ABSTRACT

This research assesses how managers of farms with more than one million dollars in gross annual revenue evaluate strategies and allocate time. We find that farm managers place greater emphasis on controlling costs and managing production as strategies for success. Interestingly, very few producers spend most of their time controlling costs. As farmers get larger, managers are more apt to find managing people an important strategy and use of time.

Strategies and Time Allocation of Large, Commercial Agricultural Producers

By Josiah Ringelberg, Michael Gunderson, and David Widmar

Introduction

The strategies employed by producers provide critical insight into how active players in the agricultural industry obtain competitive advantage. A certain level of efficiency must exist within all operations of a business; however, the most successful organizations often specialize in one particular act or process in developing their products. This specialization differentiates the business from its competitors. From controlling the costs of production to excellence in employee management, producers often identify their organization as having one dominant success strategy.

Authors are Graduate Research Assistant, Associate Professor, and Senior Research Associate in the Center for Food and Agricultural Business at Purdue University in West Lafayette, Indiana.

Analyzing how a farmer allocates his time toward common dominant strategies provides a clue as to whether or not farmers prioritize the activities related to their dominant strategy over other business operations. This also reveals where farmers' believe their time can be best allocated. Interestingly, farmers often allocate their time towards activities other than their dominant strategy. For example, many farmers may pursue a competitive advantage in marketing their product, but given the time-consuming nature of producing agricultural goods, few are likely to allocate most of their time toward marketing. One might observe the opposite in individuals who pursue a dominant strategy by managing assets (land, equipment, and facilities).

Since 1993, the Center for Food and Agricultural Business (Center) at Purdue University has conducted the Large Commercial Producer (LCP) Survey. This survey is conducted every five years. It monitors and explores the buying behavior, perceptions, and attitudes of producers in the agricultural industry. In accordance with its mission statement, the Center has used the LCP survey and other data resources to provide innovative expertise to professionals in the food and agriculture industry. As with prior surveys, the Center released a Themes Report following an analysis of its 2013 survey respondents. This report gives a general overview of the four overriding themes of the survey. They are as follows: information and the salesperson, loyalty, buying preferences, and producer strategy.

For the first time, the survey inquired about the importance strategy and time allocation practices play in the success of a business. Agribusinesses will be able to create and communicate value by aligning product and service offerings with producers' goals. In addition, identifying where time constraints exist should aid in the creation of valuable service offerings.

Objective and Hypotheses

The objective of this research is to analyze the dominant strategies employed in the industry, their frequency, and farmer's time allocation practices toward the various strategies. The relationship between strategy selected, enterprise of the respondent, and size of the respondent are reviewed. The results help identify what drives a producer's decision.

Hypothesis 1: Dominant strategies will vary by size. Smaller farms will focus on traditional strategies involving asset and production management. Larger operations will focus on gains from superior employee management given their ability to influence markets and exploit economies of scale.

Hypothesis 2: Different farm enterprises will have noticeably different time allocation priorities compared to each other. Particularly, there will be a distinguishable difference between livestock and crop producer strategies.

Hypothesis 3: Selecting a dominant strategy correlates with increased time dedicated toward the activities supporting the selected strategy.

Literature Review

Literature regarding large agricultural producers' dominant strategies and time allocation is sparse, particularly regarding producers with revenues in excess of one million dollars. Work regarding concepts relating to topics analyzed within this paper certainly exist; however, the concentration on agricultural producers and the use of the LCP survey isolates this paper from literature of a broader context.

McBride and Johnson (2006) categorized respondents differently and were primarily interested in weights a farmer applies to various activities. They were not focused on the overriding dominant strategy of an operation. Furthermore, they apply a linear regression to the sample data in use and isolate only three approaches of farmers. Their definition of farmers is limited exclusively to cash-grain farmers in 2001. Their interests pertain to the price negotiation, long-term cost control, and input adjustment of these operations. The authors individually evaluate many activities classified under a general category such as production management. Their research is of value to readers interested in production, cost management, and marketing/output prices strategies.

Kimhi (1996) analyzes Israeli farm's time allocation, with a specific focus on the household. Although he found attributes of farm households that influence time allocation toward farm operation, the paper is limited in its evaluation of specific farm activities. The practice of consolidating all farm activities into a one-time entity is common. However, doing so limits the understanding and analysis of time exhaustive activities of an agricultural operation.

Gloy and Akridge (1999) used cluster analysis on the LCP survey to segment the commercial producer market for agricultural inputs. Gloy and Akridge sought to identify specific sub-populations within the agricultural producer industry. To this avail, the authors discovered four distinguishable groups of input buyers, each adhering to a different purchasing practice. Harbor, Martin, and Akridge (2008) analyzed the LCP survey with respect to brand loyalty and marketing/output prices. The authors suggest that the loyalty of farm business influences purchasing habits and business decisions. The sub-segments used in the analysis of producer loyalty are the same as those used to evaluate producer strategy in this research.

Methodology & Data

The 2013 Large Commercial Producer Survey (LCP) surveyed producers by phone, mail, and email. The survey took approximately 30 minutes to complete. More than 1,600 producers returned usable responses. The survey asked respondents to select whether they identified as a crop-based or livestock-based organization. The survey then asked the respondent to estimate a headcount or acreage count of his or her current operation. Although respondents reported numbers for multiple business operations on their farm, only the largest business operation determined the size designation. For the purposes of this paper, size designations correspond to the ranges in Table 1.

The survey also prompted each respondent to select from a list of five strategies the strategy that is most important to their operation's success. Respondents identified a dominant strategy by making multiple comparisons of the strategies on the list of five. Questions asked respondents to select one of two strategies. We used transitive logic to determine a single strategy as the most valuable to the success of the organization.[1] We classified respondents who broke transitivity as having a mixed strategy.

The survey also considered the time allocation practices of each respondent. Respondents could choose only the most time consuming activity; no pairing occurred, as it did with the dominant-strategy inquiry. They were prompted with activities that corresponded to available success strategies. If an individual wished, they could

specif their own most time-consuming activity if the available options did not accurately reflect their operation. We omitted those that chose to enter time options not reflective of corresponding dominant strategies from the time allocation analysis.

Drivers of Dominant-Strategy Selection

Respondents of the LCP survey predominantly selected cost control or production management as the dominant strategy employed at their firm. Asset (land, equipment, and facilities management) followed as the third most selected success strategy. About nine percent of respondents selected either employee management or marketing to enhance output prices as a dominant success strategy.

Firm size was measured by acres or head of livestock. It is not a factor that greatly influences the choice of dominant strategy (Figure 1). This is visible because producers of mid, commercial, and large farm size classifications implemented dominant strategies with roughly the same frequency. However, a clear exception is visible in employee management and, to a lesser degree, asset (land, equipment, and facilities) management. The frequency that mid-sized producers chose asset management as a dominant strategy was almost twice that of large producers. Moving from mid-sized to commercial and from commercial to large producers, the respondents chose asset management with less frequency.

The opposite is true when considering managing employees as a dominant strategy. Respondents in the large category chose employee management with greater frequency relative to respondents in smaller categories. Only five percent of small producers selected employee management as a dominant strategy. In contrast, 12 percent of commercial producers selected employee management as their dominant strategy. More than one-fourth of large producers selected employee management as a dominant strategy. This is a rate much larger than that of commercial producers. This trend is most likely caused by increasing returns to scale generated by large producers who employ a significant workforce.

The LCP survey asked respondents if they specialized in the production of a specific crop. Possible choices for selection included wheat, corn, soybean, or fruit and vegetables. Other respondents avoided crops altogether and created valuable businesses through exclusively cattle, hog, or dairy operations. This is variation in dominant strategy within the different crop and animal enterprises (Figures 2 and 3). Production management and cost control dominated as the most frequently selected strategies across all enterprises. Though all enterprises are different, deviation in the frequency selection distribution of dominant strategies was rarely notable. The exception exists with the deviation of hog, dairy, and fruits, nuts, and vegetables enterprises. These enterprises saw an increase in their focus on employee management. Though somewhat counterintuitive, cattle respondents ranked managing assets more important than employee management. These producers were likely focusing on the significant grazing acres needed for cattle production.

Drivers of Time Allocation

Respondents chose the activity that they perceived as most time consuming. In general, respondents chose with greatest frequency production management and asset management as the most time exhaustive. Large producers, however, also viewed employee management

as tantamount to asset and production management (Figure 4). One can identify a trend across producers of various sizes concerning asset and employee management. The former decreases while the latter increases with size. The marketing/output price strategy exhibits a decreasing value of importance among larger producers but to a lesser degree. Selection of asset management as the most time consuming activity decreases as one moves from mid-sized to commercial. This trend visible again in the transition from commercial to large producers. The largest decrease occurs during the transition from commercial to large. There, producers become 13 percent less likely to select asset management as the most time consuming activity.

Unlike asset management, the likelihood producers selected employee management as their most time-consuming activity increased dramatically as organizational size increased. Once again, the transition from commercial to large producers more than doubled the likelihood that respondents selected employee management. Observing how much time large producers spend managing their workforce, it seems natural that larger organizations would select employee management as a dominant strategy. Typically, larger companies focus on exploiting asset and production management through economies of scale. Producers evoke competitive advantage through the effective use of another resource such as a company's workforce. As a company nears peak production and asset efficiencies, workforce efficiency can become the primary strategy that allows for replication on a larger scale.

Lastly, it is interesting to note how time-consuming production management and asset management is among mid-sized and commercial producers. Almost 80 percent of mid-size or commercial producers selected production management or asset management as their most time consuming activity. Given the industry's history and the intrinsic importance of these two strategies, it is not surprising that producers prioritize these strategies.

From an industry-level perspective, livestock producers are significantly more likely to select employee management (Figures 5 and 6). Compared to crop producers, livestock producers were three times more likely to select employee management (almost a 10% differential). Fruits, nuts, and vegetables producers also chose employee management with much greater frequency relative to crop peers.

Dominant Success Factors and Time Allocation

Figures 7 through 11 display the most time-consuming activity identified by dominant strategies employed by the farmers. As might be expected, a correlation exists between time spent on an activity and its probability of being the dominant strategy of a responding organization.

Consistently, respondents were more likely to select asset management as the most time-consuming activity. This occured regardless of the dominant strategy of the organization. Only among respondents whose dominant strategy was employee management did producers respond that employee management was the most time-consuming activity. Even in this case, production and asset management ranked as the next two most time-consuming activities.

Interestingly, less than 0.5 percent of individuals selected controlling costs as the most time-consuming activity when employee management was the dominant

strategy. It is likely that farms pursuing competitive advantage through their employees invest heavily in their employees and trust them to make decisions. Time spent controlling costs would be time spent improving employees – a primary source of the firm's costs. Asset management and production management were the most time consuming for 29 and 21 percent of respondents, leaving 6 percent of respondents in this segmentation to select marketing/output prices.

Cost control, employee management, and marketing/output price management remained relatively constant and insignificant when one neglects all instances where the dominant strategy and the time-consuming activity aligned. Given a dominant strategy, its matching time activity had a greater number of respondents select it as most time consuming activity than any other dominant strategy. For example, concerning the percent of individuals who selected cost control as their dominant strategy and cost control as their most time-consuming activity, no other dominant strategy pool reported a higher percentage of producers also selecting cost control as their most time-consuming activity. This phenomenon is true for all activities and their corresponding dominant strategies.

Across all dominant strategies, respondents rarely selected controlling costs as the most time-consuming strategy. In three out of five dominant strategy segments, cost controlling was the least selected. When asset management was the dominant-strategy, three percent of respondents selected controlling costs; just one percent more than selected employee management. Although those who did select controlling costs as a dominant strategy also selected it as the most time-consuming activity significantly more than in any other segmentations (by almost 10%), it was still only chosen by 14 percent of respondents. The majority felt asset and production management were the most time consuming (43 and 30%, respectively).

Of individuals with a dominant strategy of marketing/output prices, 17 percent selected the corresponding marketing/output prices activity as most time exhausting. About 70 percent of respondents with a marketing/output prices dominant strategy chose production management and asset management as most time consuming. Respondents as a whole only considered production management as more time consuming when marketing/output price or production management was the dominant strategy. Those who selected marketing/output prices as their dominant strategy had the least variation in the spread of responses of time-consuming activities.

Employee Management

Employee management was unique in that it experienced the most dramatic change in importance as the size of the operation increased. Recall that only large producers held employee management strategies on par with production and cost management (Figure 1). Furthermore, large producers held employee management equal to production and asset management as the most time-consuming activity (Figure 4). With only a quick review, it is evident that the number of hog, dairy, and fruits, nuts, and vegetables respondents increased greatly across enterprise size designations. Labor-intensive enterprises may be one of the reasons behind why larger producers selected employee management as a dominant strategy more often than smaller producers. In fact, when a livestock producer selected employee management as his or her dominant strategy, he or she selected employee

management as his or her most time-consuming activity almost 50 percent of the time. Therefore, the strong correlation between employee management as a dominate strategy and time-consuming activity is likely driven by livestock producers.

Further Research

Although many characteristics of the large agricultural producer industry have emerged through the above analysis, many questions have also arisen. In general, an overriding goal of this paper was to look into where the industry perceives successful opportunities exist and where producers allocate time resources. Production management and cost management dominate the industry as the two most common dominant strategies. However, extension and further elaboration on what drives these strategies would shed light on underlying principals and attributes of the industry.

The current respondents considered production and asset management the most time-consuming activities, with large producers also identifying employee management as the most time-consuming activity of their operation. Future research could delve into the transitioning process of growing companies. For example, at what point does a company start dedicating the majority of its time toward employee management?

Lastly, the approach used to acquire the most time-consuming activity of a firm is quite limited. Future surveys may wish to breakdown how firms allocate the summation of their time. For instance, no data on secondary or tertiary activities is currently collected. One might want to inquire regarding the weights or percentage values of time-consuming activities. Acquiring such data may allow more insight to be gathered into the correlations existing between dominate strategies and time allocative activities.

Conclusion

From the above analysis, several key behaviors of agricultural producers emerge. First producers largely consider either production management or cost management as the most effective dominant strategy in the industry. The largest producers are unique in that they also elevate employee management to be roughly tantamount in importance to cost and production management. As one reviews larger pools of producers, asset management continually declines as an identified dominant strategy. The opposite is true for employee management, which experiences substantial increases in relevancy.

When considering corresponding activities with which a producer must allocate time, respondents perceived production and asset management as most time-consuming activities in the industry. Respondents who identified as large producers distinctly reported employee management at a frequency equal to or greater than that of asset or production management. As with dominant strategies, producers displayed a negative correlation between asset management being the most demanding activity of an organization and the size of the organization. In contrast, a positive correlation revealing a larger organization's tendency to find employee management as the most demanding activity is apparent in the results.

Reviewing the hypotheses proposed in the paper, all three were accepted and supported with the analysis conducted. Figure 4 displays a clear difference between how often small and large producers prioritize asset and

employee management. However, the other strategies did not seem to vary greatly in their selection as size designation changed. Figures 6 and 7 provide evidence in support of hypothesis 2. The differences between enterprises are not as directly related to the enterprise type (crop-based or livestock-based) as might be expected. Lastly, a correlation between selection of a dominant strategy and it being the most time consuming activity of an operation existed. Typically, producers with a shared dominant strategy allocated more of their time to that activity relative to peers with other dominant strategies. For example, producers who selected cost control as a dominant strategy were also most likely to select it as the activity they devoted the most of their time.

Lastly, cross-sectional analysis conducted on the dominant strategy of an organization and the organizations most time-consuming activity provides an in-depth understanding of producer trends. In general, most producers selected asset and production management as the most time-consuming activity of their organization. This is regardless of the dominant strategy employed by the organization. However, when a company identified employee management as its dominant strategy, it had a greater likelihood of allocating more time to employee management than any other activity. Besides asset and production management, which consistently held a high reported frequency, the dramatic correlation between companies who viewed employee management as their most time-consuming activity and employee management as a dominant strategy was a singular occurrence.

End Notes

[1] Transitivity implies that if strategy A is preferred to strategy B and strategy B is preferred to Strategy C, Strategy A is preferred to strategy C.

References

Gloy, B.A. and J.T. Akridge (1999). "Segmenting the commercial producer marketplace for agricultural inputs" *International Food and Agribusiness Management Review*. 2:145-163.

Harbor, A., M. A. Martin, and J. T. Akridge (2008). "Assessing Input Brand Loyalty among U.S. Agricultural Producers" *International Food and Agribusiness Management Review*. 11:17-33.

Kimhi, Ayal (1996). "Demographic Composition of Farm Households and Its Effect on Time Allocation" *Journal of Population Economics*. 9:429-439.

Mc Bride, W.D and Johnson, J.D (2006). "Defining and characterizing approaches to farm management". *Journal of Agricultural and Applied Economics*. 38:155-167.

Widmar, David et al (2014). "Themes Report Results from the 2013 Large Commercial Producer Survey".

Table 1. Enterprise size classifications.

Enterprise	Mid	Commercial	Large
Corn/Soybeans (acres)	300-1,499	1,500-4,999	5,000+
Wheat/Barley (acres)	700-3,499	3,500-6,999	7,000+
Cotton(acres)	200-1,099	1,100-2,999	3,000+
Fruit, Nut and Vegetable (acres)	0-138	250-2,349	2,400+
Dairy (head)	40-199	200-1,090	1,100+
Finished Hogs (head)	800-3,999	4,000-27,999	28,000+
Feeder Pigs (head)	3,300-16,499	16,500-41,999	42,000+
Finished Cattle (head)	150-799	800-6,999	7,000+
Feeder Cattle (head)	250-1249	1,250-6,999	7,000+

Figure 1. Dominant strategy by size.

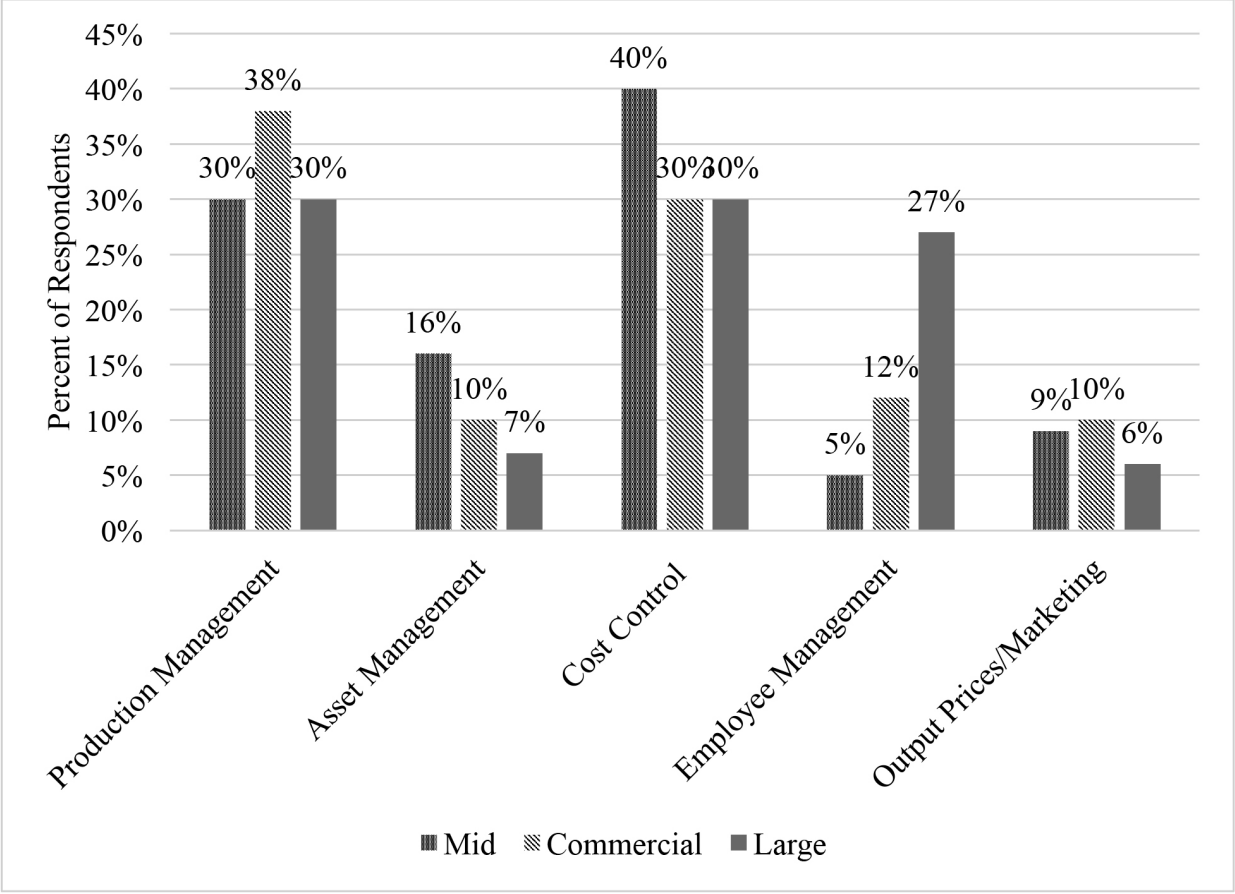

Figure 2. Dominant strategy by cropping enterprises.

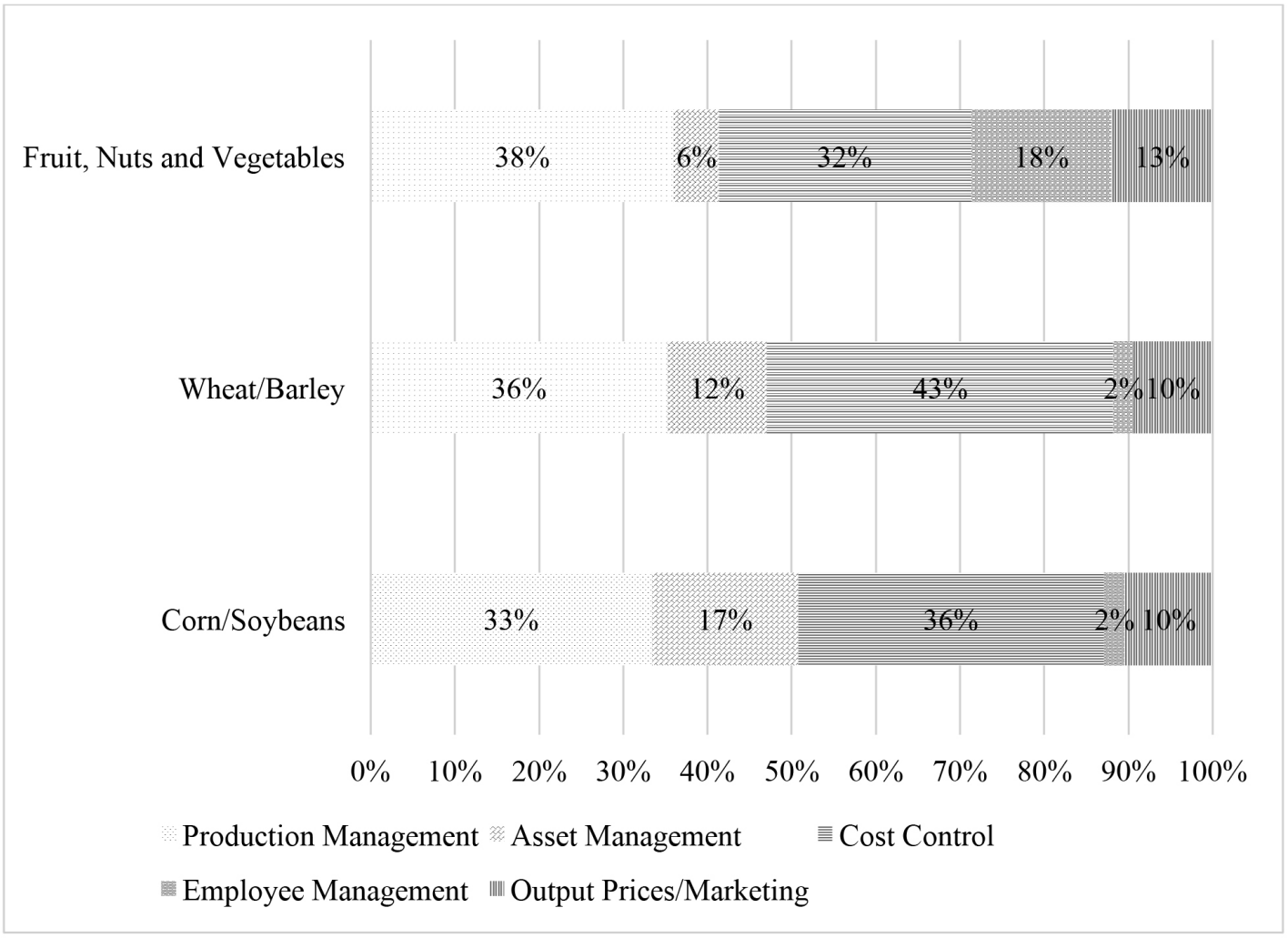

Figure 3. Dominant strategy by animal enterprises.

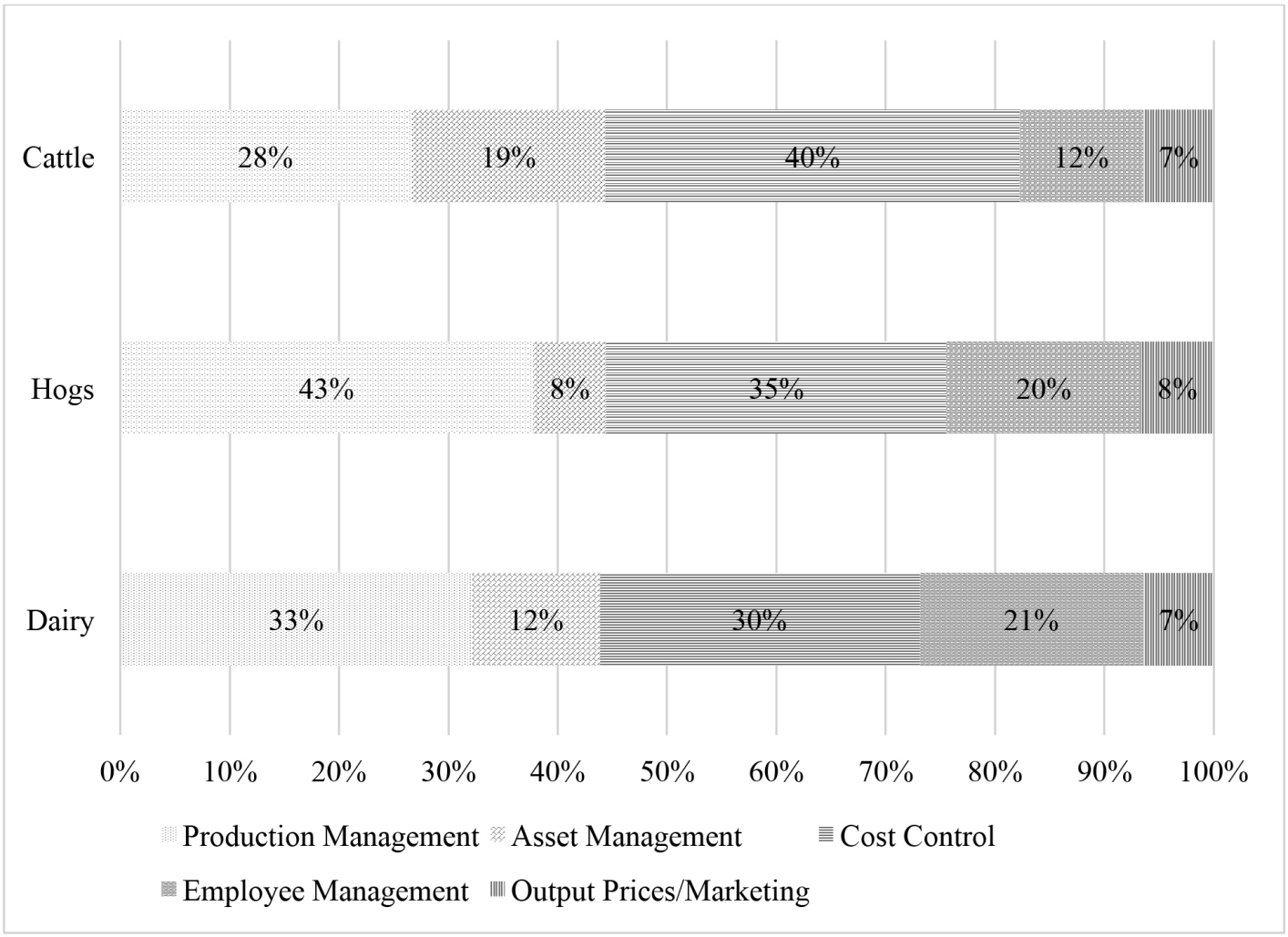

Figure 4. Most time consuming activity by farm size.

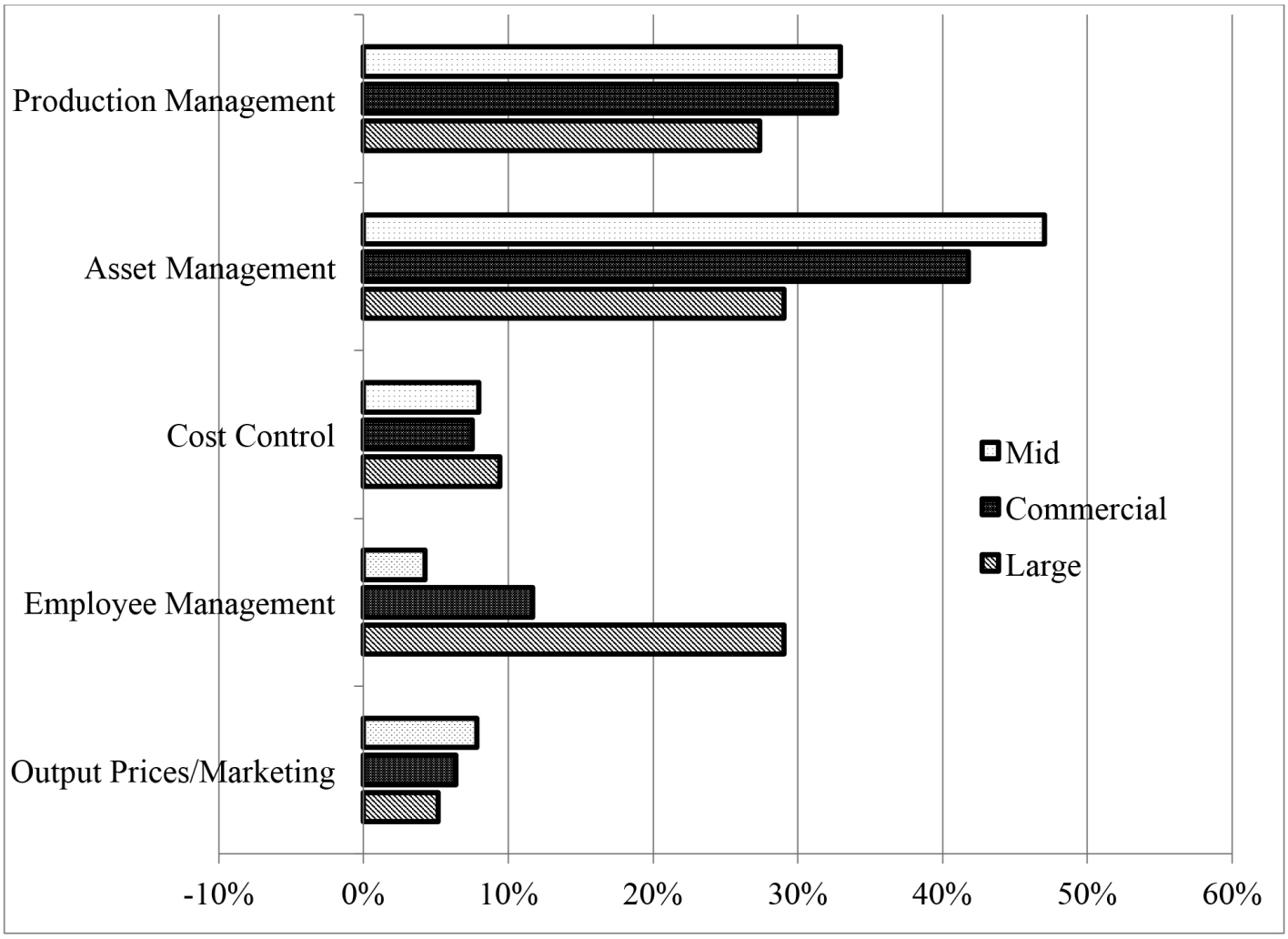

Figure 5. Most time consuming activity by crop enterprise.

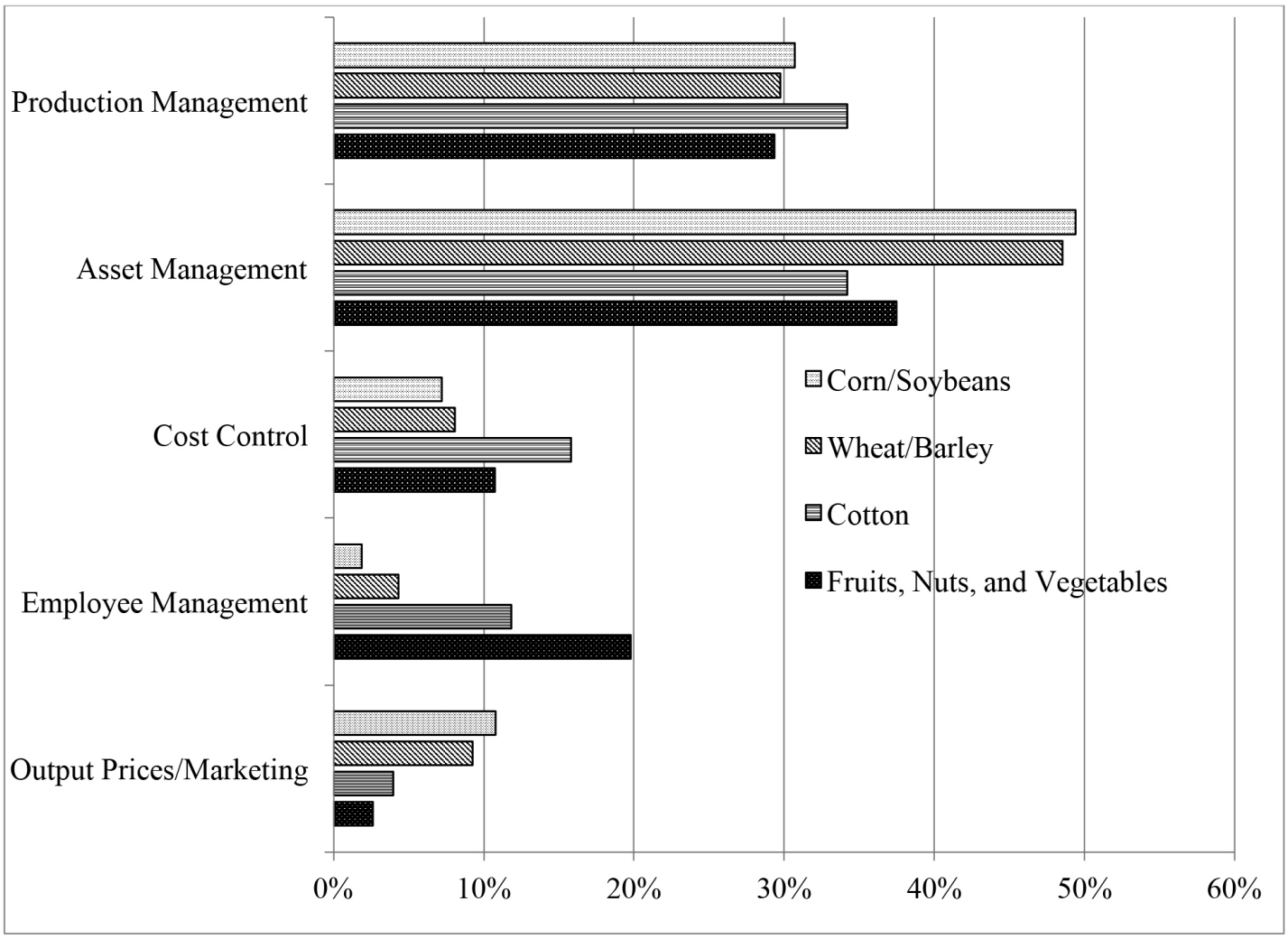

Figure 6. Most time consuming activity by animal enterprise.

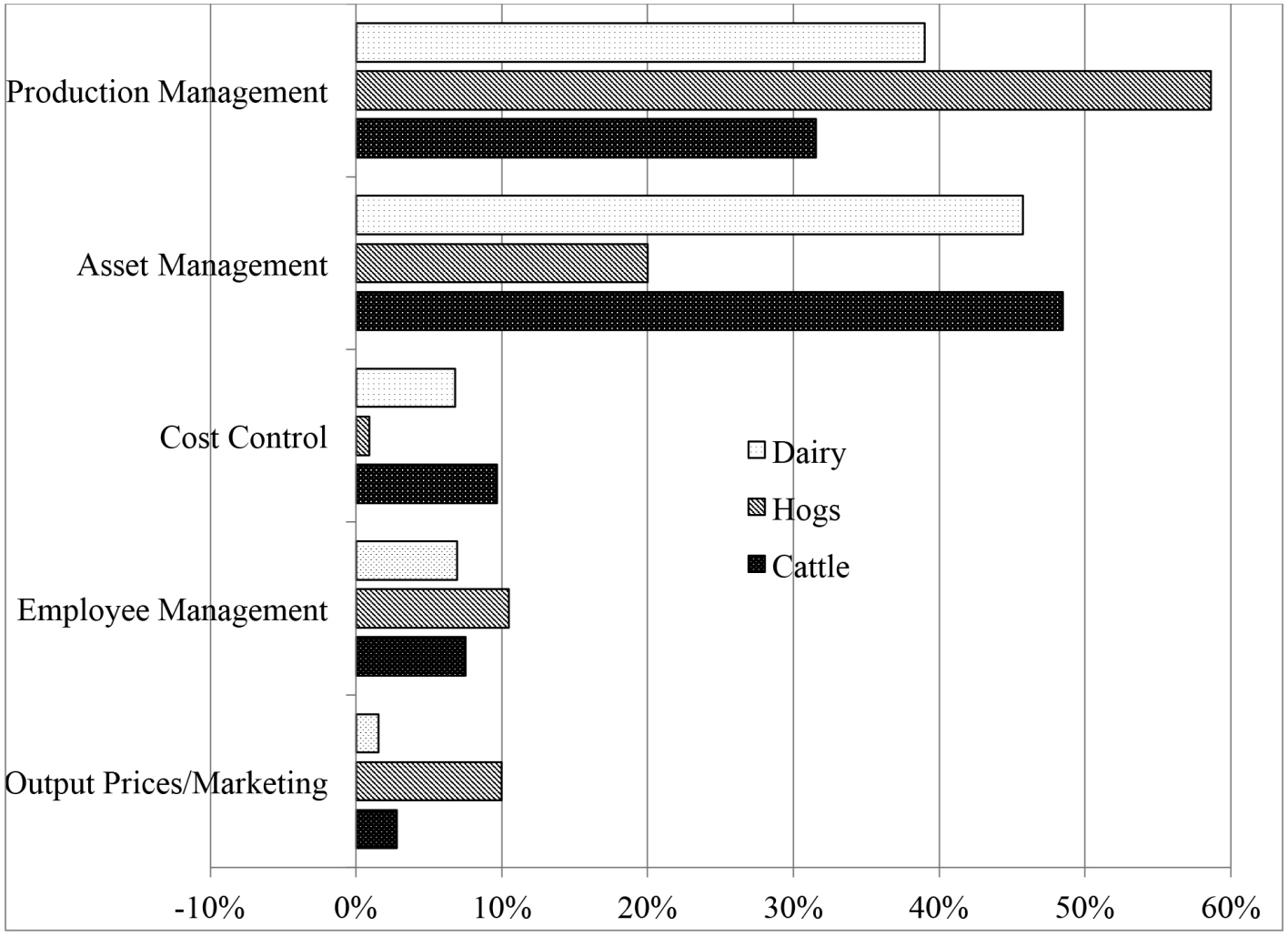

Figure 7. Most time consuming activity by respondents with dominant strategy of asset management.

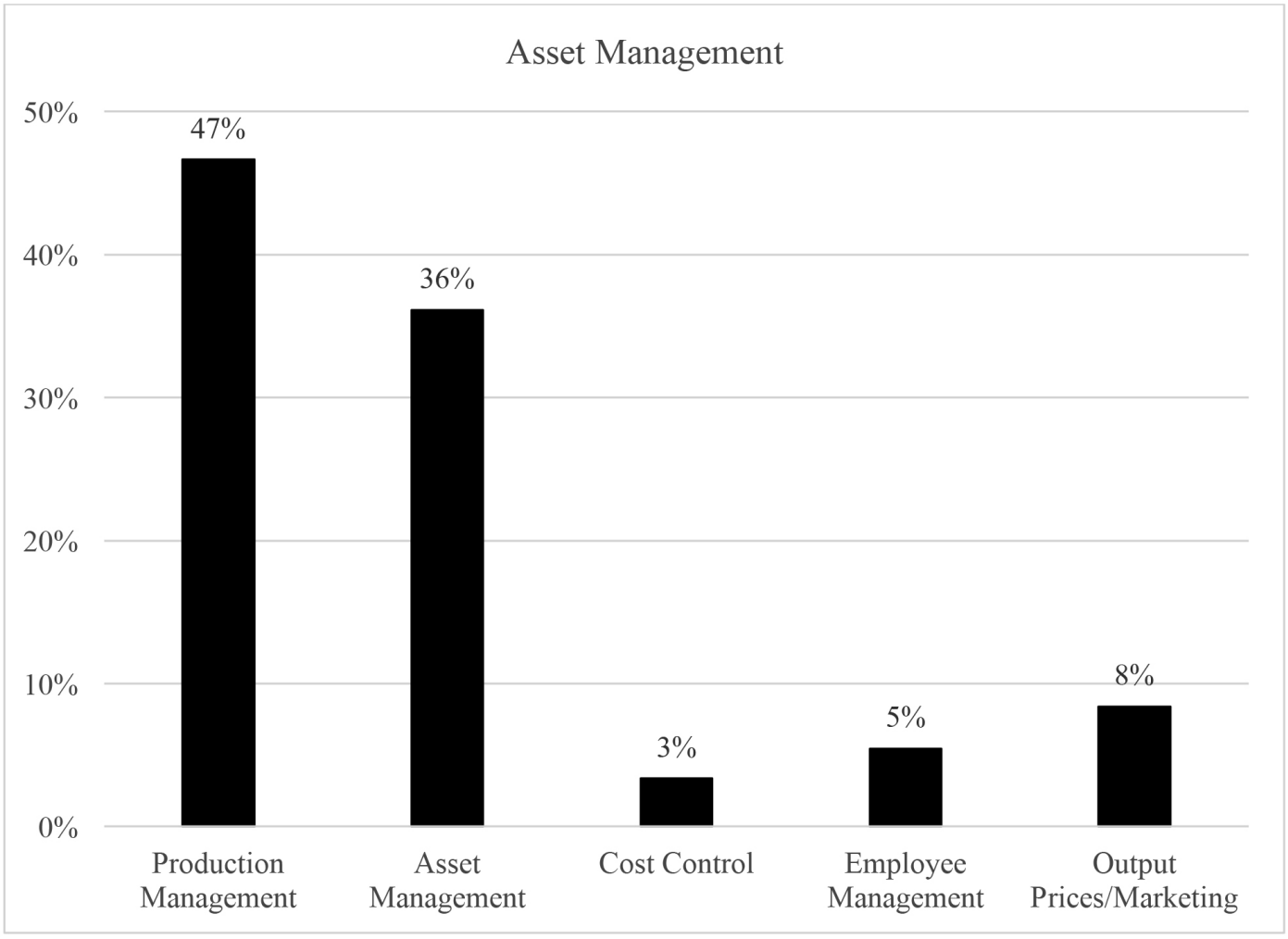

Figure 8. Most time consuming activity for respondents with dominant strategy of production management.

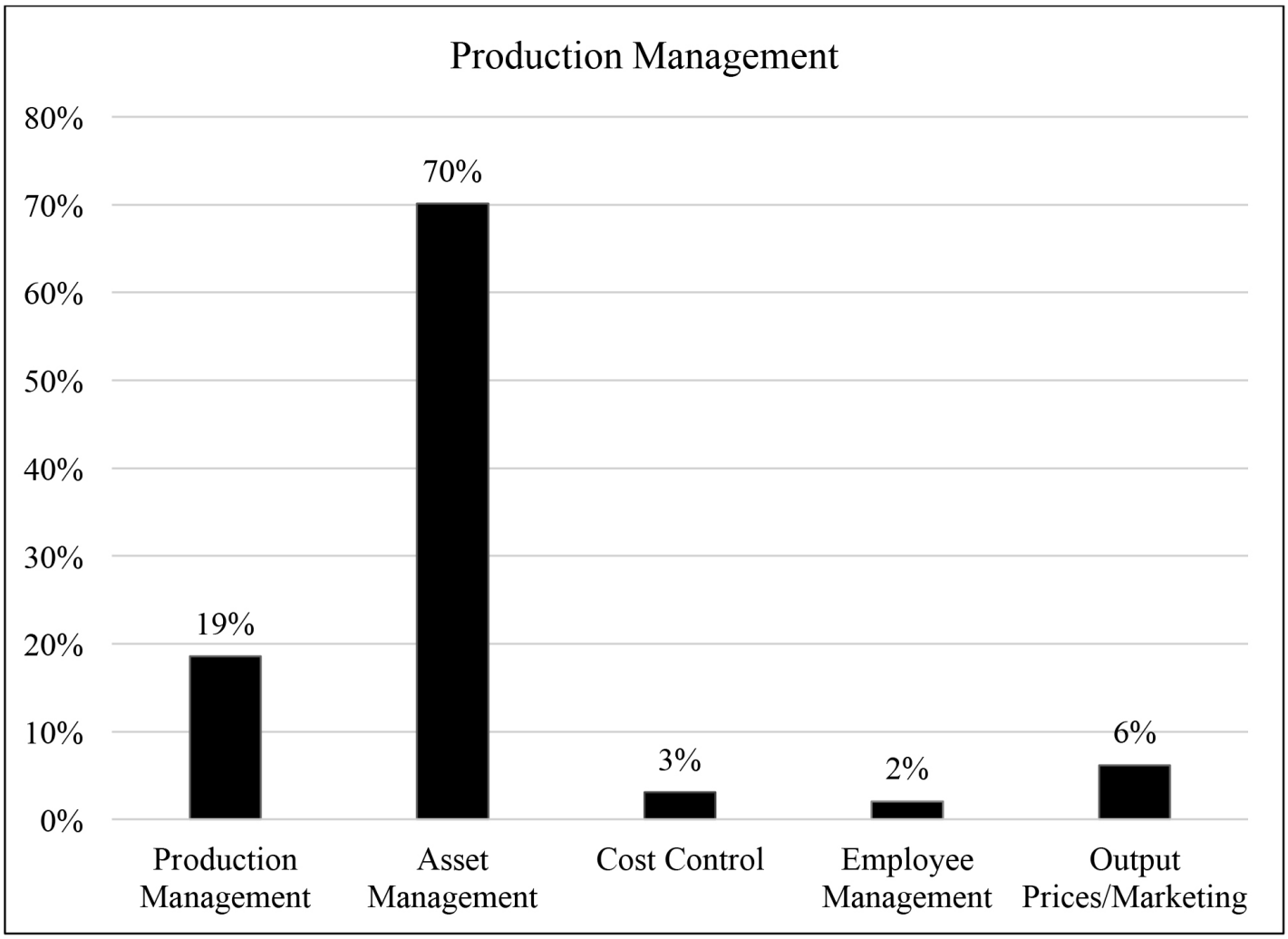

Figure 9. Most time consuming activity for respondents with dominant strategy of employee management.

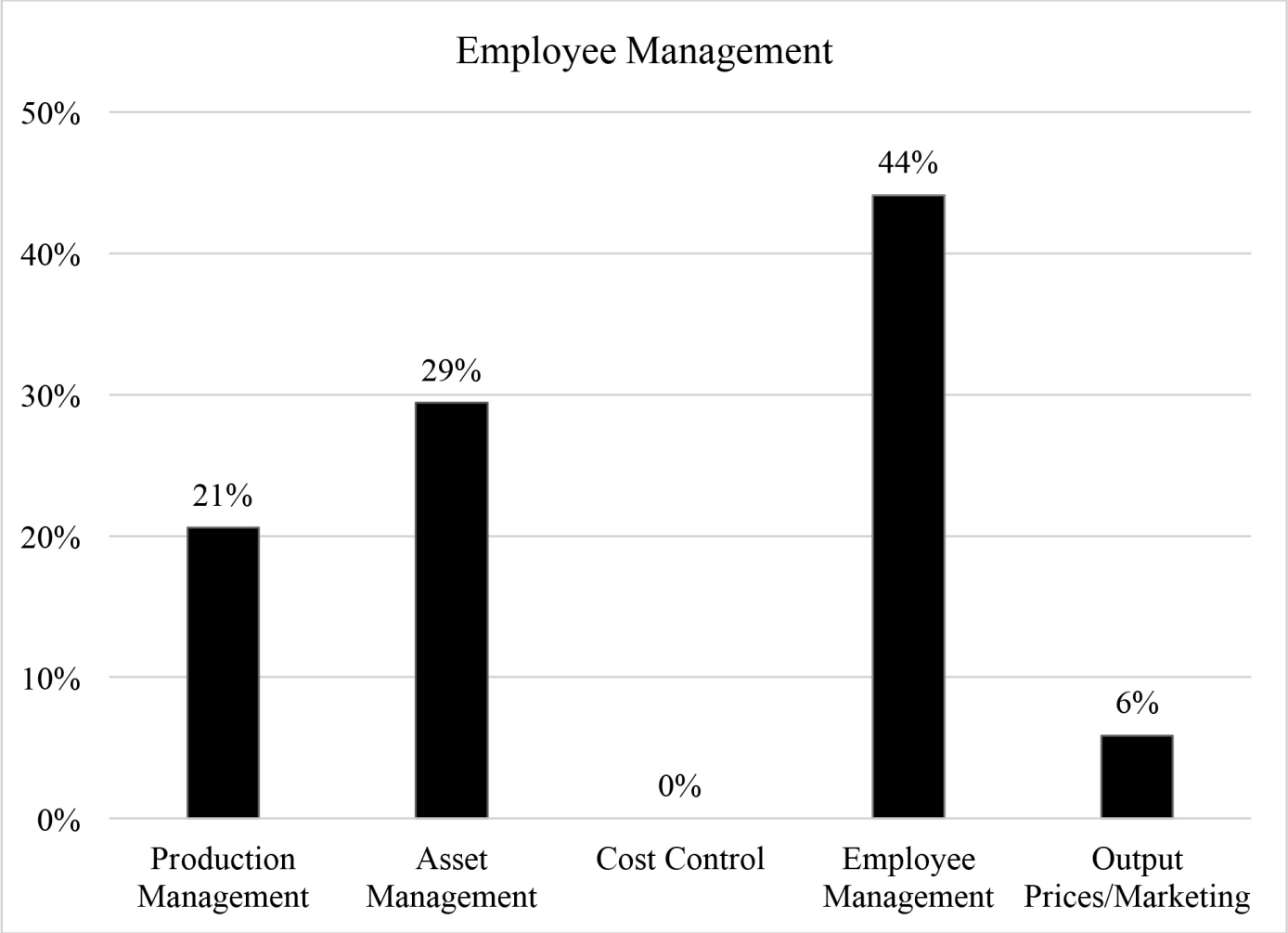

Figure 10. Most time consuming activity for respondents with dominant strategy of cost control.

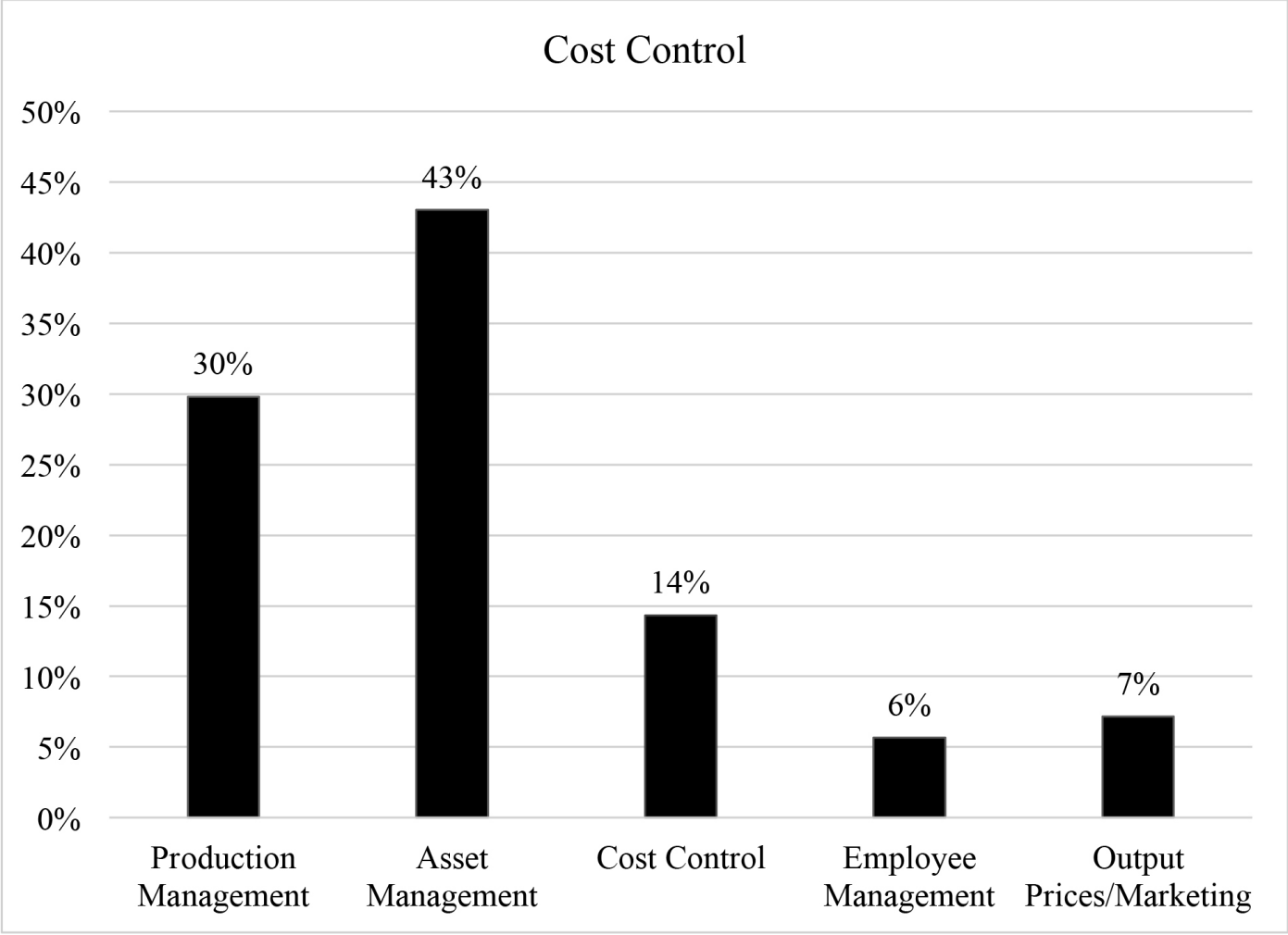

Figure 11. Most time consuming activity for respondents with dominant strategy of output prices and marketing.