



LABOR EFFICIENCY AND PRODUCTIVITY BENCHMARKS

This article examines labor efficiency and productivity benchmarks using data for KFMA farms with continuous data from 2005 to 2009. Labor efficiency is measured by dividing total labor cost (unpaid family and operator labor cost plus hired labor cost) divided by value of farm production. Labor productivity is measured by dividing value of farm production by the number of workers which includes hired labor as well as family and operator labor.

Table 1 contains summary statistics for hired labor cost, unpaid family and operator labor cost, value of farm production, the number of workers, labor efficiency, and labor productivity for the 1,052 farms with continuous data from 2005 to 2009, and for the top and bottom operating profit margin quartiles. Operating profit margin quartiles were determined using five-year average data. Farms with lower labor efficiency indices and higher labor productivity values are doing a better job of managing their labor.

Labor efficiency averaged 0.162 for all farms, 0.120 for the top profit margin quartile, and 0.328 for the bottom profit margin quartile. Figure 1 provides a graphical depiction of individual labor efficiency indices for farms in the top and bottom profit margin quartiles. The green triangles represent individual top profit margin farms while the red circles represent

individual bottom profit margin farms. Almost all of the top profit margin farms are below an index of 0.250 while it is typical for the bottom profit margin farms to be above this index value. Note that the labor efficiency index is significant and negatively correlated with farm size. This means that there is a tendency for relatively larger farms to have lower labor efficiency indices.

Labor productivity averaged \$259,175 for all farms, \$374,151 for the top profit margin quartile, and \$121,943 for the bottom profit margin quartile. Figure 2 provides graphical depiction of labor productivity for farms in the top and bottom profit margin quartiles. The green triangles represent individual top profit margin farms while the red circles represent individual bottom profit margin farms. Most all of the top profit margin farms have a labor productivity value above \$250,000 while it is typical for the bottom profit margin farms to have a labor productivity value below this value. Note that there were several farms with labor productivity values above \$1,000,000 which was more than four times the average labor productivity value. Also, note that labor productivity is significant and positively correlated with farm size. This means that there is a tendency for relatively larger farms to have higher labor productivity values.

Labor efficiency and productivity vary by farm size and farm type. Table 2 illustrates labor efficiency and productivity for five farm size categories and five farm types. Labor efficiency

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is below average for farms with a value of farm production above \$500,000. Similarly, labor productivity is above average for farms with a value of farm production above \$500,000. An examination of labor efficiency and productivity by farm type reveals that it is difficult to control labor costs and achieve high levels of productivity for farms with intensive livestock enterprises such as a cow calf enterprise or a dairy enterprise. For this reason, these farm

types should compare their performance to farms of the same type rather than using the average figures in table 1 or the information by farm size in table 2.

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Table 1. Labor Efficiency and Productivity Benchmarks.

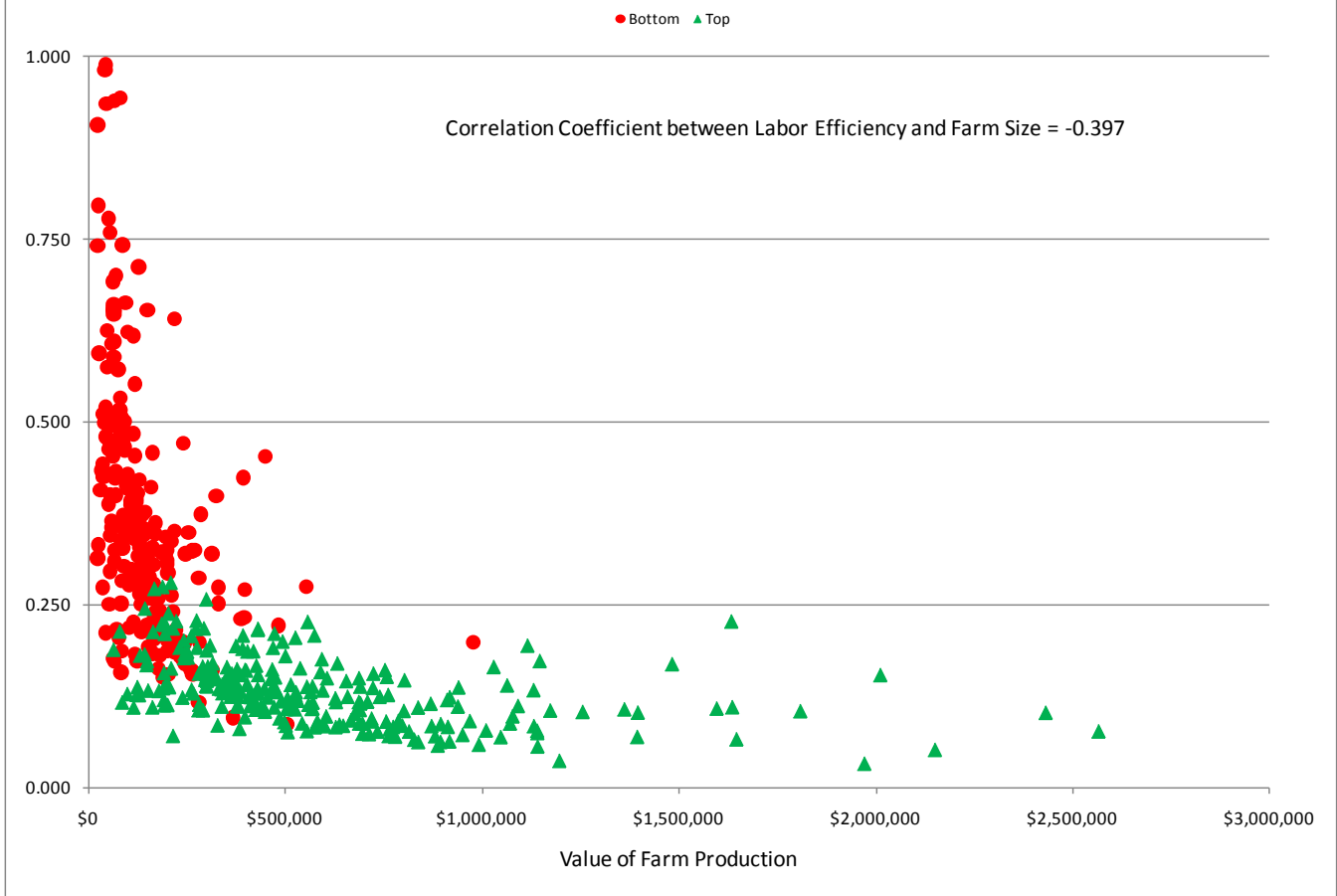
Variable	Average	Top	Bottom
<u>Labor Efficiency</u>			
Hired Labor	\$14,401	\$14,639	\$5,354
Unpaid Family and Operator Labor	\$48,853	\$54,304	\$39,368
Value of Farm Production	\$389,428	\$573,717	\$136,456
Labor Efficiency	0.162	0.120	0.328
<u>Labor Productivity</u>			
Value of Farm Production	\$389,428	\$573,717	\$136,456
Number of Workers	1.50	1.53	1.12
Value of Farm Production per Worker	\$259,175	\$374,151	\$121,943

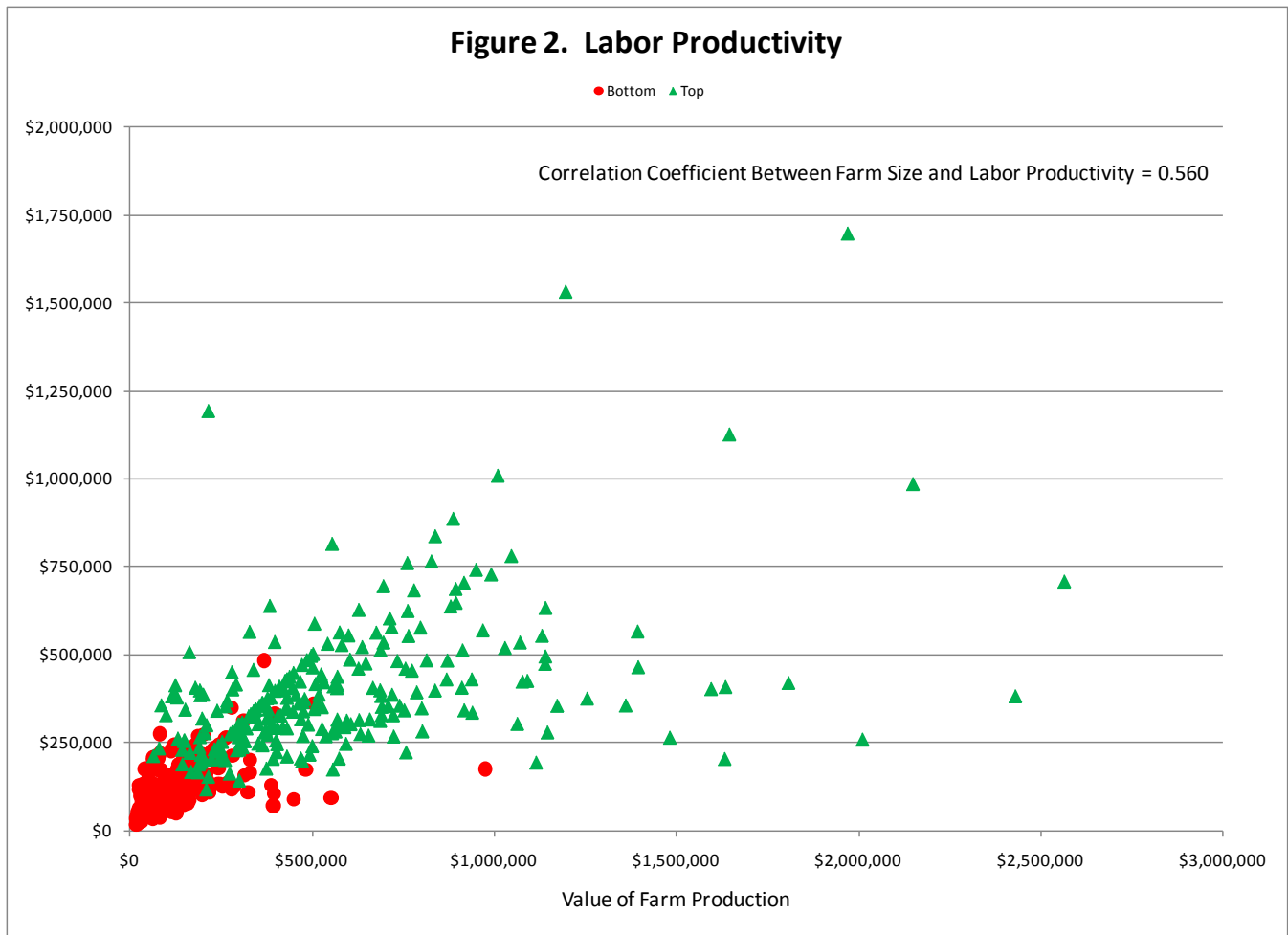
Source: KFMA Databank, 2005-2009.

Table 2. Labor Efficiency and Productivity Benchmarks by Farm Size and Type.

<u>Variable</u>	<u># of Farms</u>	<u>Labor Efficiency</u>	<u>Labor Productivity</u>
<u>Farm Size Category (Value of Farm Production)</u>			
VFP < 100,000	131	0.451	\$88,225
100,000 < VFP < 250,000	324	0.247	\$169,387
250,000 < VFP < 500,000	348	0.168	\$244,080
500,000 < VFP < 1,000,000	183	0.128	\$326,790
VFP > 1,000,000	66	0.123	\$354,970
<u>Farm Type</u>			
Dryland Crop	641	0.148	\$287,862
Irrigated Crop	18	0.101	\$459,498
Crop/Beef Cow	62	0.302	\$131,685
Crop/Backgrounding	21	0.170	\$256,222
Crop/Dairy	33	0.271	\$134,120

Figure 1. Labor Efficiency





PHYSICAL AND ECONOMIC LABOR PRODUCTIVITY OF GLOBAL COW-CALF PRODUCTION

This article examines labor productivity using data from *agri benchmark*, a global network of beef economists. The beef branch of *agri benchmark* has been operating for 9 years and currently involves 24 countries (see Table 1). The numbers after the country abbreviations in table 1 represent the herd size for each representative farm. For example, AT-30 represents a farm in Austria with 30 beef cows. In the United States, both Kansas State University and Texas A&M University are involved in the *agri benchmark* beef network. The US-160 farm is a representative Kansas farm with beef cows and cash crops.

The beef network of *agri benchmark* records data on sales, production costs, and cattle performance measures such as labor productivity, calving rate, calf mortality, and weaning percentages. This short article focuses on labor costs and productivity. Labor costs include opportunity costs. There are two factors impacting labor costs: physical labor productivity and wages. Physical labor productivity represents kilograms of beef produced per hour of labor input (hired and operator labor). Economic labor productivity represents total U.S. returns per U.S. labor costs (hired and operator labor). The operator labor is

imputed in the computation of labor costs.

Figure 1 presents cost proportions by country using 2009 data. Costs are first broken into two categories: factor costs (land, labor, and capital) and non-factor costs. Land costs include crop share and cash rent paid and imputed rents for owned land. Labor costs include hired labor and an imputed charge for operator labor. Capital costs include interest paid and an imputed charge on equity. Non-factor costs represent all costs not classified as land, labor, and capital costs. It is evident from examining figure 1 that cost proportions vary significantly among countries. These large cost differences are due to differences in production systems and relative input prices among the countries. Non-factor costs on average account for 50.1 percent of total cost. Land costs on average account for 23.2 percent of total cost and range from 2.9 percent for one of the farms in Indonesia (ID-2) to 71.0 percent for one of the farms in Argentina (AR-1000). Labor costs (see figure 2) on average account for 20.7 percent of total cost and range from 3.2 percent for one of the farms in the Ukraine (UA-295) to 69.3 percent for one of the farms in Indonesia (ID-3). Labor costs for the US-160 farm account for 10.8 percent of total cost. Capital costs on average account for 6.0 percent of total cost and range from 0.2 percent for one of the farms in the Czech Republic (CZ-420) to 27.5 percent for one of the farms in South Africa (ZA-400).

Physical and economic productivity for each country in the beef network of *agri benchmark*

is presented in figure 3. Average physical and economic productivity are 25.7 and 5.8, respectively. It is important to note that physical and economic productivity are not strongly correlated (correlation coefficient of 0.277). The different relative position of farms ranked using physical productivity versus economic productivity is largely due to differences in wage rates among countries. Farms with above average physical and economic productivity include FR-80B, ES-160, UK-40, UA-295, US-160, AR-800, and AR-1000. The representative Kansas farm (US-160) has a physical productivity measure of 68.7 and an economic productivity measure of 7.4. Interestingly, the farm with the highest physical productivity measure (i.e., AU-1100) has a below average economic productivity measure.

This article used data from the *agri benchmark* beef network to examine labor productivity differences among countries. Future articles will explore production system, return, and total cost differences among countries. The web site for *agri benchmark* is as follows: www.agribenchmark.org.

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Table 1. Abbreviations for Countries Involved in Agri Benchmark Beef Network.

Country	Abbeviation
Argentina	AR
Austria	AT
Australia	AU
Brazil	BR
Canada	CA
China	CN
Columbia	CO
Czech Republic	CZ
Germany	DE
Spain	ES
France	FR
Hungary	HU
Indonesia	ID
Italy	IT
Mexico	MX
Norway	NO
Peru	PE
Poland	PL
South Africa	ZA
Sweden	SE
Ukraine	UA
United Kingdom	UK
United States	US
Uruguay	UY

Figure 1. Cost Proportions by Country

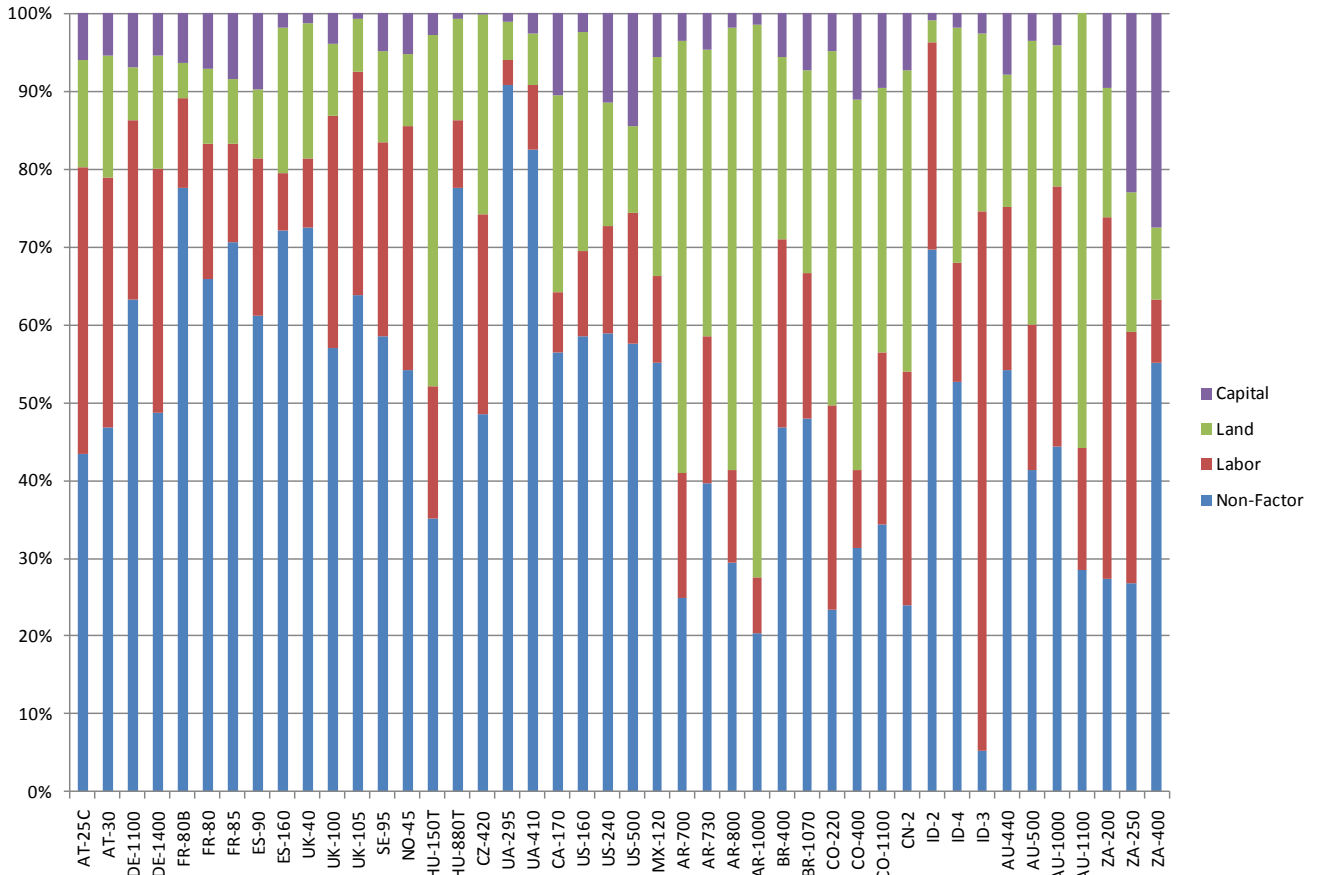


Figure 2. Labor Cost as a Proportion of Total Cost

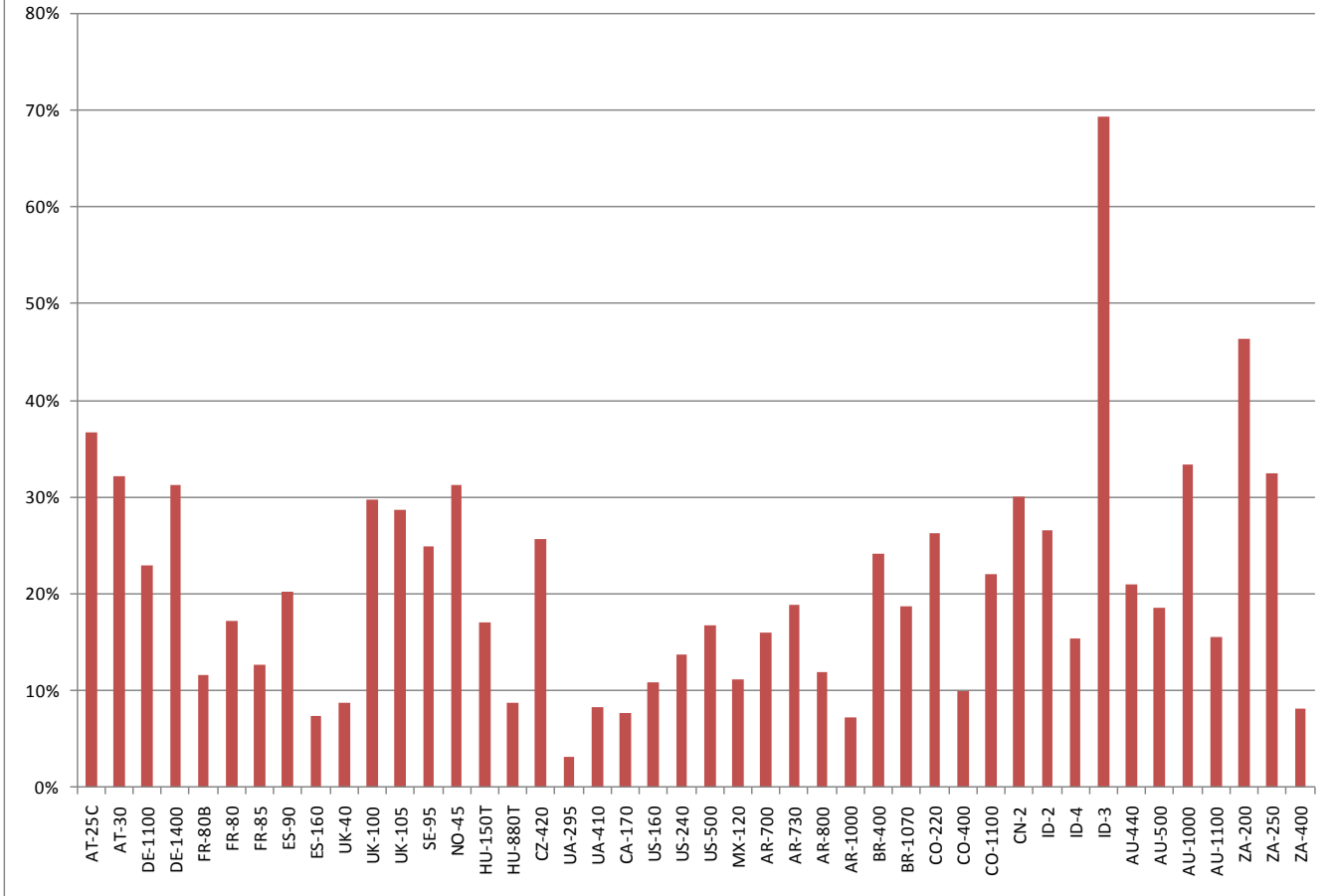
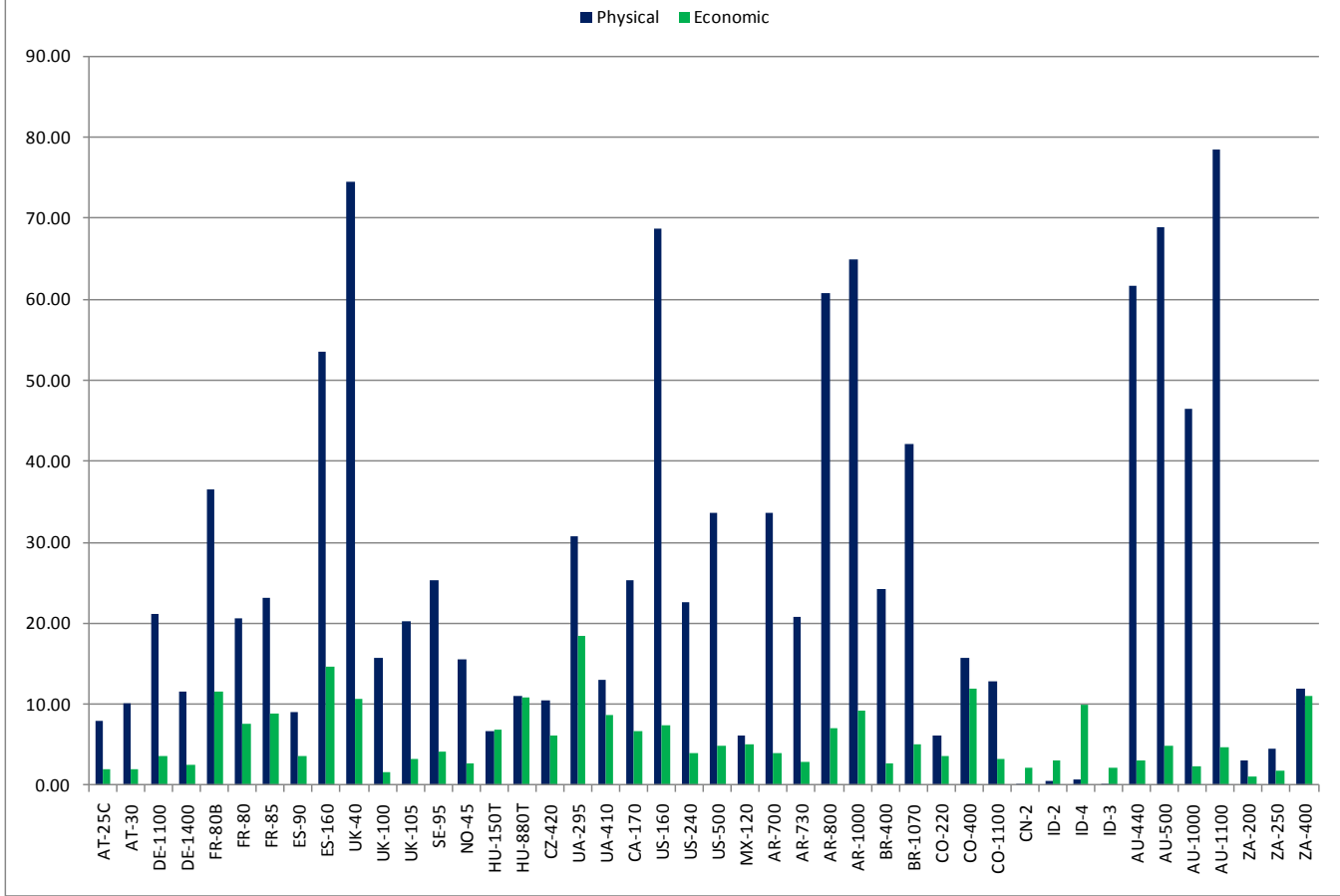


Figure 3. Physical and Economic Labor Productivity



RECOMMENDATIONS FOR FURTHER READING

The purpose of this section of the newsletter is to briefly discuss articles and web sites that may be of interest to readers. In general, the articles discussed will not report on original research. Rather, the articles will contain citations to web sites and articles that discuss topics of general interest.

The February 7 edition of K-State Extension Agronomy e-updates discussed tillage trends in 23 counties. Specifically in this e-update, results of a 2010 ground survey of 23 counties were compared to results from 2004. In terms of acreage, corn and soybeans increased in 18 to 19 of the counties surveyed while wheat and grain sorghum decreased in 18 to 19 of the counties surveyed. Acres planted to no-till corn

were higher in 2010 than 2004 in 17 of the 23 counties while conventional tillage was lower in 10 of the 23 counties. No-till grain sorghum increased in 14 of the 23 counties and no-till soybeans increased in 16 of the 21 counties where soybean tillage practices were observed. For wheat, no-till increased in 16 of 22 counties and conventional tillage declined in 8 counties. More information can be found on the following web site:

www.agronomy.ksu.edu/extension/tillage.

The February 4 edition of K-State Extension Agronomy e-updates reports no-till and crop rotation research at Tribune. Determining the long-term impact of changes in crop rotations and tillage practices is a long-run process. The

Southwest Research-Extension Center has been conducting research on tillage intensity in a wheat/sorghum/fallow system since 1991. The three tillage intensities include conventional, reduced tillage, and no-till production systems. Grain yields of both wheat and grain sorghum are higher in the reduced tillage systems. Results are also presented for three four-year rotations: wheat/wheat/grain sorghum/fallow; wheat/grain sorghum/grain sorghum/fallow; and continuous wheat. Recrop wheat in the wheat/wheat/grain sorghum/fallow rotation yielded approximately 83 percent of first-year wheat while recrop grain sorghum in the wheat/grain sorghum/grain sorghum/fallow rotation yielded approximately 70 percent of first-year grain sorghum.

Alan Auerbach and William Gale have updated their projections related to the federal budget outlook in a paper entitled “Tempting Fate: The Federal Budget Outlook”. Previous projections were described in the May 2010 and October 2010 newsletters. Under what the authors refer to as “reasonable” assumptions, the ten year deficit from 2012 to 2021 is expected to be \$12.1 trillion. Moreover, the debt to GDP ratio is expected to exceed 98 percent by 2021, the highest level since 1946. As the authors note, the unsustainability of federal fiscal policy has been discussed since the 1980s. However, the problem has become more urgent in recent years for several reasons including the following: the medium-term projections have deteriorated

significantly; the issues driving the long-term projections, particularly the aging of the baby boomers, are more important; there are increasing concerns about foreign countries’ demand for U.S. debt; and many other countries, and states within the U.S., are facing similar fiscal problems. As they have done in previous papers, the authors compute the fiscal gap which measures the size of immediate and permanent increase in taxes and/or reductions in non-interest expenditures that would be required to set the present value of all future budget amounts remaining after subtracting non-interest expenditures from revenue equal to the current value of the national debt. Under their extended policy scenario, the fiscal gap is \$45.8 trillion through 2085. For further detail on the authors’ budget projections and fiscal gap computations, I encourage you to examine the article which can be found on my contributor site under “Recommendations for Further Reading”.

For those interested in more information pertaining to macroeconomics and economic policy, I encourage you to check out the web site for the Brookings Institution (www.brookings.edu). The Brookings Institution is a nonprofit policy organization based on Washington, D.C.

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The Kansas Farm Management Association (KFMA) Newsletter is distributed monthly to provide farm management information to farm decision makers. Further farm management information can be found on the KFMA program website: www.agmanager.info/kfma; and, on the Extension Agricultural Economics website: www.agmanager.info. The Newsletter is edited by Michael Langemeier, Professor, Department of Agricultural Economics, Kansas State University.



Kansas State University Agricultural Experiment Station and Cooperative Extension Service.

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