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Market Failures and Land Grant Universities

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One hundred and fifty years ago, the 1862 Morrill Land Grant Act was signed into law. Wise people at that time recognized that the private market for education failed to produce an efficient level of education decades before the economic theory was developed to explain that market failures reduce efficiency. The purpose of this paper is to review the history of selected events that resulted in the development of publicly funded U.S. educational institutions and to issue a challenge for our profession to do a better job of educating about the theoretical justification for using tax dollars to support university education and agricultural research and the efficiency enhancing consequences of that use.

I realize that I don't deserve this recognition, but I accept it on behalf of my colleagues at Oklahoma State and on behalf of my co-authors and graduate students who have been dragging me along for these many years. I think of myself on a good day as a singles hitter. Singles hitters are not worth much unless they are surrounded by an excellent team. It has been my good fortune to be part of excellent teams. I do appreciate the recognition and thank my colleagues for the nomination and the committee for the selection and for their service to the profession.[1]

My mother would be proud of this recognition. Neither of my parents attended high school. Mom graduated from the eighth grade, which for her contemporaries was considered to be a terminal degree. She told us that she was the salutatorian. We asked her what that meant. She said that it meant that she had to give a speech. To my sister and brothers and me, it seemed to be more of a bad thing than a good thing. We wanted to make sure that we didn't make the mistake of becoming a salutatorian and being required to give a speech.

Our father didn't talk about his formal education in the one room school located near the intersection of three rural trails about a mile from his home. One day my sister found his report cards and was surprised to learn that he was marked absent every other day in both the seventh and eighth grades. Upon learning of our father's absenteeism, she asked if she could skip school every other day. Mom said, "No." The discovery of chronic absenteeism, however, required an explanation. So Dad explained that when he entered the seventh grade, he knew that the teacher taught seventh grade material one day and eighth grade material the next. On the days she taught eighth grade, the seventh graders were responsible for maintaining the stove, the grounds, and keeping the building and outhouses clean. Dad initially proposed to attend and participate in academics both days and complete both grades in one academic year. The school board members, all neighboring farmers that he knew, denied the request, probably for two reasons. First, it would have set a bad precedent, and second, by law, he was required to

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[1] Appreciation is also expressed to my wife Maryellen and our sons Alan and Eric who refer to the annual Southern Agricultural Economics Association meetings as the Super Bowl meetings. My attendance at the SAEA meetings often meant that I failed to attend their "Superb Owl" parties.

attend at least 14 weeks per year until his fourteenth birthday. The school year was 7.5 months, so even if he skipped every other day, he could technically fulfill the 14 weeks requirement.

This enterprising seventh grader negotiated a deal to do his fair share of the work details before and after classes on the alternate days that he attended. He mastered sufficient material with the alternate day schedule for two academic years to earn an eighth grade diploma. At the age of 14, he became fully immersed in a farming career. Given the lack of electricity, the livestock activities (cows to be milked; hogs to be fed and eventually butchered and processed; and eggs to be gathered and cleaned) and the crop activities (corn to be harvested by hand; hay to be harvested, stored, and fed), "full time" meant seven days a week, year after year. The organic subsistence farm provided food and sufficient surplus to barter for subsistence goods and services. In many ways in the early 20th century, the activities of my parents did not differ much from those of their European ancestors in the 19th century. However, the opportunity cost of land was lower and the ability to own land was greater for my parents.

Nasar reminds us that, "...the eighteenth-century founders of economics ... assumed that nine out of ten human beings were sentenced by God or nature to lives of grinding poverty and toil..." (Nasar, 2011, p. 461). This was a rephrasing from Burke who wrote that, "...nine Parts in ten of the whole Race of Mankind drudge through life..." (Burke, 1756, p. 93). Little opportunity was available for movement from the industrial class of commoners to the professional class. My mother would not have blamed it on God, but she would not have disagreed with the "grinding poverty and toil" description. She would have described it simply as "poor, but happy." For her, happiness was a matter of adjusting her utility function. By today's standards, her situation in the early 20th century would rate high on a misery index. However, as the century progressed, rural electrification arrived, internal combustion engines were adopted, and with research produced and extended by the land grant university system, the level of grinding poverty and toil declined. For my generation, high school education was expected, and higher education became a possibility.

In the 18th century, children born to members of the professional class (ministers, lawyers, physicians, and nonfarm business owners) had substantially greater access to education. However, the historical record suggests that many of the U.S. founding fathers (a) desired to design a system that would enable all citizens to have access to education; (b) recognized that education for all was important for society at large; and (c) recognized that it was appropriate for the government to provide for the use of public resources to provide education for all. Of course, not everyone was included in the "all" set. It did not include women and it did not include those of African descent.

This unique forum provides an opportunity to present a version of the evolutionary process in the United States that lead to the development of education and research institutions, from the one room school that my father attended to the land grant university that employs me. These evolutionary processes include the use of public resources to fund common schools and the very unique set of circumstances (the great mutation) that preceded public investments in land grant universities. The discipline that we know as agricultural economics evolved from these investments. The citizens of the United States, through their representatives, decided that it would be wise to provide public resources for elementary and secondary education and eventually for university level agricultural education, research, and extension.

My working hypothesis is that the discipline that we know as agricultural economics in the United States evolved from the seeds of publicly funded common schools and high schools that established the precedence for land grant universities. Wise people recognized that the private market for education failed to allocate resources to their best use decades before the theory of microeconomics was introduced. The purpose of this paper is to review the history of selected events that resulted in the development of publicly funded U.S. educational institutions and to issue a challenge for our profession to do a better job of educating about the theoretical justification for using tax dollars to support

university education and agricultural research and the efficiency enhancing consequences of that use.

Mom told us that most past events include (a) his story, (b) her story, and (c) what actually happened. I do not know if this version of the story is accurate. Some of the events have different versions in the historical record. I hope that the account is free from substantive errors.

Founding Fathers

In 1776, when the U.S. Declaration of Independence was signed (the year that Adam Smith published *An Inquiry into the Nature and Causes of the Wealth of Nations*), formal economic theory was not available to explain market failure and the justification for government intervention in markets. It had not yet been "discovered" (Bator, 1958). The case for publicly funded common schools was more a matter of common sense, which is the case for many results derived from the standard theory of microeconomics.

More than a century after the U.S. Declaration of Independence was signed, Alfred Marshall, one of the founders of microeconomics theory, wrote in his *Principles of Economics* that, ". . . .We may then conclude that the wisdom of expending public and private funds on education is not to be measured by its direct fruits alone. It will be profitable as a mere investment, to give the masses of the people much greater opportunities than they can generally avail themselves of. . . . The economic value of one great industrial genius is sufficient to cover the expenses of the education of a whole town. . ." (Marshall, 1890). Marshall's book was published 28 years after the Morrill Land Grant Act was signed by President Lincoln.

The founding fathers intuitively recognized that the aggregate net social benefits from grade school education for all surely exceeds the aggregate net private benefits. A fully private education market would fail to allocate resources to their best use, and the size of the economic pie would be less than what it could otherwise be. At some level, the expected benefits from market intervention are greater than the expected cost of intervention.

Benjamin Franklin (1749) wrote "The good education of youth has been esteemed by wise men in all ages, as the surest foundation of the happiness of both private families and of commonwealths. Almost all governments have therefore made it a principal object of their attention, to establish and endow with proper revenues, such seminaries of learning, as might supply the succeeding age with men qualified to serve the publick with honour to themselves, and to their country. . . ." (Isaacson, 2005) (He didn't mention women. All didn't mean "all".)

John Adams (1785) wrote "The whole people must take upon themselves the education of the whole people and be willing to bear the expenses of it. . . ." (Adams, 1856) The land ordinance passed by the Continental Congress on May 20, 1785 (two years prior to the adoption of the U.S. Constitution) granted section 16 (one square mile) of every 36 square mile township to be used for public education. The federal government awarded to the states section 16 of each township from the public domain to be used for schools to provide education for citizens.

Thomas Jefferson (1787) also recognized the external benefits of education. "Above all things I hope the education of the common people will be attended to, convinced that on their good sense we may rely with the most security for the preservation of a due degree of liberty. . . ."[2] (Cornwell, 2011) Use of the adjective "common" could be interpreted as recognition of the existence of a practical class distinction. Jefferson also recognized the potential external cost of not funding education. "If the children are untaught, their ignorance and vices will in future life cost us much dearer in their consequences than it would have done in their correction by a good education. . ."[3] (Cornwell, 2011).

Justification for government support for education was also included by the Continental Congress in the Northwest Ordinance of 1787. "Religion, morality, and knowledge, being necessary to good government and the happiness of

[2] Quote attributed from Thomas Jefferson to James Madison, 1787.

[3] Quote attributed from Thomas Jefferson to Joseph C. Cabell, 1818.

mankind, schools and the means of education shall forever be encouraged....” While it might be an exaggeration to say no one opposed collecting taxes or to providing public resources to support grade schools, I could not find any references in the literature to arguments from the founding fathers for not doing so.

In some regions, the support for education extended to high schools. However, not every taxpayer thought this was appropriate. In 1873, a lawsuit was filed in Kalamazoo County, Michigan courts to bar the use of tax dollars to fund a high school. Charles E. Stuart, a former Michigan U.S. Senator, along with two associates, evidently resented the tax burden that the public high school placed on them. Some argue that their intent was to bring a test case that would insure the continuation of funding for high schools. They won their initial case but lost on appeal to the Michigan Supreme Court. Judge Thomas Cooley’s 1875 decision included: “We supposed it had always been understood . . . that education, not merely in the rudiments, but in an enlarged sense, was regarded as an important practical advantage to be supplied at their option to rich and poor alike, and not as something . . . to be brought . . . within the reach of those whose accumulated wealth enabled them to pay for it. . .” (Cubberley, 1920). The distinction between rich (professional class) and poor (common class) was clear. The Kalamazoo Case established the legality of collecting taxes to support Michigan high schools. The case established a precedent and was cited in other states to justify collecting taxes to support public high schools.

The Fight for Publicly Funded Agricultural Universities

As with many historical events, the story told regarding the Morrill (Land Grant) Act of 1862 depends on who is doing the telling (Campbell, 1995; James, 1910; Lee, 1963; Martin, 2001; Nevins, 1962; Simon, 1963; Williams, 1991; Wrone, 1998). According to Nevins (1962), the first public suggestion for U.S. agricultural colleges originated with Simon DeWitt. DeWitt wrote in 1819 “There are now thousands of wealthy citizens in this state who do not know what to do with their sons. In the first place, without any determinate object in view, they give them a liberal education, or rather, they send them for four years to a college to obtain the reputation of having a graduate’s diploma, and so much instruction in the dead languages and the ordinary sciences as they are compelled or disposed to attend to; after that there are only three professions from which ordinarily they are to choose their means of living and rising into consequence — law, physic and divinity; but so great are the numbers of young gentlemen destined for those professions, that their prospects are truly dismal. . .” (DeWitt, 1819, pp. 3–4).

DeWitt suggested establishing The Agricultural College of the State of New York. “Its primary object should be to teach the theory and practice of agriculture, with such branches of other sciences as may be serviceable to them. . .” (DeWitt, 1819, p. 26). While DeWitt argued for an agricultural college, his vision was of an agricultural college to serve the sons of the professional class. DeWitt did not envision an agricultural college for commoners. He did not challenge what may have been conventional wisdom among the professional class that “. . .nine out of ten human beings were sentenced by God or nature to lives of grinding poverty and toil. . .” (Nasar, 2011, p. 461).

Jonathan Baldwin Turner is credited by some with the original idea for publicly funded teaching and research agricultural and mechanical colleges for all citizens. Turner used the phrase “industrial class.” Turner was born into the professional class. He studied Latin, Greek, and classical literature at Yale. Yale, as with most other U.S. colleges at the time, was a religious school whose mission was to educate men (not women) to become professionals, that is, preachers, missionaries, teachers, lawyers, and physicians. After Turner graduated from Yale in 1833, he accepted a faculty position at Illinois College in Jacksonville. Illinois College was also a private church affiliated liberal arts institution. Turner became a professor of Belles-Lettres, Latin, and Greek.

Turner developed a reputation as an effective instructor. According to one story, two of Turner’s students tutored Abraham Lincoln when Lincoln was working as a farm hand for

their family. In addition to being effective, he was controversial. Turner was an outspoken abolitionist. He was also known to criticize his denomination; he was a rabble rouser. Eventually, he was accused of inappropriately politicizing the classroom and left the college in 1847. Very likely, his choice was to either leave or be fired. Turner stayed in Illinois. He farmed and became an evangelist for establishing state supported university level training for the "industrial class" (commoners).

Turner sought out opportunities to describe his plan. The historical record notes major addresses to the Illinois Teachers Institute (1850), the Illinois Industrial League (1851), and a Buel Institute convention of farmers (November 18, 1851). The plan was formally proposed at a meeting (or convention) organized by the Buel Institute. The institute was an association organized in 1846 and was made up of farmers from six central Illinois counties. They sponsored the 1851 convention that drew farmers from across the state of Illinois, "...to take steps toward the establishment of an agricultural university..." (Turner, 1851). The convention was designed to provide a forum for Turner to present his plan for an "Industrial University" of Illinois. Rather than the traditional curriculum that included the study of Latin and Greek, Turner (and others) advocated for a college that would address the practical concerns of life and issues that could benefit farmers and other citizens of the industrial class. Turner wrote "...we do not really need over one professional man (religion, law, medicine, science, art, and literature) for every hundred leaving ninety-nine in the industrial class..." (Turner, 1851, p. 7).

The agricultural colleges envisioned by Turner were to include sufficient land to enable agricultural experiments. He wrote that, "...there should be connected with each institution...a sufficient quantity of land of variable soil ... for annual experiments..." "...(P)rofessors should conduct, each in his own department, a continued series of annual experiments...". The plan also called for experiments on all modes of "...crossing, rearing and fattening domestic animals..." (Turner, 1851, p. 9). In other words, the proposal included a plan for establishing and managing agricultural experiment stations.

Turner's plan was printed and widely distributed. Versions were printed in farm magazines and newspapers across the country. *The New York Tribune*, the nation's most widely circulated newspaper at the time, included a version. A *Tribune* editorial advocated in support of using public lands to provide higher education, "...for the sons and daughters of farmers, mechanics and laborers..." (September 4, 1852) (James, 1910).

Along with the support was also strong opposition to the plan (Wrone, 1998). Some newspapers editorialized against what they viewed as a waste of public lands and public money. Many farmers were also against Turner's plan. They knew that they did not have to attend college to learn how to farm and thought it would be foolish to do so. College would enable sons to avoid the practical work that they should be doing on the farm. Some local citizens expressed their "thanks" to Turner for his innovative idea by burning his barn and outbuildings (Wrone, 1998).

Turner was undeterred and continued to lobby. He lobbied both Abraham Lincoln and Stephen Douglas while they were competing for a seat in Congress. While how much influence Turner's lobbying had on Vermont Congressman Justin Smith Morrill, who drafted and introduced the legislation, is not clear, Turner did provide the writings that included the plan to Morrill (Williams, 1991, p. 204). In 1857, Morrill submitted a bill to Congress. The bill did not make it out of committee. In 1858, Morrill resubmitted the bill. It failed to gain sufficient votes in the House. In 1859, Morrill again resubmitted the bill. It narrowly passed both houses but President Buchanan vetoed the bill.

Opposition to the bill was from groups that objected to the funding mechanism. Use of land grants to support public projects can be traced back to Roman times. The net effect of granting federal lands would be to increase the quantity of land in private hands. In the aggregate, this increase in quantity was expected to reduce land values across the country. In addition, making more land available to the private sector would provide opportunities for would-be factory workers to migrate west and become

farmers. Some representatives objected to losing potential factory workers. Representatives from the South objected to increasing the population of regions of the country that might support non-slave states. As with many pieces of potential legislation in the decades prior to the Civil War, the real issue was slavery. The slave states feared that the land grants would benefit proponents of abolition relatively more than proponents of slavery. Buchanan's stated reason for vetoing the bill was that he thought it was unconstitutional. However, Buchanan did not want to upset the very tenuous balance that might lead to a Civil War. Because his position could have been anticipated, some who voted for the bill may have done so even though they did not support it.

The Great Mutation

Lincoln was elected President on November 6, 1860 and inaugurated on March 4, 1861. Between December 20, 1860 and June 8, 1861, 11 states seceded from the Union and relinquished their votes in the U.S. Congress. On April 12, 1861, the Civil War began. The crisis and change in the relative makeup of Congress opened the door to the passage of legislation that had been debated for years. Legislation passed and signed during the next three months forever changed the face of U.S. agriculture. On May 15, Lincoln established the U.S. Department of Agriculture; on May 20, Lincoln signed the Homestead Act; on July 1, Lincoln signed the Pacific Railway Act; and on July 2, 1862, Lincoln signed the Morrill (Land Grant College) Act.

Even with the change in the makeup of Congress, Morrill did not have an easy time channeling his bill through the system. The phrase, "including military tactics," was added to the 1862 version of the bill. The House version of the bill was sent to a committee chaired by a representative who did not support the legislation, and the committee recommended that the bill not be approved. Supporters tried to override the committee report on the House floor, but they were defeated.

An identical version of Morrill's bill was introduced in the Senate by Franklin Wade of Ohio. It was sent to the Senate Committee on Public Land. The Committee supported the bill. It passed the Senate and was sent to the House. Morrill called it up on the floor for debate and vote, effectively bypassing the House committee who could then not block it by procedural methods. Wade's bill was passed by the House, was signed by Lincoln on July 2, 1862, and has since been known as the Morrill Land Grant Act.

Wade supported the bill because, "...the thoroughly educated, being most sure to educate their sons, appeared to be perpetuating a monopoly of education inconsistent with the welfare and complete prosperity of American institutions...." (Campbell, 1995) Once again, the class distinction was very clear as well as the intuitive understanding of the external consequences of restricting higher education.

The 1862 Morrill Act offered states too much to refuse but too little to establish and operate an agricultural college. It opened the door. It did not encounter the anticipated constitutional challenge and thereby reinforced a precedent for public support of higher education. However, it did not provide means for sustainable funding. Legislation that followed, including the 1887 Hatch Act, the Morrill (Agricultural College) Act of 1890, and the 1914 Smith-Lever Act were all essential for the development of the system that evolved. The 1994 Elementary and Secondary Education Reauthorization Act authorized tribal colleges as land-grant colleges.

Several decades passed between the time Turner presented his original proposal and tangible benefits from the original investments were forthcoming. Eventually, research findings were extended by land grant institutions to help reduce the "grinding poverty and toil" encountered by many in my parents' generation. Over time, land grant universities became established sustainable institutions. Departments and the profession of agricultural economics evolved from the great mutation of 1862. The consequences of investing public funds in higher education and agricultural experiment stations and in opening higher education opportunities to the sons and daughters of all citizens have been enormous.

Performance

Huffman (2010) reports that during the 1970–2004 period, the marginal real rate of return to U.S. public agricultural research institutions that evolved in large part from the 1862 great mutation was approximately 50% (Huffman, 2010; Huffman and Evenson, 2006a,b).[4] Similarly, Alston et al. (2010) report an average benefit-cost ratio of 32 from investments in public agricultural research and extension. The record is impressive, but it does point out a sizable level of allocative inefficiency. A benefit-cost ratio of 32 is not likely to result from equating marginal social benefits with marginal social costs. By these measures, far too few resources have been allocated to agricultural education, research, and extension activities.

The level of investments in public agricultural education and research and extension institutions was less than the economically efficient level. The size of the economic pie is smaller than it could have been. Across the spectrum of scientific professions associated with agricultural research, agricultural economists are best equipped to explain and to provide the technical information for implementing public policies to address this issue. To date, these data suggest that we have done a less than optimal job. As a profession, we should be concerned greatly about these allocative inefficiencies. How much "...grinding poverty and toil..." persists not only in the United States, but around the world, as a result of our collective inability to effectively educate the public and our elected representatives about the existence of these market failures and the economically efficient fixes that are possible?

Call for Efficiency Seeking Behavior

A reasonable overarching goal of our profession is to improve the allocation of resources to increase the size of the economic pie. If all markets were successful, then all resources would flow to their best use, and the pie would be as big as it can be. But if all markets were successful, then we would have little reason to study microeconomics. Our challenge is to produce an educated citizenry that can differentiate between markets that can successfully allocate resources to their best use and markets that fail to do so (Doering, 2007). One very important goal of our curriculum is to teach the following:

> (a) If markets are successful, resources will flow to their best use, and the economic pie will be as big as it can be.
> (b) Some markets are not successful. They fail to allocate resources to their best use thus restricting the size of the pie.
> (c) Several factors (market power, externalities, public goods, asymmetric information) cause markets to fail to allocate resources to their best use.
> (d) In the case of market failure, if the expected benefits from government intervention exceed the expected cost, then appropriate well-designed intervention can be expected to increase the size of the economic pie.

This endeavor is not an easy task. Even though government intervention may result in everyone being better off, if a possibility exists that the relative position of one group may change, that group can be expected to fight the intervention (Frank, 2007).

For most college students, the only opportunity to explain the economic way of thinking and the pie-constraining consequences of inefficiency and of not collectively correcting market failures is in a principles class. Hansen, Salemi, and Siegfried (2002) found that the first course in economics has little impact on students. After six months, students who completed the principles class scored no better on economic literacy exams than cohorts who did not take the class. Arum and Roksa (2010) argue that the majority of college students learn very little during their first two college years, which evidently is not a new problem. According to Nevins (1962), in the early 1800s "the [Harvard] law and medical faculties gave their degrees to any man who had paid three term bills covering eighteen months and had not been irregular in

[4] Attavanich and McCarl (2011) suggest that these returns are overstated since the studies failed to account for the value of carbon fertilization of the atmosphere.

attending lectures. . .” (Nevins, 1962, p. 11). Nevins also reported that in 1870 “. . .written examinations are impossible in the [Harvard] Medical School. A majority of the students cannot write well enough. . .” (Nevins, 1962, p. 11).

Frank (2006) suggests that the reason students retain little from the traditional principles of economics course is because too many ideas and concepts are presented. Frank and Bernanke (2008) propose that the principles course be used to introduce and reinforce a limited number of core principles: scarcity; cost-benefit analysis; incentives matter; comparative advantage; increasing opportunity cost; equilibrium; and efficiency. It is difficult to limit the number of topics but “efficiency” is included on their short list.

Much of the tough work, the institution building, has been done by individuals that did not have an established body of theory to guide them. The task should be easier now than at any time in human history. Institutions have been established. Scientific professions exist. Our challenge is to develop and implement a system to educate not only our students, but the citizens at large.

Franklin, Jefferson, Adams, Jonathan Turner, Justin Morrill, and Franklin Wade were not aware of the economic theory that explains market failure and that government intervention is warranted to address the failure and increase the size of the economic pie for all. But, they had the common sense to recognize that in many cases markets fail to allocate resources to their best use. They intuitively understood that the private market did not allocate sufficient resources to education and research. They understood that it was efficient to tax ourselves to produce higher education and agricultural research. They had the courage to try to address the market failure, and in part, as a result of the great mutation of 1862, were successful in opening the doors of higher education to the masses. Why is it so difficult for us to teach what for them was intuitively obvious? Our profession is not immune from extinction. If we fail to actively engage in efficiency-seeking behavior, we may well become extinct. Rather than blame God or nature, the blame will more nearly lie with our inability to educate when we were provided the opportunity.

A reasonable goal for an economics principles class taught at a public university is that six months after completion, the students would be able to explain the economic theory that explains that taxing citizens to help pay for the class (a) was in the best interest of those who paid the tax, (b) was in the best interest of the students who completed the class, and (c) was expected to increase the size of the economic pie for society. If students leaving a principles class have learned only about successful markets, we have not only failed to solve the problem, we have created additional problems.

Epilogue

My mother, the salutatorian, and my father, the organic farmer, lived during a period of incredible change. For most U.S. citizens at the time, public-supported education was limited to grade schools. My parents benefited immensely from living in a system that permitted successful markets to flourish. They also benefited from actions taken decades earlier by Jonathan Turner, Justin Morrill, and Franklin Wade. These men and many of their colleagues intuitively understood that the private market did not allocate sufficient resources to higher education and agricultural research. They understood that it was efficient to tax ourselves to produce higher education and agricultural research. I am grateful that their actions opened the doors to higher education and rescued me and millions of others from lives of “grinding poverty and toil.”

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