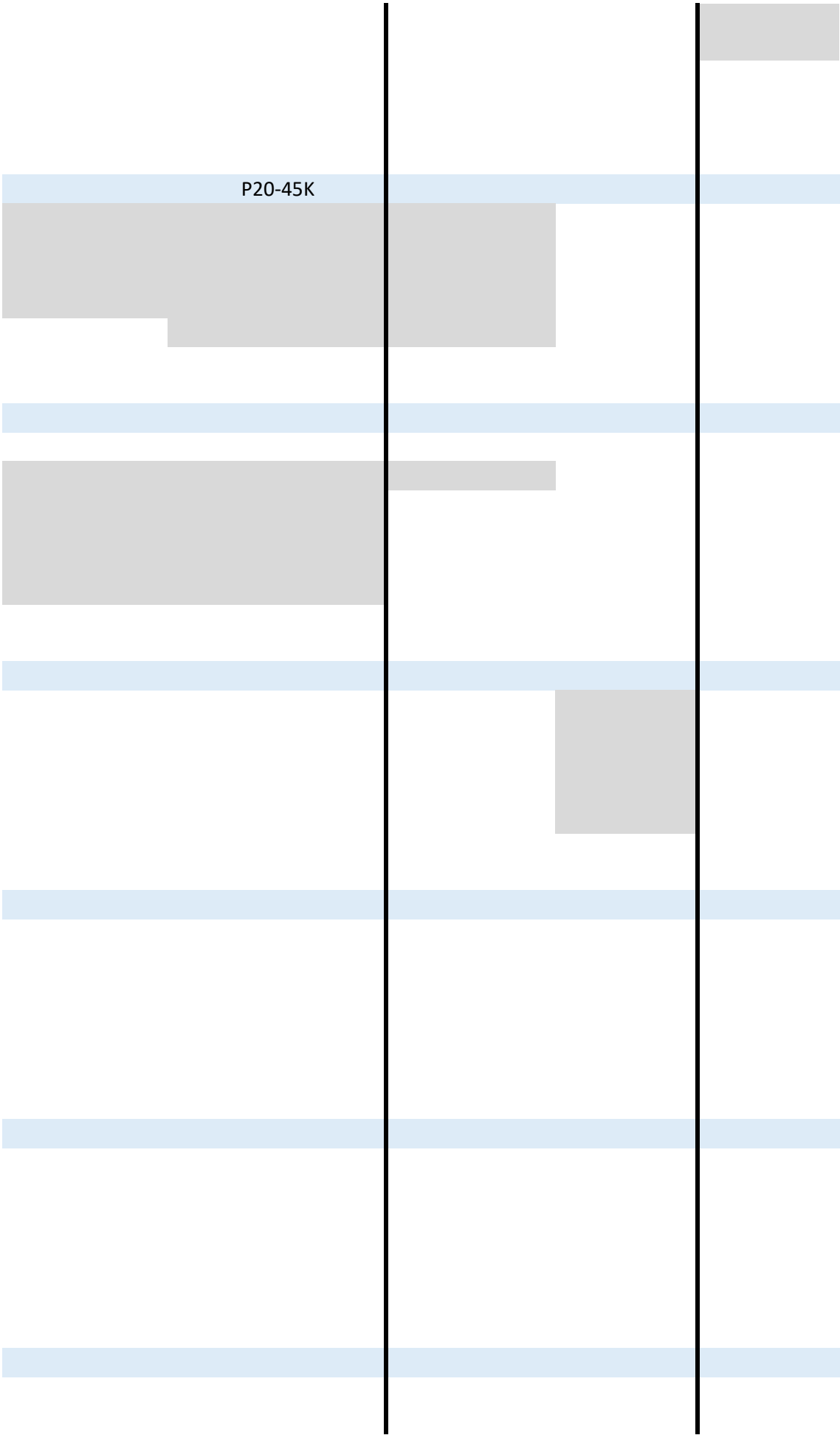


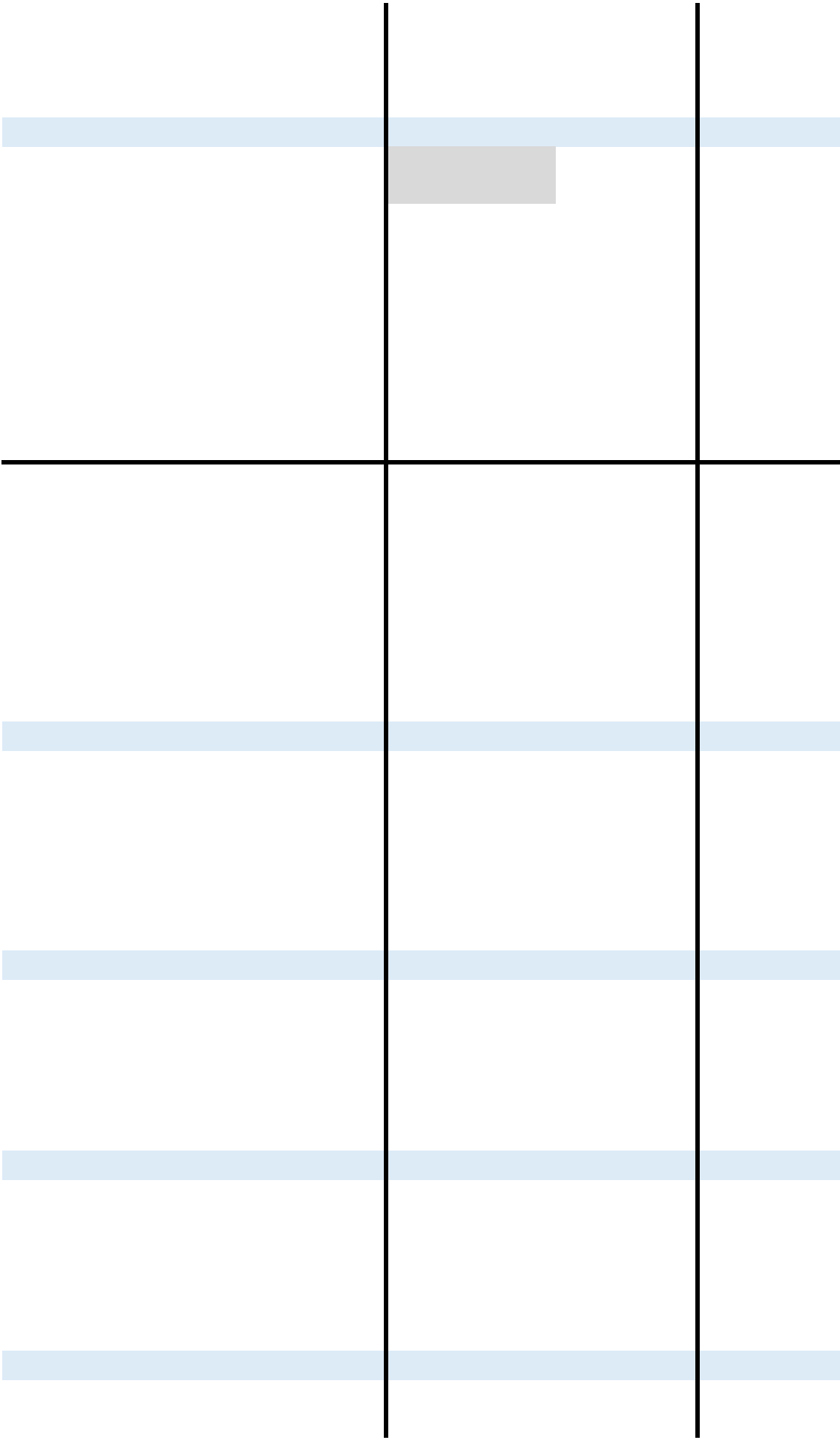
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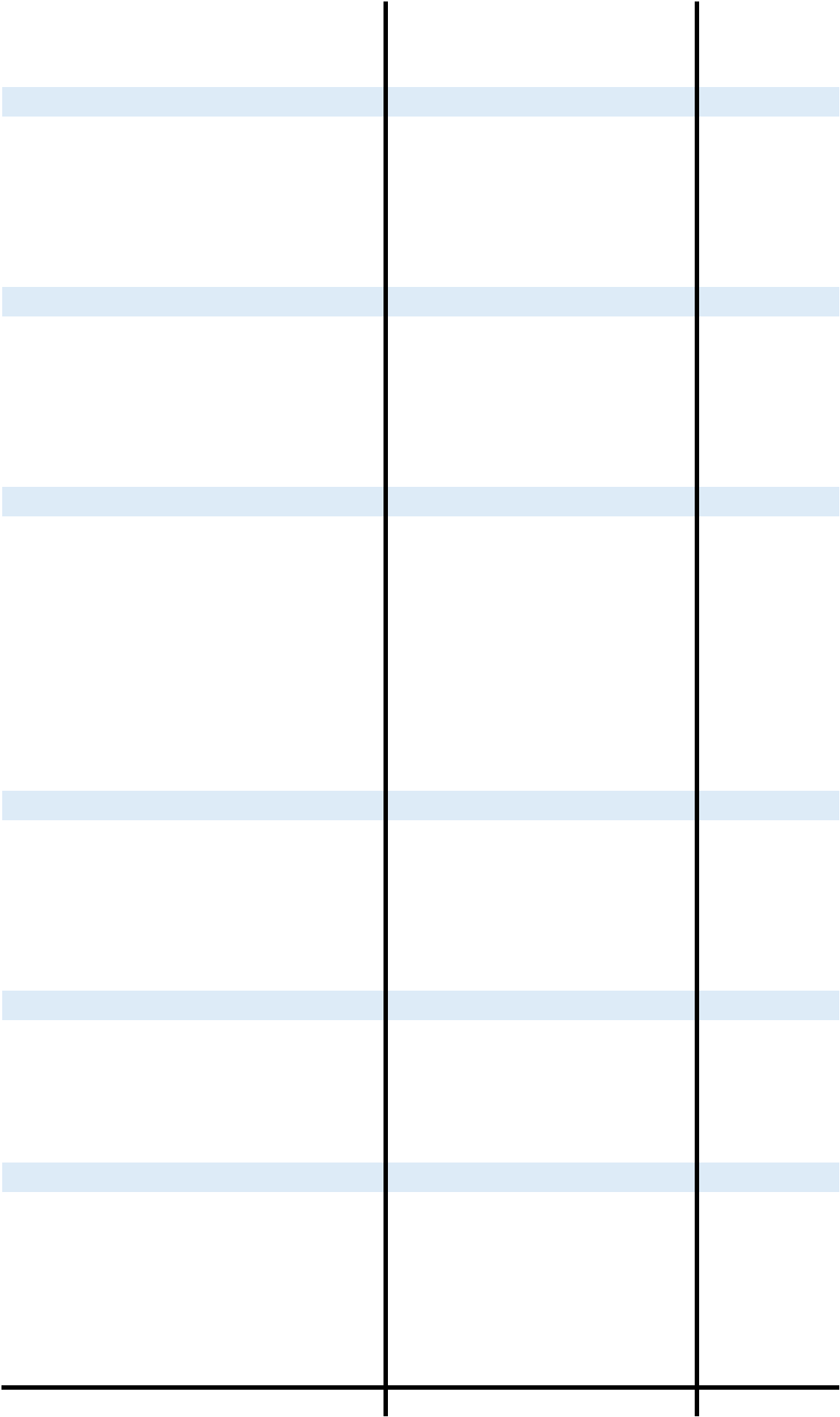


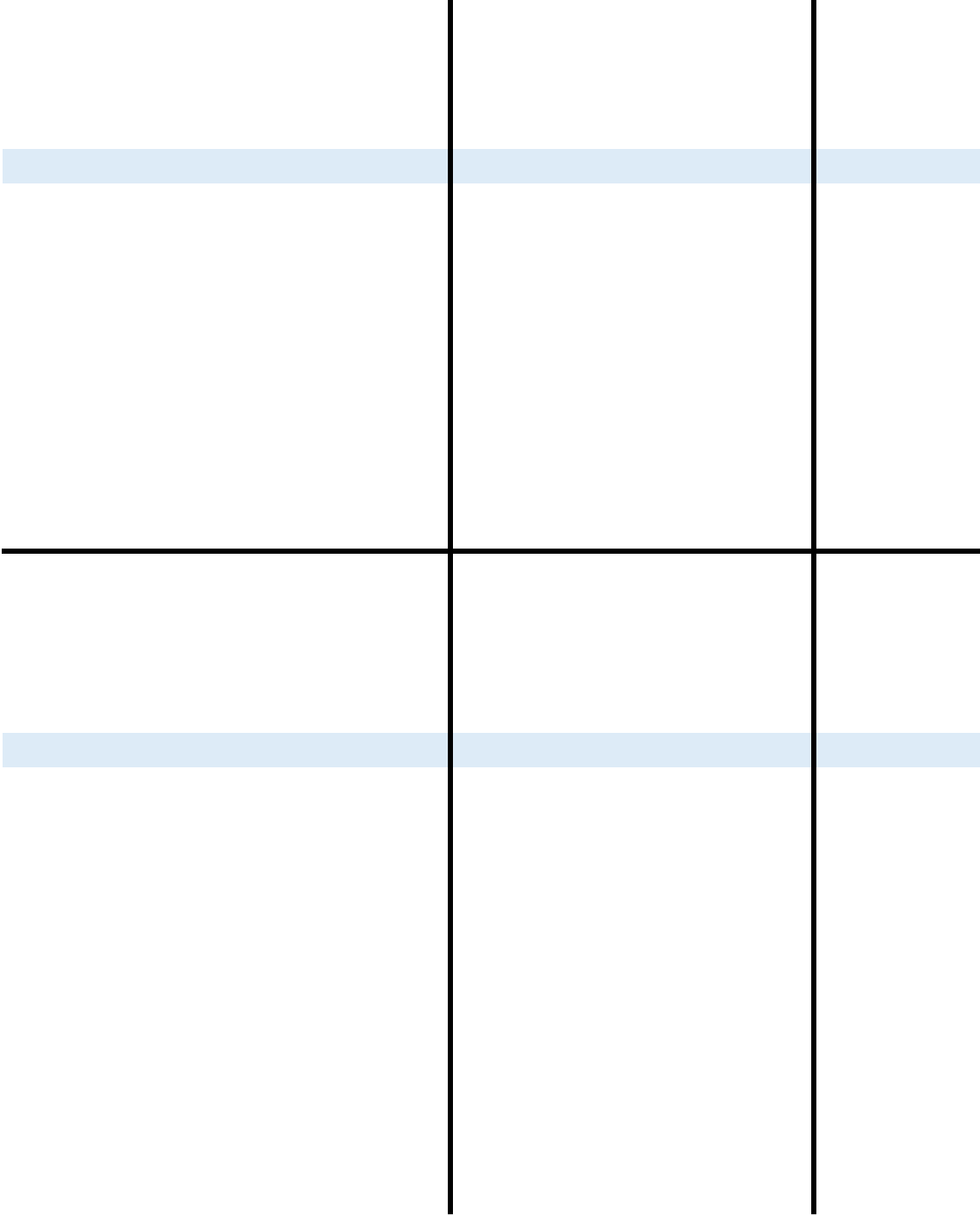
P8-15K



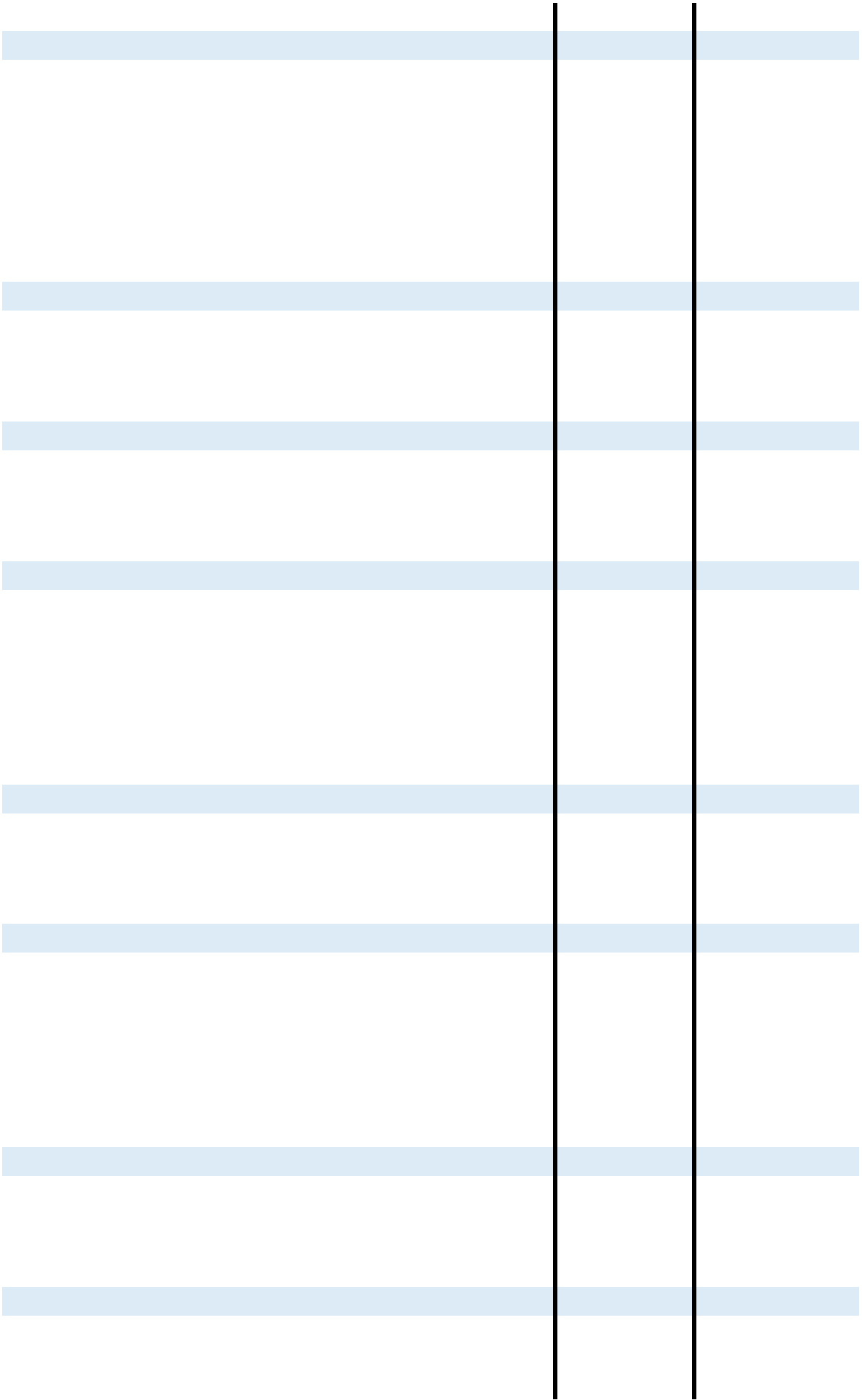


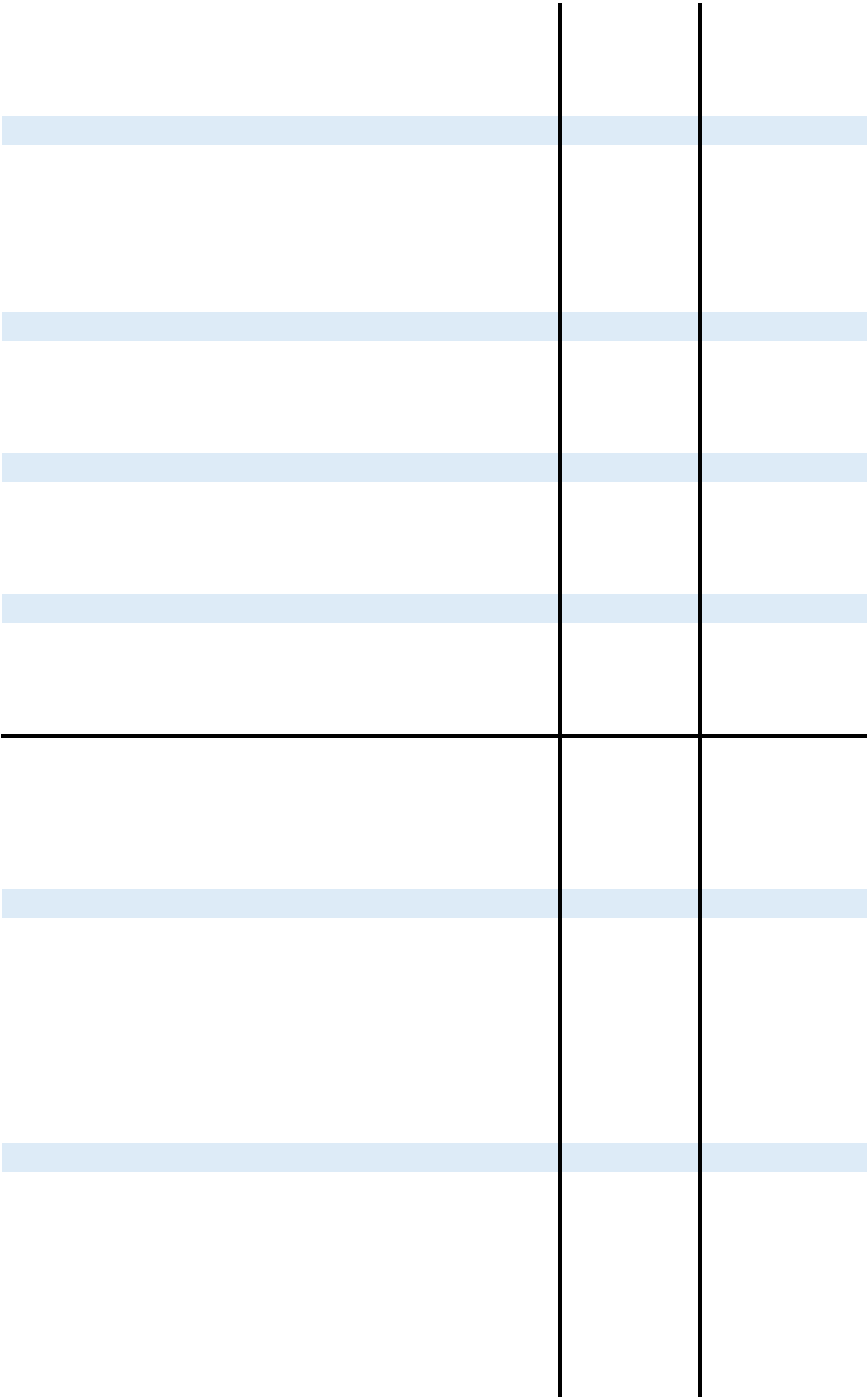


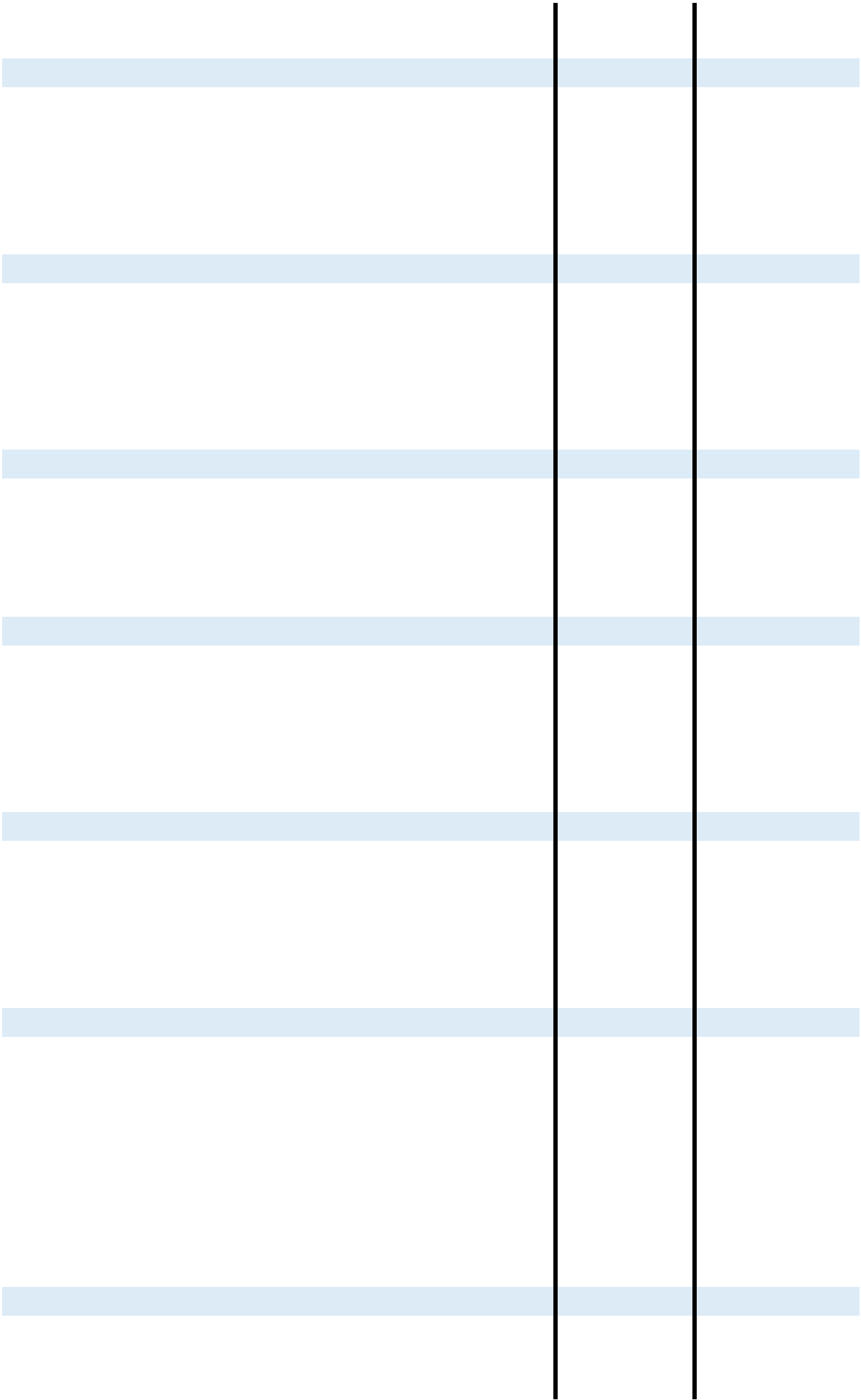


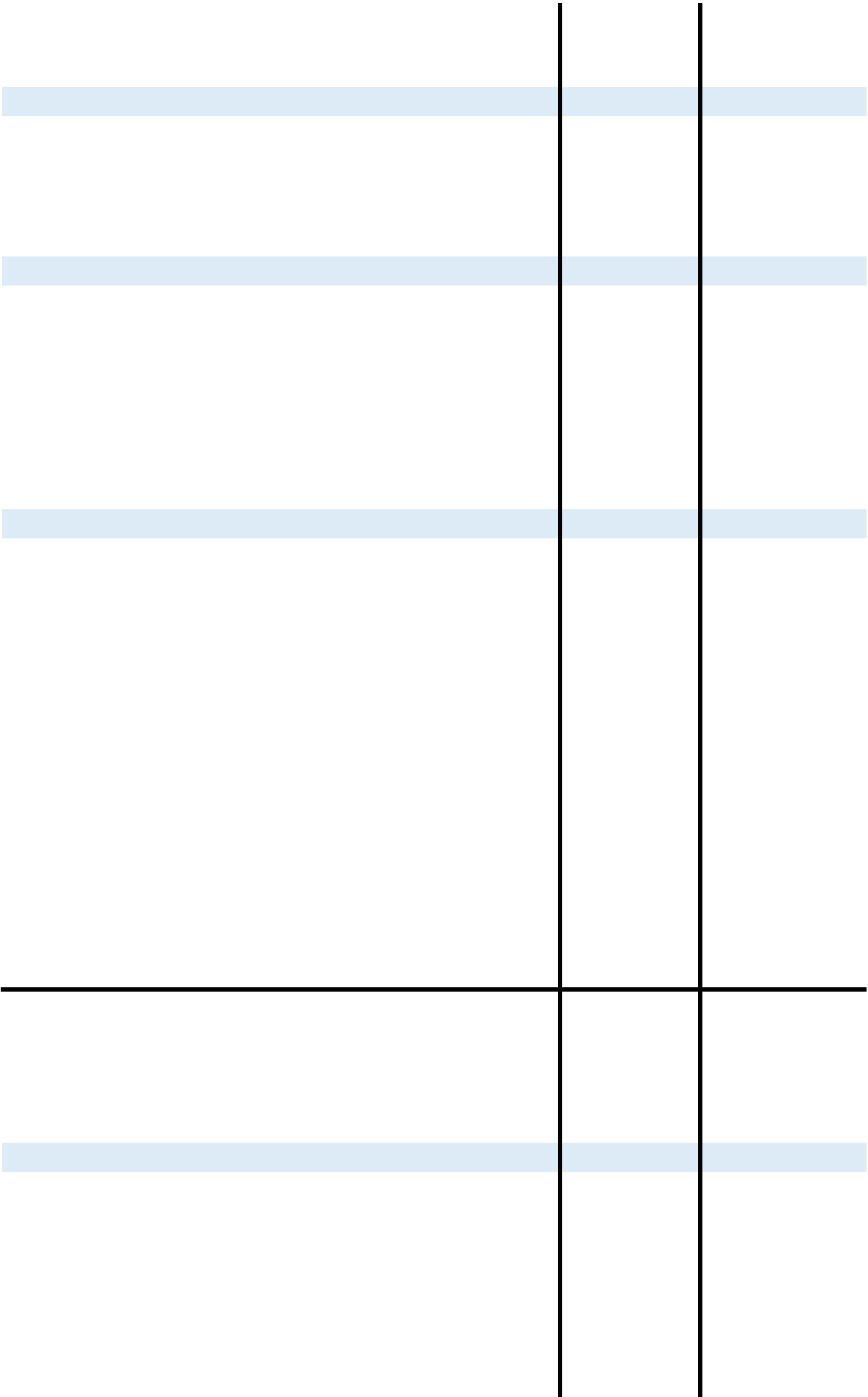


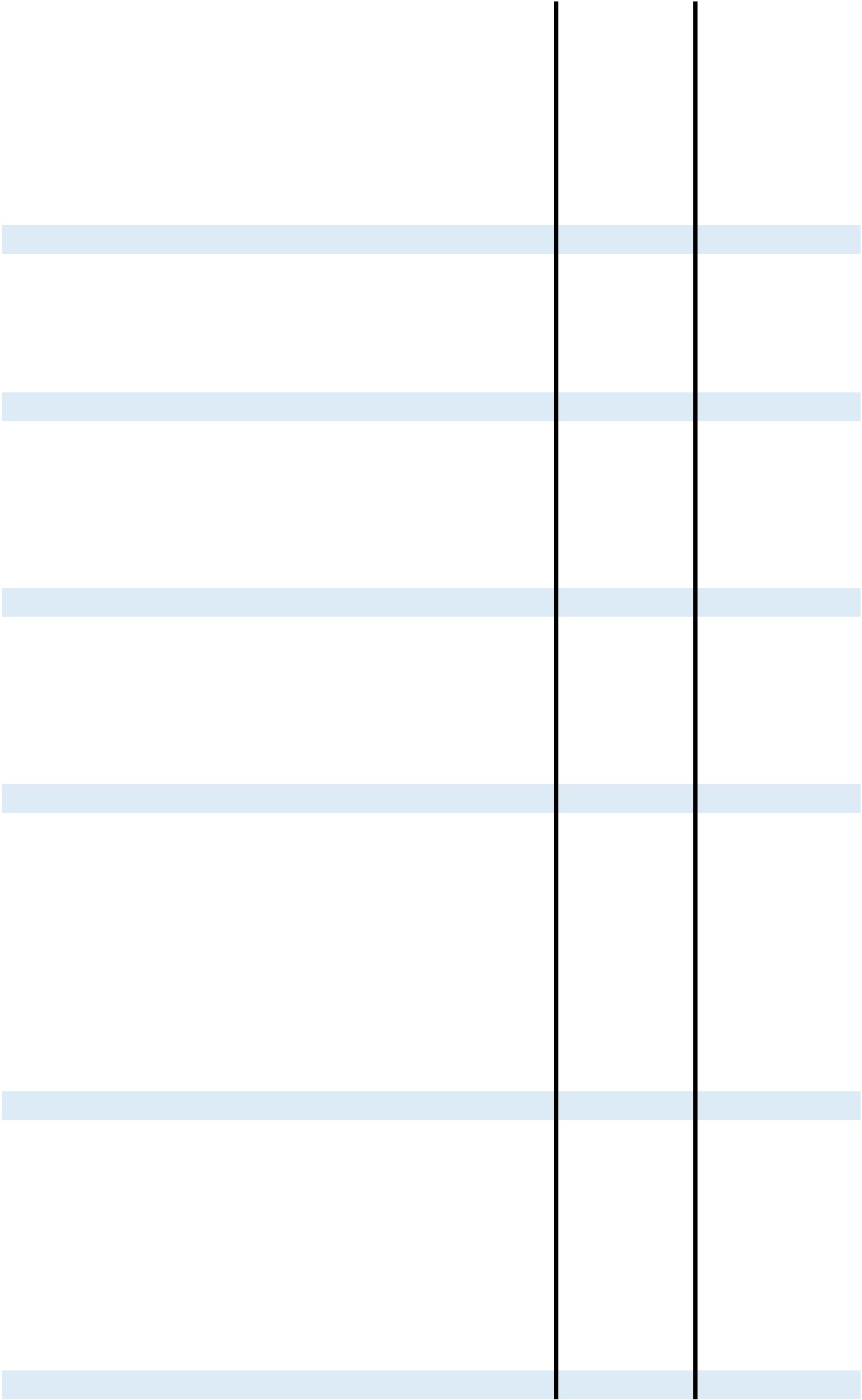
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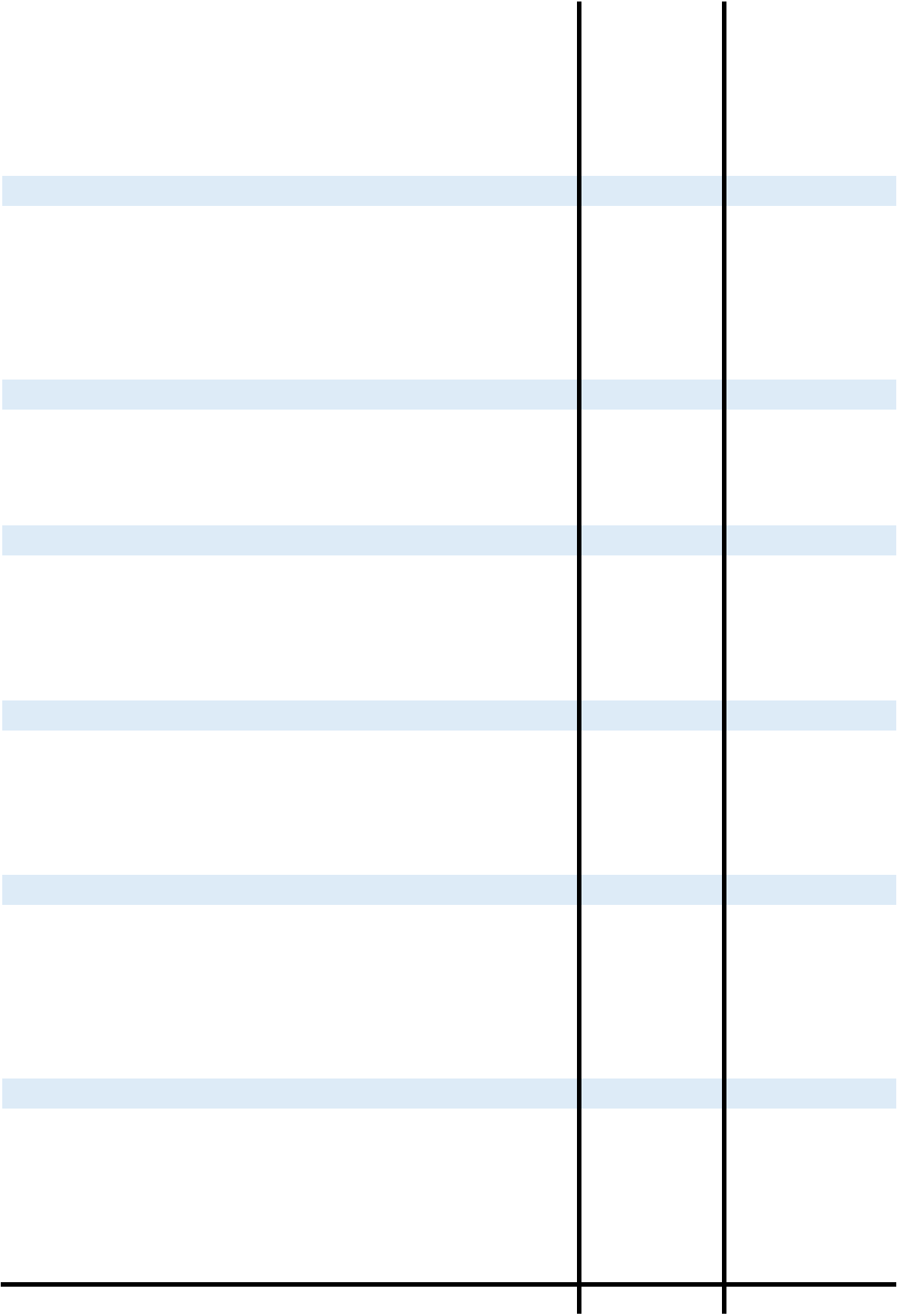


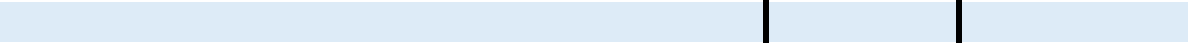




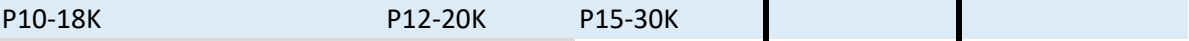
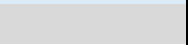
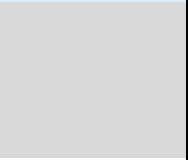








P8,000-15,000

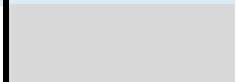
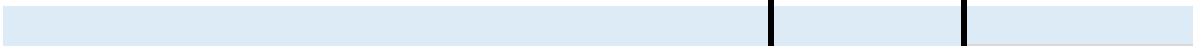
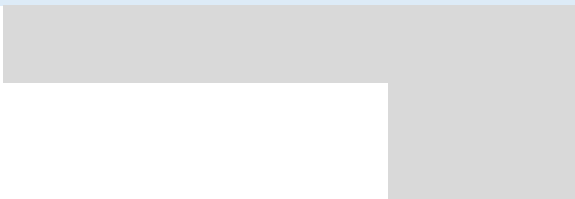
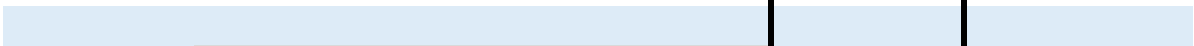
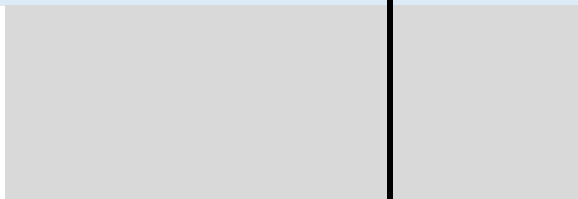
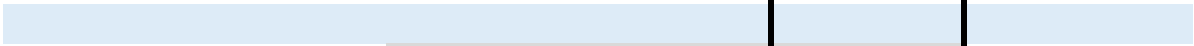
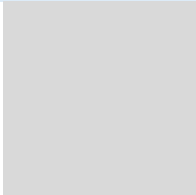
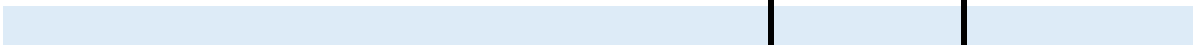
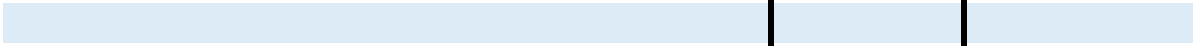
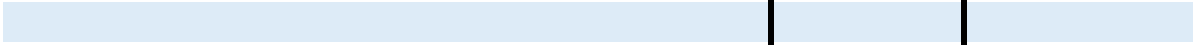
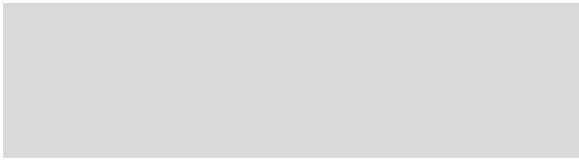


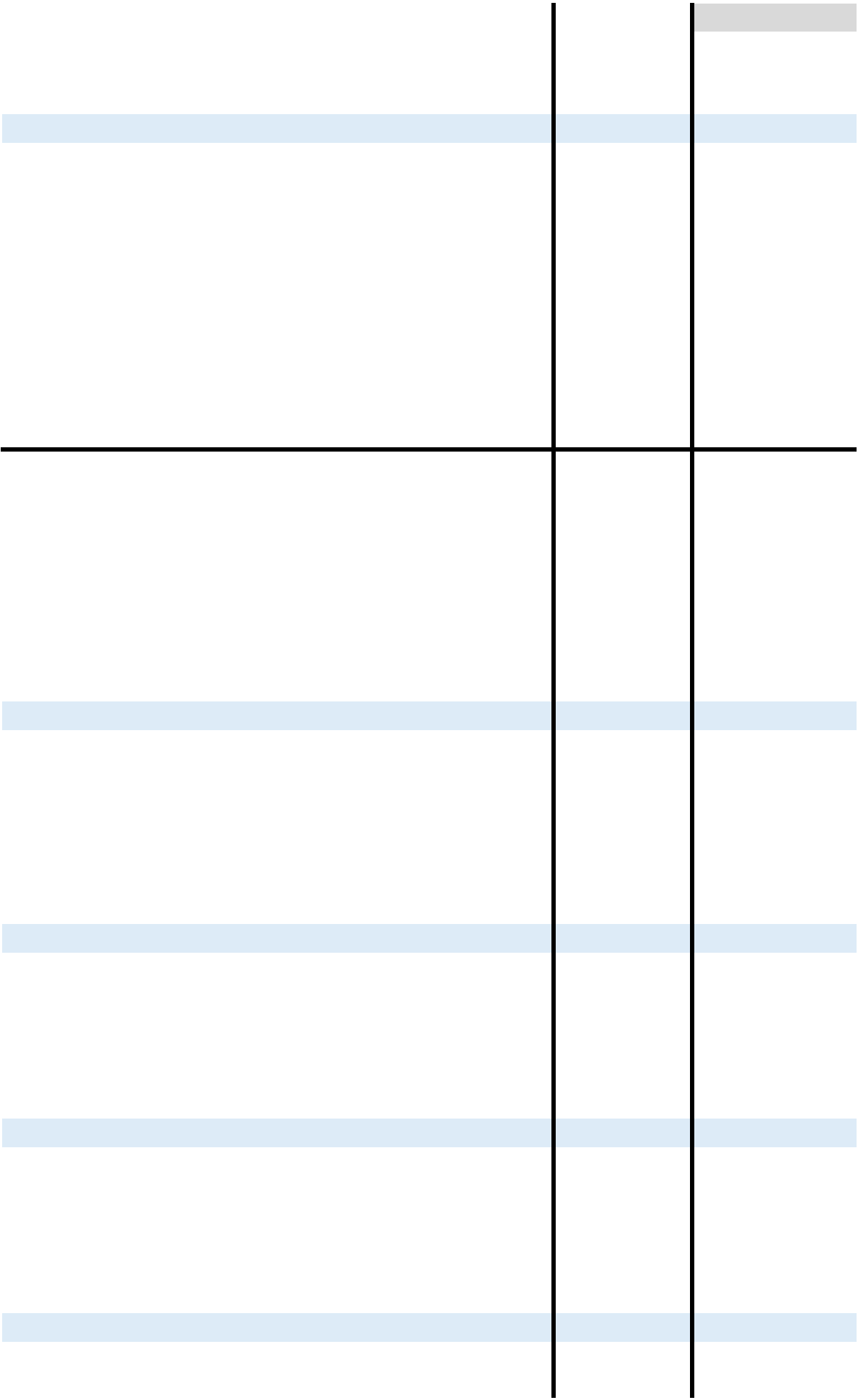
P10-18K

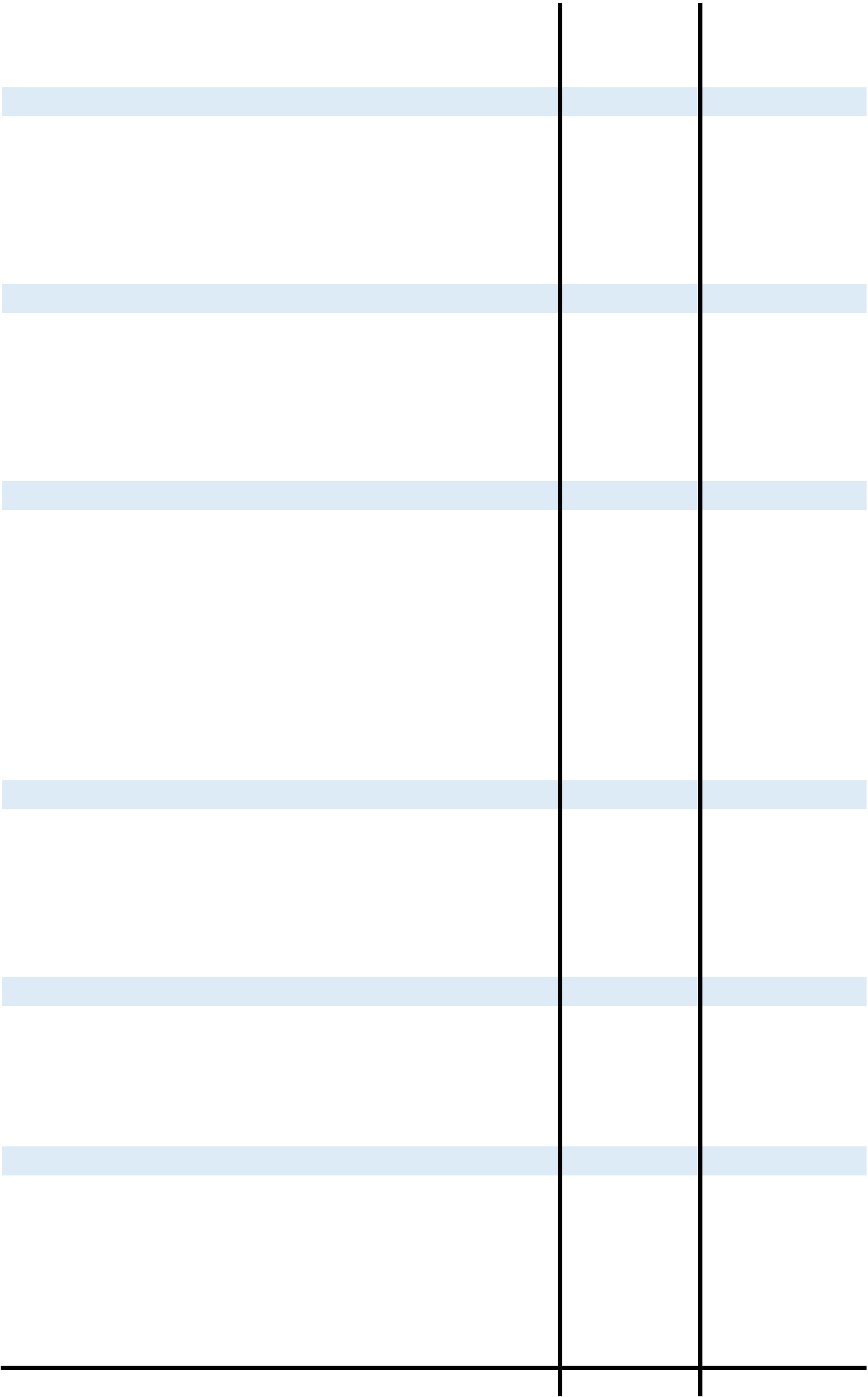
P12-20K

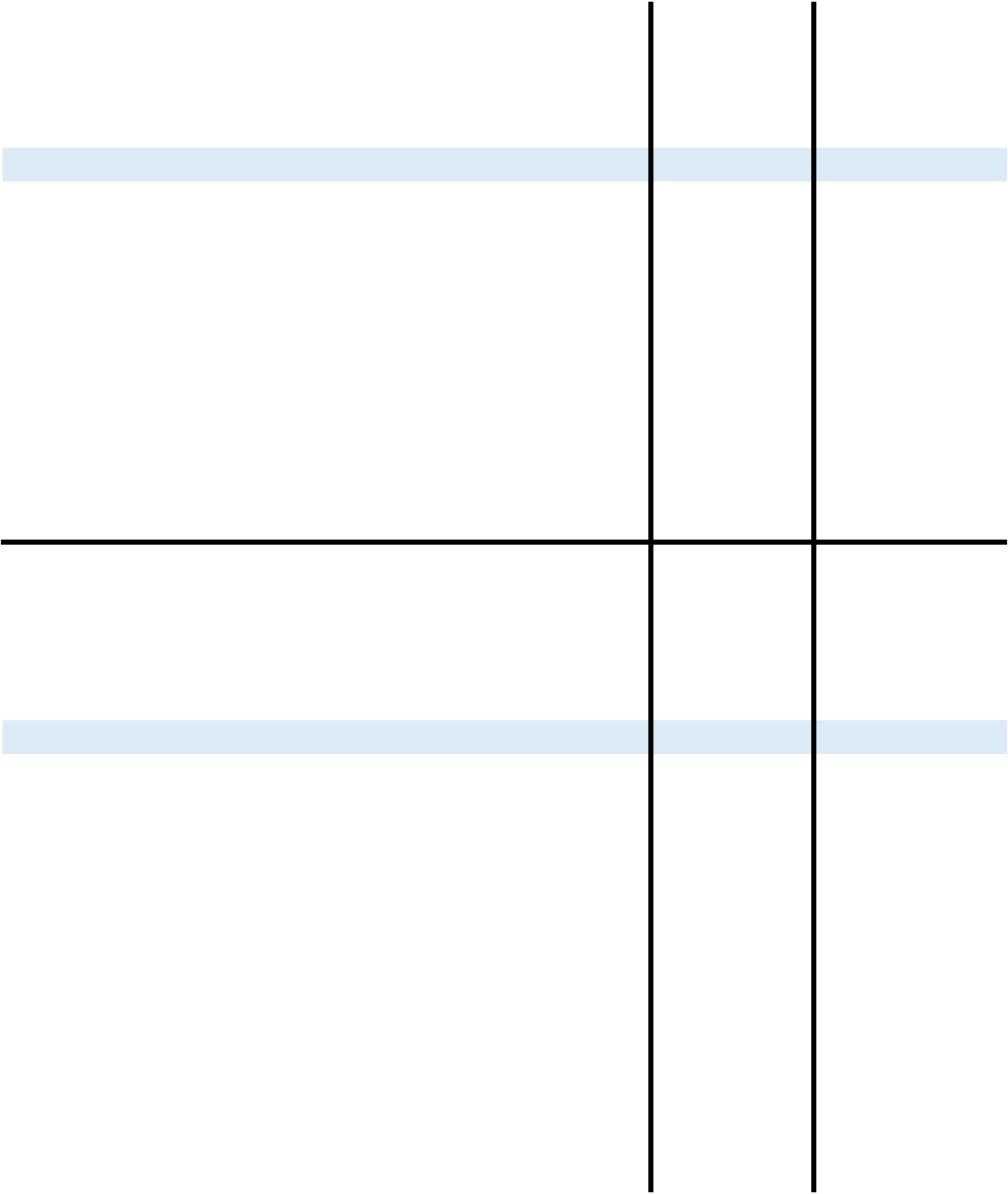
P15-30K











[illegible]

