

Suppose we observe the following financial statements.

| Balance sheets | Ending balance | Beginning balance |
|----------------------|----------------|-------------------|
| Cash | 110 | 80 |
| Receivables | 80 | 70 |
| Inventory | 30 | 40 |
| Property & equipment | 110 | 100 |
| Total assets | 330 | 290 |
| Payables | 100 | 70 |
| Owner's equity | 230 | 220 |
| Total equities | 330 | 290 |

| Income statement | for period |
|------------------|------------|
| Sales | 70 |
| Cost of sales | 30 |
| SG&A | 30 |
| Net income | 10 |

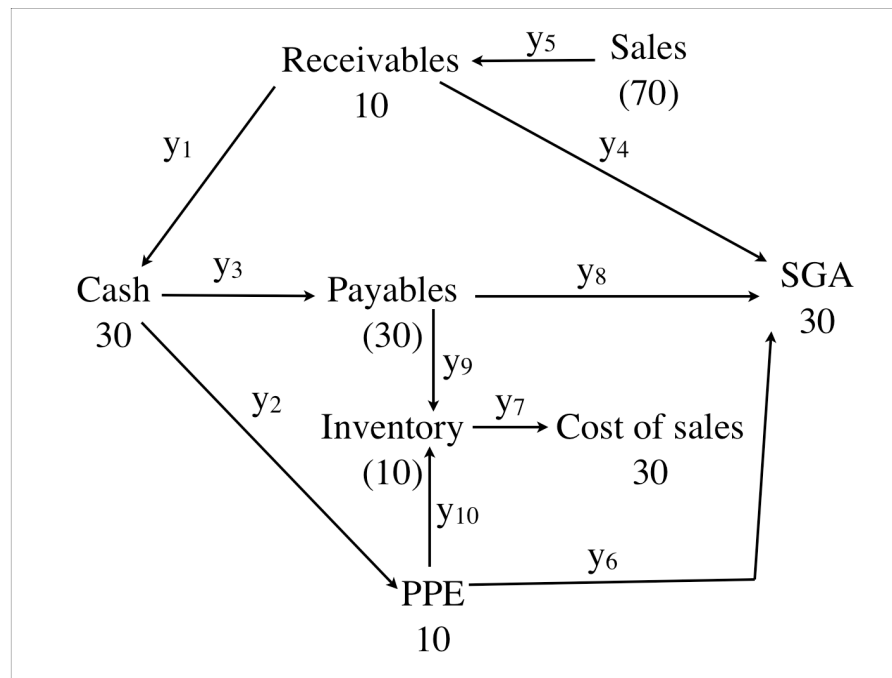
Let x be the change in account balance vector where credit changes are negative.

| change in account | amount |
|-------------------------------|--------|
| Δ cash | 30 |
| Δ receivables | 10 |
| Δ inventory | (10) |
| Δ property & equipment | 10 |
| Δ payables | (30) |
| sales | (70) |
| cost of sales | 30 |
| sg&a expenses | 30 |

We envision the following transactions associated with the financial statements and are interested in recovering their magnitudes y .

| transaction | amount |
|------------------------------------|----------|
| collection of receivables | y_1 |
| investment in property & equipment | y_2 |
| payment of payables | y_3 |
| bad debts expense | y_4 |
| sales | y_5 |
| depreciation - period expense | y_6 |
| cost of sales | y_7 |
| accrued expenses | y_8 |
| inventory purchases | y_9 |
| depreciation - product cost | y_{10} |

A crisp summary of these details is provided by a directed graph.



Directed graph of financial statements

Cash flow statement
Directed graph analysis

| A | y1 | y2 | y3 | y4 | y5 | y6 | y7 | y8 | y9 | y10 | x |
|--------|----|----|----|----|----|----|----|----|----|-----|-----|
| cash | 1 | -1 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| rec | -1 | 0 | 0 | -1 | 1 | 0 | 0 | 0 | 0 | 0 | 10 |
| invent | 0 | 0 | 0 | 0 | 0 | 0 | -1 | 0 | 1 | 1 | -10 |
| ppe | 0 | 1 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | -1 | 10 |
| liab | 0 | 0 | 1 | 0 | 0 | 0 | 0 | -1 | -1 | 0 | -30 |
| rev | 0 | 0 | 0 | 0 | -1 | 0 | 0 | 0 | 0 | 0 | -70 |
| cgs | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 30 |
| sga | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 30 |

| cash flow stmt | amounts | transactions |
|------------------|---------|----------------|
| net income | 10 | y5-y4-y8-y6-y7 |
| add depr | +d | y6+y10 |
| less incr rec | -10 | -(y5-y4-y1) |
| plus decr invent | 10 | -(y9+y10-y7) |
| plus incr pay | 30 | y8+y9-y3 |
| oper cf | 40+d | y1-y3 |
| less invest ppe | -(10+d) | -y2 |
| add fin'g | 0 | none |
| net cf | 30 | y1-y2-y3 |

