Allied Academies
International Conference

New Orleans, Louisiana
April 7-10, 2004

Academy for Economics
and Economic Education

PROCEEDINGS

Table of Contents

THE INFANT-INDUSTRY ARGUMENT CIRCA l960-l965

Robert L. Brittingham, Christian Brothers University
rbrittin@cbu.edu
Sarah T. Pitts, Christian Brothers University
spitts@cbu.edu
Rob H. Kamery, Christian Brothers University
rkamery@cbu.edu

ABSTRACT

By the end of the 1950s, the notion that infancy served as a sufficient reason in itself to justify protection had been almost entirely discarded, replaced by an emphasis on economies external to the industry that would benefit all of society. This paper discusses the interest and analysis of the period 1960 to 1965.

INTRODUCTION

J.R. Black (1959) rejects infancy as a sufficient reason for protection, giving qualified approval of only two reasons for protection of new industries: first, if "...the government considers itself better able to forecast the future success of the industry, or to take a more long-sighted view about waiting for returns than the available entrepreneurs, but does not want to run the industry itself," and second, where there are possible external economies (p. 205). Gunnar Myrdal (1960) takes the same position when he states that already industrialized countries need no trade protection because economies external to the firm are a very small proportion of all economies (p. 204).

MURRAY KEMP--A DIFFERENT APPROACH

In a short but significant article, Murray Kemp took an entirely different approach by reexamining the earlier formulation of the infant-industry argument as presented by John Stuart Mill and modified by the cost criterion of Charles Bastable.

Kemp (1960) presents a model based on four assumptions: (1) factors of production are in perfectly elastic supply to the industry, (2) factor prices are constant in time, (3) abroad the industry is mature, that is, it has nothing further to learn from experience, and (4) all static economies and diseconomies are internal to the firm (pp. 65-66). It is essentially this fourth assumption which separates Kemp from others who studied infant-industry protection at that time.

Given these assumptions, the validity of the Mill-Bastable argument depends, according to Kemp, on the nature of the cost curve facing the firm. He discusses three cases. Kemp (1960) illustrates the case of static increasing costs (p. 66).

On a graph, the line WW' represents the minimum average cost of foreign firms, which is horizontal because of assumption (3), and DD' represents "...the time path of the minimum average

cost of domestic firms. Its downward slope reflects the basic assumption of the infant-industry dogma, viz., that the members of the infant-industry learn from experience" (Kemp, 1960, p. 66). At time to a tariff is set at an initial ad valorem rate of DW: to W, and it diminishes until it is eliminated at the time t1. The price path will then move somewhere between the limiting boundaries DD' and WW'. The precise location of this price path will depend upon the nature of the learning process, and here Kemp (1960) presents two alternative assumptions: "either the individual firm can learn only from its own experiences in production or it can learn only from the experience of other firms" (p. 67).

Under the first assumption, all of the benefits stemming from the early learning period t0t1 accrue to the infant firm. In this case, protection is by no means clearly indicated, for "...the prospect of later profit may be sufficiently attractive to warrant the shouldering of losses during the initial learning period" (Kemp, p. 66-67).

The situation is entirely different, however, under the second assumption, for here Kemp considers initial protection to be absolutely essential to the establishment of the industry. "No firm would be willing to shoulder the losses of the early learning period t0t1 if the lessons of its experience were fully and freely available to any follower" (Kemp, 1960, pp. 66-67). If some benefits derive only from a firm's own experience, while at the same time others come only from the experiences of others, some degree of protection would still appear to be justified in light of Kemp's analysis, though he does not discuss this possibility.

MICHAEL FABER AND A.P. WALSHE--OLDER ECONOMIC DOCTRINES

Michael Faber and A.P. Walshe also examined older economic doctrines, but in the context of their own underdeveloped African economies. Faber directs himself to the question of whether the classical theory of international trade is applicable to underdeveloped economies. As Faber views it, the essence of the classical theory is that the principle of comparative economic advantage implies that "the smaller the barriers placed in the way of the free interchange of goods, the greater would be the overall advantage to all the nations of the world, considered collectively" (Faber, 1960, p. 15). Faber answers his question in the negative, because of his belief that the major assumptions, whether stated or implied, underlying the classical theory do not hold in underdeveloped economies. Faber presents four such assumptions:

1. The assumption that all factors of production are normally, in the equilibrium situation, fully employed.
2. The assumption that international demand for the country's leading exports is infinitely elastic.
3. The assumption that it is physically possible to expand the production of the country's exports, while recognising that the law of diminishing marginal returns is likely to come into operation.
4. The assumption that it is broadly possible to switch most factors of production between different productive uses (Faber, 1960, p. 15).

Commenting on the first and fourth assumption, Faber states that "…as long as involuntary under-employment exists, there is a prima facie obligation upon the government to take whatever action is needed to bring the unemployed factors into useful production" (Faber, 1960, p. 16). Where these four assumptions do not hold (and Faber would say they do not in most underdeveloped economies), this aspect of the classical theory must be discarded. Faber emphasizes that this does not imply that it should be replaced by a general theory of protection. He believes that individual economies are so unique that no general theory is particularly useful, and argues that "...for every separate economy, at each different time period, we need a distinct model" (Faber, 1960, p. 16).

In a later comment on Faber's paper, Walshe discusses the elements which might be common to most models of specific underdeveloped economies. Walshe believes that comparative costs are not an important consideration because of underemployment; what is valid is what he calls the Young Economy Argument for Tariffs. Once the economic structure begins to change, however, and unemployment declines, protection might best be confined to specific infant industries (Walshe, 1960, pp. 76-78).

The above doctrine is pure Friedrich List in its emphasis on the different stages of development of any economy and the impossibility of developing a general theory that is applicable in all stages of development. Moreover, the description of the levels of development calling successively for general protection, modified protection, and then ultimately free trade approximates List's analysis.

Whether what remains when this purely relativistic approach is followed is economics or politics is not entirely clear. The approach is not without its economic usefulness, however, for it forces an examination of the assumptions underlying a particular theory, and it is frequently the assumptions that merit investigation, rather than the theory itself.

HOLLIS CHENERY--COMPARATIVE COST CONCEPT AND GROWTH THEORY

Hollis Chenery also concerns himself with the relationship between the comparative cost concept and growth theory, and he finds the source of conflict to be the underlying assumptions. As Chenery views it, the classical theory, with its emphasis on static equilibrium, is not applicable to underdeveloped countries, which require a growth theory that is essentially dynamic (i.e., involving an economy which neither aims at nor attains equilibrium in the relevant time period).

Where these assumptions hold, states Chenery (1961), "Market forces will not necessarily lead to optimal investment decisions because present prices do not reflect the cost and demand conditions that will exist in the future" (p. 196). Market forces, therefore, need to be implemented, and Chenery recognizes his second assumption as suggesting infant-industry protection as such an implementation:

> The possibility of rising efficiency as labor and management acquire increasing experience in actual production has long been recognized and forms the basis for the infant-industry argument.
> Chenery does not agree, however, with those who take it for granted that this rising efficiency of labor and management will occur only in an industrial context. On the contrary, Chenery believes that when the attempt is made to measure comparative advantage over time (and such measurement must be made when rationally attempting to substitute policy decisions for market forces), it may well be that "…there is often as much scope for technological improvement in agriculture as in industry" (Chenery, 1961, p. 199).

KENNETH ARROW--EXTERNAL ECONOMIES INTO RIGOROUS MODELS

Modern proponents of some form of infant-industry protection removed the fourth assumption of Kemp (1960) that "all static economies and diseconomies are internal to the firm" (P. 68), finding the primary rationale for temporary protection to be the existence of external economies; however, these external economies are usually described only in general terms, such as the development of skilled labor or the acquiring of experience. Until Kenneth Arrow's 1962 article, "The Economic Implications of Learning by Doing," no attempt had been made to incorporate such external economies into a rigorous model where their precise economic effects could be analyzed. It is such a model-building project which Arrow (1962) undertakes, and even though his article makes no mention of the infant-industry argument, it is nonetheless of no small importance in the development of the concept because of the aforementioned close relationship between modern infant-industry arguments and external economies (pp. 155-173).

According to Arrow, previous analyses of the production function treated knowledge or experience as an exogenous variable, a situation that he does not consider realistic. His article is an attempt to treat changes in knowledge as an endogenous variable in a model analyzing "intertemporal and international shifts in production functions" (Arrow, 1962, pp. 155-173).

Arrow's hypothesis is "that technical change in general can be ascribed to experience, that it is the very activity of production which gives rise to problems for which favorable responses are selected over time" (Arrow, 1962, p. 155). In selecting an economic variable which represents experience, he takes "cumulative gross investment (cumulative production of capital goods) as an index of experience" (Arrow, 1962, p. 156). Another problem in constructing a formal model involves specifying where learning precisely affects the production function. In Arrow's model, technical change is assumed to be "...completely embodied in new capital goods. At any moment of new time, the new capital goods incorporate all the knowledge then available, but once built their productive efficiency cannot be altered by subsequent learning" (Arrow, 1962, p. 157).

There are simplified assumptions, among them, first, "...that the production process associated with any given new capital good is characterized by fixed coefficients, so that a fixed amount of labor is used and a fixed amount of output obtained; …[second]...that the new capital goods are better than old ones in the strong sense that, if we compare a unit of capital goods produced at time tl with one produced at time t2 t1, the first requires the cooperation of at least as much labor as the second, and produces no more product; ...[third]...that capital goods have a fixed lifetime." (Arrow, 1962, p. 157). Arrow then constructs his model. What is significant to our discussion is that the model shows the divergence between private and social product, which had

been argued less rigorously by previous economists. In Arrow's model, a given new investment is associated with a production function which is constant over time; however, this investment makes possible a later investment which will have a higher production function. In Arrow's words: "…the presence of learning means that an act of investment benefits future investors, but this benefit is not paid for by the market. Hence, it is to be expected that the aggregate amount of investment under the competitive model...will fall short of the socially optimum level" (Arrow, 1962, p. 168).

The implication is clear: something rather than competitive forces is needed to enable an economy to achieve the socially optimum level of output. The model possibly overstates this conclusion because of its underlying assumptions. It is possible that technological change could be embodied in more highly skilled labor as well as in new capital goods, so that the owner of the older capital goods could still share in the learning experience. Arrow himself admits that it is probably unrealistic to assume that "no learning takes place in the use of a capital good once built" (Arrow, 1962, p. 172). Nevertheless, the altering of these assumptions would affect only the degree of non-competitive intervention in the market and would not alter the basic necessity of such intervention. Arrow thus provides the advocates of infant-industry protective tariffs, as well as advocates of other forms of protection, with their strongest theoretical support.

The model constructed by Arrow allows for a rational and economically justifiable intervention in the market, but Arrow makes no attempt to analyze the possible nature of this intervention. Most of the debate over infant-industry tariffs had been in the context of the larger debate between protectionists and the advocates of free trade, but from the early 1960s to the present the infant-industry tariff has become the subject of debate within what may be called the interventionist school, as questions have been raised as to the best means of achieving the goals which cannot be reached in a purely competitive market.

CONCLUSION

During this period studied, two significant conclusions can be drawn. First, assumptions that appear eminently logical and universally valid may not be so. Second, any attempt to devise a theory of development for an underdeveloped economy should include the psychological makeup of entrepreneurs as an endogenous variable. Since it would be difficult to incorporate this into a formal theory, perhaps the best that can be done is to be aware of these psychological factors when devising a development plan. If this is done, then it appears that the limits within which infant-industry protection is economically justifiable must be extended well beyond those set up by most modern theories.

REFERENCES

Arrow, K.J. (1962). The economic implications of learning by doing. *Review of Economic Studies, 29*(6), 155-173.

Black, J.R. (1959). Arguments for tariff. *Oxford Economic Papers, 11*(6), 191-208.

Chenery, H. (1970). Comparative advantage and development policy. *Economic development, readings in theory and practice*. Edited by T. Moran and G.W. Betz. Belmont, CA: Wadsworth Publishing Company. Article originally published 1961 in American Economic Review, 51(3), 18-51.

Faber, M. (1960). Is the classical theory of international trade applicable to under-developed economies. *East African Economic Review, 7*(6), 13-21.

Kemp, M.C. (1960). The Mill-Bastable infant-industry dogma. *Journal of Political Economy, 68*(2), 65-67.

Myrdal, G. (1960). *Beyond the welfare state: Economic planning and its international implications.* New Haven: Yale University Press.

Walshe, A.P. (1960). Further thoughts on the classical theory of international trade and the underdeveloped economies. *East African Economic Review, 7*(12), 76-79.

EVIDENCE OF A COMPENSATING WAGE DIFFERENTIAL FOR NFL STARS THAT PLAY ON ARTIFICIAL TURF

C. A. Dole, State University of West Georgia
cdole@westga.edu
Mary Kassis, State University of West Georgia
mkassis@westga.edu
Michael Raper, State University of West Georgia
mraper@westga.edu

ABSTRACT

Compensating wage theory claims that workers who are employed in riskier jobs receive a higher wage to compensate for this risk. Survey results from the NFL Players Association (NFLPA) showed that over 90% of players believed artificial turf was more likely to contribute to injury and shorten their careers. If players believe that they have a riskier job, they should negotiate for a higher salary. We use data for the top 25 highest-paid players for the 2000 - 2002 seasons to determine if they are compensated for their risk.

EXTENDED WARRANTY CONTRACTS:
TO GET OR NOT TO GET?

Martin Gritsch, William Paterson University of New Jersey
Gritschm@wpunj.edu

ABSTRACT

We have all been there: A salesperson has just gone through great lengths to convince us why we should buy a certain product, which often enough is partially based on the alleged superior quality of the product in question. As soon as you agree to purchase the product, you get asked the question: "Would you be interested in an extended warranty plan?" While this may seem annoying, it turns out that this question may not have an obvious answer.

It can be shown that under simplifying assumptions, a customer's expected payoff from buying an extended warranty will indeed be lower than if he/she had not purchased the additional coverage. This does not mean, however, that all customers opting for the extended warranty are ignorant or irrational. I derive conditions under which a perfectly informed rational customer's optimal action is to indeed purchase optional additional insurance coverage, which extends beyond the initial manufacturer's warranty. One issue, which plays an important role in these considerations, is the implicit interest rate, which is used to discount future payments. Another factor, which must be taken into consideration, is whether a consumer is risk-averse, risk-neutral, or risk-loving. Additionally, after a certain amount of time (which is individual-specific), having a product repaired is not as desirable as being able to replace it by purchasing a-presumably more advanced-product.

TEACHER SELF-EFFICACY AND PERFORMANCE IN ACTIVE LEARNING ECONOMIC EDUCATION WORKSHOPS

Robert F. Hodgin, University of Houston-Clear Lake
hodgin@cl.uh.edu
Roberto Marchesini, University of Houston-Clear Lake

ABSTRACT

As suggested in their prior research on personal economic teaching self-efficacy measurement, the authors report data on the workshop training sensitivity of the instrument designed to assess this newly recognized and important dimension of teacher effectiveness in economic education. Their recently validated psychological theory-based instrument measures the extent to which a teacher believes he or she has the capacity to affect student performance in economics. The prime determinant, among three others, of teaching self-efficacy is content mastery. Three elementary and intermediate public school teacher active learning 1.5 to 2.5 day workshops on economic concepts revealed significant improvements in both self-efficacy and performance. Economic understanding was measured by a 20-item true-false set of selected commonly misunderstood ideas in micro and macro economics.

One policy implication to be drawn from the results is that well structured active training seminars conducted by economic education councils need not be long or theoretically intense to generate measurable improvements in teacher self-efficacy and economic understanding. This set of workshop results must be replicated across similar active learning experiences and teachers of other grade levels to further substantiate the findings.

THE ESTABLISHMENT OF SANITARY LANDFILLS IN MISSISSIPPI: SOME VARIABLE FACTORS

Frank E. Hood, Mississippi College
fhood@mc.edu
Sarah T. Pitts, Christian Brothers University
spitts@cbu.edu
Rob H. Kamery, Christian Brothers University
rkamery@cbu.edu

ABSTRACT

Sanitary landfill technology offers municipalities in sparsely populated areas a possible alternative of solid waste disposal that is efficient and economical. The purpose of this paper is to establish the sanitary landfill as the most desirable technology for use in Mississippi and to briefly review three alternative methods of sanitary landfill development.

INTRODUCTION

Historically, solid waste has been accumulated in large concentrations, placed in rather secluded areas, and left to the forces of nature, which were supposed to reduce the refuse heap back to the natural elements contained in organic matter. So long as the collection of refuse was conveniently located out of sight, the residents of a community were content with this short-run solution to the problem of solid waste management. However, the forces of nature are usually unable to keep pace with the growth of refuse heaps. The result becomes a public health crisis caused by rodents, insects, air pollution, and water pollution. Both animals and humans are known to scavenge through the refuse for edible materials, which increases the probability of disease. Without proper technology, this refuse heap produces more problems than solutions in the long run.

THE OPEN DUMP

The open dump is probably the oldest method of solid waste disposal. An open dump (hereafter called an open dump or a dump) is a land disposal site where solid wastes are accumulated in uncovered piles with little or no regard for health problems, pollution, aesthetics, or economic losses.

Open dumps may be found almost anywhere. Land that has little or no value for private use can be used as the recipient for all types of refuse. Streambeds and banks, roadsides, and abandoned lots usually become prime candidates to receive the cast-off residue of the surrounding population. Open dumps contain all types of solid waste, including abandoned automobiles, old tires, foodstuffs, the decaying bodies of animals, and all of the remnants of consumption. Unfortunately, these

concentrations also provide food and shelter for rodents, flies, and other unwanted pests. In addition, dumps give rise to and further air and water pollution.

In many cases, open dumps appear to be in a constant state of turmoil. Fires started either to reduce the size of the refuse accumulation or to drive off rats and other pests burn incessantly. Burning does little either to reduce the size of the solid waste or to disrupt the lifestyles of the dumps' rodents and flies. Fire usually burns only the packaging surrounding organic matter, thus providing the rats and flies with easier access to the available foodstuffs. Fires also contribute to air pollution and provide a source of noxious odors from burning, decaying organic matter.

Open dumps provide a multitude of health hazards. All too often scavenging is permitted in and around open dumps. Uncovered sharp objects, diseased organisms, and fires present hazards to people or animals that roam open piles of refuse and seek either food or usable items.

Foodstuffs gathered in dumps to be fed to domestic animals may present a very serious health problem. Decomposition usually renders any food substance unfit for human consumption, but this same foodstuff may appear to be fit to feed to swine or other domestic animals. However, pathogenic organisms and toxic chemicals may cause harm to society through spoiled meat that results from animals fed with scavenged foodstuffs (Brunner, Hubbard, Kekker & Newton, 1971).

OPEN DUMPS AND SOCIAL COST

While it is impossible to measure the aesthetic damage resulting from open dumps, the scenic products of this method of waste disposal are quite evident to the community. The landscape is ruined by the accumulation of rusting metal, and burning organic matter provides smoke pollution. As long as the solid waste disposal methods of the community are hidden from view, there is little or no public reaction to the environmental damage caused by open dumping. However, once the environmental damage becomes obvious through polluted streams, a hazy atmosphere, or scenic blight, there is generally a public outcry for a more acceptable alternative method of solid waste disposal. The public literally stumbles on to the environmental damage by expanding population concentrations. Areas once well adapted for open dumping because of their seclusion or remoteness quickly become unsuitable as population expands geographically into the sphere of influence of accumulated solid waste. With the realization that the usage of an open dumping system of solid waste disposal costs society in land and living comfort, society will demand a cessation to this type of refuse disposal.

Open dumping appeared to provide an economical and relatively trouble-free method of solid waste disposal in an earlier period of U.S. history. However, the use of open dumps in modern society represents an anachronism that is too costly both economically and socially. Because of the realization by the public concerning the significance of the solid waste problem, open dumping may cease to be a problem of national significance. The public should demand alternative methods of solid waste disposal even in remote areas in order to protect the environment and the lives and health of the citizens.

SANITARY LANDFILL TECHNOLOGY

Theoretically, the landfill can be defined as the ultimate disposal of residue from all refuse reduction processes. However, the term landfill itself generally refers to the disposal of non-putrescible, non-incinerable solid waste when alternative disposal methods are available. Since the inputs of the landfill neither burn nor decompose, this type of disposal can be accomplished with few precautions. The accumulations are spread and then covered with a suitable cover material. The residue from incineration or construction projects is suitable for the landfill technology.

The sanitary landfill consists of dumping refuse in a selected area where the solid waste is compacted in a cellular construction and covered with earth (Master plan for solid waste collection and disposal tri-parish metropolitan area of New Orleans, 1969). For the purposes of this paper the terms landfill and sanitary landfill are considered synonymous, as there is no feasible alternative technology to consider, such as incineration. Although the sanitary landfill has been used for centuries, it was not until this century that the sanitary landfill achieved the official sanction of municipalities as a serious replacement for the open dump (Master plan for solid waste collection and disposal tri-parish metropolitan area of New Orleans, 1969).

PUBLIC HEALTH AND SAFETY

Unfortunately, the public often misconstrues the sanitary landfill as an open dump. The inefficient operation of many sanitary landfills tends to provide an abundance of evidence to lend support to the general public's misconceptions, and only a small portion of the total solid wastes accumulated are disposed of through sanitary landfill technology. The problem is further complicated by the fact that according to a 1968 national survey, 94 percent of all landfill disposal projects fall short of complying with all criteria for fully acceptable operations for sanitary landfills (Municipal refuse disposal, 1970).

The U.S. Public Health Service, in conjunction with the American Public Works Association, has established standards by which sanitary landfill operations can be classified:

1. Class A: Operated without public nuisance or public health hazard covered daily and adequately.
2. Class B: Operated without public nuisance or public health hazard, but location permits burning of certain types of waste, or covering of fill only three times weekly.
3. Class C: Operating techniques permit development of public nuisance and potential public health hazards, such as vector breeding and odors. Class C is actually an open dump regardless of what city officials decides to call this type of system (Municipal refuse disposal, 1970).

Both the Mississippi State Board of Health and the Department of Health, Education, and Welfare are prone to disregard the above classifications. Governmental agencies of this type would prefer to have only two classifications, a landfill or a dump. Any solid waste system that could meet the requirements established by the "A" classification would be considered a sanitary landfill. If a disposal system fell into either the "B" or "C" classification, it would be considered a dump and attempts would be made either to close it or to convert it. Although an efficient sanitary landfill is

the objective of every municipality in Mississippi, the rejection of the previous classifications for lack of merit is probably a little impractical. Further study reveals that with few exceptions, municipal solid waste operations in Mississippi are dumps. The use of the classifications could provide the municipalities with a greater degree of flexibility in their efforts to solicit more cooperation from state officials in achieving successful landfill operations; if this classification is not used, the only alternative is a get it right or else attitude on the part of state officials. Some of the disposal operations in the state could deviate from the pure definition of the sanitary landfill because of their seclusion from population concentrations. Also, a sliding scale of correctness could provide municipalities with some measure as to their progress toward the establishment of an efficient landfill operation.

State and federal agencies should recognize the value of the previously suggested classifications in their evaluations of dumps and landfills. Realistically, as noted previously, almost all of the landfill operations currently in operation fall short of the definitional standards of a sanitary landfill.

SITE SELECTION

The selection of a site for a proposed sanitary landfill must be made with respect to political, social, and economic factors. Proper consideration of these factors aids in the avoidance of possible economic and legal difficulties and helps to provide adequate social considerations. Theoretically, provision for the sanitary landfill should be made in the comprehensive city plan. However, in Mississippi the problem is largely one of improving existing landfill facilities. The same political, social, and economic factors that aid in the site selection apply to the conversion of an existing facility to a modern sanitary landfill.

Generally, between one and two and one-half acres of land or more should be available for each 10,000 persons that will be served by the sanitary landfill (Standards and Guidelines for Sanitary Landfills, 1971). A well-planned landfill will provide adequate room for growth and emergency conditions. Planning of the landfill size should be based on community needs and growth patterns for a 20 year period. In Mississippi, the transition from open dumps to sanitary landfills must include the accommodation of more than 1,900 pounds of solid waste per person per year, or an average of 5.5 pounds per person per day (Personal statement, V.T. Hawkins, Director of Solid Waste Planning, Mississippi State Board of Health, Jackson, MS, April 30, 1971).

Sanitary landfill site selection is influenced by existing collection systems, density of population in the geographical areas served, expected growth of the municipality, and many other related factors. The site should be located in close proximity to the major source of waste generation, which is usually considered to be the center of the city. If the landfill is located fairly close to the center of the city, the hauling cost will be minimized.

Landfills located inside the city limits of various municipalities have been operated successfully. Generally, 15 to 30 mile round trip is considered maximum for economical operation (Standards and Guidelines for Sanitary Landfills, 1971). All of the landfills operated by municipalities surveyed were located within the 15 to 30 mile round trip guideline. To be sure, the primary factor in site selection is economic; however, social factors may force the location of a landfill in a less economical area.

ALTERNATIVE METHODS OF SANITARY LANDFILL DEVELOPMENT

There are basically three types of sanitary landfill operations that may prove useful in the Mississippi situation: the area landfill, the trench landfill, and the slope landfill. The first type, the area sanitary landfill, is one of the most common types of landfill operations. Solid waste accumulations are scattered and compacted by a bulldozer or similar equipment and then buried by an earth cover. This type of landfill is best suited for flat areas, gently rolling slopes, and quarry fills. Cover material is either hauled from outside the landfill area or obtained from adjoining areas.

The second type, the trench method, derives its name from the practice of depositing the solid waste accumulations in previously excavated trenches, spreading and compacting the solid waste, and covering the waste with the earth that has been removed from the trench. The trench method is suitable for flat land and should not be used when water tables are present near the ground surface. The main disadvantage of the trench technology is that more than one piece of equipment is often necessary to complete landfill operations.

The third type of sanitary landfill, the slope method, consists of depositing solid waste on the side of an existing slope. After the refuse is spread in thin layers, it is compacted and covered with an earth cover. This type of landfill operation is generally suited to all areas. The slope can be constructed from existing piles of covered refuse or from hill terrain, such as gullies, and can be easily adapted to many situations. The major advantage of the slope method is that only one piece of equipment is needed. The empirical data illustrates that Mississippi can make excellent use of the slope method to reclaim marshes, gullies, quarries, and other areas normally considered as useless.

DESIGN OF THE SANITARY LANDFILL

Solid waste should be compacted to conserve space and to facilitate disposal. Compressed layers of refuse should be less than two feet thick. The refuse is compacted and covered forming a cell of refuse and earth, thus allowing a greater overall depth by placing these cells one on top of the other. The recommended height of these compressed cells is about 10 feet, although some large operations have used up to 30-foot depths (Standards and Guidelines for Sanitary Landfills, 1971). By maintaining a similar depth on most operations, a standardization of cell construction is produced that will aid in accomplishing a smooth finished surface.

CONCLUSION

Mississippi operates a large number of open dumps at the expense of public health and general well being. The problem is to determine an efficient alternative to open dumping that will allow municipalities the use of available technology and that will not place an excessive financial burden on the public sector. The Mississippi State Board of Health is attempting to convince municipalities that the sanitary landfill is an acceptable alternative to open dumping. The sanitary landfill offers a methodology that can be implemented by almost any city in Mississippi. Little equipment is necessary and the landfill technology requires only modest capitalization as opposed to the significant capitalization of incineration.

REFERENCES

American Public Works Association (1970). Municipal refuse disposal. Chicago: Public Administration Service.

Brunner, D., S.J. Hubbard, D. Keller & J. Newton (1971). Closing open dumps. Cincinnati: Environmental Protection Agency, 2-5.

Standards and Guidelines for Sanitary Landfills (1971). Division of Solid Waste Planning. Jackson, MS.

MISSISSIPPI'S MOST ECONOMICAL TECHNOLOGY FOR THE DISPOSAL OF SOLID WASTE ACCUMULATIONS: THE SANITARY LANDFILL

Frank E. Hood, Mississippi College
fhood@mc.edu
Sarah T. Pitts, Christian Brothers University
spitts@cbu.edu
Rob H. Kamery, Christian Brothers University
rkamery@cbu.edu

ABSTRACT

This paper provides evidence that the sanitary landfill represented the most economical technology for the disposal of solid waste accumulations in Mississippi in the 1970s. Existing sanitary landfills in Mississippi were experiencing economies of scale with present operations in the early 1970s and indicated the need for the expansion of current facilities rather than the adoption of a more expensive alternative technology. In addition, this paper illustrates the methodology used to calculate economies of scale and to project solid waste generation from 1970 to 1980. These solid waste projections supplied the evidence illustrating that the growth of solid waste in the state was not going to reach critical proportions during the 1980s.

INTRODUCTION

Solid waste, the result of production, consumption, or the action of governmental units, is an externality provided by the everyday actions of economic units. If it were not for the unpleasantness of the externality of solid waste accumulations, there would be little need for disposal actions on the part of local governmental structures. Unfortunately, the externalities of solid waste present threats to public health through air pollution, water pollution, and aesthetic damage, and they represent reasons why society must bear the cost of the externality of refuse. Society either pays for the disposal of solid waste efficiently through the action of the public sector or inefficiently through payment for the negative externalities of solid waste generation through lower levels of public health and environmental damage. Society cannot escape the costs associated with solid waste generation by either method.

The passage of the Solid Waste Act of 1965 and the Resource Recovery Act of 1970 indicated that the problem of solid waste management was reaching critical proportions in many areas of the U.S. The Department of Health, Education, and Welfare, and later the Environmental Protection Agency (EPA), was given the responsibility to encourage research and innovation in the area of solid waste disposal. The gravity of the solid waste problem is best illustrated by the

increase in federal funds available for solid waste projects. Only $7 million was allocated in 1965, while $426.7 million was made available in 1970.

METHODS OF SOLID WASTE DISPOSAL EMPLOYED IN THE U.S. (1970s)

Three methods of solid waste disposal are presented below.

1.   Incineration, which changes the form of matter and reduces its volume to a more manageable size, is the major alternative to the sanitary landfill. The incinerator offers some hope for technological change that may be useful in the future for solid waste disposal. Incineration technology to aid in resource reclamation and power generation is currently being used in several pilot projects. These projects represent possible solutions for future refuse disposal, but they are not yet widely adopted because they have been in operation only a short period of time. No data as to the economic feasibility of these projects are available except from the producers themselves, hardly a logical reason for serious consideration of a technology of this type without further study.

2.   Resource reclamation, or recycling, represents the conclusion of the economic cycle: the used good flowing back to the producer for reuse. This study provided evidence that various programs of resource reclamation are economically feasible. The major obstacle to a program of resource recovery is the accumulation of usable refuse in quantity. Both the producers of aluminum and the producers of glass operate workable recycling programs, and both producers report difficulty in obtaining the raw material to operate their programs efficiently on a large scale. Recycling may provide a portion of the solution to the solid waste problem. In the early 1970s, recycling was not used on a very large scale. However, with technological improvement resource reclamation offers a possible answer to the problem of rapidly depleting natural resources and a source of possible municipal revenue to aid in offsetting the fiscal burden of solid waste disposal.

3.   The sanitary landfill technology consists of dumping solid waste in a selected area, compacting it, and covering it with a layer of earth. The sanitary landfill is an excellent technology for adoption in Mississippi. A sanitary landfill will ensure a high level of public health, low operating cost, and land reclamation. Mississippi's solid waste disposal practices consist predominantly of open dumps in the early 1970s. By expanding these dumps and reorganizing them into sanitary operations, municipalities can take advantage of the economies of scale available. The existence of economies of scale indicates that the expansion of current facilities will result in a decrease of long-run average cost by increasing the scale of operations.

The sanitary landfill provides Mississippi with a methodology that can be utilized without excessive capital expenditures. The landfill, when compared with alternative technologies, offers Mississippi municipalities the most economical method of efficiently disposing of existing solid waste accumulations. The capitalization required to establish a sanitary landfill is minimal when considered with alternative methodologies. Haul cost is not yet a prohibitive factor in Mississippi because no municipality presents what can be described as an urban sprawl. The land space

available for solid waste disposal activities is not yet prohibitive in cost, and the prospect of returning land of higher value for unused land provides additional incentives for landfill adoption.

SUGGESTIONS FOR IMPROVING SOLID WASTE DISPOSAL SYSTEMS

The major problem concerning solid waste system management in Mississippi today is the failure of many municipalities to utilize available equipment and resources to establish efficient solid waste disposal programs. The majority of the municipalities researched reported that they maintained the equipment necessary for the operation of a sound sanitary landfill.

The already established landfills in the Mississippi study have not yet fully realized the available economies of scale with their current operations. Most of the cities reported only moderate accumulations of refuse relative to the size of their disposal sites and the equipment available for use on landfill projects. The existence of economies of scale should serve as a motivation for municipal units to expand and improve current refuse disposal operations before considering alternative technologies. The solid waste generation projections provided evidence that the population growth in Mississippi would be relatively stable; thus, the cities had ample time to adopt efficient sanitary landfill technology before considering more expensive alternatives.

To deal with the solid waste problems facing Mississippi, this paper offers the following suggestions:

1.   Municipalities should adopt the objective of converting their unsanitary solid waste disposal operations into efficiently run sanitary landfills. Unfortunately, solid waste is often recognized as a problem only after refuse accumulations reach critical proportions. By establishing the sanitary landfill as a goal, municipalities can profit from the mistakes of larger population concentrations and avoid a solid waste problem of crisis proportions in the future. Municipalities can expect extensive technical aid from the Mississippi State Board of Health.
2.   The Mississippi State Board of Health should take whatever action is necessary to ensure that all sanitary landfills in the state meet basically the same criteria. The State Board of Health publishes a series of guidelines that are available to municipalities upon request. Standardization of landfill operations will help to ensure that municipalities will benefit from existing economies of scale.
3.   Both the State Board of Health and municipalities should agree to adopt a sliding scale to measure the progress, or lack of it, that a municipality is making toward the establishment of an efficient landfill. This paper suggests that the following classifications presented by the U.S. Public Health Service should work efficiently.

Class "A" landfills, or landfills by definition, would be operated without any trace of public nuisance, namely burning, water pollution, rats, flies, or other unpleasant factors. These landfills would follow the model of the sanitary landfill exactly; therefore, the class "A" landfill would be ideal for large municipalities with sizeable population concentrations.

Class "B" landfills would operate much the same as class "A" landfills, but with one exception: burning would be permitted in those areas which were considered rural and where no

significant nuisance factors would arise. The process of burning could aid in the disposal of large objects that otherwise might provide special disposal problems for the smaller landfill. Under no circumstance would water pollution be allowed with either the "A" classification or the "B" classification. Water pollution presents special problems by providing breeding places for insects or by causing pollution to community water supplies.

Class "C" landfills represent open dumps and are not to be tolerated. Any municipality found to be operating an open dump should be given a period of time to correct the situation or face possible court action.

The establishment of a sliding scale type of landfill measurement allows a degree of flexibility that will make the task of converting all of the unsanitary refuse disposal operations in the state into sanitary landfills much easier. Such a scale gives the small rural town the time necessary to convert to a sanitary disposal project by allowing the operation of a class "B" landfill until the town has the knowledge and finances needed to operate a sanitary landfill. An attitude of convert now or else by federal or state authorities will probably be met with a hostile reaction rather than the desired result of a sanitary landfill.

4.   Mississippi should enact legislation that will allow the Mississippi State Board of Health some type of police power over the problem of solid waste disposal. The effectiveness of the process of relying on the Air and Water Pollution Control Commission to enforce Board of Health standards is limited. The extent of the authority of the Air and Water Pollution Control Commission over the problem of solid waste is unknown. Therefore, the power to enforce solid waste decisions should be made clear and should rest with the agency that is most closely connected with these decisions.

5.   A system of record keeping must be required of all landfill operations.   There is no regulation requiring the maintenance of records by any refuse disposal operation. The collection of historical data was one of the major limitations of this study since there was none available. Municipalities cannot expect to be able to benefit adequately from any type of cost analysis without providing accurate records describing the daily activity of the sanitary landfill. Forms for accounting systems for the sanitary landfill may be acquired from heavy equipment manufacturers or the U.S. Public Health Service.

6.   All of the solid waste disposal costs are paid for out of the general fund of every municipality studied. Studies should be undertaken to determine the feasibility of a user price to pay for future solid waste disposal operations. Municipalities are going to find their general funds strained as solid waste disposal becomes more and more expensive. At some point, increased solid waste service will be possible only through a reduction of some other public service. The only way to expand the general fund without decreasing another service is by increasing taxes-- not a popular choice.

A user price is possible because solid waste disposal can be reduced to measurable units, namely tons, pounds, bags per household, and other measures. By implementing a user price type of tax, the persons who contribute the most to the solid waste accumulations will help to pay for their disposal.

7.   The following suggestion is possibly the most meaningful for future solid waste problems. Mississippi should consider the possibility of city and county consolidation of solid waste

disposal operations. Separate refuse districts, resembling the separate school districts, might be formed to achieve further reductions in duplications of refuse disposal functions. The larger operations could take fuller advantage of economies of scale that exist for solid waste disposal operations. One site could serve an entire area rather than just one city or county. Equipment cost could be reduced by reducing the number of idle vehicles that now operate only part-time on the various disposal sites in the state.

8.   The most efficient method of obtaining any goal that requires the aid of the general public is through the use of a well-planned program of public education. Mississippi should begin to include the use of public education in any comprehensive plan for solid waste disposal. A well-informed public is more likely to act in a manner that is desirable to the municipality than is an uninformed public that is susceptible to rumors and misrepresentations.

CONCLUSION

This paper introduced the problem of solid waste disposal in Mississippi to the academic community and concerned governmental officials. Only through realization of the complexity of the solid waste problem will the research that is necessary to produce solutions to the solid waste problem emerge and enable the state to cope with future problems of solid waste accumulation disposal.

REFERENCES

Brunner, D. (1971). Closing open dumps. Cincinnati: Environmental Protection Agency.

Drobny, N.L., H.E. Hull & R.F. Testin (1971). Recovery and utilization of municipal solid waste. Washington: Environmental Protection Agency.

Environmental Protection Agency (1970). *Plastic waste in the coming decade.* H.H. Connolly (Ed.). Washington: U.S. Government Printing Office.

Hanson, R. (1967). Politics and trash. Proceedings of the Surgeon General's Conference on Solid Waste. U.S. Public Health Service Publication No. 1729. Washington: U.S. Government Printing Office.

Mississippi State Board of Health (1969). Mississippi Health, a Monthly Bulletin of the Mississippi State Board of Health, April-May.

Mississippi State University (1971). Mississippi Statistical Abstract, 1971. State College, MS: Mississippi State University.

Prindle, R.A. (1967). Health aspects of solid waste. Proceedings of the Surgeon General's Conference on Solid Waste Management. U.S. Public Health Service Publication No. 1729. Washington: U.S. Government Printing Office.

Solid Waste Disposal Act (PL 89-272) § 202, Stat. 997 (1965), 42 U.S.C. § 3251 (1965).

Standards and Guidelines for Sanitary Landfills (1971). Division of Solid Waste Planning. Jackson, MS.

Standards and Guidelines for Solid Waste Storage and Collection (1971). Division of Solid Waste Planning, Jackson, MS.

U.S. Department of Commerce, Bureau of the Census (1971). 1970 census of population, Mississippi advance report, general population characteristics PC (V2)-26. Washington: U.S. Government Printing Office.

U.S. Department of Commerce, Bureau of the Census (1971). 1970 census of population, United States summary number of inhabitants. Washington: U.S. Government Printing Office.

U.S. Department of Commerce, Bureau of the Census (1971). Survey of current business. Washington: U.S. Government Printing Office, August.

U.S. Department of Health, Education, and Welfare (1970). An accounting system for incineration operations. U.S. Public Health Service Publication No. 2032. Washington: Environmental Health Service.

USING FREE COMPUTER ALGEBRA SYSTEMS IN UNDERGRADUATE ECONOMICS COURSES

Max E. Jerrell, Northern Arizona University
max.jerrell@nau.edu
James N. Morgan, Northern Arizona University
james.morgan@nau.edu

ABSTRACT

We suggest that a computer algebra system (CAS) can be used to reduce students reluctance to use mathematics in an undergraduate economics course. We recommend using a public domain CAS (Maxima) or one free for student use (MuPAD) to reduce cost to the student. We present an example using MuPAD to derive the demand for labor equation from a Cobb-Douglas production function. The example could be used for a class room demonstration or as the basis for a student project.

The Cobb-Douglas production function is

$$Q = AN^{\alpha}K^{1-\alpha}$$

where Q is the output generated using N hours of labor input and K units of capital input. In short run models only one factor of production is allowed to change. In most cases the variable factor is labor while capital is considered to be fixed. In what follows commands given to MuPAD are shown in small font type and are left justified. MuPAD responses are shown in small font type and are indented. This display is similar to that shown in a MuPAD session. The following commands specify values for the coefficients are used in this demonstration:

    K:=1: a:=0.5: A:=10:

The production function is written as

    Q:=N->A*(N^a)*(K^(1-a));

        N -> A*N^a*K^(1 - a)

The value of the production function if *N=10* is

Q(10);

        15.8113883

A plot of the production function is shown in Fig. 1. MuPAD plotting commands are a bit complex and are not shown here.
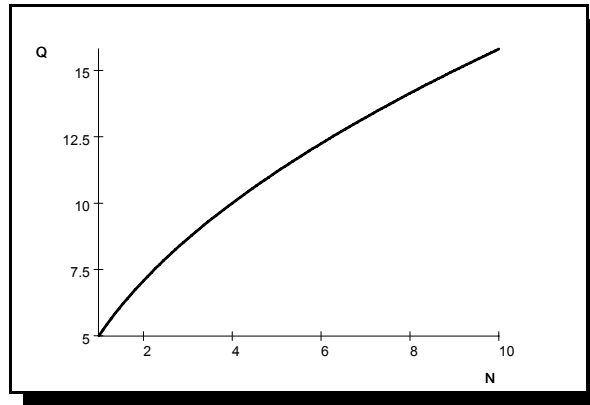
Figure 1. A plot of the production function

A plot of the marginal product of labor

$$Q'(N) = \frac{\Delta Q}{\Delta N}$$

is shown in Fig. 2.
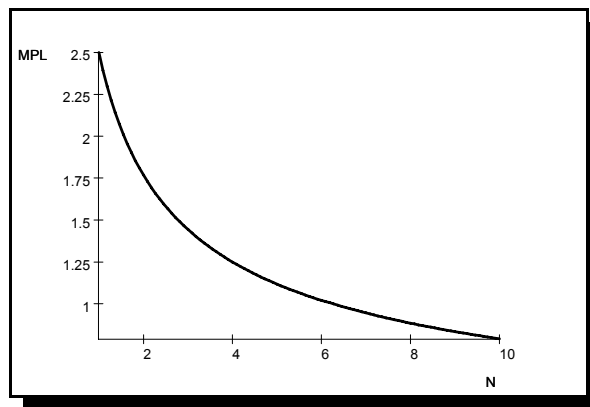
Figure 2. The marginal product of labor curve for the Cobb-Douglas production function. The marginal product of labor declines as more and more labor is used with the same fixed capital.

The profit maximizing condition for a competitive firm will be shown next. First define the profit function

assume(W>0): assume(P>0) :
profits:=N->P*Q(N) - W*N ;

N -> P*Q(N) - W*N

where *P* is the product price. A necessary condition for profit maximization is that

$$\frac{\Delta}{\Delta N}(\textit{profits}) = 0$$

ans:=profits'(N) ;

```
      2.5 P
      -----   -  W
        0.5
       N
```

Set ans to zero and solve for N gives the labor demand function

solve(ans=0, N) ;

```
              2.0
       6.25 P
        ---------
              2.0
          W
```

and if *W*=10 and *P* = 10 then *N* = 6.25.

W:=10: P:=10:
solve(ans=0, N) ;

```
          {6.25}
```

A plot of profits and the first derivative of profits can verify this is an optimal solution. This plot is shown in Fig. 3.Note that profits, the upper line, reaches a maximum at *N* = 6.25.
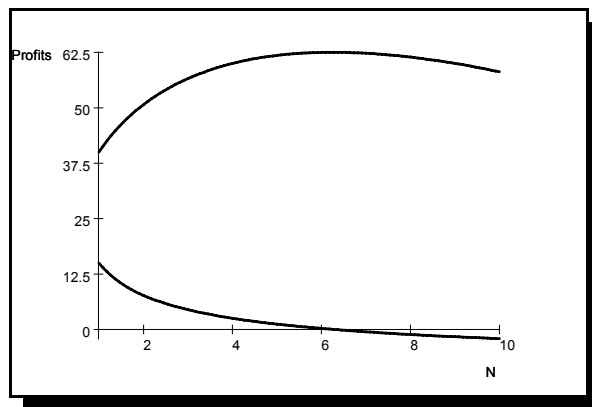
Figure 3. Profits(N) and profits'(N) shown as function of N. Note that profits are a maximum at N=6.25 and that profits'(N) is equal to zero at that value

Computing profits(N) and profits'(N) at values near 6.25 can also confirm this

profits(6.25); profits'(6.25);

62.5

0.0

profits(6.24); profits'(6.24);

62.49995997

0.008009612818

profits(6.26); profits'(6.26);

62.49996003

-0.007990412782

  A plot of the value of the marginal product, the wage rate (*W=10*) and profits as a function of the number of hours used is shown in Fig. 4. Note that the wage rate is equal to the value of the marginal product at N=6.25 which is the profit maximizing level of labor utilization for the firm. The plots are shown in Fig. 4. The upper line is profits, the downward sloping line is the value of the marginal product, and the horizontal line is the wage rate.
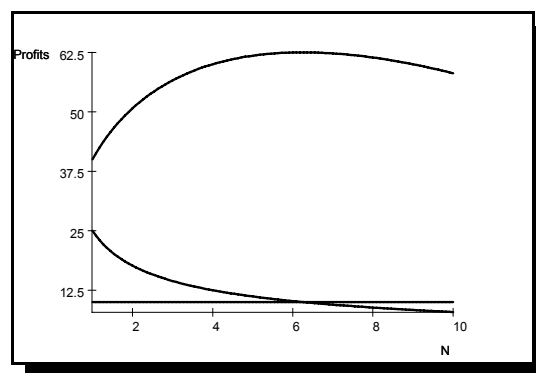
Figure 4. A graph showing the profit maximizing condition for a competitive firm. The upper curve represents profits, the downward sloping line represents the value of the marginal product and the horizontal line is the wage rate.

A similar process could be used to show the impact of a parameter change, such as the price of labor. Early results from the use of this method suggest that it does give students and improved understanding of optimization concepts and supports experimentation without requiring tedious hand calculations.

SUMMARY

This paper presents an example of the use of free (to the student) computer algebra software in an undergraduate economics course. The example presented shows the determination of the profit maximizing employment level based upon a Cobb-Douglas production function. Similar methods could be used to illustrate profit maximization in a goods market in the short and long run and for a number of related optimization problems that are critical parts of introductory and intermediate micro and macro economics courses. The investment in class time required to get students started using the software is minimal and can easily be justified if this techniques is used repeatedly for various optimization problems throughout a semester course.

We believe that the use of this technique can give students an improved intuition about optimization issues. We feel that it also provides a way to translate the abstract formulas presented in class into tangible concrete results which help to reinforce the understanding of the concepts underlying the formulas.

SPACE R&D: MACRO AND MICRO IDEAS

Anne Macy, West Texas A&M University

aterry@mail.wtamu.edu

ABSTRACT

This paper presents unique lecture material for a workshop on the role of technology in the economy. Technology is the vehicle to show the connection between macroeconomic and microeconomic concepts, a relationship neglected in many classrooms. The topic area is space and research and development (R&D). Technology's role in growth and development develops into the issue of public funding for R&D and NASA's technology transfer program. Tempur foam is examined as a successful innovation that evolved into a public company, the microeconomic application of a macroeconomic idea. History, government and mathematics are included to increase the applications of the lecture.

INTRODUCTION

In the current environment of testing combined with a lack of time in the classroom, economics becomes a more difficult subject to teach. Modern education requires that students understand the relationships between ideas and how those concepts interact. Unfortunately, integrating material is easier said than done. As one begins to draw the comparisons, the story becomes longer and the possibility that the students become lost increases. The length of the example and the knowledge gained by the students are sometimes inversely related. Thus, clear examples of economic ideas combined with other disciplines are needed to increase the opportunity to teach economics and the probability of student understanding.

This paper presents a unique way to consider the roles and interaction between basic macroeconomics and microeconomic concepts. Through work for the West Texas Center for Economic Education, it became clear that one area the teachers found difficulty with is the production possibilities frontier (PPF). While they were able to define and apply it to simple issues, the teachers did not know how to connect it to microeconomics. To them, it is purely macro. While the production possibilities frontier is a macroeconomic idea, its movements affect the microeconomic world and visa versa. The PPF is dynamic not static. Thus, the issue becomes how the PPF affects the firm and how the firm affects the PPF.

By not showing the students how the entire economy interacts, the students are left without the ability to see how the macroeconomic ideas and policies of the country affect themselves as individuals and their firms. One reason young individuals vote at reduced levels to other age groups may be because they don't see how the various government actions affect them. Showing how macroeconomic ideas and microeconomic ideas are interrelated may encourage students to see themselves in the economy.

The Executive Summary of the National Summit on Economic and Financial Literacy focuses on the areas lacking in economic education (NCEE, 2002). In particular, economic

education is important for informed citizens. It also identifies the need to integrated examples with other disciplines. The findings of the Survey of the States Report Card (NCEE, 2003) coincide with Executive Summary.   Most states short change economic education even it they acknowledge its importance. Both reports note that the comprehensive understanding of an idea involves knowing how it affects and is affected by other concepts. This lecture addresses this concern.

As a focal point for the workshop, space was chosen. With the renewed interest in space, space technology is timely and interesting to students. In addition, space technology allows the teacher to integrate economics with science, history, government, and mathematics.

Economics is one discipline that connects the other disciplines to each other. Showing how the technology from space affects our everyday lives increases the importance and relevance of science. Science benefits because economics tells us why it is important and how society uses it. A historical comparison is included to show how society has always explored and innovated. Government expenditures and the role of government funding for research adds a political element to the discussion. Mathematical extensions on the stock price of the private company are included to show how math is used in microeconomics. Thus, the lecture can be included in a variety of courses not just economics.

REFERENCES

National Council on Economic Education. Executive Summary: National Summit on Economic and Financial Literacy. May 2002. Retrieved December 12, 2003. http://www.ncee.net/summit/

National Council on Economic Education. Survey of the States: A Report Card. April 2003. Retrieved December 12, 2003. http://www.ncee.net/about/survey2002/

WORKPLACE COMPUTER USE AND WAGES: GENDER, ETHNICITY, AND RACE EFFECTS

James Morgan, Northern Arizona University
James.Morgan@nau.edu
Wendy Campione, Northern Arizona University
Wendy.Campione@nau.edu
Max Jerrell, Northern Arizona University
Max.jerrell@nau.edu

ABSTRACT

In this study, we apply a will know technique in the wage discrimination literature to examine computer use patterns in the workplace. Using data from a CPS survey of computer use, we apply this technique to decompose differences in the both the rate of computer use at work and the wage rate. This allows the assessment of the extent to which computer use at work might help minority and female workers overcome discriminatory wage differentials, or alternatively, the extent to which computer use generates a lower reward to these workers.

REVIEW OF PREVIOUS WORK

There is a substantial body of literature dealing with wage and earnings differentials by gender and by race. Here we summarize major findings reported in Blau, Ferber, and Winkler (2002). Economists have attributed differences in earnings patterns across race or gender groups to two factors, differences in human capital and discrimination. An obvious area of difference in human capital across groups is education level, but occupational differences and differences in work experience can also represent differences in human capital. Differences in educational attainment for white females versus white males have nearly disappeared; significant, but declining differences continue for black workers. The degree of occupational segregation has declined substantially since the 1950s, particularly in the 1970s and 80s. However, considerable occupational segregation between male and female workers remains and the amount of segregation found increase when detailed job categories and roles within occupations are considered. Further, training opportunities are generally more widely available in male dominated occupations. Historically, female workers have had lower average levels of work experience. However, the experience gap has shrunk substantially in recent years.

In addition to these differences due to characteristics, there is substantial evidence of differences in returns to equivalent investments in human capital. White males receive larger returns to increased education than white and black females and their wages rise more rapidly with age. The ratio of female to male earnings hovered at around 60 percent through the 1960s and 70s, but had risen to just over 72 percent by 1998. Wage differentials between white and black males are somewhat smaller than this. Historically, black female wages have been found to be lower than

those of white females, although some recent studies suggest that this difference may have essentially disappeared.

Computer use represents an important dynamic in recent wage trends. White females are now more likely than white males to use a computer on the job, and computer use at work is generally associated with higher earnings. At the same time Black and Hispanic workers are much less likely to use a computer at work than their white counterparts. Further access to training in the use of computers is a potential area of discrimination either directly or indirectly through occupational segregation of some groups into low computer use jobs.

METHODOLOGY

In this paper we use a standard method initially developed by Blinder(1973) and Oaxaca(1973) to decompose differences in computer use rates (and wage rates) into a component that is due to differences in the characteristics of groups and a component that is due to differences in coefficients across groups. This method starts with a set of identical regressions across the distinct gender/race groups yielding the following:

$$YPr_c = B_cX_c \qquad \text{and} \qquad YPr_i = B_iX_i$$

YPr is the predicted value of the dependent variable, B is a set of estimated coefficients, X is a set of independent variables, c represents a comparison group (white males in our case), and i represents the ith gender/race group. The difference between YPr_c and Ypr_i for the ith group can be decomposed into two components:

$$B_cX_c - B_iX_i = B_c(X_c - X_i) + X_i(B_c - B_i)$$

The first component isolates the effects of differing characteristics (with respect to the independent variables) across groups while holding the coefficients constant at the levels determined for the comparison group. The second component isolates the effects of differing coefficients across groups holding the distribution of characteristics constant. In wage equations, the second component has been interpreted as discrimination since equivalent bundles of skills receive differing returns to different groups. The first component represents differences based upon the attributes of the groups, but may still involve discrimination if access to education or access to jobs in certain occupations is restricted based upon gender, ethnicity, or race.

In applying this method to computer usage rates, attribution of differences to discrimination is problematic. The measure of computer use is a crude one. Computer use may represent a valuable skill that the worker was able to acquire, or it may be a result of the position the worker holds and require little additional skills. Despite this limitation, the use of the Blinder method will allow us to assess the relative importance of factors influencing computer use.

In this study, we apply the above methodology to examine differences in the rate of computer use and wage rates across gender, ethnicity and race. We use CPS data from September 2001, since it provides data about computer use at work. To reduce comparability problems we restrict our sample to workers between the ages of 25 and 64. Also, we include only those working at least 35

hours per week and earning at least the minimum wage. Workers reporting themselves as both "Black" and "Hispanic" are treated as "Black" in this study.

The range of independent variables used for this analysis includes sets of dummy variables for 5 year age groups (e.g. 30 - 34), education level, region, city size, industry, and occupation. The wage equations also include a dummy for computer use at work, and include weekly hours worked as a continuous variable. When using sets of dummy variables, it is necessary to omit one grouping in each category which then serves as the basis for comparison. In our analyses the base case represents a 25 to 29 year old, high school graduate, living in the South, in a mid-sized city, working in a personal services industry, and in a personal services occupation. For the wage equations, the base case further assumes that the worker does not use a computer and that she/he works 40 hours per week. The base case represents a worker that might be expected to have low wages and a low probability of computer use. Thus, coefficient effects measure the extent to which having a more favorable education level, occupation, etcetera, translates into improved odds of using a computer and increased wages.

The dependent variable for the computer use analysis is a dichotomous variable. Thus, logistic regressions were performed for each group; these regressions produce estimates of the log-odds ratio of a worker using a computer. In the analyses below these values are converted to estimates of the actual probability of computer use. The dependent variable used for the wage equations was the log of wage, and it has been converted to dollar wage estimates in the analyses below. The regression coefficients are not presented here, but are available upon request.

RESULTS FOR COMPUTER USE BY RACE AND GENDER

Table 1 presents the predicted rate of computer use at work across gender, race, and ethnicity categories and splits differences in each group's rate compared to the white male (WM) rate into a characteristics component and a coefficients component. Note that computer use rates tend to be higher for female versus male workers across all races, and that white female (WF) workers have the highest usage rate at over 77 percent. Also both male (HM) and female (HF) Hispanic workers as well as black male (BM) workers have computer usage rates substantially below those of white workers and black females (BF). For black and Hispanic females, the differences in usage rates appear to be primarily due to differences in coefficients, whereas most of the differences are due to variations in characteristics for the other groups.

Table 1: Computer Use Rates (CUR) by Gender, Race, and Ethnicity with Comparisons to White Male Rates						
	WM	WF	BM	BF	HM	HF
Computer Use rate (CUR)	62.05%	77.91%	33.94%	54.11%	0.17%	31.69%
Differences Due to Characteristics	-	-9.91%	16.53%	0.11%	29.41%	11.45%
Differences Due to Coefficients	-	-5.95%	11.58%	7.83%	15.33%	18.91%

Table 2 looks at the break down of the impact of differences in characteristics across groups. The most notable factors appear to be education level, and occupation. Hispanic and, to a lesser extent, black male workers tend to have lower education levels which account for substantial portions of their lower computer use rates. On the other hand, white females have a slightly favorable education mix compared to white males. With respect to occupation, white and black female workers tend to be more concentrated in occupations that use computer extensively. Thus, adjusting their occupational distribution to that of white males actually reduces their expected usage rates. On the other hand, black and Hispanic males appear to have occupation mixes that lead to substantially lower computer use rates than white males.

Table 3 looks at the break down of the impact of differences in coefficients across groups. Computer use by white males increases slightly with age through the early 50s, while for most other groups the rate is steady or shows a slight decline with age. This is reflected in the effects shown in Table 3. Note also that computer use increases more rapidly with education for white males than for any other group except black males. Industry and occupation effects are substantial and sometimes contradictory to each other. They represent the increase in the probability of using a computer as a worker moves to a more favorable industry or occupation.

Table 2: Computer Use Rate Differences Due to Differences in Characteristics					
(vs. White Male Reference Group)					
Coefficient Group	WF	BM	BF	HM	HF
Intercept	0.00%	0.00%	0.00%	0.00%	0.00%
Age	0.00%	0.03%	-0.09%	-0.02%	-0.18%
Region	0.03%	1.35%	1.31%	-0.87%	-0.78%
Education	-0.61%	5.24%	2.64%	12.99%	9.80%
City Size	-0.02%	0.51%	0.65%	1.36%	1.37%
Industry	-0.62%	-0.13%	-1.02%	1.72%	-0.83%
Occupation	-8.69%	9.52%	-3.37%	14.23%	2.07%
TOTAL EFFECT	-9.91%	16.53%	0.11%	29.41%	11.45%

Table 3: Differences in Computer Use Due to Differences in Coefficients					
(vs. White Male Reference Group)					
Coefficient Group	WF	BM	BF	HM	HF
Intercept	-5.69%	9.64%	6.85%	-1.02%	26.61%
Age	3.53%	6.01%	0.36%	2.98%	4.46%
Region	1.16%	3.12%	3.87%	6.06%	-0.87%
Education	1.97%	-3.60%	1.29%	5.77%	4.32%
City Size	-0.05%	-0.30%	1.40%	-1.73%	-3.94%
Industry	-4.86%	4.53%	-5.70%	11.50%	-8.98%
Occupation	-2.03%	-7.81%	-0.24%	-8.22%	-2.70%
TOTAL EFFECT	-5.95%	11.58%	7.83%	15.33%	18.91%

RESULTS FOR WAGE BY RACE AND GENDER

Since the focus of this study is on the impact of computer use, we will present only highly selected results from the wage analyses. Table 4 shows the predicted weekly wage rate across gender and race categories and splits differences from the white male rate into a characteristics component and a coefficients component. Note that there is a substantial, $150 plus per week, difference due to coefficients for Female workers across all Ethnicity categories. Differences based on characteristics are particularly large for workers of Hispanic origin.

Table 4: Wage Rates by Gender, Race, and Ethnicity with Comparisons to White Male Rates						
	WM	WF	BM	BF	HM	HF
Weekly Wage	$805.96	$594.61	$603.92	$505.30	$514.31	$445.30
Differences Due to Characteristics	-	$59.95	$120.60	$130.70	$201.23	$197.06
Differences Due to Coefficients	-	$151.41	$81.43	$169.96	$90.41	$163.60

Table 5 summarizes the impact of computer use on wage patterns across groups. Note that, for all groups except black females, the return for using a computer at work is actually slightly higher than the return received by white males. Further, white female workers benefit both from a higher rate of using computers (the characteristics effect) and a slightly larger return from computer use. Thus computer use slightly reduces the wage gap between female and male white workers. For black and Hispanic workers of both sexes, computer usage on balance increases their wage gap

relative to white males. In all cases, the impact of computer use is relatively small, accounting for no more than 10 percent of the total wage differential.

Table 5: Wage Differences vs. White Male Wages Attributable to Computer Use					
	WF	BM	BF	HM	HF
Differences in Characteristics	-$12.88	$17.11	$4.00	$24.51	$11.83
Differences in Coefficients	-$3.88	-$7.79	$6.53	-$4.30	-$5.27
TOTAL EFFECT	-$16.76	$9.32	$19.53	$20.21	$6.56

SUMMARY

This study examines differences in computer use at work across gender, race, and ethnic groups. A standard model used in wage discrimination studies is used to examine how computer use among other groups of workers compares to the computer use rate of white males. With respect to differences in characteristics, we find that lower average education levels among Hispanic workers and, to a lesser extent, black males contribute to their lower rates of computer use. The other major area where computer use is affected substantially by characteristics is occupation. Black and Hispanic males tend to be concentrated in Occupations less like to use computers, while white females and, to some extent black females, are concentrated in occupations that are more likely to use computers (as compared to the occupation mix of white males). Perhaps the most important differential among the coefficient effects is age. Computer use increases slightly with age among white miles until the early 50s while for most of the other groups usage is flat or declines slightly with age across all age categories. This may reflect greater opportunities for white males to move into managerial supervisory positions as their careers progress.

We also applied the same technique to the wages earned across the groups in order to examine the effect of computer use on wages. Our results indicate that (for all of the groups except black females) returns to computer use are actually slightly higher than those for white males. Since white females also have a higher rate of computer use than white males, computer use actually reduces the earnings gap between these two groups by just over $15 or about 7 percent. For the other groups of workers, their lower rates of computer use lead to an overall increase in their wage deficit versus white male workers.

REFERENCES

Blau, F. D., M. A. Ferber & A. E. Winkler (2002). *The Economics of Women, Men, and Work* (Fourth Edition). Upper Saddle River, NJ: Prentice Hall.

Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Elements. *Journal of Human Resources, 8*(4), 436-55.

Oaxaca, R. L. (1973). Male-Female Differentials in Urban Labor Markets. *International Economic Review, 14*(3), 693-709.

THE MONETARY APPROACH TO BALANCE OF PAYMENTS: A TAXONOMY WITH A COMPREHENSIVE REFERENCE TO THE LITERATURE

Kavous Ardalan, Marist College
Kavous.Ardalan@Marist.Edu

ABSTRACT

This paper provides a taxonomy of the monetary approach to the balance of payments with a comprehensive reference guide to the literature. The paper very briefly reviews the three major alternative theories of balance of payments adjustments. These theories are the elasticities and absorption approaches (associated with Keynesian theory), and the monetary approach. The paper focuses on the monetary approach to balance of payments and points to the long-run and short-run lines of research within the monetary approach to balance of payments. Throughout, the paper provides a comprehensive set of references corresponding to each point discussed. Together, these references exhaust the existing literature on the monetary approach to balance of payments.

INTRODUCTION

This paper provides a taxonomy of the monetary approach to the balance of payments with a comprehensive reference guide to the literature. The paper very briefly reviews the three major alternative theories of balance of payments adjustments. These theories are the elasticities and absorption approaches (associated with Keynesian theory), and the monetary approach. The paper focuses on the monetary approach to balance of payments and points to the long-run and short-run lines of research within the monetary approach to balance of payments, as reviewed by Ardalan (2003a and 2003b). Throughout, the paper provides a comprehensive set of references corresponding to each point discussed. Together with references in Ardalan (2003a and 2003b), these references exhaust the existing literature on the monetary approach to balance of payments.

DIFFERENT APPROACHES TO THE BALANCE OF PAYMENT ANALYSIS

Three alternative theories of balance of payments adjustment are reviewed in this section. They are commonly known as the elasticities, absorption, and monetary approaches.

The elasticities approach applies the Marshallian analysis of elasticities of supply and demand for individual commodities to the analysis of exports and imports as a whole. It is generally assumed that exports depend on the price of exports, and imports depend on the price of imports. These relations are then translated into elasticities, by differentiating the above equation with respect to the exchange rate. A criterion for a change of the balance of trade in the desired direction can be

established, assuming that export and import prices adjust to equate the demand for and supply of exports and imports.

The absorption approach seeks to look at the balance of trade from the point of view of national income accounting. It is useful in pointing out that an improvement in the balance of trade calls for an increase in production relative to absorption.

The monetary approach looks at the balance of payments as the change in the monetary base less the change in the domestic component. The monetary approach assumes that the domestic assets component of the monetary base is unaffected by balance of payments flows. The monetary approach assumes full-employment and an integrated world markets.

The concentration on the absolute, rather than relative, price level is a notable point of departure from the Humean monetary approach that long preceded Keynes. In Hume, the domestic price level can vary from purchasing power parity due to stock disequilibrium in the domestic money market. Such a variation in relative price levels gives rise to changes in trade flows which affect the balance of payments, and hence the domestic money stock in the long run. The monetary approach, on the other hand, often relies on the excess demand for money to directly affect the overall balance rather than via a change in relative price levels. It should be pointed out that both the Humean adjustment process and the monetary approach have the same implications with respect to the price level in the long run.

A FOUNDATIONAL COMPARISON OF THE THREE APPROACHES

The preceding pages present a brief review of the three major approaches to the balance of payments – elasticities, absorption, and monetary. It may be noted that the three approaches are all correct and assert identical propositions, even if capital movements are included when all variables are defined as ex-post, realized entities.

RESEARCH ON THE MONETARY APPROACH TO BALANCE OF PAYMENTS

Research on the monetary approach to the balance of payments can be divided into two different approaches; one focuses on the long-run equilibrium, the other considers the adjustment mechanism and the channels through which equilibrium is reached. The first approach is based on the reserve flow equation developed by H. G. Johnson (1972). Testing was undertaken by J.R. Zecher (1974) and others. The second approach is based on theoretical work of S.J. Prais (1961), with corresponding empirical work undertaken by R. R. Rhomberg (1977) and others.

CONCLUSION

This paper very briefly reviewed three alternative theories of balance of payments adjustments. These theories were the elasticities and absorption approaches (associated with Keynesian theory), and the monetary approach. The paper focused on the monetary approach to balance of payments, pointed to the long-run and short-run lines of research within the monetary approach to balance of payments, and listed a comprehensive set of references corresponding to each

line of research. Accordingly, the reference section together with referenced cited in Ardalan (2003a and 2003b) exhausted the literature on the monetary approach to balance of payments.

This is a comprehensive list of references in the context of the monetary approach to balance of payments which have discussed the other approaches to balance of payments.

Blejer, Khan, and Masson (1995), Dombrecht (1978), Frenkel and Johnson (1976b), Harberger (1950), Helliwell (1978), Hossain (1988), Jager (1978), Johnson (1958, 1972, 1973b, 1976a, 1977a, 1977b, 1977c), Jonson and Kierzkowski (1975), Kenneally and Finn (1985), Meller (1987), Pearce (1961), Rhomberg and Heller (1977), Shone (1980), Tsanacas, Kasibhatla, and Malindretos (2000), Tullio (1981a), and Whitman (1975).

This is a comprehensive list of references regarding the modern revival, theoretical foundation, further development, and review articles related to the theory, assumptions, features, and empirical work on the monetary approach to balance of payments.

Modern Revival by: Collery (1971a), Hahn (1959), Harberger (1950), Kemp, M.C. (1962, 1970), Komiya (1966, 1969), McKinnon (1968), McKinnon and Oates (1966), Meade (1951), Mundell (1968a, 1971a), Negishi (1972), Pearce (1961), Polak (1957), Polak and Argy (1971), and Prais (1961).

Theoretical Foundation: Dornbusch (1973a), Johnson (1958, 1972, 1973a), and Mundell (1968a, 1971a).

Further Developed by: Frenkel (1975), Frenkel and Johnson (1976a, 1976b), Frenkel and Rodriguez (1975), Humphrey and Keleher (1982a), International Monetary Fund (1977), Johnson (1976a, 1977b), Johnson and Nobay (1974), Kemp, D.S. (1975), Mussa (1974, 1976), Putnam and Wilford (1978), and Swoboda (1973, 1976).

Review Articles: Kreinin and Officer (1978), Magee (1976), and Whitman (1975).

Further Review Article: Arize, Grivoyannis, Kallianiotis, and Malindretos (2000), Blejer, Khan, and Masson (1995), Connolly (1986), Dombrecht (1978), Finn (1982), Grubel (1976), Hahn (1977), Helliwell (1978), Horne (1983), Hossain (1988), Johnson (1973b, 1975, 1977b), Mussa (1974, 1976), Rabin and Yeager (1982), Rhomberg and Heller (1977), and Tsiang (1977).

Review Assumptions and Features: Akhtar (1986), Blejer (1983), Branson (1975a, 1975b), Connolly (1986), Frenkel and Johnson (1976b), Frenkel and Rodriguez (1975), Grubel (1976), Haberler (1976), Hahn (1977), Humphrey (1986a, 1986b), Humphrey and Keleher (1982b), Johnson (1958, 1962b, 1972, 1973b, 1975, 1976a, 1976b, 1977a, 1977b, 1977c), Kasibhatla and Malindretos (1993), Kemp, D.S. (1975), Kenneally and Finn (1985), Manouchehi (1988), Metzler (1976), Mussa (1974, 1976), Putnam (1976), Rohmberg and Heller (1977), Swoboda (1976), Tsanacas, Kasibhatla, and Malindretos (2000), Tullio (1981b), Wilford, D.S. (1977a), and Wilford, W.T. (1986).

Review of Empirical Work: Arize, Grivoyannis, Kallianiotis, and Malindretos (2000), Kreinin and Officer (1978), Magee (1976), Malindretos (1988), and Whitman (1975).

This is a comprehensive list of references in the context of the monetary approach to balance of payments which discuss or incorporate the real-balance effect.

Agenor (1990), Aghevli (1975), Aghevli and Khan (1980), Aghevli and Sassanpour (1982), Archibald and Lipsey (1958), Argy (1970), Baker and Falero (1971), Bergstrom and Wymer (1976), Bilquees (1989), Black (1975), Blejer (1977, 1983), Blejer and Fernandez (1978, 1980), Blejer and Leiderman (1981), Bonitsis and Malindretos (2000), Bourne (1989), Brissimis and Leventakis (1984), Coghlan (1981), Collery (1971a, 1971b), Connolly and Taylor (1976), Courchene (1973),

Currie (1976), De Silva (1977), Dornbusch (1971, 1973a, 1973b), Dornbusch and Mussa (1975), Frenkel (1976a, 1976b), Frenkel and Johnson (1976b), Frenkel and Rodriguez (1975), Friedman (1970), Girton and Roper (1977), Guitian (1973, 1976), Gupta (1984), Helliwell (1978), Henderson (1977), Horne (1979), Humphrey (1986a, 1986b), Humphrey and Keleher (1982b), Jimoh (1990), Johnson (1958, 1972, 1975, 1976a), Jonson (1975, 1976), Jonson and Kierzkowski (1975), Jonson, Moses, and Wymer (1977), Kasibhatla and Malindretos (1993), Kasibhatla, Malindretos, and Kutasovic (2000), Keleher (1986), Kemp, D.S. (1975), Khan (1974, 1976, 1977), Khan and Knight (1981), Kieran (1970), Kim (1983), Knight and Mathieson (1983), Knight and Wymer (1976, 1978), Knoester and Van Sinderen (1985), Kouri (1976), Kreinin and Officer (1978), Laidler and O'Shea (1980), Leon and Molana (1987), Leventakis (1984), Levy (1981), Miller (1980), Mundell (1968b, 1971b), Parkin (1974a), Patinkin (1965), Polak (1957), Porter (1974), Prais (1961), Purviz (1972), Reid (1973), Rhomberg (1977), Rodriguez (1976), Sassanpour and Sheen (1984), Schotta (1966), Spencer (1974), Spinelli (1979, 1983), Swoboda (1976), Taylor (1987b), Tsanacas, Kasibhatla, and Malindretos (2000), Tsiang (1977), Tullio (1981a, 1981b), Vaez-Zadeh (1989), Wein (1974), Whitman (1975), Wilford (1977a), and Yusoff (1988).

This is a comprehensive list of references related to discussions of criticisms of the monetary approach to balance of payments.

Akhtar (1986), Arize, Grivoyannis, Kallianiotis, and Malindretos (2000), Bilquees (1989), Borts and Hanson (1977), Branson (1975a), Currie (1976, 1977), Darby (1980a), De Grauwe (1975, 1976), Fontana (1998), Fratiani (1977), Frenkel, Gylfason, and Helliwell (1980), Hacche and Townend (1981), Hahn (1977), Hodjera (1976), Horne (1983), Hossain (1988), Johnson (1972, 1977a, 1977c), Jonson (1976), Kamas (1985), Karacaoglu (1980), Kenneally and Finn (1985), Kouri and Porter (1974), Kreinin and Officer (1978), Laskar (1982), Lee and Wohar (1991), Leon (1988), Looney (1991), Magee (1976), McNown and Wallace (1977), Miller (1980), Nobay and Johnson (1977), Obstfeld (1982), Petoussis (1985), Putnam and Wilford (1977), Rabin and Yeager (1982), Rasulo and Wilford (1980), Salop (1976), Scheetz (1986a, 1986b), Sheehey (1980), Sohrab-Uddin (1985), Spanos and Taylor (1984), Swoboda (1976), Taylor (1987a, 1987b), Tsiang (1977), Tullio (1981c), Watson (1988, 1990), Whitman (1975), and Wohar and Burkett (1989).

This is a comprehensive list of references in the general context of the monetary approach to balance of payments which discuss sterilization.

Addison, Demery, and Page (1993), Bloomfield (1959), Boyer (1979), Cooper (1969), Courchene (1973), Darby (1980b), Feige and Johannes (1981), Frenkel, Gylfason, and Helliwell (1980), Frenkel and Johnson (1976b), Frenkel and Rodriguez (1975), Galliott (1973), Helliwell (1978), Horne (1979), Humphrey (1986a), Johnson (1972), Kim (1983), Knight and Wymer (1976, 1978), Lee (1985), Magee (1976), Michaely (1970), Miller (1980), Mundell (1968a), Mussa (1974, 1976), Roper (1971), Schotta (1966), Swoboda (1973, 1976), Whitman (1975), Wilford, W.T. (1986), and Willms (1971).

This is a comprehensive list of references which discuss the weak and strong forms of the monetary approach to balance of payments.

Hodgson and Schneck (1981), Kenneally and Nhan (1986), Lee and Wohar (1991), and Rabin and Yeager (1982).

This is a comprehensive list of references to the Humean origin of the monetary approach to balance of payments.

Berdell (1995), Cesarano (1998), Connolly (1986), Courchene (1973), Dombrecht (1978), Fausten (1979), Hume (1752), Johnson (1973b, 1976a, 1977b, 1977c), Kasibhatla and Malindretos (1993), Keleher (1986), Kenneally and Finn (1985), Kreinin and Officer (1978), McCloskey and Zecher (1976), Putnam and Wilford (1986a), Rhomberg and Heller (1977), and Wilford (1977a).

This is a comprehensive list of references in the context of the monetary approach to balance of payments which discuss the compatibility of the monetary approach with other approaches to the balance of payments.

Akhtar (1986), Blejer (1983), Dornbusch (1973a, 1973b), Frenkel, Gylfason, and Helliwell (1980), Hossain (1988), Jager (1978), Johnson (1972, 1976a), Jonson and Kierzkowski (1975), Kenneally and Finn (1985), Khan (1976), Kreinin and Officer (1978), Laidler (1981), Montiel (1984, 1985), Mussa (1974, 1976), Petoussis (1985), Rhomberg (1964), Rodriguez (1976), Sassanpour and Sheen (1984), Swoboda (1976), and Wilford (1986).

This is a comprehensive list of references in the context of the monetary approach to balance of payments which discuss the historical background of the monetary approach.

Fausten and Victoria (1980), Frenkel (1976b), Frenkel and Johnson (1976b), Humphrey (1986b), Keleher (1986), Myhrman (1976), and Spinelli (1988).

This is a comprehensive list of references which discuss the Keynesian-monetarist controversy in the context of the monetary approach to balance of payments.

Arize, Grivoyannis, Kallianiotis, and Malindretos (2000), Beladi, Biswas, and Tribedy (1986), Bonitsis, Kasibhatla, and Malindretos (1995), Bonitsis and Malindretos (2000), Dornbusch (1971), Fontana (1998), Frenkel, Gylfason, and Helliwell (1980), Grubel (1976), Horne (1983), Johnson, Kasibhatla, and Malindretos (2000), Kamas (1986), Kasibhatla, Malindretos, and Kutasovic (2000), Malindretos (1984, 1988, 1991), Miller (1978), Rivera-Solis, Kasibhatla, and Malindretos (2000), Spencer (1974), and Whitman (1975).

REFERENCES

Ardalan, K. (2003a). The Monetary Approach to Balance of Payments: A Review of the Seminal Long-Run Empirical Research. *Academy of Economics and Economic Education Research Journal*, forthcoming.

Ardalan, K. (2003b). The Monetary Approach to Balance of Payments: A Review of the Seminal Short-Run Empirical Research. *Academy of Economics and Economic Education Research Journal*, forthcoming.

ARE FOREIGN LOANS GOOD OR BAD COLOSTROL IN THE ECONOMIC GROWTH OF HIGHLY INDEPTED POOR COUNTRIES? CORRABORATIVE EVIDENCE

Abdalla Hagen, Grambling State University
hagegrambling@yahoo.com
Ghebre Keleta, Grambling State University
keleta@gram.com
Ghirmay Ghebreysus, Grambling State University
ghebreg98@yahoo.com
Mark Cadet, Grambling State University
cadet@gram.edu

ABSTRACT

This study investigates the impact of foreign debt on the economic growth of 43 heavily indebted poor countries over ten-year period (1991-2001). The findings of this study revealed that foreign debt has a negative and insignificant impact on the economic growth of the surveyed countries. Although debt cancellation may be less effective in the long term, we still concur with the African proposals for debt cancellations suggested by Greenhill and Blackmore (2002) in the report of Jubilee research at the new economics foundation.

THE IMPACT OF SALES TAXES ON RETAIL EMPLOYMENT, EARNINGS AND SALES

Paul Nelson, University of Louisiana at Monroe
nelson@ulm.edu
Robert Eisenstadt, University of Louisiana at Monroe
eisenstadt@ulm.edu

ABSTRACT

It has long been known that retail sales taxes create distortions in the location of retail outlets. Most studies have focused on effects between central cities and suburbs or border situations where there are substantial differences in tax levels. The general conclusion of the literature is that retailers do disproportionably tend to locate in lower tax locales.

This paper takes a different approach. We look at the impact of average combined state and local sales tax levels across all fifty states and the District of Columbia on the number of retail establishments, dollar sales, retail payrolls, and retail employment. Sales tax rates vary appreciably across the United States from a low of zero percent (five states) to a high of 9.3 percent (Tennessee).

We develop four models using as dependent variables: the number of retail establishments, dollar sales, retail payrolls, and number of retail employees by state. We regress each of these variables on per capita state income, gross state product, population, median age, average state and local sales tax rate and dummy variables for exemptions for food and prescription drugs.

We find for each of the four dependent variables, the average state and local tax rate is negatively related indicating that higher sales taxes do negatively affect the retail sector. In three of the four models; dollar sales, payroll, and number of retail employees the coefficient on average combined state and local sales tax rate is significant at the 5 percent level. For the number of establishments the coefficient is negative but not significant. The dummy variables for exemptions for food and prescription drugs are positive indicating such restrictions could reduce the impact of sales taxes but the coefficients are not significant in any model.

We calculate the loss in terms of dollar sales, payrolls and employment and compare that to the revenue raised as a bare minimum estimate of the excess burden of the sales tax.

THE TESTING OF THE CONFIRMATION/ DISCONFIRMATION MODEL: JOINT DECISION- MAKING IN HOME BUYING

Reginald M. Peyton, Christian Brothers University
rpeyton@cbu.edu
Sarah T. Pitts, Christian Brothers University
spitts@cbu.edu
Rob H. Kamery, Christian Brothers University
rkamery@cbu.edu

ABSTRACT

This paper discusses the methodological issues relevant to testing the confirmation/ disconfirmation model in a joint decision-making situation concerning home buying. Major emphasis is placed upon the statistical techniques employed to test the hypotheses.

INTRODUCTION

This paper presents the general research hypotheses along with some rationale for their development. In light of the research questions raised and the literature reviewed, a number of research hypotheses were developed and presented under the headings of dyadic-related hypotheses and confirmation/disconfirmation model-related hypotheses. These hypotheses serve as the basis for the study and are presented along with some rationale for their formulation.

DYADIC-RELATED HYPOTHESES

In the review of the literature on family decision-making, there is some controversy concerning the family member from whom data should be gathered (Hill & Scanzoni, 1982; Scanzoni, 1983; Thomson & Williams, 1982). These researchers assert that wife-reported data does not adequately report on the family decision-making process. Since under or over reporting on the decision-making process may be occurring when only one spouse is the respondent, it is hypothesized that H1: With respect to their principal place of residence, there exists a significant difference between the individual satisfaction of husbands and wives.

The formulation of this hypothesis prompts the development of two other hypotheses. These hypotheses take into account the dyadic interaction that occurs between couples and implies that joint action may result in joint or dyadic satisfaction with the results from a decision. Heffring (1978) asserts that the social exchanges that occur within these dyads result in shared rather than individual attitudes of the parties in the group.

Symbolic interaction (SI) theory postulates that group decision-making results from a "give and take" between the parties to the decision. As applied to the consumer satisfaction/

dissatisfaction (CS/D) process, expectations and evaluations are hypothesized to be due in part to various forms of "give and take" resulting from group interaction. This interaction occurs because of the roles and expectations of the parties to the decision. Similarities in goals between husbands and wives result in the development and reinforcement of family roles (Davis & Rigaux, 1974; Min, 1983; Waldroff, 1988). This proposition provides the basis for the hypothesis relating to the relationship between joint satisfaction and the satisfaction of the individual spouses.

> H2: There exists a significant difference between joint satisfaction and the individual satisfaction of husbands and wives with respect to their principal place of residence.
> H3: There exists a significant difference between joint satisfaction and the average of the individual satisfaction of husbands and wives.

Among the factors which affect group interaction and decision-making are family cohesiveness or connectedness and patterns of power and influence. These factors act as mediators of decision-making and CS/D. Family congruence is an indication of shared attitudes and meanings of family members with respect to purchases. It reflects the degree to which family members have knowledge of and agree with the perceptions, likes, and dislikes of other family members. This implies that the parties have overlapping frames of reference and not that they do have the same likes and dislikes. If family members participate effectively and help to establish joint expectations prior to the purchase, then each person should share or have knowledge of the beliefs, perceptual biases, buying motives, and predispositions of other family members. The SI framework implies that individual and group attitudes are constantly being modified because of the dyadic interaction. Thus, congruence can improve as a result of increased interaction or because of the cumulative effects of interaction. It is therefore hypothesized that

> H4: There exists a significant positive relationship between couple congruence or consensus and consumer satisfaction in the context of joint decision-making.

While congruence represents the degree to which family members share common attitudes and meanings about a product, solidarity reflects the degree of cohesiveness, or "oneness," regarding those attitudes and meanings. At the dyadic level, Spanier (1976) notes that this connectedness or solidarity is reflected by the degree to which there exist:
1. troublesome dyadic differences,
2. interpersonal tensions and personal anxiety,
3. dyadic satisfaction as an indication of cohesion and,
4. consensus on matters of importance to dyadic functioning.

Greater solidarity should result in greater adherence to group norms. This in turn results in greater potential for acceptance of and satisfaction with purchase outcomes. Family solidarity may also reflect the degree to which one spouse supports the spouse who is dissatisfied with a purchase. Based on this discussion, it is hypothesized that H5: There exists a significant positive relationship between couple connectedness or cohesiveness and customer satisfaction.

The amount of input that each spouse has in the decision and consumption processes can be a mediating factor affecting CS/D. Since the wants, preferences, and resource contributions of

family members are not always identical (Heffring, 1978), one family member may have more influence or power than other family members. The role of family power has been widely researched (Blood & Wolfe, 1960; Safilios-Rothschild, 1970; Olson, 1969; Davis & Rigaux, 1974; Davis, 1976). Davis and Rigaux (1974) have suggested that the effects of power can be active, not only in the pre-purchase and final purchase phases, but also in the post-purchase phase. This implies that dimensions of power exhibited in the earlier decision-making phases may also be reflected in the post-evaluation phase. In fact, dissatisfaction may be a function of the extent to which one spouse feels left out of the decision process.

The Blood and Wolfe (1960) scale has been used to assess the conjugal power in the family. This scale, also employed by Davis and Rigaux (1974), might serve as one of the predictor variables to explain patterns of CS/D in family decision-making. In this study, input into the decision-making process is measured in terms of the degree to which the purchase decision was husband dominant, wife dominant, or joint. Therefore, it is hypothesized that

H6: There exists a significant positive relationship between syncratic decision-making and consumer satisfaction.

CONFIRMATION/DISCONFIRMATION MODEL-RELATED HYPOTHESES

The second set of hypotheses relates the dyadic data to the confirmation/disconfirmation model. According to this model, the consumer forms norms or expectations about product performance. Using these norms or expectations, the individual consumer makes judgments about the product performance to determine if the expectations were positively or negatively disconfirmed and if satisfaction results from the process (Cadotte, Woodruff & Jenkins, 1987).

While this model has been widely tested with data gathered from individuals, the model has never been tested with data gathered from dyads or larger groups. Therefore, this study focuses on testing the basic hypotheses inherent in the confirmation/disconfirmation model using data gathered from members of dyads. Support for these hypotheses should provide even greater confidence in the validity of the disconfirmation model.

Disconfirmation theory postulates that satisfaction is related to the size and direction of the discrepancy between prior expectations and actual product performance (Swan & Coombs, 1976; Oliver, 1980a; Barber & Venkatraman, 1986). This implies that confirmation occurs when product performance is equal to prior expectations and thus leads to satisfaction. Conversely, disconfirmation occurs when performance does not equal prior expectations. When product performance exceeds prior expectations, positive disconfirmation results and this also leads to satisfaction. On the other hand, negative disconfirmation is the result of performance being lower than expected, leading to dissatisfaction. Based on the disconfirmation theory of consumer satisfaction, it is hypothesized that H7: There exists a significant positive relationship between disconfirmation and consumer satisfaction.

Rivaling the confirmation/disconfirmation model, Oliver and Bearden (1983) found that the importance of expectations as determinants of satisfaction decreases for high involvement products, while the importance of outcomes or performance increases. Accordingly, performance becomes an independent determinant of satisfaction. This assertion has also been supported by Churchill and

Surprenant (1982). They found satisfaction with a video disc player to be mainly determined by the product's performance. As a result of this conceptual and empirical research, an alternative hypothesis is proposed. This hypothesis states that H8: There exists a significant positive relationship between performance and consumer satisfaction.

After using the product on an individual and also on a joint basis, the consumer will note performance along various attributes. Woodruff, Cadotte and Jenkins (1983) note that through a cognitive process, consumers form perceptions, which result in a set of beliefs about how the product has performed along some set of performance dimensions. The consumer, however, may note overall performance independent of perceptions of the various attributes. High levels of perceived performance lead to high levels of satisfaction, while low levels of perceived performance should lead to low levels of satisfaction.

Thus, for a given decision, the major issue is whether expectations are necessary to explain variation in consumer satisfaction. Some researchers argue that there is more to satisfaction than can be explained by consumer perception of performance alone (Churchill & Surprenant, 1982). The contribution of the disconfirmation model is that satisfaction results from a comparison between some standard or expectation and performance. This hypothesis compares the explanatory power of the performance satisfaction model with that of the more detailed or complex disconfirmation/satisfaction paradigm. Therefore, it is hypothesized that

H9: The couples' perception of disconfirmation better predicts satisfaction than does the couples' perception of performance.

In this study, regression analysis was used to test the statistical significance of the individual parameters and the overall model and to facilitate the identification and ranking of factors that affect the dependent variable, satisfaction. Because the technique allows a weighting of the confirmation/disconfirmation model constructs in the development of satisfaction for both the individual and the joint responses, the differences in the regression models for the two levels of responses (individual and joint) can also be compared.

CONCLUSION

The study was cross-sectional in nature. Data were collected from couples in Memphis, Tennessee, who had purchased a house between January 1986 and December 1989. A listing of at least 447 couples was compiled from the MLS and the RSR and screened to develop the sample frame from which to survey. First, a notification letter was sent to each couple in the list to inform them of the research effort and to solicit their support. This letter was followed by a phone call aimed at screening prospective respondents and scheduling times with qua1ified respondents.

Chi-square analysis was used to establish that the groups are comparable on the basis of their socio-demographic profiles. Differences within and among groupings of husbands and wives (hypotheses H1, H2, and H3) were tested using the t-test, and univariate analysis of variance (ANOVA) techniques. The relationship between satisfaction, the single criterion variable, and the set of predictor variables as suggested in hypotheses H4 through H9, was investigated using regression analysis.

REFERENCES

Barber, M. & M. Venkatraman (1986). The determinants of satisfaction for a high involvement product: Three rival hypotheses and their implications in the health care context. In R. Lutz (Ed.), *Advances in Consumer Research*, *13* (pp. 316-320). Ann Arbor: Association for Consumer Research.

Blood, R. & D. Wolfe (1960). *Husbands and wives: The dynamics of married living*. Glencoe: The Free Press.

Cadotte, E., R. Woodruff & R. Jenkins (1987). Expectations and norms in models of consumer satisfaction. *Journal of Marketing Research*, (8), 305-314.

Churchill, G. & C. Surprenant (1982). An investigation into the determinants of customer satisfaction. *Journal of Marketing Research*, *19*(11), 491-504.

Davis, H. (1976). Decision making within the household. *Journal of Consumer Research*, (3), 241-260.

Davis, H. & B. Rigaux (1974). Perception of marital roles in decision processes. *Journal of Consumer Research*, *2*, 51-62.

Heffring, M. (1978). Consumer satisfaction: The family perspective. In R. Day and H. Hunt (Eds.), *New Dimensions of Consumer Satisfaction and Complaining Behavior* (pp.162-168). Bloomington: Indiana University.

Hill, W. & J. Scanzoni (1982). An approach for assessing marital decision-making processes. *Journal of Marriage and the Family*, (11), 927-941.

Min, K. 1983. *The decision-making of married couples*. Unpublished Ph.D. Dissertation: Seattle, The University of Washington.

Oliver, R. (1980a). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, *17*(11), 460-469.

Oliver, R. & W. Bearden (1983). The role of involvement in satisfaction processes. In R. Bagozzi & A. Tybout (Eds.), *Advances in Consumer Research*, *10* (pp. 250-255). Ann Arbor: Association of Consumer Research.

Olson, D. (1969). The measurement of family power by self-report and behavioral methods. *Journal of Marriage and the Family*, *31*(8), 545-550.

Safilios-Rothschild, C. (1970). The study of family power structure: A review 1960-1969. *Journal of Marriage and the Family*, (11), 539-552.

Scanzoni, J. (1983). *Shaping tomorrow's family: Theory and policy for the 21st century*. Beverly Hills: Sage Publications.

Spanier, G. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, (2), 17-21.

Swan, J. & L. Combs (1976). Product performance and consumer satisfaction: A new concept. *Journal of Marketing*, *40*(4), 25-33.

Waldruff, D. (1988). *Analytic path model of joint decision-making by husbands and wives*. Unpublished Ph.D. Dissertation. The University of North Carolina at Greensboro.

Woodruff, R., E. Cadotte & R. Jenkins (1983). Modeling consumer satisfaction processes using experienced-based norms. *Journal of Marketing Research*, *20*(8), 296-304.

AN EXPLANATION OF THE PARTIAL ADJUSTMENT ADAPTIVE EXPECTATIONS (PAAE) MODEL

Sharon S. Seay, Mississippi College
seay@mc.edu
Sarah T. Pitts, Christian Brothers University
spitts@cbu.edu
Rob H. Kamery, Christian Brothers University
rkamery@cbu.edu

ABSTRACT

This paper explains the history of the PAAE model and the theory underlying the selection of firm-specific variables used to explain the variations across firms in the ratio adjustment process. The partial adjustment and adaptive expectations models are special cases of more general models. Nerlove (1958) was the first to provide a rationalization for the partial adjustment model, using it to examine the lags in farmers' response to price changes. Other economists have subsequently employed the model in a wide variety of empirical research efforts, especially inventory and investment behavior studies. The adaptive expectations model was first used by Cagan (1956) to examine price inflation and consumer behavior, respectively.

INTRODUCTION--THE PARTIAL ADJUSTMENT MODEL

The partial adjustment model may be depicted as follows. Let y be some economically relevant and observable variable which is adjusted through time to some target or desired, but unobservable, level y* as illustrated below:

(1) $y_t - y_{t-1} = ë (y_t^* - y_{t-1}), 0 < ë ? 1$

where y_t = a firm's financial ratio in period t,
y_{t-1} = a firm's financial ratio in period t-1,
y_t^* = the target level of a particular ratio, and

ë = the speed of adjustment coefficient.

Equation (1) postulates that at any particular time period t, only a fixed fraction of the desired adjustment is accomplished. Equation (1) states that the current level of financial ratio, y_t, will move only partially from the previous position, y_{t-1}, to the target level, y_t^*. The amount of the adjustment between time t and t-1 is equal to ë (y_t^* - y_{t-1}), where the fraction ë measures the speed of adjustment.

The coefficient ë may assume values from 0 to 1. When ë is equal to one, adjustment of the target ratio is instantaneous. The smaller the value of ë, the greater the adjustment lag. Lambda (ë) is

interpreted as a coefficient of adjustment, which characterizes the fact that there are limitations to the rate of adjustment of y due to technological constraints and/or institutional rigidities and inflexibilities.

Assume that the target, y_t^*, is determined by some other observable economic variable x_k, where

k = t or t-1:

(2) $y_t^* = x_k$, k = t or t-1

where x_k is the industry norm (mean or median) of a particular financial ratio at time t or t-1. Waud (1966) and Lev (1969) noted that equation (2) can be made more general by setting $y^* = bx-1$. The coefficient b = 1 indicates that firms want to maintain a fixed deviation from the target ratio. The deviation coefficient, b, can be used to measure the existence of a fixed deviation of the industry norm (average or median) from the target ratio. Lev (1969) found that empirical results in terms of R^2 and the t-statistics for ë were better when x_t was used as the target level. The magnitude of adjustment depends on both ë and y_t^*.

The combination of (1) and (2) defines the partial adjustment model.

(3) $y_t - y_{t-1} = ë (x_t - y_{t-1})$

In this equation, y_t is the observed value of a financial ratio at time t, y_t^* is the value of the target ratio for time t, and x_t is the industry mean of the ratio which determines the target according to (2).

Therefore, the partial adjustment model postulates that when the firm observes a deviation between its ratio and the industry mean (i.e., x_t-y_{t-1}), it will adjust its ratio in the next period (i.e., y_t) so that the observed deviation will be partially eliminated. For example, when the firm's ratio is above the industry mean and ë = .5, the firm will decrease the value of the ratio in the next period by half the deviation. When (3) is applied to actual data and the estimated ë falls between 0 and 1, this indicates the firm adjusts the year-to-year differences in the ratio according to the industry mean. The speed of adjustment is determined by the size of ë; the closer ë is to 1, the faster is the periodic adjustment. This model was used by Lev (1969) and Frecka and Lee (1983) to test whether firms adjust their financial ratios to the industry average. Their results tend to support adjustment to the industry mean.

THE ADAPTIVE EXPECTATIONS MODEL

Now consider the adaptive expectations model. A major issue facing the firm is the interpretation of any recent change in the industry mean (or other norm, e.g., the median). A change in industry mean/median can be either a permanent change or a transitory fluctuation. The manager's assessment of the persistence of the current change in industry mean/median determines the firm's financial ratio adjustment toward that industry mean/ median. If the change is highly transitory, the ratio adjustment is expected to be relatively small. Conversely, if the change in the industry mean/median is largely permanent, the adjustment would be relatively large.

The expected persistence of the change in industry mean/median is incorporated into the ratio adjustment model by specifying the process for expectation formation. The expectation formation process considered here is adaptive expectations. If y_t^* is the unobservable expected value of some variable of economic interest, the adaptive expectations model postulates that the period-to-period revision of expectations is described by:

(4) , $y_t^* - y_{t-1}^* = \delta\left(x_t - y_{t-1}^*\right)$ $0 < ä \ ? \ 1$

(2) $y_t^* = x_t$

or equivalently,

(5) $y_t^* = \delta x_t + (1-\delta) y_{t-1}^*$ $0 < ä \ ? \ 1$

where x_t is the observed value of x in period t, y_{t-1}^* is the target level of a particular ratio or the value of x expected to prevail in period t-1, y_t^* is the value of the target ratio for time t or the value of x expected to prevail in period t. Delta (ä) is interpreted as the coefficient of expectations, the proportion of the current change in industry mean/median taken to be permanent rather than transitory. This expectation formation process is based on the premise that current expectation is derived by modifying previous expectation with currently available information. The extent of expectation revision depends on the persistence of current information. The target ratio level, y_t^*, is updated each period by a fraction of the discrepancy between the current level of industry average and the previous target level.

Equation (5) implicitly assumes that corporate managers revise their expectations of the target ratio gradually. The magnitude of the revision is determined by the size of ä. The coefficient of expectations, ä, is the proportion of the industry change assessed as permanent rather than transitory. When ä = 1, the expected target ratio is instantaneously adjusted to the current level of the industry mean.

Muth (1960) has shown that the adaptive expectations model implies that the expected target ratio, y_t^*, for any given year is an exponentially weighted moving average of past observed industry averages (x_{t-s}). Recursively substituting the values of y_{t-1}^*, y_{t-2}^*,… and y_{t-s}^* into the right-hand side of equation (5) gives:

(6) $y_t^* = \delta[x_t + (1-\delta)\,x_{t-1} + (1-\delta)^2 x_{t-2} + \ldots + (1-\delta)^s x_{t-s}] = \delta x_t + (1-\delta)\, y_{t-1}^*$

Recent values of industrial averages are weighted more heavily in the moving average, according to the adaptive model. Muth (1960) has shown that this forecast for the unobserved target ratio is the best linear forecast in terms of the sum of squared error minimization. His study indicates that the forecast for the next period is the forecast for all future periods as well because it is an estimate of only the permanent component.

   If changes in the permanent component are small relative to the noise, then the forecast gives nearly equal weights to all past observations in order that the transitory components tend to cancel each other out. The forecasts then do not depend very much on recent information because information states very little about the future. On the other hand, if changes in the permanent component are large relative to the noise, recent information is weighted heavily.

   Therefore, the time series for which the exponentially weighted moving average equals the conditional expected value consists of two random components--one lasting a single time period, and the other lasting through all subsequent periods. Muth (1960) shows that the exponentially weighted moving average is an appropriate measure of the permanent component.

   Equation (6) permits estimation of ä from actual time series data. The estimated value of equation (6) reflects management's assessment of the persistency of current industrial ratio changes--the permanent component. Substituting (6) into (1) yields:

$$(7) \quad y_t = \lambda \delta [x_t + (1-\delta) x_{t-1} + (1-\delta)^2 x_{t-2} + \ldots + (1-\delta)^s x_{t-s}] + (1-\lambda) y_{t-1}$$

Using the Koyck transformation to simplify equation (7) produces:

$$(8) \quad y_t - y_{t-1} = \lambda \delta x_t + (2-\lambda-\delta) y_{t-1} - (1-\lambda)(1-\delta) y_{t-2}$$

   Equation (8) characterizes the adjustment process of financial ratios in terms of the partial adjustment due to technological and institutional constraints and the adaptive expectations due to uncertainty and discounting of current information. If ä = 1, then equation (8) reduces to:

$$y_t - y_{t-1} = \lambda (x_t - y_{t-1}) + y_{t-1}$$

which is a version of Lev's partial adjustment model. The reduced equation assumes availability of the current industry mean, or that firms can obtain unbiased predictions of the current industry mean. Therefore, when the change in industry mean is considered as completely permanent, the firm's revision of financial ratios will follow a simple partial adjustment process. Equation (8) is, thus, a generalized case of Lev's model.

   Waud (1966) was the first to recognize that the partial adjustment and adaptive expectations models are simply special cases of a more general model. However, even though the partial adjustment and adaptive expectations models lead to equivalent estimating equations, economists view them as conceptually different models.

   The partial adjustment and adaptive expectations models may be combined. A statistically estimable form of the partial adjustment adaptive expectations (PAAE) model can be formulated based on equation (9) as follows:

$$(9) \quad y_t = a_0 + a_1 x_t - a_2 y_{t-1} + a_3 y_{t-2} + u_t$$

where a_0 = the intercept term,

$$y_t = a_0 + \lambda\delta x_t + (2 - \lambda - \delta)y_{t-1} - (1-\lambda)(1-\delta)\ y_{t-2}$$

Suppose $\lambda = \delta = 1$. Then

$$y_t = a_0 + (1)(1)x_t + (2-1-1)y_{t-1} - (1-1)(1-1)y_{t-2}$$

$$y_t = a_0 + x_t$$

Suppose $\lambda = 1, \delta = 0$. Then

$$y_t = a_0 + (1)(0)x_t + (2-1-0)y_{t-1} - (1-1)(1-0)y_{t-2}$$

$$y_t = a_0 + y_{t-1}$$

Suppose $\lambda = 0, \delta = 1$. Then

$$y_t = a_0 + (0)(1)x_t + (2-0-1)y_{t-1} - (1-0)(1-1)\ y_{t-2}$$

$$y_t = a_0 + y_{t-1}$$

If $\lambda = \delta = 1$, then should not $y_t = y_t$?

$a_1 = \ddot{e}\ \ddot{a}$
$a_2 = 2 - \ddot{e} - \ddot{a}$
$a_3 = -(1-\lambda)(1-\delta)$
u_t = the disturbance term.

While Lee and Wu (1988) include an intercept term, their study predicts and the results confirm very small, statistically insignificant intercept estimates. Lee and Wu (1988) include the intercept term to see if their model explains a large degree of the variation in ratio adjustment. Their results, showing high R^2s and insignificant intercepts, provide evidence that the PAAE model explains a large percentage of the variation in the ratio adjustment process.

The econometrics literature (Johnston, 1972) often includes an intercept term when specifying the PAAE model. However, this term is often constrained to equal zero. One can certainly argue for exclusion of the intercept term. Consider equation (10)

CONCLUSION

In this paper, an intercept term is included (equation 10) so as to enhance comparability to earlier studies using the PAAE model to investigate the ratio adjustment process. However, according to Lee and Wu (1988), the intercept term is expected to have value close to zero.

REFERENCES

Cagan, P. (1956). The monetary dynamics of hyper-inflations. In M. Friedman (Ed.), *Studies in the Quantity Theory of Money, 1.* Chicago: The University of Chicago Press.

Frecka, T. & W. Hopwood (1983). The effects of outliers on the cross sectional distributional properties of financial ratios. *Accounting Review*, January, 115-128.

Frecka, T. & C.F. Lee (1983). Generalized financial ratio adjustment processes and their implications. *Journal of Accounting Research*, Spring, 308-316.

Johnston, J. (1972). *Econometric methods*. New York: McGraw-Hill Book Co., Inc.

Lee, C.F. & C. Wu (1988). Expectation formation and financial ratio adjustment processes. *The Accounting Review*, *4*, 292-306.

Lev, B. (1969). Industry averages as targets for financial ratios. *Journal of Accounting Research*, Autumn, 290-299.

Muth, J.F. (1960). Optimal properties of exponentially weighted forecasts. *Journal of the American Statistical Association*, *6*, 299-306.

Nerlove, M. (1958). Adaptive expectations and cobweb phenomena. *Quarterly Journal of Economics*, May, 227-240.

Waud, R.N. (1966). Small sample bias due to misspecification in the "partial adjustment" and "adaptive expectations" models. *Journal of the American Statistical Association*, *12*, 1130-1152.

HOW DOES CONSUMPTION RESPOND TO SHOCKS IN THE STOCK MARKET AND MONETARY POLICY?

Tricia Coxwell Snyder, William Paterson University

Snydert@wpunj.edu

ABSTRACT

This paper empirically determines how shocks to the stock market and monetary policy impacts consumption (C). In recent years there has been growing talk regarding "wealth effects" stimulating the United States economy. If stock market wealth effects are growing, it potentially alters the transmission mechanisms of money, having important implications for the effectiveness of monetary policy. Using quarterly data from 1959.Q1-2000.Q4, I use an error correction vector autoregression (ECM) model to determine the predictive power of the money supply (M2), the Federal funds interest rate (FFR), stock market wealth (measured as the DJ industrial average), and output (GDP) on C. Results find that consumption appears to respond to changes in monetary policy and the stock market, while output appears to respond to changes in consumption.

INTRODUCTION

During the 1990s, the 260-percent increase in corporate equities led to growing talk regarding the "wealth effects" stimulating the United States economy. During this same period, consumption (C) and output (GDP) also grew at a record pace. In fact, the economic expansion of the nineties is the longest in the United States' history.

While these variables were expanding during the 1990s, it raised a number of economic questions. How do changes in the stock market financial wealth influence economic activity and output? Would a relatively strong "wealth effect" impact the transmission mechanism of money, and could this have implications for the effectiveness of monetary policy? This paper empirically examines some of these questions by measuring the sign and magnitude of the relative impacts of shocks in stock prices, monetary policy, and income on C.

Macroeconomic theorists have long debated the transmission mechanisms of monetary policy. As suggested by Mishkin's (1995) Symposium on the Monetary Transmission Mechanism, the traditional Keynesian interest rate transmission mechanism suggests that reductions in money create an increase in interest rates, which eventually reduces aggregate demand and overall output. Supporting the Keynesian interest rate transmission mechanism, Taylor (1995) suggests that changes in interest rates change consumption.

However, Bernanke and Gertler (1995) along with Meltzer (1995) find little support for a strong interest rate transmission mechanism. They, along with other monetarists, suggest that while the interest rate transmission mechanism may not be very strong, it may work along side alternative monetary transmission mechanisms. One alternative transmission mechanism is Modigliani's life cycle hypothesis. In Mishkin's (1995) explanation of Modigliani's model, reductions in the money supply generate reductions in equity prices, which would then lower the value of consumers

financial wealth. Since stock market wealth is a major component of financial wealth, a negative shock to the stock market reduces the lifetime resources of consumers. Thus, over a consumers life cycle, they must reduce consumption, which eventually reduces output. To support this mechanism, results should find that stock market shocks help predict changes in consumption.

While economists ponder over these and other potential transmission mechanisms, they make very little distinction regarding the size of their impacts on consumption. An empirical investigation may shed light on the quantitative nature of the effects of money, interest rates, and the stock market on consumption. While several recent studies, such as Becker (1997), Kahn (1999), and Poterba (2000) explore the question of how changes in equity prices impact consumption few have used modern time series techniques, such as vectorautoregressions (VARs).

The rest of the paper is as follows. The next section describes the empirical procedures and data collection. Section 3 reports the empirical findings. Lastly, section 4 draws policy conclusions and further extensions based on these results.

EMPIRICAL PROCEDURES AND DATA

An empirical investigation into the relative importance of the stock market wealth effects and monetary policy on consumption is perhaps an even more relevant exercise in today's economy. This paper examines the explanatory power of money (M2), the Federal Funds interest rate (FFR), and stock market financial wealth (measured as the Dow Jones industrial average (DJ)) on consumption (C). The Bureau of Economic Analysis reports real C and GDP in quarterly 1996 dollars from 1959.Q1-2000.Q4 at http://www.bea.doc.gov/. Data regarding stock market wealth is gathered from Economagic.com, which reports the quarterly average of the closing Dow Jones Industrial average. All data regarding monetary policy are gathered from the St. Louis Federal Reserve Bank (FRED) website at http://www.stls.frb.org/fred/. These data are transformed into quarterly averages from the monthly averages of the seasonally adjusted M2 dollars and the nominal Fed. Funds rate.

Even if wealth effects are relatively small, the sheer magnitude of wealth accumulations due to the stock market increases of the last decade may create a substantial effect on consumption and aggregate demand as a whole. As suggested by Poterba (2000), it is possible for changes in the stock market to affect spending directly and indirectly by affecting consumer confidence and creating uncertainty about future economic conditions. Consequently, this study needs an approach that can capture direct and indirect effects of these impacts on real variables.

However, the majority of the studies in this literature have used a single equation "St. Louis" type approach, which place structural causality assumptions onto the model. Following Chowdhury et al (1986) I employ a nonstructural ECM model instead of the "St. Louis" type of approach to avoid imposing potentially spurious aprior constraints on the exogeneity of the variables in the system. While this approach can not determine direct causality, it is a good way to test the predictive power of monetary policy and stock market wealth effects for changes in consumption. This technique allows for both direct and indirect feedback effects between the variables in the system.

An ECM is also a useful method for analyzing the impact of a given variable on itself and on all other variables in the system by using forecast error variance decompositions (FEVD) and impulse response functions (IRF). These tools enable policy makers to empirically evaluate the

magnitude of the impacts of a shock to money, interest rates, wealth and income in terms of their ability to predict changes in consumption.

EMPIRICAL FINDINGS

Using an ECM approach, this study determines the impacts of stock market wealth and monetary policy shocks on consumption behavior. A central issue in examining these effects is timing, making an examination of impulse response functions (IRF) and forecast error variance decompositions (FEVD) useful in determining the impacts of monetary policy and the stock market fluctuations on real variables. As suggested by Poterba (2000), if the lag between increases in any or all of these fluctuations takes years to develop; then their oscillations may have a limited impact on business cycles. However, if the link is powerful and immediate then increases in monetary policy, income and/or asset values may exhibit a strong and powerful influence on real variables.

Interestingly, Impulse Response Functions displayed in Figures 1-3 show that consumption responds to both monetary policy and stock market shocks. Similarly, forecast error variance decomposition (FEVD) results in Table 1 shows that the stock market shocks explain close to one forth of the innovations in consumption. Thus, while Becker (1997) suggests that a relatively small relationship exist between consumption and stock market wealth, findings in this paper support a strong positive relationship between consumption and stock market wealth. As suggested by Modigliani's life cycle hypothesis this may be due to downturns in wealth reducing consumers overall lifetime consumption.

Impulse response functions and FEVD results also show a strong negative relationship between interest rates and consumption. Table 1 shows that both the money supply and interest rates explain between ten and thirteen percent of the innovations in consumption after a year. As Taylor (1995) suggests, this may be due to higher real interest rates increasing the cost of borrowing money, which will encourage consumers to reduce their consumption.

It is also of interest to explore how these impacts affect output. The Impulse response function in Figure 6 shows that stock market shocks only have a minor positive impact on the innovations in GDP, suggesting that wealth shocks have only a small influence on the innovations in GDP. Table 2 shows that DJ shocks explain close to fifteen percent of the innovations in GDP. Collectively this suggests that stock market shocks have only marginal impacts on GDP.

More importantly, evidence suggests that Consumption shocks play an essential role in business cycle movements for the overall economy. The impulse response function in Figure 7 shows that consumption has a strong growing positive impact on the innovations in GDP. FEVD results in Table 2 show that consumption explains close to a third of the innovations in GDP. It is not surprising that consumption, which comprises close to seventy percent of aggregate demand strongly influence the innovations in GDP

Lastly, it is of interest to see how shocks in monetary policy, consumption and output influence the stock market. In general, results show that changes in interest rates, consumption and output have very little predictive power for movements in GDP. Thus, while the stock market may directly impact consumption and indirectly impact GDP through its impact on consumption, these variables appear to have little impact on the stock market.

CONCLUSIONS

The success of monetary policy and government actions depend upon understanding the way in which changes in the monetary policy and the stock market shocks transmit through the economy. Using an ECM approach, this study empirically examines how equity prices and monetary policy influences the real economic activity of consumption.

Results find that consumption responds to both shocks in monetary policy and shocks in stock market wealth. This suggests that changes in consumption behavior may be due to its response to expansion monetary policy and changes in the stock market.

Results also find little support for a strong stock market wealth effect altering output and business cycles. While changes in consumption help explain the innovations in GDP, shocks to the stock market appear to explain very little of the fluctuations in GDP. This suggests that the 2001 recession may not be highly related with the stock market bubble bursting or the downturn in stock market wealth, but more with downturns in consumption or consumer confidence.

While this model is limited to examining the impacts of monetary policy and wealth effects on consumption, there may by many impacts between these and other variables that are not captured in this model. One potentially interesting question might be how these variables respond with investment behavior.

REFERENCES

Becker, G. (April 1997) Why a Crash Wouldn't Cripple the Economy. *Business Week*, April 14, p. 26.

Bernanke, B. and M. Gertler (1995) Inside the Black Box: The Credit Channel of Monetary Policy Transmission. *Journal of Economic Perspectives*, Fall, 9, n4, pp. 27-48.

Engle and Granger, (March, 1987). Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, 55, n2, pp. 251-76.

Hamilton, J. (1994) *Time Series Analysis*. Princeton University Press: Princeton, NJ.

Mishkin, F. (1995) Symposium on the Monetary Transmission Mechanism. *Journal of Economic Perspecitves*, Fall, 9, n4, pp. 3-10.

Poterba J. (2000) Stock Market Wealth and Consumption. *Journal of Economic Perspectives*, Spring, 14, No. 2, pp. 99-118.

Sims, C. (1972) Money, Income and Causality. *American Economic Review*, 62, pp. 540-52.

Sims, C. (1980) Comparison of Interwar and Postwar Business Cycles: Monetarism Reconsidered. *American Economic Review*, 70, No. 2, pp. 250-257.

Taylor, J. (1995) The Monetary Transmission Mechanism: An Empirical Framework. *Journal of Economic Perspectives*, Fall, 9, No. 4, pp. 11-26.

DAGWOOD DOESN'T WORK HERE ANYMORE?: THE DENOMINATOR, UNEMPLOYMENT, AND WAR

Angela Moore Sparkman, Meridian Community College
Asparkma@mcc.cc.ms.us
Doh-Kuhl Kim, Mississippi State University
DK62@meridian.msstate.edu
Jack E. Tucci, Mississippi State University
Jtucci@meridian.msstate.edu

ABSTRACT

In the years leading up to 2001, the United States economy saw an unprecedented level of growth. From all accounts, economists and the general public alike where in agreement that we had never been here before. During this period, the Dow Jones Industrial Average reached 11,000 and unemployment was at an all time low of 4.0%. So where are we today? In the last year, the DOW reached 10,000 before dropping again, and America's unemployment rate ended the year of 2003 at 5.9%. The United States economy is in its third year of recession. With employment at an unsettling level, could it be worse if it were not for the effects of war? Everyone, including our President, wants to be able to say that we have hit the bottom and that we have begun recovery. Has the time come that we can begin to relax and ride the American dream?

THE CONTINGENT WORKFORCE

Christopher J. Surfield, Lander University
csurfield@lander.edu

ABSTRACT

The perceived increase in the use of contingent work arrangements such as consulting, contracting and temporary work has led to concerns that a disposable workforce is being created. The employment instability and poor compensation packages thought to be associated with these work forms makes these employment arrangements particularly undesirable. Given these concerns, however, one might wonder why workers would select such employment. Using a large nationally-representative dataset, the Current Population Survey (CPS), we explore not only the decision to engage in contingent employment, but also the extent to which it has penetrated the U.S. labor markets. Analysis of the 1995 to 2001 rounds of the CPS suggests that the proportion of workers employed in contingent arrangements is actually decreasing. Less than fifteen percent of the workforce can be considered contingent. Furthermore, these workers are voluntarily seeking this employment. Family and personal needs, as well as the desire to have scheduling flexibility, is encouraging nearly sixty percent of contingent workers to remain in these arrangements.

INSTRUMENTAL FREEDOM AND ECONOMIC DEVELOPMENT

Neil Terry, West Texas A&M University
nterry@mail.wtamu.edu
Amjad Abdullat, West Texas A&M University
aabdullat@mail.wtamu.edu

ABSTRACT

Amartya Sen, the 1998 Nobel Prize winner in economics, argues that they key ingredient to economic development is freedom. Sen separates freedom into five different instrumental categories: (1) political freedoms, (2) economic facilities, (3) social opportunities, (4) transparency guarantees, and (5) protective security. These instrumental freedoms tend to contribute to the general capability of a person to live more freely, but they also serve to complement one another. While development analysis must be concerned with the objectives and aims that make these instrumental freedoms consequentially important, it must also take note of the empirical linkages that tie the distinct types of freedom together, strengthening their joint importance. This purpose of this manuscript is to briefly describe the five instrumental freedoms and offer an extension applied to Western freedoms.

INTRODUCTION

The idea of human rights and instrumental freedom has gained a great deal of ground in recent years, and it has acquired something of an official status in international discourse. Weighty committees meet regularly to talk about the fulfillment and violation of human rights in different countries in the world. Certainly the rhetoric of human rights and instrumental freedom are much more widely accepted today than it has ever been in the past. And yet this apparent victory of the idea and use of freedom coexists with some real skepticism, in critically demanding circles, about the depth and coherence of this approach. The suspicion is that there is something a little simple-minded about the entire conceptual structure that underlies the oratory on freedom and human rights. The purpose of this manuscript is to define the instrumental freedoms of Amartya Sen (1999) and briefly explore theoretically extensions.

INSTRUMENTAL FREEDOMS

Amartya Sen identifies five instrumental freedoms in his body of Nobel Prize winning work. The first is political freedom. Political freedom refers to the opportunities that people have to determine who should govern and on what principles, and also include the possibility to scrutinize and criticize authorities, to have freedom of political expression and an uncensored press, to enjoy the freedom to choose between political parties, and so on. They include the political entitlements

associated with democracies, encompassing opportunities of political dialogue, dissent and critique as well as voting rights and participatory selection of legislators and executives.

The second instrumental freedom is based on economic facilities. Economic facilities refer to the opportunities that individuals respectively enjoy as a means of utilizing economic resources for the purpose of consumption, production, or exchange (i.e., markets should be free and fair). The economic entitlements that a person has will depend on the resources owned or available for use as well as on conditions of exchange, such as relative prices and the working of the markets. Insofar as the process of economic development increases the income and wealth of a country, they are reflected in corresponding enhancement of economic entitlements of the population. It should be obvious that in the relation between national income and wealth, on the one hand, and the economic entitlements of individuals, on the other, distributional considerations are important. The availability and access to finance can be a crucial influence on the economic entitlements that economic agents are practically able to secure. This applies all the way from large enterprises employing thousands of people, to tiny establishments.

The third instrumental freedom is the freedom of social opportunities. Social opportunities in this context refers to the arrangements that society makes for education, health care and so on, which influence the individual's substantive freedom to live better. These facilities are important not only for the conduct of healthy private lives, but also for more effective participation in economic and political activities. For example, illiteracy can be a major barrier to participation in economic activities that require production according to specification or demand strict quality control. Similarly, political participation may be hindered by the inability to read newspapers or to communicate in writing with others involved in political activities. Higher education can also be an important step in improving the standard of living of a family.

Next we turn to the fourth category of instrumental freedom, often referred to as transparency guarantees. In social interactions, people deal with one another on the basis of some presumption of what they are being offered and what they can expect to get. In this sense, the society operates on some basic presumption of trust. Transparency guarantees deal with the need for openness that people can expect: the freedom to deal with one another under guarantees of disclosure and lucidity. When that trust is seriously violated, the lives of many people may be adversely affected by the lack of openness. Transparency guarantees can thus be an important category of instrumental freedom. These guarantees have a clear instrumental role in preventing corruption, financial irresponsibility, and underhand dealings.

Finally, no matter how well an economic system operates some people can be typically on the verge of vulnerability and can actually succumb to great deprivation as a result of material changes that adversely affect their lives. Protective security is needed to provide a social safety net for preventing the affected population from being reduced to abject misery, and in some cases, even starvation and death. The domain of protective security includes fixed institutional arrangements such as unemployment benefits and statutory income supplements to the indigent as well as ad hoc arrangements such as famine relief or emergency public employment to generate income for people that are destitute.

CRITIQUES OF HUMAN RIGHTS

Instrumental freedom is inextricably linked to human rights. Sen offers three rather distinct concerns about the intellectual edifice of human rights. There is, first, the worry that human rights confound consequences of legal systems, which give people certain well-defined rights, with pre-legal principles that cannot really give one a justifiable right. This is the issue of the legitimacy of the demands of human rights: How can human rights have any real status except through entitlements that are sanctioned by the state, as the ultimate legal authority? Human beings in nature are, in this view, no more born with human rights than they are born fully clothed; rights would have to be acquired through legislation, just as clothes are acquired through tailoring. This line of attack is called the legitimacy critique. In the end, the focus of this critique is that human rights must be explicit. The moral right of a wife to participate fully, as an equal, in serious family decisions may be acknowledged by many as an implicit right but it is not an explicit right. Explicit human rights are a set of ethical claims that are identified with legislated legal rights.

The second line of attack concerns the form that the ethics and politics of human rights take. Rights are entitlements that require, in this view, correlated duties. If person A has a right to some X, then there has to be some agency, say B, that has a duty to provide A with X. If no such duty is recognized, then the alleged rights cannot but be hollow. This is seen as proposing a tremendous problem for taking human rights to be rights at all. It may be all very nice to say that every human being has a right to food or to medicine, but so long as no agency-specific duties have been characterized, these rights cannot really mean very much. Human rights, in this understanding, are heartwarming sentiments, but they are also, strictly speaking, incoherent. This is known in the literature as the coherence critique.

The third line of skepticism does not take quite such a legal and institutional form, but view human rights as being in the domain of social ethics. The moral authority of human rights, in this view, is conditional on the nature of acceptable ethics. But are such ethics really universal? What if some cultures do not regard rights as particularly valuable, compared to other prepossessing virtues or qualities? The disputation of the reach of human rights has often come from such cultural critiques; perhaps the most prominent of these is based on the idea of the alleged skepticism of Asian values toward human rights. Human rights, to justify that name, demand universality, but there are no such universal values, the critics claim. This is known as the cultural critique.

THE UNIQUENESS OF FREEDOM IN THE CONTEMPORARY WEST

Is the idea of human rights really so universal? Are there not ethics that tend to focus on discipline rather than on rights, on loyalty rather than on entitlements? Insofar as human rights include claims to political liberty and civil rights, alleged tensions have been identified by some Asian theorists. The nature of Asian values has often been invoked in recent years to provide justification for authoritarian political arrangements in Asia. These justifications for authoritarianism have typically come not from independent historians but from the authorities themselves or those close to people in power, but their views are obviously consequential in governing the states and also in influencing the relation between different countries.

Are Asian values opposed—or indifferent—to basic political rights? Such generalizations are often made, but are they well grounded? In fact, generalizations about Asia are not easy, given its size and religious diversity. There are no quintessential values that apply to this immensely large and heterogeneous population, none that separate them out as a group from people in the rest of the world. Sometimes the advocates of Asian value have tended to look primarily at East Asia as the region of particular applicability. In fact, however, even East Asia itself has much diversity, and there are many variations to be found among Japan, China, Korea, and other parts of East Asia. Various cultural influences from within and outside the region have affected human lives over the history of this rather large territory.

Authoritarian lines of reasoning in Asia—and more generally in non-Western societies—often receive indirect backing from modes of thought in the West itself. There is clearly a tendency in America and Europe to assume the primacy of political freedom and democracy as a fundamental and ancient feature of Western culture—one not to be easily found in Asia or the rest of the world. It is a contrast between the authoritarianism allegedly implicit in Asia versus the respect for individual liberty and autonomy allegedly deeply rooted in Western liberal culture. Western promoters of personal and political liberty in the non-Western world often see this as bringing Occidental values to Asia and Africa. The world is invited to join the club of Western democracy and to admire and endorse traditional Western values.

In all this, there is a substantial tendency to extrapolate backward from the present. Values that European Enlightenment and other relatively recent developments have made common and widespread cannot really be seen as part of the long-run Western heritage—experienced in the West over millennia. What we do find in the writings by particular Western classical authors is support for selected components of the comprehensive notion that makes up the contemporary idea of freedom. But support for such components can be found in many writings in Asia traditions as well.

To illustrate this point, consider the personal freedom and toleration propositions. The first proposition is that personal freedom is important and should be guaranteed for all in a good society. The second proposition focuses on the idea that there must be toleration of diverse beliefs, commitments, and actions of different people. Aristotle wrote much in support of these propositions, but in his exclusion of women and slaves did little to defend the latter. Indeed, the championing of equality of this form is of quite recent origin in the West. The Western freedom preached to the rest of the world can be characterized from a historical perspective as a concept of "do as I say, not as I do." In fact, the history of Western culture has been full of harmful religious zeal (the Crusades were originally put forth as a means of preventing in-fighting among European Christians), slavery, anti-Semitic extremism, unequal treatment of women, lack of respect for native cultures (there was generally an attempt in European colonies to civilize the native occupants), and the mistreatment of immigrants. Respect for explicit and implicit human rights is an old theory but a relatively new practice in the West. The city of Philadelphia was given the nickname as the city of brotherly love in the late eighteen century because it was one of the only places in the Western world that would tolerate religious heterogeneity (in the early days of the United States most cities were secularly intolerant). Even today the United States is not the melting pot we claim to be. Most U.S. citizens do not live in a racially diverse neighborhood nor do they feel comfortable in the neighborhood of another ethnic group. Ultimately, we must be careful about criticizing the rest of

the world for not following Western values since Western values have a less than sparkling historical record.

Western ideals of freedom, democracy, and equality are well known to most and founded on the writings of people like Aristotle, Thomas Jefferson, and John Rawls more recently. Other cultures are founded on similar ideals. In Buddhist tradition, great importance is attached to freedom. Nobility of conduct has to be achieved in freedom, and even the ideas of liberation have this feature. Confucius did not recommend blind allegiance to the state over the rights of an individual. When Zilu asks him "how to serve a prince," Confucius replies, "Tell him the truth even if it offends him." Those in charge of censorship in Singapore or Beijing might take a very different view. Confucius is not averse to practical caution and tact, but does not forgo the recommendation to oppose a bad government. Indeed, Confucius provides a clear pointer to the fact that the two pillars of the imagined edifice of Asian values, namely loyalty to family and obedience to the state, can be in severe conflict with each other. Many advocates of the power of Asian values see the role of the state as an extension of the role of the family, but as Confucius noted, there can be tension between the two. The Governor of She told Confucius, "Among my people, there is a man of unbending integrity: when his father stole a sheep, he denounced him." To this Confucius replied, "Among my people, men of integrity do things differently: a father covers up for his son, a son covers up for his father—and there is integrity in what they do."

If we turn to Indian traditions we can find a variety of views on freedom, tolerance, and equality. In many ways, the most interesting articulation of the need for tolerance on the egalitarian basis can be found in the writings of Emperor Ashoka, who in the third century commanded a larger Indian empire than any other Indian king. He converted to Buddhism, and not only helped to make it a world religion by sending emissaries abroad with the Buddhist message, but also covered the country with stone inscriptions describing forms of good life and the nature of good government.

Because of the experience of contemporary political battles, especially in the Middle East, Islamic civilization is often portrayed as being fundamentally intolerant and hostile to individual freedom. But the presence of diversity and variety within a tradition applies very much to Islam as well. Iranian mathematician Alberuni devoted much of his life to fostering mutual understanding and tolerance in his eleventh-century world. The Turkish emperors were often more tolerant than their European contemporaries. Abundant examples of this can be found also in Cairo and Baghdad. Indeed, even the great Jewish scholar Maimonides, in the twelfth century, had to run away from an intolerant Europe and from its persecution of Jews, to the security of a tolerant and the patronage of Sultan Saladin.

REFERENCE

Sen, Amartya (1999). *Development as Freedom*. New York: Random House Publishing.

PROSPECTS FOR RESOLVING
THE SENIOR BOOM ISSUE

Neil Terry, West Texas A&M University
nterry@mail.wtamu.edu

ABSTRACT

When the U.S. Congress invented Social Security the young to old ratio was in the shape of a pyramid. Soon after World War II, the suburbs exploded with babies, new schools, and a seemingly endless supply of future workers to pay for their elders. This endless supply of workers does not exist anymore. In fact, the boomers themselves helped create the problem. The 1960s mantra about the population explosion, which discouraged some parents from having kids, urbanization, and the availability of modern birth control, curbed the baby boom. Between 1965 and 1980, the number of school kids in the United States actually dropped by more than 15 percent. This paper presents background information and ad hoc solutions to the impending senior boom problem created by the retirement of the baby boom generation and the subsequent drain on Social Security and Medicare.

INTRODUCTION

The United States, which always prided itself as a youthful republic, is getting old fast. Our national priorities are switching from the schoolhouse to the nursing home. For the first time in history, we will have more old people than children. Today's anxious class of twenty-something workers may have to give up most of their future earnings just to meet the government's obligations to their parents and grandparents. Social Security and Medicare are expected to combine for over one trillion dollars by 2009. The purpose of this manuscript is to explore issues and solutions relating to the impending senior boom problem.

BACKGROUND

The seventy-eight million baby boomers that pushed the Beatles and the Rolling Stones into stardom are middle aged. Indeed, the future of America is now on display in Florida, where one person in five is over sixty-five. In less than twenty years, almost twenty percent of all Americans will be sixty-five or older. Just as the post-World War II baby boom presented both obstacles and opportunities, so too does the graying of America. Two principal forces are behind America's senior boom. First, we are living longer. Average life expectancy in 1900 was forty-seven. Today it is seventy-eight and is likely to reach eighty within the next decade. Second, the birth rate is near record low levels. Today's mothers are having half the number of children that their mothers had. In short, the old are living longer and the ranks of the young are growing too slowly to offset that fact. Together, these forces are pushing up the proportion of the population over sixty-five; indeed, the population of seniors is growing at twice the rate of the rest of the population. In 1970, the

median age in the United States—the age that divides the older half of the population from the younger half—was twenty-eight; by 1999 the median age was thirty-six and rising rapidly.

Compounding these factors, the average age at retirement has been declining as well, from sixty-five in 1963 to sixty-two currently. The result is more retirees relying on fewer workers to help ensure that their senior years are also golden years. Why should a person who is under thirty-five be concerned with the age of the rest of the population? Well, old people are expensive. In fact, people over sixty-five now consume a bit over one-third of the federal government's budget. Social Security payments to retirees are the biggest item, followed by Medicare (hospital and doctor's bills for the elderly), and Medicaid (medical payment for the poor, with a third of the current budget allocated to seniors). Under current law, the elderly will consume forty percent of all federal spending within thirteen years. In a nutshell, senior citizens are the beneficiaries of an expensive and rapidly growing share of federal government spending.

The responsibility for the huge growing bills for Social Security and Medicare falls squarely on current and future workers, because both programs are financed by taxes on payrolls. Thirty years ago, these programs were adequately financed with a payroll levy of less than ten percent of the typical worker's earnings. Today, the tax rate exceeds fifteen percent of median wages and is expected to grow rapidly. By the year 2020, early baby boomers, born in the late 1940s and early 1950s, will have retired. Late baby boomers, born in the 1960s, will be nearing retirement. Both groups will leave today's college students, and their children, with a staggering bill to pay as the baby boomers create a senior boom. For Social Security and Medicare to stay as they are, the payroll tax rate may have to rise to twenty-five percent of wages.

One way to think of the immense bill facing today's young adults, and their successors, is to consider the number of retirees each worker must support. In 1946, the burden of one Social Security recipient was shared by forty-two workers. By 1960, nine workers had to foot the bill for each retiree's Social Security benefits. Today, roughly three workers pick up the tab for each retiree's Social Security, plus his or her Medicare benefits. By 2030, only two workers will be available to pay the Social Security and Medicare benefits due each recipient. Paying all the bills presented by the twenty-first century's senior citizens will be made more difficult by another fact: Older workers are leaving the workplace in record numbers. The average retirement age is down to sixty-two and declining. Only thirty percent of the people age fifty-five and over hold jobs today, compared with forty-five percent in 1930. Thus even as the elderly are making increasing demand on the federal budget, fewer of them are staying around to help foot the bill.

Along with our population statistics, our cultural norms are also changing. For most of human history, and even during the first few decades of this century, adults viewed children as income producers for the family. More hands on the farm meant more bushels of corn to sell. We now find child labor offensive and the idea of viewing children as income-producing assets as backward if not downright repulsive. But could baby boomers end up turning the clock back on this ethic? While their Depression-era parents may have been raised in a spirit of frugality and sacrifice, the post-World War II suburbs raised an indulged generation. Off the farm and into a postwar consumer explosion, baby boomers were reared more like luxury goods than financial assets. The suburbs emphasized schools, and the rate of college attendance skyrocketed, with higher property taxes paying the way. In the 1950s and 1960s the entire Western world seemed to worship the teenager. The baby boomers clearly intended to pass along the indulged childhood to their

offspring. More so than ever, today's parents see a child as a precious financial drain, not as an income-producing asset. But the size of the economic pie is not going to be large enough for both the indulgence of youth and the prosperity of the old. Choices will have to be made as to how big of a slice of the economic pie seniors are entitled to.

Have today's youth been raised with the cultural values that will steer them toward extraordinary generosity? The kids of boomers have learned that in the job market they must make their own way, forgetting old-fashioned norms like lifetime employment and guaranteed benefits. Now that Xers are in their late twenties and early thirties and earning decent incomes, economists are finding that they do a remarkable job of saving and investing for the future compared to the spend thrifty baby boomers. Teamwork sounds great on the surface, but self-reliance and entrepreneurship now look like the keys to success. Offices are dressing down for casual Friday, but the pressure on individuals to perform or be downsized is more intense than ever. When the baby boomers ask young workers to show them the money, will they do it? The demographics say yes. Democracy (or gerontocracy) will force the young to support the old as seniors will flock to the voting booth. Finding a solution to the senior boom problem is a tremendous challenge.

OPTIONS FOR THE FUTURE

The senior boom issue is more of a national problem than a generational war. Specifically, the greedy seniors of tomorrow are the parents and grandparents of today's young workers. Few want to kick mom to the curb. In fact, if we did dramatically cut senior benefits then there is a chance than many seniors may fall into poverty. A more productive approach is to consider what can be done to salvage senior benefit programs like Social Security and Medicare without putting generations XYZ in the poor house. This section briefly discusses a list of ten talking points relating to the senior boom issue.

The first proposed way to address the senior boom problem is to cut Social Security benefits. The most obvious cut would be on senior citizens with a net wealth above a specified level. The system would be very similar to the financial aid system for college students. Families with a large net wealth do not qualify for financial aid, while poor families do. Many senior citizens will complain that they could be punished for having a productive and prosperous career. This proposal attempts to save Social Security by confiscating the contributions of wealthy seniors. The analogy of financial aid for college students is somewhat negated by the fact that college students do not lose assets that have put forth into the financial aid system, like wealthy seniors would lose if this proposal moved forward.

A second savings strategy is to cut Medicare benefits. The controversial way to save money for Medicare is to limit near death support. Most people spend over half of their lifetime medical expenses in the last three months of life. Heart transplants and other risky procedures would only be performed on the elderly when the probability of success was at a reasonable level. Limiting expenses on death prevention would be very difficult to implement, essentially turning Medicare into an HMO. But it would save a lot of money and if HMO's are good enough for the working public, shouldn't they be good enough for the retired public?

The third proposal often discussed is to privatize social security. The problem is that insurance companies are not in business to lose money. Hence, a private firm would have to raise

rates (i.e., taxes on generations XYZ) in order to fund the system. In many ways, it is already too late to privatize Social Security. The fourth proposal, which was put forth by the President Bush during the 2000 Presidential election, is to put part of the Social Security surplus into the stock market. Over the long-run equities out perform debt. Instead of getting a 3-5% average annual return on debt, stock could provide an average return of 7-10%. This extra return on equities could save the system. Of course, stocks are riskier—and negative returns on equities are possible. Compounding the problem is the fact that baby boomers have thrown money into the stock market during the nineties in order to get a higher return. The baby boomer increase in demand for stocks resulted in a bull market throughout most of the nineties. When the boomers look to cash in during retirement it is predicted that the reverse effect will kick in and a decrease in demand for stocks will turn the market very bearish.

Another idea put forth by the Bush administration is the partial privatization for generations XYZ. This idea states that some of the Social Security money being paid in by young people should go to seniors and some of the money should go directly into a private account for the young worker putting it into the system (giving young people an incentive to care about the system). After all, more young workers today believe in UFO's than believe they will ever see a dime of Social Security money. The problem is that Social Security is a pyramid system and this idea does nothing to deal with the problem facing the country in the years 2010 through 2020. In fact, it compounds the problem. Yet the idea has some legs within the economics literature. The manuscript entitled "The 6.2 Percent Solution," by Michael Tanner of the CATO Institute published in 2004 has garnered a significant following.

A sixth proposal is to save money by raising the retirement age. For generations XYZ the retirement age has already been bumped up to 67. It does not seem fair to allow baby boomers to retire at 65 and paying for it by further increasing the retirement age of generations XYZ to the age of 70 or even 75. The argument that can be made is that medical technology has changed in a way that makes the 75 year-old of tomorrow just as healthy as the 65 year-old of today. An argument could be made that the retirement age of 67 should be instituted before the year 2027, maybe 2010. This slight change or any variation of changing the retirement age sooner than later could save a significant amount of Social Security money in the short-run.

The seventh proposal that is often considered is to increase immigration. There are educated people from the developing world that are anxious to come to the United States and take their chance at the "American Dream." A country that was built on the backs of immigrants could bring look to the "tired, poor, and huddled masses" of the rest of the world in order to expand the base of Social Security pyramid. Of course, young natives struggling to pay taxes and move up the corporate ladder may not enjoy the extra job competition and lower wages that would result from a massive influx of foreigners. About a million immigrants come to America each year, the largest number in our nation's history. Yet more than ninety percent of new immigrants are admitted based on a selection system unchanged since 1952, under which the right of immigration is tied to family preference. As a result, most people are admitted to the United States because they happen to be the spouses, children, or siblings of earlier immigrants, rather than because they have skills or training highly valued in the American workplace.

The last three proposals focus on money saving considerations that will not solve the senior boom problem but will take a step in the right direction. The eighth idea focuses on the idea that

extra Social Security and Medicare money will be added to the government coffers via the untaxed retirement savings of the baby boomers. Some people argue that current retirement plans allow people to avoid current taxes but the money will be tapped at a later date. Hence, when the boomers retire they will be required to pay income taxes on retirement funds that are cashed in. The problem is that the tax rate will be substantially lower for people living off a pension but every dollar counts. The ninth idea is to not allow people that retire abroad to collect Social Security or Medicare benefits. The point is to force retirees to spend their Social Security money domestically. The reality is that some people do retire in places like the border of Mexico and still collect U.S. Social Security but the numbers are not real big. The tenth idea is to change the Social Security system where it encourages senior citizens to work instead of punishing them for earning an income via lost Social Security benefits. During the last ten years a lot of progress has been made to address this specific issue because many senior citizens are willing and capable of working a part-time job. The penalties associated with working after retirement has dramatically been reduced in recent years.

HUMAN CAPITAL RETURNS FROM PRISON INDUSTRY INVESTMENT AND PRODUCTION

Neil Terry, West Texas A&M University
nterry@mail.wtamu.edu
Barry Duman, West Texas A&M University
bduman@mail.wtamu.edu
Knut A. Rostad, The Enterprise Prison Institute
krostad@aol.com

ABSTRACT

A common complaint about prison industry production is that inmates do no learn marketable work skills while incarcerated. This concern may have merit for stereotypical work of the chain gang or license plate production. But a modern approach to prison industry production recognizes several positive attributes associated with prison industry production including reduced recidivism, increased employability in the private sector, complement effects on other industries, an increase in overall national productivity, and a decrease the burden on taxpayer with respect to funding prison system. The purpose of this study is to propose a methodology and estimate the value of human capital investment associated with the prison work experience. The results of this study are of an exploratory nature put forth to illustrate the importance of human capital obtained by prison industry production. Floor assembler, call center representative, and welder are the jobs explicitly analyzed.

INTRODUCTION

The current economy has put relentless pressure on taxpayers and state budgets. It is the purpose of this paper to suggest a long-term, partial solution to this reality. Our approach will take time and is not the only possible solution but one that offers potential relief. The authors are economist-not sociologists or psychologists. There is a good deal of crossover but our purpose here is to utilize standard economic analysis to at least get a grip on some fundamental issues. In this present case, we are attempting to use a human capital return model to establish the case for comprehensive and meaningful training for prisoners—both long term and pre-release. Our preliminary view is that the human capital that is acquired through useful and vendable production while incarcerated will ultimately be transferable to the private sector upon an individual's release and the returns on that original capital investment made by the state will positively impact recidivism rates and thereby reduce prison over crowding, nonproductive maintenance expenditures, and the endless revolving door that characterizes the typical prison environment. The positive impacts on the free world would clearly be a trained labor force, enhanced productivity and perhaps employment security and economic viability for both the former prisoner and employer.

The approach of this study is to identify areas of prison production where individuals might conceivably be trained for ultimate outside employment. "Floor assembler," "call center representative," and "welder" are three sample professions that provide realistic prison human capital training and private sector employment opportunities. Certainly, security issues would have to be resolved and occupations where dangerous materials as tools have to be used would not be likely candidates. Our hope is to move away from traditional prison production which emphasizes garment manufacturing and farming, both of which are not of much use in the private sector as these trades have either been exported or severely transformed through the use of technology and labor saving techniques. A secondary purpose is to estimate the current human capital enhancing skills that are now being provided in selected state prisons and attempt to identify other areas that would either enhance or substitute the nature of that training.

The authors are not oblivious to the counter arguments that so often are presented by vested labor organizations. Some cite hypothetical similarities with slave labor programs allegedly found in China and others emphasize the punishment aspects of incarceration. To the extent that all of these arguments have some validity, we believe that the overall long-term net benefits to individuals, society and policy makers is transcendental. The organization of the remainder of this paper will focus on the professions of floor assembler, call center representative, and welder. Each profession is analyzed with a focus on job characteristics, related human capital obtained via prison industry production, employment opportunities for former inmates in the private sector, and the return to human capital provided by productive training in the prison system.

FLOOR ASSEMBLER

A floor assembler assembles fabricated parts at floor stations, and test and calibrates parts and mechanisms to meet tolerance and product specifications. The job may require 0-3 years of apprenticeship or formal training in the field or a related area. Specific current examples of floor assembly in prison include shoe manufacturing, furniture production, and circuit board assembly. Based on interviews and discussion with prison and private sector representatives, the authors estimate that approximately fifty percent of the human capital required to successfully work in the private sector in the field of floor assembly could be obtained in prison by working for two or more years (twenty percent derived from formal education and another thirty percent firm-specific human capital). The entry-level private sector salary for an individual seeking employment in the industry is approximately $10 per hour or $20,000 per year. Applying the below market discount rate approach, an inmate released from prison at age twenty-five and working in the industry until the age of sixty-five will earn a net present value of approximately $800,000 during a lifetime. The return to human capital in this study is derived from a parsimonious variation of models created by Ben-Porath (1967), Heckman (1976), and Borjas (1996). The specific return to human capital model employed in this study considers the net present value of future earning derived from an investment in human capital assuming a forty year work window (ages 25-65), the value of the human capital investment attributed to the current wage (e.g., a starting wage of $10 an hour derived from a prison industry human capital investment of fifty percent of the productive value would yield a human capital investment for prison industry production of $5 an hour). Assuming a depreciation rate of five percent the net present value of the return to human capital from prison industry work

experience is $172,000 over the life-cycle. The model specified provides a return to human capital throughout the entire life-cycle but at a declining rate. As time passes, there is an erosion of the value of the initial human capital investment since on-the-job training, production techniques, and technology change.

CALL CENTER REPRESENTATIVE

A call center representative is responsible for initiating calls to potential clients, often using a prepared selling script to promote and sell products and services of a company. The job requires a minimum of a high school diploma or its equivalent and 0-2 years of related experience. Specific current examples of call center representative work in prison include solicitation of travel packages and long-distance phone offers. Based on interviews and discussion with prison and private sector representatives, the authors estimate that approximately sixty percent of the human capital required to successfully work in the private sector in the field of call center representatives could be obtained in prison by working for two or more years (twenty percent derived from formal education and another twenty percent firm-specific human capital). The entry-level private sector salary for an individual seeking employment in the industry is approximately $10 per hour or $20,000 per year. Applying the below market discount rate approach, an inmate released from prison at age twenty-five and working in the industry until the age of sixty-five would earn a net present value of approximately $800,000 during a lifetime. Applying equation 1 yields a net present value return to human capital for prison industry work experience in the profession of call center representative at $206,000 over the life-cycle.

WELDER

A welder joins, fabricates, and repairs metal and other weldable material by applying appropriate welding techniques. May require 0-2 years of apprenticeship or formal training. The work is normally performed under immediate supervision but primary job functions typically require exercising independent judgment. A specific example of the work being performed in prison is the welding of snowplow accessories. Based on interviews and discussion with prison and private sector representatives, the authors estimate that approximately seventy percent of the human capital required to successfully work in the private sector in the field of welder could be obtained in prison by working for two or more years (twenty percent derived from formal education and another ten percent firm-specific human capital). The entry-level private sector salary for an individual seeking employment in the industry is approximately $11.50 per hour or $23,000 per year. Applying the below market discount rate approach, an inmate released from prison at age twenty-five and working in the industry until the age of sixty-five would earn a net present value of approximately $920,000 during a lifetime. Applying equation 1 yields a net present value return to human capital for prison industry work experience in the profession of welder at $264,000 over the life-cycle.

RESEARCH EXTENSIONS

The next stage of this research is to inquire into the transferability of these skills to the private sector and logically attempt to estimate the return to these individuals as a result of their state supported funding in a present value context. A problem likely to be encountered will involve separating on-the-job skills from those skills acquired in an enhanced prison supported human capital training program. We believe we can do this by visiting employers currently using former offenders and surveying these firms to ascertain the degree of training provided after employment with their expectations as to the new hire's skills upon presenting himself or herself for employment. Our belief is that an employer would highly value a person who has been previously well trained in a related occupation and is able to proceed to work immediately without much additional training. The efficiency and productivity returns are self-evident and meaningful. As far as the former offender is concerned, we believe that enhanced return on the states' investment in productive human capital will serve as a stimulus for non-disruptive behavior while in prison, provide for a reasonable and dignified means of support for the offender and dependents, perhaps even while in prison, and ultimately and most importantly, serve to provide a realistic and viable means for an individual to re-enter productive society.

REFERENCES

Ben-Porath, Y. (1967). "The Production of Human Capital and the Life Cycle of Earnings." *The Journal of Political Economy*, 75(4), 352-365.

Borjas, G. (1996). *Labor Economics*. New York: McGraw-Hill.

Duman, B. and N. Terry (2001). "The Efficacy of Prison Labor Production: The Texas Wardens Respond." *Southwestern Economic Review*, 28(1), 159-167.

Heckman, J. (1976). "A Life-Cycle Model of Earnings, Learning, and Consumption." *The Journal of Political Economy*, 84(4), S11-S44.

TITLE IX COMPLIANCE VERSUS PROFITS

Neil Terry, West Texas A&M University
nterry@mail.wtamu.edu
Crecencio Ramirez, West Texas A&M University
cramirez32@hotmail.com

ABSTRACT

Title IX has become a central figure in the profit structure of college athletics. The empirical results from this study provide evidence supporting the prevailing notion that men's college football on the Division 1-A level is the dominant source of profits for collegiate athletic programs. Women's programs are shown to earn significantly less than all men's and gender neutral programs. Three possible approaches to addressing the gender equity versus profit debate are discussed. The three arguments are as follows: (1) Expand compliance to all extracurricular activities, not just college athletics; (2) Separate football from other sports as part of the Title IX compliance estimation; (3) Reduce the number the number of Division I football scholarships.

INTRODUCTION

In 1972 Title IX was established into law as a portion of the Education Amendments. Title IX has been the greatest contributing factor that has put forth gender equality in athletics but at the possible cost of many non-profit-generating male athletic programs such as swimming, baseball, and wrestling. Recently the controversy about the efficacy of Title IX and the impact it has on the profitability of collegiate sports has been debated in the media by the National Wrestling Coaches Association, Title IX supporters, and by elite college football programs. The purpose of this research is to explore compliance versus profit proposals relating to Title IX. This paper is divided into three sections. The first section offers a brief discussion on the role of Division I-A football in collegiate athletics. The second section applies a nonparametric technique in order to compare the profitability of college athletic programs by classification. The third section explores the benefits and costs associated with Title IX versus profit proposals.

THE ROLE OF FOOTBALL IN DIVISION I-A COLLEGIATE ATHLETIC

College football is big business. During the 2001-2002 academic year Division I-A college football earned a combined profit of over $225 million. Fans provide financial funding to football programs by attending games, purchasing licensed merchandise, watching television, and contributing to the alumni association. Division I-A football is considered to be a revenue sport. A revenue sport is actually a misnomer, as the term does not mean that they generate revenue, but that they generate revenue in excess of their costs. With the profit, football is able to subsidize other

non-revenue sports such as swimming, gymnastics, and wrestling. Football carries the financial load in Division I-A athletics. The average annual profit is close to $5 million for football, while the average profit for the entire Division I-A athletic program is below $2 million. Football profits spill over and helps other sports. Football profits mean better basketball facilities, higher-profile coaches, and more TV exposure, all of which help attract the best talent. This creates a domino effect where all athletic programs benefit from football profits. The perceived conflicts between gender equity and profits have been debated for over thirty years. Athletic administrators argue that they have been slow to respond to Title IX requirements because they barely break even as it is. Therefore, either non-profit-generating men's programs will have to suffer or profits will have to come out of men's programs that generate profits, primarily football. Some argue diverting money from football could weaken the ability of the football program to continue to prosper and subsidize other sports, making all of the athletic programs at any college worse off. The solution has been to cut non-profit-generating men's programs. The University of Kansas athletic department cut men's swimming and tennis in 2001 to stay in the black, saving about $600,000 per year and reducing participation by 50 male athletes. Among the reasons cited for the cuts were increasing scholarship costs, increases in team travel costs for other sports, increases in coaches' salaries, and to meet gender equity requirements. Title IX defenders put forth the argument that non-revenue-generating men's sports are not being eliminated because of gender equity but because a disproportionate amount of athletic resources are distributed to football programs. The extension of this argument is that instead of eliminating men's wrestling, swimming, and tennis programs many universities could reduce the resource base of football instead of blaming gender equity.

COMPARISON OF THE PROFITABILITY OF COLLEGIATE ATHLETIC PROGRAMS

Is there a difference in the profitability of college athletic programs by classification? The general belief about college athletics is that football and men's basketball programs earn large profits that subsidize other men's programs and women's athletics. In this section we compare the profitability of collegiate athletic programs in four different categories during the 2001-2002 academic year. The sample is drawn from 116 athletic programs with Division I-A football. The data source is the Office of Postsecondary Education Equity in Athletics Disclosure Website, a division of the United States Department of Education. The four program classifications are men's football, men's basketball, women's programs, and other programs. Other programs include men's athletic programs outside of the football and basketball area and gender-neutral athletic programs such as track & field. The statistical methodology incorporates a nonparametric approach to comparing the profitability of athletic programs. The Kruskal-Wallis test is employed because it offers the most powerful test statistic in a completely randomized design without assuming a normal distribution. The Kruskal-Wallis test is designed to be sensitive against differences among means in the k populations and is extremely useful when the alternative hypothesis is that the k populations do not have identical means. The Kruskal-Wallis test is used in this study to test the null hypothesis that the k profitability of athletic programs is derived from an identical distribution function. The specific equations used in the calculations are as follows:

(1) $N = \sum_i n_i$ with i = 1 to k

(2) $R_i = \sum_j R(X_{ij})$ with j = 1 to n_i

(3) $R_j = \sum_i O_{ij} R_i$ with i = 1 to c

(4) $S^2 = [1/(N-1)] [\sum_i t_i R_i^2 - N(N+1)^2/4]$ with i = 1 to c

(5) $T = (1/S^2) [\sum_i (R_i^2/n_i) - N(N+1)^2/4]$ with i = 1 to k

(6) $|(R_i/n_i) - (R_j/n_j)| > t_{1-a/2} [S^2(N-1-T)/(N-k)]^{1/2} [(1/n_i) + (1/n_j)]^{1/2}$

where *R* is defined as the variable rank and *N* is the total number of observations. The first three equations are used to find average ranks. Equation (4) is used to calculate the sample variance, while equation (5) represents the test statistic. If, and only if, the null hypothesis is rejected, equation (6) is employed to determine multiple comparisons of profitability across the various athletic programs.

The empirical approach yields a T-value of 34.36 (p-value = .0001), indicating a significant difference in profitability across the four program classifications. Table 1 presents a summary of the average profitability of athletic programs listed by conference classification for illustrative purposes. Assuming an alpha level of .05, the empirical results from equation 6 indicate that men's football is significantly more profitable than the other three program classifications. In addition, men's basketball is significantly more profitable than the remaining two program classifications. Finally, women's athletics earns profits that are significantly lower than other programs at an alpha level of five percent. It should be noted that women's basketball programs are profit generators for some colleges and would not be lower than the other programs classification if isolated from other women's sports as part of the multiple comparison test.

The results provide evidence supporting the notion that the profits from men's football and, to a lesser extent, men's basketball subsidize women's and other college athletic programs. The combined average profitability of men's football and men's basketball is just under seven million dollars for the 2001-2002 academic year while the combined average profitability of women's athletic and other programs is approximately negative five million dollars. Table 1 provides a clear picture on program profitability. Football is clearly the dominant program in 8 of the 12 conference classifications, highlighted by an astonishing average profit of more than $18 million per university in the SEC conference. Women's programs have the smallest profits or biggest losses in 10 of the 12 conference classifications. One interesting pattern derived from the Table 1 summary is the observation that conferences that are not part of the Bowl Championship Series (BCS) for college football do not usually earn very large profits from the football programs and are often more successful in men's basketball or other programs. The conferences that received an automatic bid into the BCS are ACC, Big East, Big Ten, Big Twelve, Pac Ten, and SEC. With the exception of the Big East, five of the six most profitable conferences are BCS conferences.

GENDER EQUITY VERSUS PROFIT PROPOSALS

Title IX has become a central figure in the profit structure of college athletics. The empirical analysis put forth in this study clearly verifies the importance of college football with respect to the profit structure of Division I-A athletic programs. Despite the financial considerations it is clear based on anecdotal evidence that the impact of Title IX on women's athletics has been immensely positive. The number of women participating in intercollegiate athletics has gone from approximately 30,000 to more than 150,000 since 1972. In the last 20 years alone the number women's college teams has nearly doubled. Before Title IX only tennis and golf had established professional league tours. Now there are also women's professional leagues for soccer, volleyball, basketball, and bowling. Women have even made inroads in the traditionally male sport of boxing. In this section we look at three possible approaches to addressing the gender equity versus profit debate.

One approach to the Title IX issue is to expand compliance to all extracurricular activities, not just college athletics. Most colleges offer extracurricular activities in art, dance, speech, band, and miscellaneous other areas. Female participation in non-athletic activities is often equal to or greater than male participation. Title IX interpretation could be expanded in a way that tabulates all extracurricular activities and funding as part of the compliance equation. The proportionality issue with Title IX would not be such a headache and might prevent the loss of many male non-revenue-generating sports. The counter argument against the extracurricular expansion proposal is that it could setback many of the gains made by women in collegiate athletics during the last thirty years. For example, major strides have been achieved in women's basketball during the last ten years. Women's college basketball programs at the University of Connecticut, University of Tennessee, and Texas Tech University are examples of programs that have turned the corner and make a profit. The women's college basketball championship tournament has continually earned more profit each year from the tournament broadcast rights. The examples of successful women's programs suggest that a little short-term pain while investing in the promotion of women's sports can pay off.

The second proposal revolves around the idea that Division I-A football is unlike any comparable women's sport and should be separated from other sports as part of the Title IX compliance estimation. The uniqueness of football is primarily derived from the large number of athletes needed to field a team plus the profits generated by the sport. Variations on this proposal are not new. On May 20, 1974, the Tower Amendment was proposed but rejected. This amendment attempted to exempt profit-generating sports from being tabulated when determining Title IX compliance. The Tower Amendment and related proposals have never been able to convince the courts that gender inequality is acceptable in the name of profits. There is little doubt that on the Division I-A level, football programs subsidize many other male and female athletic programs. But the courts have recognized that subsidies are a key component of a well functioning institution of higher learning, not just in athletics but also in academics. The average enrollment for a Division I-A institution is over twelve thousand. Pursuance of a degree in higher education requires that student take university and major core requirements. The enrollment and subsequent funding derived from introductory core classes in history, math, and English subsidizes upper-level courses and specialty fields like philosophy and Latin. The high enrollment from principles of

microeconomics and macroeconomics often subsidize upper-level and graduate economic courses at many universities. Football programs can be viewed as unique entities that need to be separated from the Title IX compliance tabulation but they can also be viewed as providing a subsidy umbrella; they generate profits that help pay and maintain the existence of other athletic programs.

At any given time in a football game a team is only allowed eleven players on the playing field. The majority of Division I-A football programs are compromised of one hundred football players not including the coaching staff and trainers. Football programs offer as many as eighty-five scholarships to players during an academic year. This vast number of football scholarships counts toward Title IX compliance requirements and is one of the primary reasons that non-profit-generating men's programs are often eliminated. There is no comparable women's program to balance the athletic scholarship numbers. This is where the primary problem starts for men's athletic programs other than football. Football has been left untouched and is held as the golden goose. Football runs through the veins of sports fans and the money it generates is the life force of college athletic departments. The third proposal acknowledges the popularity of football and puts forth the suggestion that the number of players offered full athletic scholarships be reduced by approximately twenty spots and reallocated to other sports. Cutting football scholarships and redistributing the money could prevent the loss of other athletic programs. Reduction in the number of football scholarships in the past has improved the competitive balance in the sport, which in turn increased profits. There is no reason to believe that there would be an appreciable decline in the profit from football in the future if this proposal were applied. The primary weakness of this proposal is that it might exasperate racial inequality problems. In Division I men's sports, 61.6 percent of the athletes are white and 25.5 percent are African-American, even though the latter has a higher percentage of players in basketball and an equal share of football. The reduction of football scholarships would probably have a positive impact on Title IX compliance without hurting football profits but it would also have a tendency to deprive African-American athletes an opportunity at obtain higher education. Reducing football scholarships might also be economically inefficient. An efficient allocation normally provides more resources to profit centers, assuming there is ability to achieve profit growth.

Table 1
Average Profitability of Collegiate Division I Athletic Programs (by Conference)

Conference	Total	Football	M Basketball	Women	Other
ACC	2,291,000	4,442,667	5,100,000	-3,498,889	-3,752,778
Big East	-2,122,750	2,797,250	779,700	-3,881,800	-1,817,900
Big Ten	5,811,364	12,211,640	5,219,455	-5,844,000	-5,775,727
Big Twelve	5,978,417	9,553,667	2,033,250	-3,652,750	-1,955,750
Conf. USA	-1,304,500	-538,100	1,627,800	-2,414,200	20,000
MAC	-1,195,462	-1,198,308	-304,154	-1,518,154	1,825,154
Mount. West	1,014,000	-70,500	1,391,875	-2,318,750	2,011,375
Pac Ten	1,994,000	6,841,800	2,479,000	-4,368,200	-2,958,600
SEC	8,914,750	18,435,830	2,973,417	-4,102,583	-8,391,917
Sun Belt	-784,000	-749,000	-255,429	-1,048,714	1,269,143
WAC	-1,402,500	-410,300	510,700	-2,334,600	831,700
Independent	1,397,417	3,032,667	-191,500	-1,632,750	189,000
ALL	1,965,931	5,071,629	1,913,733	-3,198,138	-1,821,293

A REVIEW OF SOME LITERATURE OF TAX COMPETITION BETWEEN JURISDICTIONS

Robert J. Walsh, Marist College

robert.walsh@marist.edu

ABSTRACT

A substantial amount of academic research has been done on the level of public goods provided with governments compete against one another. This is particularly true when governments offer incentive packages for businesses to move to a different geographical location.

Tax competition between state and municipal government generally promote negative effects for the jurisdiction -- a less-than-optimal tax rate for the government fund-raising effort, as well as a shortage of public goods and services for all citizens. In addition, tax savings are generally not required to be reinvested in the community and few jurisdictions attach other social provisions to their receipt. Tax burdens between jurisdictions are extremely difficult to assess and may rely on arbitrary assumptions.

This paper concludes by pointing out those areas of the research which are incomplete, or where future questions still require researching.

ECONOMICS IN EDUCATION: A COURSE DESIGN FOR COLLEGES OF EDUCATION

Fred M. Carr, University of Akron
fmc1@uakron.edu

ABSTRACT

The contribution of education to the overall well being of societies has been recognized throughout the ages from Aristotle to Thomas Jefferson to present day researchers. Alfred Marshall related economics to education when he referred capital investment to human beings. "The most valuable of all capital, is that invested in human beings…" (Marshall, 1920). The value of human capital was defined and refined in Human Capital *(Becker, 1964). Problems appear when trying to measure the rates of return from education. Problems for researchers are reflected by in the observation, "The problem is that the only real measure we have of whether people are productive and economically valuable is their wages. … People who look at the returns to education are at pains to distinguish between private returns – the benefits to individuals who receive the education – and social returns, which take into account costs and benefits to members of the society as whole, not just the educated individual." (Alison, 2002).*

Economics in Education has been a subject of increasing interest at universities over the past decade. Most of the courses to date, which address this area, are carried out in Departments of Economics and taught by instructors or professors of Economics. While this is a valuable and desired trend, it is, in the opinion of the author, a trend that needs to be extended into Colleges of Education at both the graduate and the undergraduate level.

Educators need to be able to analyze the economics of education to related issues. Superintendents, principals, and teachers need to understand and be able to explain the rates of return investment in education provides. They need to be able to analyze educations contribution to, and impact on, labor markets, economic growth and wealth creation, and distribution of income. They need to be able to analyze the economics related to educational policy in the areas of local, state and national taxation, salaries, graduation rates, and equitable distributions in higher education admissions and matriculation. It is also important for all sectors of society to be able to understand the rates of return provided by education, the causes and remedial alternatives to the constant raising costs of education. Only if educators fully understand the economic variables effects on these areas and include them in a national educational pedagogy, can society have a fully informed population that can make the best decisions to solve the problems it faces.

It is evident, from precursory searches on the World Wide Web, that the content of the courses involved in presenting Economics in Education are diverse and without uniformity. An outline of topics and course objectives will most certainly evolve over the coming years. This work will discuss the major subjects that are currently being presented and provide suggestions for other subject areas to be included in the development of Economics in Education for educators.

REFERENCES

Becker, G. S. (1964), *Human Capital,* New York: National Bureau of Economic Research.

Marshall, A. (1920). *Principles of Economics*. London, England: Macmillan & Co., Ltd. Book VI Chapter IV.

Wolf Alison, (2002). *Does Education Matter: Myths about Education and Economic Growth*. London. England: Penguin Books Ltd

Authors' Index