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Has Specialization Put a Limit on How Far Cattle Contracting Can Go?

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IN 1776 Scottish philosopher Adam Smith published *An Inquiry into the Nature and Causes of the Wealth of Nations*, or as it is better known, *The Wealth of Nations*. In many mundane ways, Smith merely chronicled the burgeoning European industries he was observing; but, in doing so, he helped spread a revolutionary thinking about how factories could take advantage of specialization. Smith's discussion of a visit to a pin factory has been re-told so often that many people probably know the story without knowing the source. The story goes like this: If you were to make a pin, how would you do it? Well, you need to cut some steel, pound and twist it into a wire, cut the wire, straighten it, sharpen one end, affix a tiny ball to the other, and once, say, 100 were ready, box them up for delivery. Smith records 18 distinct tasks involved in making a pin and opines that an untrained 18th century worker



could at best fashion one pin per day. Specialized training increases the output to a dozen per worker so that a factory of 100 workers might produce 1200 pins. However, in the modern pin factory he visited, instead of training one person to do everything, workers were each trained for just one of the 18 distinct tasks, and the factory produced 48,000 pins per day. From automobiles to computers to packinghouses, specialization increases output while lowering cost per unit. This revolution in specialization also leads to increased demand for inputs. As output increases, more and more inputs must be secured, whether those inputs are steel or soybeans, plastic or pigs. But what happens in industries that compete for those inputs? They often become concentrated.

Meat processing became very specialized in the last 50 years. Processing plants today package most cuts directly in the plant instead of shipping carcasses to the retailer to butcher and package for individual

sale. Instead of a retail butcher slicing all of the cuts off of a side of beef, specialized workers at the packing plant now make the cuts as the meat proceeds down an assembly line into a package that then goes to the supermarket for minor trimming if any. This change in processing required a massive reorganization of supply chains, transportation, and technology at processing plants and, once in place, gave processors the ability to take advantage of enormous economies of scale. The result was a dramatic decline in costs per finished product. To further push processing costs down, packers needed to increase inputs so that the plants could take full advantage of the enormous size, technology, and labor used. Bigger plants meant fewer firms were needed, leading to evermore concentration in the processing sector. Today, four firms process 85 percent of cattle into beef (in value), four firms process 66 percent of hogs into pork, and another four firms process just over half of all turkeys (57 percent) ➤

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and broilers (51 percent) (USDA 2016). However, this concentration seems to have mostly slowed. These four firms seem to be in no great hurry for further mergers and acquisitions. This can be for many reasons, but one of them could be that cost savings from scale are getting smaller. Securing inputs remains important, nonetheless. With fewer and fewer firms buying more and more inputs, how do they compete with each other while taking advantage of specialization's increasing demand for inputs? They secure their supplies through contracts.

This story is by now well-known and quite consistent with how industries throughout food manufacturing evolved. As processors moved to specialization, they needed consistent supplies of inputs. Along with modernization came a move toward increased usage of contracting to secure supplies months ahead of delivery. Fifty years ago, only about 11 percent of all agricultural goods were sold to processors via contracts; today it is closer to 40 percent (MacDonald 2015). In livestock, the movement toward contracting was even more dramatic. Today, 98 percent of hogs, 90 percent of poultry, and 70 percent of cattle are procured using some form of contracting (USDA 2016). The 90 percent for poultry is misleading since it encompasses both turkeys and chicken for meat and eggs. In fact, nearly 100 percent of broilers (chickens sold exclusively for meat) are contract sales. Since the beef industry has lagged the poultry and hog industries in contract adoption, it has been natural to assume that the beef supply chain has merely been catching up. The conventional wisdom is that cash markets will mostly disappear. Perhaps that is inevitable. Forecasting industry structure is always difficult. However, we recently

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reviewed a great deal of research and data related to US livestock production and have concluded that the beef industry might be slower to move toward an increased usage of contracts. In terms of the benefits of specialization, a steer is neither a four-legged chicken nor a big pig.

First of all, to accommodate specialization, it can help if the input (the animal in this case) is homogeneous. Getting chickens and pigs to conform to standard sizes and quality is actually easier to do if you are starting at a stage of heterogeneity. Think of American chickens and pigs at the beginning of the 20th century—breeds differed, feed was mostly scraps and varied grains, animals often rummaged around farms, and chicken sold for meat was usually once the bird's egg production waned. Once scientifically controlled genetics, feeding, and developing of animals purely for meat were brought into the industries, great advances in yield developed to take advantage of the scale of specialization that could also be brought to bear in the processing industries. However, because of their enormous capital costs, humans had been breeding cattle with great care and for specific purposes for thousands of years. Cattle bred specifically for

meat derived from hundreds of hybrids over centuries into a handful of sturdy breeds that we use today. There are still improvements, of course, but the yield for cattle because of specialization was much less in the last century compared to poultry and hogs. In other words, because beef cattle became specialized much sooner, there is less room for productivity gains today.

Likewise, economists have shown that the processing efficiency gains, while increasing in all industries, have increased at a slower rate for beef than for pork and poultry. Yield, breeding, transportation, and logistic gains that resulted from moving chickens and hogs inside into controlled feeding operations do not have the same benefits for a large ruminant. Although the move to mind-bogglingly large cattle feedlots is astounding, it is important to note that nearly all of the cattle in those lots spend one-third to one-half of their lives in a pasture or range before they begin eating grain to fatten them for the packer. Why not specialize by moving calves into feedlots directly? With 155 million acres of federally subsidized rangeland (BLM 2017), feedlots are arguably at a competitive disadvantage for calf feeding, especially during spring and summer months when cheap forage is available to so many in the West. Even outside of the West where private lands exist, rangeland is still relatively cheap. While hogs and poultry can be raised anywhere in confinement, leaving good farmland to be used for profitable crops like corn and soybeans, cattle are raised on land that is already marginal. Moving cattle to feedlots does not free land for other uses because much of that land simply has no other uses.

For these and other reasons that we explain in much more detail in Crespi and Saitone (2018), we find that the current level of contract usage