

Why Competition Policy Matters for the Least Developed Countries: A Case Study of Bangladesh

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INTRODUCTION

Many countries, including countries emerging from a socialist legacy and those developing countries that in the past pursued economic development within a command economy structure, are liberalizing their economies and adopting the market economy paradigm to enhance growth rates and reduce poverty. Furthermore, most countries are increasingly integrating within the global economic structure, and increased flows of investment, financing, goods, services, and factors have highlighted the need for greater competitiveness and efficiency. These countries often do not have any competition policy or laws, or are saddled with competition policies and legislations that were more suited to economies with large state enterprise sectors that also often enjoyed considerable protection. As a result, the countries focus on enacting such laws and policies or revisit existing policies and laws. The issue of competition policy has come to the forefront of the discussion of development policy in general.

This paper presents various aspects of the macro- and microeconomic contexts of competition and competition policy. The purpose of this paper is two-fold: (1) to discuss why competition policy is important for a least developed country like Bangladesh, and (2) to identify current issues relating to competition in Bangladesh. The paper reviews some of the available literature on the impact of competition policy, particularly in some developing countries, and also presents

the current status of competition law in some neighboring countries such as India and Sri Lanka. Finally, the paper establishes the current state of competition policy in Bangladesh.

BACKGROUND

The World Bank defines competition policy as consisting of two elements:

- A set of policies that enhances competition in local and national markets—for example, a liberal trade policy, relaxed foreign investment and ownership requirements, deregulation, and privatization.
- Legislation—competition law designed to prevent anticompetitive business practices and unnecessary government intervention. It provides “teeth” and legal backing to the competition policy.

At its broadest, competition policy refers to all measures through which governments seek to promote the efficient and competitive operation of markets. Competition law refers to legislation that prohibits or otherwise deals with specific anticompetitive practices of firms such as cartels, abuses of dominant positions, monopolization and mergers, or any other practice that creates a dominant position or otherwise stifles competition (Anderson, forthcoming). Competition law is one component of competition policy. The major objective of competition law is efficient resource allocation, therefore maximizing national welfare (Richardson 1998), to protect consumers from the adverse effects of market power, to help disperse power and income fairly, to help expand entrepreneurial opportunities (Mehta et al. 2003), and to create a mechanism through which attempts to create monopolies and exploitation of market power can be addressed (Hoekman and Holmes 1999).

WHY COMPETITION POLICY MATTERS

An effective competition policy and law fostering a flexible, dynamic, and competitive private sector leads a country to sustained and widely shared economic development. Empirical data and experience from World Bank studies suggest that economies with greater competition can tackle economic shocks more effectively, and they also have higher levels and rates of growth in per capita GDP. Liberalizing trade, promoting inward foreign direct investment

(FDI), and encouraging entrepreneurship are ways of increasing competition in the domestic market under a comprehensive competition policy. Increasingly, governments worldwide are recognizing that encouraging competitive markets is one of the best ways to stimulate productivity, lower costs and widen consumer choice at the same time (The World Bank Group 2004).

Competition Policy and Welfare Effects

Mehta, Qureshi and Bansal argued in their paper, “Competition Policy and the Poor” (2003), that competition enhances overall welfare in the economy through increased efficiency within enterprises, optimum allocation of resources, technical progress, economic growth and stability. The long-term direct effects of competition policy are lower prices, higher quality of products and better market information, while indirect effects include equity, social impacts, economic freedom and opportunities. According to an UNCTAD report, a survey of 46 firms found a significant negative relationship between the level of per capita income and the size of mark-up ratios (UNCTAD Secretariat 1997).

Empirical evidence suggests that barriers to competition lead to welfare losses within an economy, regardless of governmental or private constraints (UNCTAD Secretariat 1997). A study conducted by the World Trade Organization (WTO) also has shown similar results: that in the absence of enforcement of competition law, national exhaustion, legally enforceable exclusive distributor arrangements and other anticompetitive business practices can have a major detrimental impact on welfare (Hoekman and Holmes 1999). Another study, conducted by the World Bank, can illustrate this issue of welfare loss. Examining a small number of international cartels, which were discovered and prosecuted in the 1990s, the World Bank study has estimated that developing countries imported goods and services worth \$80 billion per annum. The cartel members would have collected monopoly rents in the range of \$20–24 billion per annum from the developing world, which is roughly half the total development aid (CUTS Reguleter 2003 No. 12).

A study conducted for the Australian economy showed that the actual gains from promoting competition and deregulatory reforms are very significant (Hoekman and Holmes 1999). The expected benefits from the package of competition-promoting and deregulatory reforms in the Australian economy is an annual gain in real GDP of about 5.5 percent, or \$23 billion, where consumers would gain almost \$9 billion, besides having an increase in real wages, employment and government revenue (Mehta et al. 2003).

In the context of developing countries, there is a shortage of systematic analyses regarding the benefits of adopting a competition policy and law. However, in the Mehta et al. study (2003), the Peruvian competition agency, Indecopi, found that in the first seven years of its operation, the economic benefits due to its operations amounted to \$120 million, against operating costs of \$20 million.

Competition Policy and Business Environment

Empirical evidence suggests that a well designed competition policy and law can effectively address market imperfections and failures, besides protecting the interests of consumers. It can also create a congenial environment for new entrepreneurs to launch their businesses, creating a level playing field (Mehta et al. 2003). In many developing countries with no competition law and weak regulatory authorities, corruption, inefficiency, and rent-seeking behavior are widely prevalent among individuals and organizations. A stable macro-environment with appropriate trade and investment policies and good governance is a necessary condition to create a favorable investment climate in the country and a sound and complementary competition policy is a must to ensure a good business environment and productivity of the new investment (Mehta et al. 2003).

Competition Policy and Development

Well-designed competition law, effective law enforcement and competition-based economic reform promote increased economic efficiency and therefore contribute to the economic growth of the country. The strength of product-market competition plays an important role in economic growth, by allocating resources more efficiently. Competition may often lead to improved labor-market performance. For example, competition plays an important role in achieving productivity gains, which is critical for maintaining rapid economic growth particularly in the service sector. An Organization for Economic Cooperation and Development (OECD) paper commented that strong competitive forces in the United States have contributed to good economic performance, compared to other OECD countries (Suppanz 2004).

Several other studies show a positive relationship between competition policy and economic growth (Mehta et al. 2003). A study conducted by the WTO has identified that national competition policies that are well adapted to the unique circumstances of the developing countries can support development and the anticompetitive practices of firms can impede economic development (Anderson, forthcoming). Another study presented empirical evidence that

showed a well designed competition policy and law can buttress economic development, and aid poverty reduction efforts (Mehta et al. 2003).

Competition Policy and Trade Liberalization

Over the past few years, international interest in the interface between trade and competition policy has intensified. The main reasons for this interest are the growing integration of the world economy through both trade in goods and services and increasing volumes of FDI, which implies that anticompetitive business practices increasingly have trans-border dimensions. Furthermore, with the expansion of trade and investment, foreign companies are concerned about whether national competition laws are adequate to deal with anticompetitive practices by domestic companies. And developing countries, a large number of which do not yet have competition laws in place, are concerned that they be able to address possible abuse of market power by multinational corporations (MNCs) that have a free command over regional natural resources in the same areas across the borders. Competition law is also increasingly attracting the attention in OECD countries. Driven by domestic export interests, OECD trade policy officials argue that anticompetitive practices impede their ability to sell goods and services in foreign markets. Developing countries have another great interest in implementing an active domestic competition policy: to minimize the potential negative consequences of implementing some WTO agreements (Hoekman and Holmes 1999).

Osakwe emphasized the importance of introducing complementary domestic policy reform for successful trade liberalization, in order to generate sustained development and growth (Osakwe 2001). If economic policy reforms are implemented in unstable economic environments, in the absence of strong trade-related domestic institutions and appropriate complementary policies, they fail to stimulate growth. To make the trade liberalization successful, steps need to be taken to reduce cost and enhance the efficiency of infrastructure sectors such as telecommunications and transportation, to promote flexibility by eliminating artificial restrictions on entry, exit, and pricing in manufacturing and other industries, and to establish and strengthen incentives for investment, innovation, creation of efficient management structures and productivity improvement. Competition policy plays a very important role in all these areas (Osakwe 2001). Failure to implement competition policy and related reforms will prevent developing countries from realizing potential gains from external liberalization (Krueger 1984).

Competition Policy and FDI

A well-defined competition policy and law may help create a sound economic environment that attracts foreign investment, by providing a stable and predictable legal economic environment for investors and by handling entry barriers and high concentration (Nitya 2004). A similar point has also been made by the WTO Working Group on the Interaction between Trade and Competition Policy: that the implementation of a transparent and effective competition policy can be an important factor both in enhancing the attractiveness of an economy to foreign investment and in maximizing the benefits of such investment.

Competition policy can make an economy attractive to foreign investors by providing a transparent dispute mechanism that is consistent with international norms. A competitive market, reinforced by competition policy, encourages foreign firms to construct state-of-the-art production facilities in host countries, transfer modern technology and also protects consumers. This is especially important for developing countries, in terms of technology transfer for economic development (WTO 1998). Properly implemented competition law also helps ensure that foreign investment is development-friendly and that the benefits are maximized for host countries (Nitya 2004).

ANTICOMPETITIVE PRACTICES IN DEVELOPING COUNTRIES

Consumer Unity & Trust Society (CUTS) categorized anticompetitive practices that exist at all levels in any economy—local, national and international—into three kinds: (1) abuse of dominance and monopolies, (2) anticompetitive agreements between firms, and (3) mergers and acquisitions that may have the effect of distorting or restricting competition. CUTS has identified some anticompetitive practices in the developing countries. For example, with the authority and control over the market, a dominant firm restricts new entry into the market, forecloses the commercial opportunity of weaker traders, or creates barriers in economic freedom of its potential competitors. This includes predatory behavior, restricting supply, and limiting access to essential facilities/network and other vertical restraints, like resale price-fixing.

Anticompetitive agreements between firms include cartels, bid-rigging, tied sales, syndicate system, refusal to supply, etc. Mergers and acquisitions do not necessarily always raise competition concerns but they do when they result in a monopoly or a dominant position. Sometimes, problems arise when large multinational firms establish themselves in the developing countries where there is no law or policy to regulate the conduct of these big firms. Big MNCs merge or take over smaller domestic businesses to acquire a dominant position. For

example, two UK-based pharmaceutical giants (Glaxo-Wellcome and SmithKline Beecham) merged. The European Commission (EC) approved the merger conditionally, after agreeing upon certain undertakings with the parties. The competition authorities of the majority of the developing countries, however, could not take a stand when the local subsidiaries of the two firms merged their operations as well. Evidence from the initial investigation obtained in Sri Lanka and Pakistan clearly indicated that the merger would have significant negative effects on consumer welfare. However, the investigation failed to go beyond the preliminary stage (Mehta et al. 2003).

At a conference organized by the World Bank in cooperation with the European Commission, in Colombo, the capital of Sri Lanka, in May 2004, some developing countries (e.g., India, Sri Lanka, Pakistan, Nepal, Indonesia, the Philippines), presented their assessments of the status of competition policies and problems in their countries. Some of the key points include:

- Some practices such as cartel, syndicate system (common in the transportation sector), bid rigging, tied selling, predatory behavior, price discrimination
- Sector-specific anticompetitive practices in different countries
- Structural constraints
- Policy failure and absence/inadequacies of legislations, unclear guidelines
- Lack of implementation
- Lack of post-privatization monitoring and evaluation mechanism
- Some success stories to handle anticompetitive business practices such as, telecommunication sector in Sri Lanka
- Status of competition policy in the WTO, post-Cancun (Samarajiva 2004).

COMPETITION LAW IN INDIA AND SRI LANKA

In the present era of globalization and liberalization, many countries, including India, Pakistan and Sri Lanka, have realized the need to install a comprehensive legal framework to deal with anticompetitive practices in order to promote orderly market growth. India and Sri Lanka have recently replaced their competition laws.

The new Indian law, Competition Act 2002, is more effective in tackling most of the known anticompetitive practices. It also provides enough flexibility to address the country's development needs. While formulating it, most of the inadequacies of its predecessor, the Monopolies and Restrictive Trade Practices Act (MRTPA) 1969, have been taken into account. For example, MRTPA did not necessarily consider restrictive trade practices bad unless they caused injury to the public interest, which placed a burden of proof on the competition authority to gather sufficient evidence. According to the new law, the restrictive trade practices are presumed to be damaging and anticompetitive. This will help simplify the implementation of competition law. Unlike in the past where the competition authority could only issue cease-and-desist orders without penalizing for the damage caused by the anticompetitive practice, the competition authority can impose heavy penalties on firms under the current law. Besides, there are also provisions for a leniency program, which has been instrumental in breaking cartels. Recognizing that the effectiveness of a competition regime depends on public awareness, the new law has included advocacy as one of the functions of the competition authority (CUTS Reguletter 2003, No. 10).

Sri Lanka has adopted the Consumer Protection Authority Act, replacing the Fair Trading Commission Act, 1987. The new law takes a unified approach to deal with competition and consumer protection issues. The new law provides for the establishment of the Consumer Protection Authority (CPA), for investigation and prosecution of consumer cases, and a Consumer Protection Council (CPC), for adjudication of competition cases (CUTS Reguletter 2003, No. 12). Sri Lanka undertook the Public Interest Program Unit (PIPU) as competition advocate, where the approach is "Competition wherever possible, regulation where necessary." Under the PIPU program, competition-friendly reforms in the infrastructure industries are included in the agenda. This approach towards competition successfully contributed to the reformation of the telecom and petroleum sectors in Sri Lanka. Currently, Sri Lanka also has competition law for regulated industries (Samarajiva 2003).

COMPETITION POLICY IN BANGLADESH

There is presently no competition law in Bangladesh, although some policy measures have been taken to create an environment for fair competition (CUTS 2003). The country has made substantial progress in trade liberalization, privatization and deregulation. Trade policy, investment framework, regulations

governing service providers, product distributors and procurement practices all encourage competition (CUTS 2003). Bangladesh, like many other developing countries, adopted these reform policies in the 1990s. As discussed earlier, an effective competition policy and law is essential in developing a healthy business environment and to maximize the benefits of such reforms. In the absence of a comprehensive competition policy and law, the government tends to regulate different markets in a piecemeal and ad hoc manner. Regulatory capture by particular business interests, or even vested interests within the government, becomes easier (CUTS 2003).

Consistency among governmental policies and laws is a critical issue in enabling a country to maximize the benefits of trade liberalization. This dimension of competition policy is often neglected (CUTS 2003). For example, even though the government of Bangladesh is encouraging competition through different policy measures, policy-induced distortion of markets can be also found in the country. The government still does not allow entry into certain industries known as reserved, regulated, or oversaturated. In a competitive market, firms do not expect the government to tell them whether any particular sector is oversaturated. “Approaches to Competition Policy in South Asian Countries,” a study conducted by the CUTS Center, found that the edible oil, electric, corrugated iron sheets industries, etc. in Bangladesh were considered to be oversaturated and so the government restricts entry of new firms. This is against the spirit of a competitive environment. It is widely believed that in the name of oversaturated sectors, the government is providing protection to the inefficient firms (CUTS 2003).

Bangladesh introduced Anti-dumping Act and Rules in 1995 and Countervailing Act in 1995 and Rules in 1996. The Tariff Commission has been designated as the Investigation Authority. Now that the antidumping and countervailing laws are in operation, any domestic industry in Bangladesh that is suffering injury or has reasonable grounds for threat of injury can formally file an application to the Bangladesh Tariff Commission. However, due to a lack of capacity at the official level, and difficulties faced by the domestic industry in collecting the information required, the initiation of the application procedure becomes complex. Bangladesh has very little experience with antidumping and countervailing measures.

The current state of competition policy in Bangladesh is summarized in Table 1.

Table 1
COMPETITION POLICY OVERVIEW

- The country has made substantial progress in trade liberalization, privatization and deregulation.
- The trade policy, the investment framework, the regulations governing service providers, product distributors and procurement practices encourage competition.
- In the absence of a comprehensive competition policy and law, the government tends to regulate different markets in a piecemeal and ad hoc manner.
- Consistency among governmental policies and laws is sometimes neglected.
- Policy-induced distortion of markets can be also found in Bangladesh. For example, edible oil, electric, and corrugated iron sheets industries (among others) are considered to be oversaturated and entry of new firms is restricted by the government.
- Bangladesh introduced Anti-dumping Act and Rules in 1995 and Countervailing Act in 1995 and Rules in 1996. However, Bangladesh has very little experience with antidumping and countervailing measures.
- Due to a lack of capacity at the official level as well as difficulties faced by the domestic industry in collecting information required, the initiation of the application procedure becomes complex.

There is no clearly spelled out competition law in Bangladesh, nor is there a regulatory body for enforcing competition law. An ordinance called “Monopolies and Restrictive Trade Practices (Control and Prevention) Ordinance” (MRTPO) promulgated in 1970 is still valid in Bangladesh. The provisions of MRTPO are too narrow to deal with the anticompetitive practices and the consumers’ grievances at large. The levels of penalties are very low as compared to other countries and this encourages businesses to pay the penalties and then continue their malpractices. MRTPO has no proper definition of unfair trade practices and has also failed to keep a check on the abuse of market dominance. Moreover, since the act does not declare monopolies, restrictive and unfair practices illegal and ipso facto void, its ability to promote competition, consumer welfare and industrial growth is limited. Also, only the private sector

comes under the purview of the law and the state-owned enterprises do not. Some state-owned enterprises, such as BTTB (the national telephone company), enjoy a monopoly market. In some cases, conflicts of interest are created when public enterprises are simultaneously partners, competitors and regulators vis-à-vis the private ones (CUTS 2003). For example, Internet Service Providers (ISPs) have to obtain telephone lines from BTTB and pay rent, while BTTB's own online service provider can enjoy free access to BTTB's resources. This creates an uneven playing field in the ISP business. There is no regulatory body to check on state-owned enterprises' activities and the authority carrying out the regulatory check tends to be biased; there is clear conflict of interests.

Although Bangladesh liberalized its tariff regime to fight smuggling, illegal imports of goods also threaten fair competition in Bangladesh. Malpractices, such as distortion through perfect and imperfect oligopolies, informal cartels, hoarding and black marketing of commodities, controlled imports and distribution by traders do exist in Bangladesh and do create artificial scarcity, resulting in higher prices. Retail price maintenance is another vertical restraint, which may run from the manufacturer to the end seller. These agreements take the form of recommended retail price or resale price maintenance. The minimum price (mostly very high) at which the product can be sold is specified to the seller. This is also a common phenomenon in Bangladesh. "Product cannot be sold under this price", or "Price marked by Manufacturer" are often found written on the product. Therefore, competition at the retail level is restrained. This is especially common in the pricing of pharmaceuticals and cosmetics in Bangladesh. There is also no predatory pricing regulation and legal price control mechanism in the country. A big player in an industry may drive out the competitors by reducing their price to an unreasonably low level.

Consumers in Bangladesh are not fully protected under the current laws. For example, if a person is injured by a faulty electronic tool or an expired or incorrect drug, there is little hope of getting proper compensation, because the complaints do not refer to concrete issues like weights, measurements or ingredients. Consumers' rights movements are not strong in Bangladesh and consumers are sometimes unaware of their rights. The legislation does not provide protection either, leaving the consumers at the mercy of producers, distributors and retailers.

The current state of competition in Bangladesh is summarized in Table 2.

Table 2
CURRENT STATE OF COMPETITION

- There is no clearly spelled out competition law in Bangladesh.
- There is no regulatory body for enforcing competition law.
- Monopolies and Restrictive Trade Practices (Control and Prevention) Ordinance (MRTPO), promulgated in 1970, is obsolete.
- MRTPO are too narrow to deal with prevailing anticompetitive practices.
- The levels of penalties are very low and this encourages businesses to pay the penalties and then continue their malpractices.
- The MRTPO does not declare monopolies, restrictive and unfair practices illegal and ipso facto void. Its ability to promote competition and industrial growth is limited.
- Only the private sector comes under the purview of the law and the state-owned enterprises do not.
- In some cases, conflicts of interest are created when public enterprises are simultaneously partners, competitors and regulators vis-à-vis the private ones.
- Illegal imports of goods also threaten fair competition in Bangladesh.
- Malpractices, such as distortion through perfect and imperfect oligopolies, informal cartels, hoarding and black marketing of commodities, controlled imports and distribution by traders exist in Bangladesh and create artificial scarcity, resulting in higher prices.
- Retail price maintenance is common in the pricing of pharmaceuticals and cosmetics in Bangladesh.
- There is no predatory pricing regulation or legal price control mechanism in the country.
- Consumers in Bangladesh are not fully protected under the current laws.
- Consumers' rights movements are not strong in Bangladesh and consumers are sometimes unaware of their rights.

There are multiple issues at play, which need to be systematically explored and studied. In particular, the issue of the adoption of standard competition laws from the WTO or from another country should be examined from an economic/business standpoint, but also from the legislative angle.

RECOMMENDATIONS

Besides protecting consumers' interests, a well-defined competition policy and competition law can help to create a sound business environment by establishing a level playing field for all. It can encourage entrepreneurial opportunities by removing the barriers to entry and, therefore, it can contribute to the private sector's growth. It can also help attract more FDI, ensure that the FDI is development-friendly, and maximize the benefits of trade liberalization and other economic reforms. It can contribute significantly to the economic development of the country. Therefore, Bangladesh needs a broad-based competition policy to create preconditions to assure effective functioning of competition in the economy, a well-defined competition law and an effective competition authority to safeguard against anticompetitive practices. This new law would signal various actors and some autonomous corrections would be more likely to take place. The next step will be to build awareness of competition and consumer right issues among the general public and businesses as well as advocates within the government, for a comprehensive competition policy and competition law for Bangladesh.

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Geographic Clustering of Firms in Knowledge-Intensive Industries: An Analysis of Spatial Autocorrelations

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INTRODUCTION

In this paper, we examine the spatial patterns of local intellectual capital, research and development (R&D) and innovations of knowledge-intensive industries. Our research question is: Does geographic proximity matter for innovation and growth for the firms in knowledge-intensive industries?

We employ Moran's *I* and Geary's *C* to examine whether there is a spatial autocorrelation among the firms in knowledge-intensive industries. Our results show that knowledge-intensive industries and knowledge-spillovers are spatially clustered and autocorrelated, suggesting that innovations and knowledge-spillovers are distance-sensitive.

LITERATURE REVIEW

Recent literature suggests that geographic location can play a significant role in the innovation performance of industrial firms (Acs, Audretsch, and Feldman 1992, 1994; Feldman and Florida 1994; Gray and Parker 1998; Malecki 1997; Porter 1998; Storper 1992). A firm's stock market value is found to be affected by the degree of industry clustering, the availability of specialized business services, the presence of related or supporting industries, university and industrial R&D spending, and local demand (Boasson 2001; Boasson and

MacPherson 2001; Boasson et al. 2004). Other notable factors include the availability of investment capital, the depth and quality of local technological resources (Feldman and Florida 1994) and the presence of public and/or private research units (Link and Rees 1990; Jaffe 1989), overall levels of R&D investment (Malecki 1997), and the presence of firms in similar or related industries (Porter 1990). These researchers argue that knowledge development, knowledge diffusion and concepts such as localized technological progress play a prominent role in economic development. Localization economies may also arise when firms are situated close to major research universities, in that technological spillovers from the academic sector are generally thought to be distance-sensitive (Anselin, Varga, and Acs 2000). These prior researchers, however, have not systematically and specifically identified and examined the spatial autocorrelation patterns in local demand, sales, and stock market valuation among publicly traded companies in knowledge-intensive industries. Thus, our study can shed more light on the importance of geographic proximity in promoting growth and innovations in such industries.

HYPOTHESES AND RESEARCH METHOD

Innovation and growth are crucial for firms operating in knowledge-intensive and high-tech industries. We hypothesize that informational advantage is distance-sensitive. Specifically, we hypothesize that there is a positive spatial autocorrelation in sales and in R&D among firms in knowledge-intensive industries. In addition, we hypothesize that local demand can stimulate growth and innovation for firms in knowledge-intensive industries.

In order to identify firms in knowledge-intensive industry-sectors and non-knowledge-intensive industries, we compare firm-level R&D expenditures and number of firms engaged in R&D at a level of or greater than 10 percent of sales across industry sectors. We choose this level of R&D intensity because it will be a sample of firms engaged in serious R&D efforts. Those firms that spend less than 10 percent of their sales on R&D often do not have complete data on their R&D expenditure over our sample period.

We then classify the industry sectors into knowledge-intensive and non-knowledge-intensive industry sectors.

In order to analyze each firm's innovation and knowledge environment geographically, we employ Geographic Information Systems (GIS) and geo-code each firm's address in the sample with its geographic longitude and

latitude. Specifically, we assign latitude and longitude coordinates to each firm and calculate each firm’s location quotients based on sales, R&D, and stock market value of the firm. Most of the companies in our sample have their R&D facilities at or close to their headquarter locations. We have also checked for firms with possible multiple R&D locations other than their headquarter locations. Only a few large companies, such as Merck and Pfizer, have their R&D sites in addition to their headquarter locations and most of their non-headquarter R&D facilities are located either close to their headquarters or within their major industry clusters. Thus, a company headquarter location can be a good proxy for a firm’s R&D location.

We conduct an industry cluster analysis for each industry in the sample in order to assemble a detailed picture of the location and performance of industries with a special focus on the linkages or externalities across industries that give rise to clusters. Specifically, industry clusters are measured by the location quotients. We use several measurements, such as employment, establishments, sales, and R&D to calculate the location quotients. The location quotient (LQ) is defined as:

$$LQ = \frac{L_{is} / T_s}{L_{inat} / T_{nat}} \tag{1}$$

where L_{is} represents the value of sales, in industry i at location s , T_s is the total value of sales in all industries at location s , L_{inat} represents the value of sales in industry i in the United States, and T_{nat} represents the value of sales, R&D, employment, and establishments in all industries in the United States. We also tested the LQ for R&D.

A location quotient greater than unity indicates a higher clustering in location s relative to the whole country. Likewise, a location quotient less than unity indicates that an economic activity is relatively less concentrated (Boasson 2002).

We employ Moran’s I technique to examine whether there is a spatial autocorrelation among the firms in knowledge-intensive industries. Moran’s I statistic is used to evaluate the presence or absence of spatial autocorrelation or spatial dependence (as suggested by Rogerson 2001 and Drennan and Saltzman 1998). Moran’s I statistic is based on the covariance among designated associated locations (Fisher and Gettis 1997). Moran’s I is interpreted in a way similar to the correlation coefficient and computed as follows:

$$I = \frac{n \sum_i \sum_j w_{ij} (y_i - \bar{y})(y_j - \bar{y})}{\left(\sum_i \sum_j w_{ij} \right) \sum_i (y_i - \bar{y})^2} \quad (1)$$

where:

n = number of firms

w_{ij} = a measure of the spatial proximity among firms

y_i = firm i 's location quotient, based on sales, R&D, market value, and total assets

Alternatively, if the variable of interest is first transformed into a z -score, then a much simpler expression for Moran's I results:

$$I = \frac{n \sum_i \sum_j w_{ij} z_i z_j}{(n-1) \sum_i \sum_j w_{ij}} \quad (2)$$

To detect and evaluate whether the clustering of an industry occurs around a region or county, the local Moran's I statistic is employed as follows:

$$I_i = n(y_i - \bar{y}) \sum_{j \neq i} w_{ij} (y_j - \bar{y}) \quad (3)$$

The sum of local Moran's I is equal to, up to a constant of proportionality, the global Moran; i.e., $\sum I_i = I$ (Rogerson 2001).

In addition, we employ Geary's C to examine the spatial autocorrelation in small neighborhoods. Geary's C is based on a paired comparison of juxtaposed map values. It is given as follows:

$$\text{Where } C = \frac{(n-1) \sum_{i=1}^{n-1} \sum_{j=i+1}^n C_{ij} (y_i - y_j)^2}{2 \left[\sum_{i=1}^{n-1} \sum_{j=i+1}^n C_{ij} \right] \sum_{i=1}^n (y_i - \bar{y})^2} \quad (4)$$

n = number of firms

C_{ij} = the similarity of attributes of points i and j

y_i = firm i 's location quotient, based on sales, R&D, market value, and total assets.

The values of C usually fall into the interval $[0, 2]$. Positive spatial autocorrelation is found with values ranging from 0 to 1 and negative spatial autocorrelation is found between 1 and 2. Geary's C statistic is similar to Moran's I statistic. The major difference between the two statistics is that by nature of their computations Moran's I provides a more global indication of spatial autocorrelation, while Geary's C usually indicates autocorrelation in small neighborhoods (Geary 1954).

THE DATA

As a first step of analysis, we gather the most current R&D expenditure data on all the companies and industry sectors currently available on Compustat database, a total of 22,181 publicly traded companies. We exclude all the firms that have missing addresses and those located outside the United States from the study sample. Our sample of all the publicly traded firms with locations in the United States includes 9,092 firms and 175 industry sectors. We then conduct a rank-order analysis on the average R&D level by each industry sector and classify the firms into knowledge-intensive and non-knowledge-intensive industries. Finally, we narrow down to three major industries that rank very high in the level of knowledge-intensity: biotech, pharmaceuticals, and software.

We then gather data from Compustat and CRSP on a set of firm-level attributes, including primary SIC and NAICS codes, industry sector codes, zip codes, street addresses, city, state, market value, total book assets, sales, R&D expenditures, for each firm and industry in the study sample from 1990 to 2002. We compute location quotients based on sales and R&D for each firm in each industry for each year from 1990 to 2002 over 3140 counties in the United States.

EMPIRICAL RESULTS

Knowledge-Intensive Industries

Table 1 shows the rankings of those industry sectors that have 10% or more R&D per sales. Results show that biotechnology is the most knowledge-intensive industry, by level of R&D intensity and by proportion of the firms engaged in at least 10% or more R&D per sales. The mean R&D per sales among the biotechnology companies is 58% and the proportion of firms engaged in at least 10% R&D per sales is 52%.

Table 2 shows the results of the main R&D-intensive industries. Of the total industrial R&D expenditure, the industry sectors listed in Table 2 have undertaken 98% of total R&D in 2000 and 2002. The number of firms engaged

Table 1
INDUSTRY SECTORS RANKED BY R&D LEVEL.

Rank	Industry Sector	Mean R&D/Sales	Mean counts of firms engaged in R&D at 10% or more of R&D/Sales	% of Firm by each sector at 10% or more of R&D/Sales
1	Biotechnology	58%	221	52%
2	Electronics (Instrument.)	17%	21	37%
3	Computers Software/Services	20%	28	36%
4	Semiconductors	19%	76	33%
5	Communications Equipment	17%	143	33%
6	Pharmaceuticals	15%	85	32%
7	Equipment (Semiconductor)	16%	16	30%
8	Application Software	20%	175	28%
9	Internet Software & Services	26%	151	27%
10	Health Care Supplies	44%	24	23%
11	Systems Software	16%	53	22%
12	Health Care Equipment	16%	112	20%
13	Computer Storage & Peripherals	13%	54	18%
14	Electronic Equipment Manufacturers	15%	56	16%
15	Fertilizers & Agricultural Chemicals	11%	6	14%
16	Computer Hardware	13%	16	12%
17	Consumer Electronics	27%	5	10%
18	Electrical Components & Equipment	20%	20	10%
19	Internet Retail	27%	8	8%
20	Electronic Manufacturing Services	14%	3	8%
21	IT Consulting & Other Services	30%	11	6%
22	Aerospace & Defense	11%	12	6%
23	Industrial Conglomerates	16%	6	5%
24	Alternative Carriers	16%	2	4%
25	Machinery-Diversified	9%	2	4%
26	Services (Commercial/Consum)	20%	8	3%
27	Commercial Printing	18%	3	3%
28	Commodity Chemicals	11%	3	3%
29	Industrial Machinery	10%	12	3%
30	Movies & Entertainment	23%	6	2%
31	Leisure Products	15%	3	2%
32	Casinos & Gaming	12%	4	2%
33	Health Care Distributors	29%	2	1%
34	Diversified Commercial Services	24%	8	1%

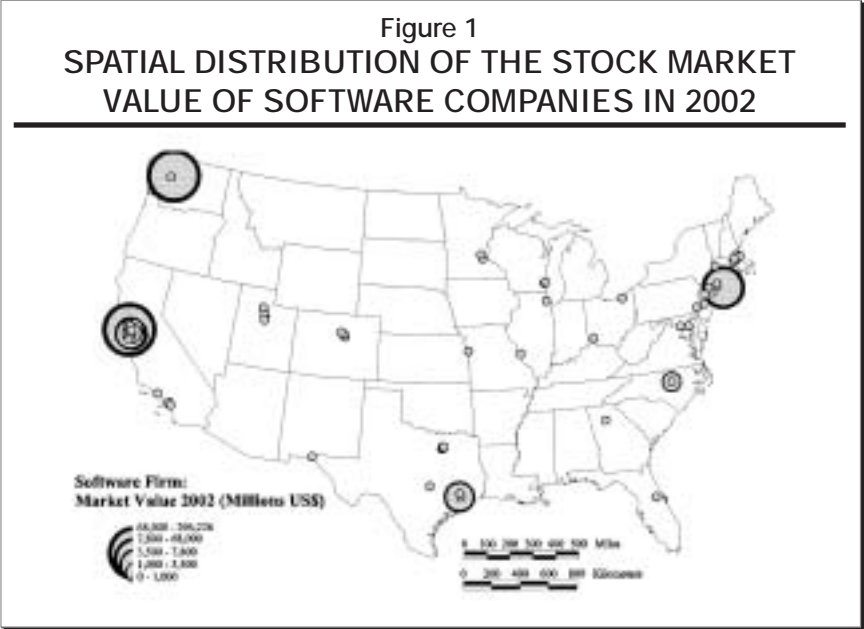
Table 2
KNOWLEDGE-INTENSIVE INDUSTRY SECTORS

Industry Sector	R&D Y2000 (\$ mil.)	R&D Y2002 (\$ mil.)	R&D/Sale Y2000 Percent	R&D/Sale Y2002 Percent	Count of Firms engaged in 10% or more level of R&D intensity Y2000	Count of Firms engaged in 10% or more level of R&D intensity Y2002
Biotechnology	9574.14	15358.06	53.8	63.0	229	213
Health Care Supplies	123.437	162.962	46.3	42.1	25	23
Internet Software and Services	3066.144	1970.144	28.4	23.1	171	130
Semiconductors	16062.36	14094.63	16.4	22.3	84	68
Electronics (Instrument.)	948.535	1035.345	12.2	21.6	22	19
Application Software	4865.899	4299.894	19.0	21.6	201	149
Equipment (Semiconductor)	1970.251	1995.806	11.9	21.0	17	15
Electrical Components and Equipment	151.274	101.946	19.7	21.0	22	17
Electronic Equipment Manufacturers	2004.726	1680.422	12.1	18.6	62	49
Communications Equipment	21298.13	14819.18	16.2	18.5	157	128
Health Care Equipment	2274.585	2228.257	14.5	17.8	123	101
Systems Software	7887.291	6552.617	15.8	16.9	55	50
Computers Software/Services	894.93	840.178	24.2	16.1	30	25
Pharmaceuticals	18712.5	21713.04	14.1	15.5	89	80
Computer Hardware	2454.513	2211.139	11.2	14.5	19	13
Computer Storage and Peripherals	2457.294	2357.621	11.0	14.4	59	48
Aerospace & Defense	352.477	341.613	11.7	11.3	13	11
Industrial Machinery	421.757	539.824	8.5	10.8	14	10
Of the Total:	98%	98%			90%	90%

in R&D per sales at 10% or more accounts for 90% of all publicly traded companies in those years. The biotech industry is the most R&D intensive industry by all criteria. The results also indicate that the level of R&D per sales for each industry sector remains relatively steady over this time period.

The Software Industry

Figure 1 shows the spatial distribution of the stock market value at the end of fiscal 2002 for the publicly traded software companies, measured by market value in millions of dollars. The biggest cluster is in the Silicon Valley, namely, the San Jose, California metropolitan area. The second largest cluster is at Seattle/Bellevue/Everett. This cluster is dominated by Microsoft. The third largest cluster is the New Jersey/New York/Boston corridor, where IBM is located.



The spatial autocorrelations test results for the software industry are reported in Tables 3 and 4. First, the location quotients are calculated for each of 244 software companies, based on sales and R&D for each year from 1990 to 2002 over 3140 counties. Then Moran's *I* and Geary *C* tests are run for the same years and counties, on the software companies' LQs, based on sales and R&D. The number of neighbors calculated totals 70,159. The t-statistics are time series t-statistics of the mean coefficient. The results show that there is a positive

Table 3
**SPATIAL AUTOCORRELATION FOR
 SOFTWARE INDUSTRY LQ BASED ON SALES**

	Moran's <i>I</i>	Geary's <i>C</i>
SoftSaLQ90	0.003	0.473
SoftSaLQ91	0.003	0.408
SoftSaLQ92	0.003	0.456
SoftSaLQ93	0.003	0.441
SoftSaLQ94	0.003	0.390
SoftSaLQ95	0.004	0.422
SoftSaLQ96	0.005	0.458
SoftSaLQ97	0.006	0.517
SoftSaLQ98	0.006	0.466
SoftSaLQ99	0.005	0.422
SoftSaLQ00	0.004	0.416
SoftSaLQ01	0.001	0.552
SoftSaLQ02	0.001	0.502

Software Industry L_Q based on sales

Moran's <i>I</i> =	0.004	Geary's <i>C</i> =	0.456
Time-series t-statistics	7.819	Time-series t-statistics	35.796
Average z-Normal <i>I</i>	1.052	Average z-Normal <i>C</i>	39.709
Var. Normal <i>I</i>	0.00001	Var. Normal <i>C</i>	0.00019
z-Random <i>I</i>	1.353	z-Random <i>C</i>	1.657
Var. Random <i>I</i>	0.00001	Var. Random <i>C</i>	0.11015
# Obs	3140	# Obs	3140
# Neighbors	70159	# Neighbors	70159

spatial autocorrelation for the software companies' sales as indicated by Moran's *I* and Geary's *C*. This shows that the software industry's customers and buyers are also geographically clustered. This evidence supports our hypothesis that local demand stimulates the growth and innovation for firms in knowledge-intensive industries. These results are statistically significant, as indicated by the average z-statistics for Geary's *C* (39.71) and time-series t-statistics (7.82 for Moran's *I* and 35.80 for Geary's *C*).

Table 4 shows that there is a positive spatial autocorrelation in R&D for firms in the software industry, as indicated by Moran's *I* and Geary's *C*. This means that the software industry's innovations and knowledge diffusions are distance-sensitive. Spatial proximity can facilitate face-to-face interactions and close

Table 4
**SPATIAL AUTOCORRELATION FOR SOFTWARE
 INDUSTRY LQ BASED ON R&D**

	Moran's <i>I</i>	Geary's <i>C</i>	
SoftRDLQ90	0.002	0.616	
SoftRDLQ91	0.002	0.617	
SoftRDLQ92	0.003	0.577	
SoftRDLQ93	0.012	0.712	
SoftRDLQ94	0.008	0.609	
SoftRDLQ95	0.009	0.611	
SoftRDLQ96	0.008	0.616	
SoftRDLQ97	0.009	0.589	
SoftRDLQ98	0.009	0.564	
SoftRDLQ99	0.007	0.523	
SoftRDLQ00	0.009	0.496	
SoftRDLQ01	0.006	0.500	
SoftRDLQ02	0.005	0.578	
Software Industry L_Q based on R&D			
Moran's <i>I</i> =	0.007	Geary's <i>C</i> =	0.585
Time-series t-statistics:	7.712	Time-series t-statistics:	36.635
Average z-Normal <i>I</i> =	1.895	Average z-Normal <i>C</i> =	30.280
Var. Normal <i>I</i> =	0.00001	Var. Normal <i>C</i> =	0.00019
z-Random <i>I</i> =	2.057	z-Random <i>C</i> =	2.026
Var. Random <i>I</i> =	0.00001	Var. Random <i>C</i> =	0.043
# Obs	3140	# Obs	3140
# Neighbors	70159	# Neighbors	70159

collaborations in research and development. The results are statistically significant, as indicated by the average z-statistics (1.90 for Moran's *I* and 30.28 for Geary's *C*) and time-series t-statistics (7.71 for Moran's *I* and 36.64 for Geary's *C*).

Overall, these results suggest that the software industry's sales, R&D and knowledge diffusions are spatially clustered, and geographic proximity among industry competitors is important to the firms' growth and knowledge diffusions.

The Pharmaceutical Industry

Figure 2 shows the spatial distribution of the stock market value at the end of fiscal 2002 for the publicly traded pharmaceutical companies, measured in

Figure 2
SPATIAL DISTRIBUTION OF PHARMACEUTICAL
COMPANIES, BY MARKET VALUE IN 2002



Figure 3
SPATIAL DISTRIBUTION OF STOCK MARKET VALUE
OF BIOTECH COMPANIES IN 2002



Table 5
SPATIAL AUTOCORRELATIONS FOR THE
PHARMACEUTICAL INDUSTRY'S LQ BASED ON SALES

	Moran's <i>I</i>	Geary's <i>C</i>
PhSaLQ90	0.052	0.959
PhSaLQ91	0.040	0.929
PhSaLQ92	0.038	0.906
PhSaLQ93	0.039	0.890
PhSaLQ94	0.054	1.044
PhSaLQ95	0.044	1.049
PhSaLQ96	0.034	0.862
PhSaLQ97	0.043	1.053
PhSaLQ98	0.044	0.868
PhSaLQ99	0.042	0.851
PhSaLQ00	0.050	0.862
PhSaLQ01	0.002	1.302
PhSaLQ102	0.002	1.298

Pharmaceutical L_Q based on Sales

Moran's <i>I</i> =	0.037	Geary's <i>C</i> =	0.990
Time-series t-statistics	8.055	Time-series t-statistics	22.928
z-Normal <i>I</i> =	10.073	z-Normal <i>C</i> =	0.709
Var. Normal <i>I</i> =	0.0000	Var. Normal <i>C</i> =	0.0002
z-Random <i>I</i> =	11.345	z-Random <i>C</i> =	0.173
Var. Random <i>I</i> =	0.0000	Var. Random <i>C</i> =	0.081
# Obs	3140	# Obs	3140
# Neighbors	70159	# Neighbors	70159

millions of dollars. The biggest cluster is at the New Jersey/New York corridor. This cluster is the biggest ranked by location quotients, by market values and by the number of establishments. The other clusters, which show on the map, are basically dominated by one or two large firms. For instance, the cluster at Indianapolis, Indiana is dominated by Eli Lilly.

The spatial autocorrelations test results for the pharmaceutical industry are reported in Tables 5 and 6. First, the location quotients are calculated for each of 267 pharmaceutical companies based on sales and R&D for each year from 1990 to 2002 over 3140 counties in the United States. Then Moran's *I* and Geary *C* tests are run for each. The number of neighbors totals 70,159. The t-statistics are time series t-statistics of the mean coefficient. The results show that there is a strong global indication of a positive spatial autocorrelation for the

Table 6
SPATIAL AUTOCORRELATIONS FOR THE
PHARMACEUTICAL INDUSTRY'S LQ BASED ON R&D

	Moran's <i>I</i>	Geary's <i>C</i>		
PhRDLQ90	0.109	1.040		
PhRDLQ91	0.081	0.932		
PhRDLQ92	0.079	0.900		
PhRDLQ93	0.082	0.875		
PhRDLQ94	0.090	0.925		
PhRDLQ95	0.058	0.908		
PhRDLQ96	0.057	1.083		
PhRDLQ97	0.051	1.053		
PhRDLQ98	0.058	1.065		
PhRDLQ99	0.054	1.086		
PhRDLQ00	0.083	1.117		
PhRDLQ01	0.094	1.083		
PhRDLQ02	0.104	1.059		
Pharmaceutical L_Q based on R&D				
Moran's <i>I</i> =	0.077	Geary's <i>C</i> =	1.009	
Time-series t-statistics	14.5397	Time-series t-statistics	41.875	
z-Normal <i>I</i> =	20.572	z-Normal <i>C</i> =	-0.685	
Var. Normal <i>I</i> =	0.0000	Var. Normal <i>C</i> =	0.0002	
z-Random <i>I</i> =	21.332	z-Random <i>C</i> =	-0.119	
Var. Random <i>I</i> =	0.0000	Var. Random <i>C</i> =	0.019	
# Obs	3140	# Obs	3140	
# Neighbors	70159	# Neighbors	70159	

pharmaceutical companies in sales as indicated by Moran's *I*. The statistical significance of these Moran's *I* test results is indicated by the average z-statistics (10.35) and the time-series t-statistics (8.05). Geary's *C* test results are also statistically significant as indicated by the time-series t-statistics (22.93). However, Geary's *C* test results indicate a weak positive spatial autocorrelation for pharmaceutical companies' sales as Geary's *C* is 0.99, very close to 1. This is understandable given the size and widespread sales of major pharmaceutical companies and the fact that Geary's *C* tends to indicate spatial autocorrelation in smaller neighborhoods. Table 6 shows that there is a strong global indication of a positive spatial autocorrelation for the pharmaceutical companies in R&D as indicated by Moran's *I*. But in terms of local indication measured by Geary's *C*, spatial autocorrelation is not significant.

Table 7
SPATIAL AUTOCORRELATIONS FOR THE
BIOTECHNOLOGY INDUSTRY'S LQ BASED ON SALES

	<u>Moran's I</u>	<u>Geary's C</u>		
BioSalLQ90	-0.001	0.808		
BioSalLQ91	-0.002	0.982		
BioSalLQ92	-0.000	0.647		
BioSalLQ93	0.0001	0.423		
BioSalLQ94	0.00004	0.412		
BioSalLQ95	0.0001	0.340		
BioSalLQ96	-0.0003	0.795		
BioSalLQ97	-0.0003	0.788		
BioSalLQ98	-0.0000	0.772		
BioSalLQ99	0.0004	0.763		
BioSalLQ00	0.0007	0.779		
BioSalLQ01	0.017	0.916		
BioSalLQ02	0.022	0.996		
Biotechnology LQ based on Sales				
Moran's I =	0.003	Geary's C =	0.729	
Time-series t-statistics	1.366	Time-series t-statistics	12.798	
z-Normal I =	0.846	z-Normal C =	19.811	
Var. Normal I =	0.000	Var. Normal C =	0.0002	
z-Random I =	0.922	z-Random C =	0.794	
Var. Random I =	0.000	Var. Random C =	0.099	
# Obs	3140	# Obs	3140	
# Neighbors	70159	# Neighbors	70159	

Overall, these results suggest that there is a statically significant global indication of a positive spatial autocorrelation for the pharmaceutical industry's sales and R&D, suggesting that innovations and knowledge diffusions are spatially clustered and geographic proximity among industry competitors is important to pharmaceutical companies' growth.

The Biotechnology Industry

Figure 3 shows the spatial distribution of the stock market value at the end of fiscal 2002 for the publicly traded biotech companies, measured in millions of dollars. The biggest cluster of the biotech industry in terms of market value is at Newbury Park, California. However, this cluster is basically dominated by

Table 8
**SPATIAL AUTOCORRELATIONS FOR THE
 BIOTECHNOLOGY INDUSTRY'S LQ BASED ON R&D.**

	Moran's <i>I</i>	Geary's <i>C</i>
BioRDLO90	0.003	0.682
BioRDLO91	0.004	0.655
BioRDLO92	0.005	0.597
BioRDLO93	0.006	0.602
BioRDLO94	0.004	0.627
BioRDLO95	0.004	0.680
BioRDLO96	0.005	0.730
BioRDLO97	0.004	0.750
BioRDLO98	0.014	0.682
BioRDLO99	0.013	0.633
BioRDLO00	0.013	0.740
BioRDLO01	0.012	0.754
BioRDLO02	0.021	0.708

Biotechnology L_Q based on R&D

Moran's <i>I</i> =	0.008	Geary's <i>C</i> =	0.680
Time-series t-statistics	5.348	Time-series t-statistics	44.832
z-Normal <i>I</i> =	2.277	z-Normal <i>C</i> =	23.377
Var. Normal <i>I</i> =	0.000	Var. Normal <i>C</i> =	0.0002
z-Random <i>I</i> =	2.366	z-Random <i>C</i> =	2.137
Var. Random <i>I</i> =	0.000	Var. Random <i>C</i> =	0.023
# Obs	3140	# Obs	3140
# Neighbors	70159	# Neighbors	70159

Amgen—the largest publicly traded biotech firm. In terms of number of establishments, many biotech firms seem to cluster along New Jersey/New York corridor, as with the large pharmaceutical companies. As one might expect, biotech firms tend to locate close to major universities and major pharmaceutical companies.

The spatial auto-correlations test results for the biotechnology industry are reported in Tables 7 and 8. First, the location quotients are calculated for each of 429 biotech companies based on sales and R&D for each year from 1990 to 2002 over 3140 counties in the United States. Then Moran's *I* and Geary's *C* tests are run for each, on the companies' LQ based on sales and R&D. The number of

neighbors totals 70,159. The t-statistics are time series t-statistics of the mean coefficient.

Table 7 shows that there is a positive spatial autocorrelation for biotech companies in sales as suggested by Geary's *C* tests, which indicate a smaller neighborhood spatial autocorrelation. Geary's *C* tests results are statistically significant, as indicated by the average z-statistics (19.81) and the time-series t-statistics (12.80). Moran's *I* tests are not statistically significant. These results suggest that many small biotech firms are selling mostly to geographically concentrated clients such as big pharmaceutical companies, which are closely clustered.

Table 8 shows that there is a positive spatial autocorrelation for biotech companies in R&D activities and collaborations, as indicated by Moran's *I* and Geary's *C* tests. Given the fact that the biotech industry is the most R&D-intensive industry, this evidence proves that the higher the level of R&D intensity, the closer spatial proximity it requires for biotech firms to cluster together. Both Moran's *I* tests and Geary's *C* tests results are statistically significant. For Moran's *I* tests, the average z-statistic is 2.28 and the time-series t-statistic is 5.28. For Geary's *C* tests, average z-statistic is 23.38 and the time-series t-statistic is 44.83.

Overall, these results suggest a statically significant local indication of a positive spatial autocorrelation for the biotech industry's sales, as indicated by Geary's *C* tests, and there is a statically significant positive spatial autocorrelation for the biotech industry's R&D, as indicated by both global and local statistical tests. These results again suggest that innovations and knowledge diffusions are spatially clustered and geographic proximity among industry competitors is important to knowledge-intensive companies' growth and development.

CONCLUSION

In conclusion, our paper has identified knowledge-intensive industries and focused on firms in biotechnology, pharmaceuticals, and software—the three knowledge-intensive industries with high levels of R&D intensity. For the software industry, both Moran's *I* and Geary's *C* tests suggest that the software industry's sales and R&D are spatially clustered and geographic proximity among industry competitors is important to the firms' growth and innovation.

For the pharmaceutical industry, Moran's *I* test results suggest that there is a

statistically significant global indication of a positive spatial autocorrelation for the pharmaceutical industry's sales and R&D, suggesting that the sales and innovations among pharmaceutical companies are spatially clustered. This geographic proximity can facilitate speedy knowledge and innovation diffusion and is thus important to pharmaceutical companies' growth.

For the biotechnology industry, Geary's *C* test results suggest that there is a statistically significant local indication of a positive spatial autocorrelation for the biotech industry's sales, whereas for the industry's R&D, both Moran's *I* and Geary's *C* test results indicate a statistically significant positive spatial autocorrelation. These results again suggest that innovations and knowledge diffusions are spatially clustered and geographic proximity among industry competitors is important to biotech companies' growth and development.

In conclusion, our findings indicate that knowledge-intensive industries and knowledge-spillovers are spatially clustered and autocorrelated, suggesting spatial proximity is important for innovations and knowledge spillovers among knowledge-intensive industries. The strategic and practical implications of our findings also indicate that a knowledge-intensive or a high-tech company may achieve greater competitive advantage by strategically locating its headquarters or major R&D facility within an innovative industry's cluster or close to its competitors.

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Income Inequality in Missouri, 1999

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INTRODUCTION

There is strong evidence that income inequality in the United States has been increasing at least since 1980 (see, for example, Levernier 1996; Levernier et al. 1995 and 1998a; Partridge et al. 1996). In addition, there is considerable variation in income inequality at the regional level. For example, nationwide, income inequality is higher in nonmetropolitan counties than it is in metropolitan areas (Levernier et al. 1998b). The causes of the observed regional variation have been studied by researchers for states (Levernier et al. 1995; Partridge et al. 1996), for counties (Levernier et al. 1998a) and for urban areas (Garafalo and Fogarty 1979).

While some studies have considered the entire universe of over 3,000 counties in the United States (for example, Levernier et al. 1998a), this study considers income inequality in the 114 counties and the independent city of St. Louis in the state of Missouri in 1999. We are concerned with identifying the causes of the variation in income inequality that exists in the 115 areas and comparing those causes with the results of other studies. Previous studies attempted to explain regional differences in income inequality in 1989 and earlier years. Therefore, it is useful to see if the factors found in earlier studies as relevant to regional differences in income inequality are important 1) in Missouri and 2) in a later period, 1999.

While the measurement of income inequality and the identification of the factors that influence inequality are interesting endeavors on their own right, the ultimate goal of a study such as this one must be to make policy prescriptions from the results. For example, policies that reduce inequality are likely to be favored over those that increase it. The results from this study are likely to be useful in crafting policies to decrease income inequality in the state of Missouri.

The organization of this paper is as follows. A review of income inequality in Missouri is given in the next section. The third section introduces the basic model that is used in this paper to identify the factors that affect the variation in income inequality in Missouri. In this section, we also briefly review results from selected earlier studies. The fourth section outlines the results of the model for Missouri. The final section offers a brief summary and conclusion.

INCOME INEQUALITY IN MISSOURI, 1999

The Gini coefficient was used in this study as the measure of income inequality in a county. Gini coefficients take on value between zero and one; zero indicates complete equality of incomes, while a one signifies complete inequality. The higher the value of the Gini coefficient, the greater the degree of income inequality. One hundred fourteen counties and the independent city of St. Louis in Missouri comprised the sample. See Figure 1 for a county map of the State of Missouri. The 2000 Census reports total income and number of families for 16 different income classes. Employing the method of previous researchers, we assume that income level for each family is equal to the midpoint of its income class. For the highest, open-ended income class, we assume families are at the mean of the income class. This method slightly understates the true level of income inequality, mostly due to the assumption concerning the highest income recipients in a region. But since this understatement occurs for all regions, there is not likely to be significant bias introduced from following this approach.

Maxwell (1990) explains the actual procedure for estimating the Gini coefficient based on income class data. We followed this procedure to arrive at the results in Table 1, which gives the Gini coefficient for each county in our study for 1999. Note that the income collected in a decennial census is actually for the previous year; therefore, the Gini coefficients are for 1999. Comparison data for the United States are also given in Table 1. Note that the state Gini coefficient is not computed as the simple average of the 114 counties and city of St. Louis, but is computed using the data from the 2000 Census.

It is apparent from the data in Table 1 that income inequality in Missouri (0.4042) is less than in the entire United States (0.4309). The county Gini coefficients range from a high of 0.4815 (Pemiscot) to a low of 0.3170 (St. Charles). In general, the highest coefficients are found in the Bootheel counties such as New Madrid, Dunklin, Mississippi, Stoddard and Scott, in addition to Pemiscot.

Table 1
GINI COEFFICIENTS

County	GINI 1999	Rank
United States	0.4309	
Missouri	0.4042	
Adair	0.4190	17
Andrew	0.3757	69
Atchison	0.3983	35
Audrain	0.3887	53
Barry	0.4035	29
Barton	0.3606	86
Bates	0.3747	71
Benton	0.3934	46
Bollinger	0.3587	89
Boone	0.4012	31
Buchanan	0.3816	60
Butler	0.4486	4
Caldwell	0.3588	88
Callaway	0.3549	93
Camden	0.4162	22
Cape Girardeau	0.3840	58
Carroll	0.3894	50
Carter	0.4210	16
Cass	0.3362	107
Cedar	0.3897	49
Chariton	0.3381	104
Christian	0.3789	66
Clark	0.3852	57
Clay	0.3518	98
Clinton	0.3643	82
Cole	0.3712	72
Cooper	0.3443	103
Crawford	0.3888	52
Dade	0.3573	90
Dallas	0.4505	3
Daviess	0.4059	28
DeKalb	0.3319	111
Dent	0.3939	44
Douglas	0.3961	39
Dunklin	0.4265	12
Franklin	0.3597	87
Gasconade	0.3535	96
Gentry	0.3852	56
Greene	0.4112	24

Gini Coefficients continued

Grundy	0.3860	55
Harrison	0.3544	94
Henry	0.3934	45
Hickory	0.3756	70
Holt	0.3947	42
Howard	0.3649	81
Howell	0.4131	23
Iron	0.4310	7
Jackson	0.4025	30
Jasper	0.3980	37
Jefferson	0.3319	110
Johnson	0.3667	78
Knox	0.3514	99
Laclede	0.3969	38
Lafayette	0.3706	73
Lawrence	0.3904	48
Lewis	0.3794	64
Lincoln	0.3305	113
Linn	0.3870	54
Livingston	0.3999	21
McDonald	0.4182	18
Macon	0.3799	63
Madison	0.3793	65
Maries	0.3498	100
Marion	0.3957	40
Mercer	0.3540	95
Miller	0.3677	76
Mississippi	0.4454	5
Moniteau	0.3348	109
Monroe	0.3616	84
Montgomery	0.3307	112
Morgan	0.3981	30
New Madrid	0.4298	8
Newton	0.3985	34
Nodaway	0.3614	85
Oregon	0.4260	13
Osage	0.3349	108
Ozark	0.4289	10
Pemiscot	0.4815	1
Perry	0.3458	101
Pettis	0.3571	91
Phelps	0.3945	43

Gini Coefficients continued

Pike	0.3655	80
Platte	0.3457	102
Polk	0.3655	79
Pulaski	0.3362	106
Putnam	0.4165	21
Ralls	0.3270	114
Randolph	0.3695	74
Ray	0.3558	92
Reynolds	0.3814	61
Ripley	0.4174	19
St. Charles	0.3170	115
St. Clair	0.3888	51
Ste. Genevieve	0.3530	97
St. Francois	0.3821	59
St. Louis	0.4212	15
Saline	0.3805	62
Schuyler	0.3778	68
Scotland	0.3996	33
Scott	0.3956	41
Shannon	0.4419	6
Shelby	0.3912	47
Stoddard	0.4067	25
Stone	0.4063	27
Sullivan	0.3674	77
Taney	0.4166	20
Texas	0.4275	11
Vernon	0.3785	67
Warren	0.3686	75
Washington	0.4225	14
Wayne	0.4295	9
Webster	0.3627	83
Worth	0.3373	105
Wright	0.4066	26
St. Louis City	0.4646	2

The Gini coefficient for the 32 metropolitan counties plus the city of St. Louis was 0.4064 in 1999. For the 82 nonmetropolitan counties, the coefficient was 0.3962. These figures are not the simple averages of the coefficients for the respective areas, but are computed using the number of total families in each of the 16 income classes for the metropolitan and nonmetropolitan areas.

MODEL AND LITERATURE REVIEW

The general approach to identifying the factors associated with income inequality is a simple model of the form:

$$\text{INEQ} = F(\text{DEMOG}, \text{LF}, \text{INDCOMP}, \text{HUMANK}, \text{GEOG})$$

where INEQ is the measure of income inequality in a region, which is the Gini coefficient in this study, DEMOG includes demographic variables, LF denotes variables related to labor force conditions, GEOG includes variables that relate to regional effects, INDCOMP includes variables that measure the industrial composition of a region, and HUMANK are human capital variables. The various studies differ as to the exact variables that are included in each category and the different categories that might be used. However, in all cases, economic theory is used to identify and support the use of the individual variables in the model.

Four demographic variables most often used include the percent of the population that is dependent (under 18 or over 64, two variables), the percent that are African-American or minorities, and the percent of families headed by a female. Due to discrimination in the labor force, it is anticipated that a greater proportion of African-Americans or minorities will lead to greater income inequality. This is generally found to be true (Persky and Tam 1994; Levernier 1996, 1999; Partridge et al. 1996). It is also expected that the greater the percent of the population that is dependent, the greater will be the degree of income inequality. People 65 years of age or older frequently have the typical lower incomes of retirement years, so a greater proportion of this age group is likely to increase income inequality in a region. Similarly, population under 18 usually receives little or no income, which could also contribute to income inequality. Actual research results are mixed, however, with respect to these variables. In some cases, just one group is found to be significant (Levernier 1999, for example, found only the group under 18 was positively related to income inequality) or has an unexpected sign (Levernier et al. 1998a, found that as the percent of the population over 64 increased, income inequality decreased in

nonmetropolitan counties). Female-headed families are much more likely to be low-income than are other families. Therefore, as the percent of such families increases in a region, income inequality should increase. Most research finds this to be true (see, for example, Levernier et. al. 1995, 1998a).

Five variables typically fall into the labor force category. Two relate to the labor force participation rate, particularly of women. Women increased their participation in the labor force in record numbers starting in the 1970s, a trend that has continued throughout the 1990s. The entrance of women into the labor force will boost the earnings of the affected families and will contribute to reductions in income inequality, if the women are from lower- and middle-class families. If women from upper-middle-income and upper-income families enter the labor force, it is possible that increased labor force participation by women will increase income inequality. The overwhelming majority of studies find income inequality falls when the labor force participation rate of women increases (e.g., Levernier 1999; Levernier et al. 1995 and 1998a). Instead of the labor force participation rate of women, some studies use the employment rate (Levernier 1996) or the labor force participation rate for both sexes (Partridge et al. 1996) with similar results. Our study includes only the female labor force participation rate. We did include the male labor force participation rate in some early regressions, but it never demonstrated any significance and was dropped from further consideration.

A third labor force variable is the percent of the population that is foreign-born. Several studies find a positive and significant relationship between foreign-born and income inequality (see, for example, Levernier 1996). The theory is that foreign-born individuals frequently have lower skills or language impediments that reduce their income, thus contributing to income inequality.

A fourth labor force variable relates to the conditions of the labor market in a region. Increases in employment in a region offer opportunities for unemployed individuals to increase their incomes, which should help to lower income inequality (see, for example, Levernier et al. 1995; Levernier 1999). Therefore, employment growth in the previous decade is included in the model as a measure of employment opportunities in the region.

The final labor force variable is the income of the region. The Kuznets (1995) hypothesis indicates that income inequality may grow with increasing income over some range of income and then decline as income increases further.

Therefore, a region's level of income inequality may be influenced by its stage of economic development. Levernier et al. (1998a), for example, find a positive relationship between income level and income inequality in their sample of over 3,000 counties. Bishop et al. (1992), also find a positive relationship for income. They use states in 1980 as their sample. Persky and Tam (1994), however, found a negative relationship between income and income inequality.

Industrial composition variables relate to the type of industries found in a region. One hypothesis is that a large manufacturing sector offers relatively high-wage employment to less educated workers, thereby contributing to reductions in income inequality. We include the region's percent of employment in manufacturing to represent this hypothesis. Another sector that could be of importance in determining income inequality is farm employment. Farm income is notoriously variable and frequently low; both of these facts could lead to greater income inequality in regions with a large farm sector.

Three human capital variables relating to education of the labor force have been used in various studies. Two variables relate to the level of education: the percent of the population (25 years of age or older) that has a college degree and the percent of the population that has a high school diploma (but no college degree). Therefore, the excluded category is high school dropouts. It is difficult to say, *a priori*, how more college graduates in a region may affect income inequality. It is possible that more college graduates will increase income inequality. An increase in population with high school diplomas is likely to decrease income inequality. Levernier et al. (1995), for example, find that increases in the percent of college graduates increase income inequality while increases in population with a high school diploma decrease it. In addition to the level of education, several studies use the standard deviation of educational attainment in a region. It is generally found that a wider dispersion of educational attainment increases income inequality (Levernier et al. 1998a).

In addition to the variables that have been discussed thus far, it is also likely that there are effects that influence income inequality that are unique to given regions. It is important to control for these region effects, usually through the use of dummy variables. In our model, we have 18 dummy variables that relate to region effects. The state of Missouri is divided into 19 regional planning areas, each served by a regional planning commission. The excluded planning area is Boonslick, which includes just three counties (Lincoln, Montgomery, and Warren). Counties in planning areas are likely to be fairly homogeneous, rendering a planning area approach tenable. One additional variable relating to

geography is the population of the county. Income inequality may be affected by economies of scale or agglomeration economies, which can be approximated by the population of the county. Levernier et al. (1998a) found that the log of population was negatively related to income inequality in metropolitan counties, but was insignificant in nonmetropolitan counties.

One further addition to our model is a dummy variable indicating whether a county is metropolitan (1) or nonmetropolitan (0). There may be factors that are unique to metropolitan or nonmetropolitan areas that also influence income inequality. However, since county population and the regional planning areas are already represented in the model, it is likely that any metropolitan or nonmetropolitan factors are being measured. Table 2 summarizes variable definitions.

Table 2
LIST OF VARIABLES

GINI	Gini coefficient (multiplied by 100)
OVER64	Percent of population that is over 64 years of age
UNDER18	Percent of population less than 18 years of age
BLACK	Percent of population that is African American
FEMALE	Percent of female headed families
FLFPR	Female labor force participation rate
EMPGROW	Employment growth rate in previous decade
LINCOME	Log of average family income, constant 1982-84 dollars
LPOP	Log of population
MFG	Percent of employment in the manufacturing sector
FARM	Percent of employment in the farm sector
COLLEGE	Percent of population 25 or older with at least a bachelor's degree
HIGH	Percent of population 25 or older with a high school diploma but no college degree
EDUC	Standard deviation of educational attainment
METRO	Dummy variable equal to one in for metropolitan counties, zero otherwise
Regional	BOOTHEEL, EAST-WEST, GREEN HILLS, KAYSINGER, LAKEOZ
Dummy	MARK TWAIN, MERAMEC, MIDAMER, MIDMO, MOKAN, NEMO
Variables	NWMO, OZFOOT, TRUMAN, SHOWME, SCOZ, SEMO, SWMO

EMPIRICAL RESULTS

Variable statistics are given in Table 3.

Variable	Mean	Standard Dev.	Maximum	Minimum
GINI	38.404	3.219	48.150	31.700
AFR-AMER	3.143	6.587	51.000	0.000
COLLEGE	13.491	6.075	41.700	6.800
EDUC	13.667	1.803	17.180	8.327
EMPGROW	20.489	16.889	97.144	-13.500
FARM	12.270	8.677	53.600	0.000
FEMALE	8.303	2.690	23.950	4.180
FLFPR	54.776	5.924	69.100	37.300
FOREIGN	1.147	1.633	13.700	0.100
HIGH	63.142	4.828	71.500	47.400
INCOME	40106.160	7322.636	68436.000	28978.000
MFG	12.306	7.484	32.600	0.000
OVER64	16.097	3.496	26.000	7.900
POP	48567.050	120081.100	1016315.000	2382.000
UNDER18	25.157	2.052	30.000	19.200

Ordinary least-squares regression was used with the Gini coefficient (multiplied by 100) as the dependent variable. Two regressions are reported in Table 4: regression (1) excludes the regional dummy variables and regression (2) adds the regional dummy variables. The inclusion of the regional dummy variables has a significant effect on the regression. The partial F statistic for the inclusion of the regional dummy variables is 3.99, which is significant at the 1% level. Thus, the regional dummy variables should be in the model and our remarks will mostly be confined to equation (2).

Many of the coefficients on the regional dummy variables are positive and significant at the 5% level. Apparently, income inequality increases as we move away from the three counties served by the Boonslick Regional Planning Commission. Beyond the regional dummy variables, five independent variables are significant at the 5% level or better in equation (2): FEMALE, LINCOME, FLFPR, COLLEGE, and HIGH. Only one other independent variable is significant at even the 20% level: OVER64.

Table 4
EMPIRICAL RESULTS

Dependent Variable: GINI Number of Observations: 115

Variable	(1)		(2)	
	Coefficient	t-Statistic	Coefficient	t-Statistic
CONSTANT	65.914	2.39	-74.710	-2.45
AFR-AMER	-0.066	-1.07	-0.052	-0.91
COLLEGE	0.113	1.63	-0.133	*1.78
EDUC	-0.251	-0.97	-0.151	-0.62
EMPGROW	0.017	1.18	-0.002	-0.11
FARM	-0.005	-0.13	-0.021	-0.63
FEMALE	0.604	***3.92	0.728	***5.07
FLFPR	-0.303	***-3.94	-0.259	***-3.36
FOREIGN	-0.077	-0.42	0.165	0.86
HIGH	-0.088	-0.97	-0.259	***-2.67
INCOME (Log)	-1.529	-0.50	13.222	***4.04
POP (Log)	0.184	0.42	-0.206	-0.44
METRO	-0.154	-0.23	0.322	0.41
MFG	0.017	0.51	-0.014	-0.47
OVER64	0.163	1.32	0.156	1.42
UNDER18	0.124	0.91	-0.095	-0.75
BOOTHEEL			3.518	**2.14
EAST-WEST			-0.572	-0.38
GREEN HILLS			4.806	***3.44
KAYSINGER			3.371	**2.30
LAKEOZ			4.703	***3.23
MARKTWAIN			4.253	***3.24
MERAMEC			2.889	*1.97
MIDAMER			0.068	0.05
MIDMO			1.489	1.10
MOKAN			1.790	1.24
NEMO			6.794	***4.51
NWMO			5.104	***3.19
OZFOOT			4.512	***2.64
TRUMAN			5.543	***3.60
SHOWME			1.901	1.31
SCOZ			8.806	***5.00
SEMO			2.380	*1.72
SWMO			5.531	***4.29
ADJ R-SQ	0.580		0.727	
F-STATISTIC	11.509		10.180	

* Significant at .1 level

** Significant at .05

*** Significant at .01

As in most other studies, there is a positive and highly significant relationship (better than 1% level) between income inequality and the percent of families that are headed by a female. The low level of income of such families, frequently due to low levels of human capital, acts to increase income inequality in a region. Note that the coefficient on FEMALE is very stable, exhibiting very little change as the region dummy variables are added to the model.

The coefficient on the log of average family income (LINCOME) is also positive and significant. This result is similar to those of several other researchers, who found that income inequality begins to rise with higher incomes (see, for example, Garafalo and Fogarty 1979). Levernier et al. (1998b) suggest that as market rewards for high-tech employment increase relative to jobs requiring lower skills, the existence of a bimodal distribution of income could lead to greater income inequality. One must be cautious making conclusions concerning income in the present study, however, because the variable's coefficient is significant only when the regional dummy variables are added, implying that a stability issue may exist.

The coefficient on the female labor force participation rate (FLFPR) is also negative and significant at the 1% level. In addition, the coefficient estimates exhibit considerable stability as additional variables are added to the regression. As females continue to enter the labor force in Missouri, incomes of lower and middle income families are likely affected most, resulting in greater income equality.

Two of the education variables in the model (COLLEGE, HIGH) are significant. The relationship for both variables is negative, indicating that income inequality falls as more of a county's population has a high school diploma or college education. Note that the coefficients on HIGH and COLLEGE are insignificant in the absence of the regional dummy variables (though COLLEGE just misses the 10% test). This suggests there is some question concerning the stability of these estimates; therefore, one must again be cautious in making conclusions concerning these variables. However, the results are consistent with the hypotheses concerning these variables, allowing some confidence in the regression results.

SUMMARY AND CONCLUSIONS

The results of this study allow for some definite policy conclusions. Income inequality in Missouri can be reduced if the trend toward increased labor force

Figure 1
MISSOURI COUNTIES



participation of women continues. Policies, such as improved access to child care, that allow women to enter the labor force in yet greater numbers will reduce inequality. In addition, improved child care choices should also help boost the incomes of female-headed families, though for these families, insufficient human capital may also be part of the equation. Therefore, job training or even high school completion policies (such as GED) could help to improve the economic fortunes of female-headed families and reduce income inequality. As Ellwood and Jencks (2004) note, “Single-parent families have become more common in all demographic groups, but the increases have been greatest among less-educated women...” (p. 5). The significance of the percent of the population with a high school diploma in our regressions indicates that more than just female-headed families would benefit from high school completion policies.

The significance of the percent of college graduates in reducing income inequality has also been noted. The rapid increases in tuition at state universities in Missouri over the past three to four years, due to state budget cuts, are likely to have reduced access for some individuals, particularly for those from lower-income families. The long-term effects are yet to be seen, but the results of this study indicate that one possible effect is an increase in income inequality in the state. To counteract this possibility, the state or its institutions should offer increased aid to students from lower income families, to ensure that they still have access to higher education.

In addition to the policy consequences of income inequality in Missouri, there are also implications for private firms in the marketing of their products. For example, it may be more difficult for firms to determine the optimum combination of goods to sell in counties where there is greater income inequality as compared to counties with greater homogeneity of incomes. In counties where the income distribution is more bimodal (rich and poor), it is more likely that firms may arise to service each group separately: luxury goods for the rich, generic, low-priced goods for the poor. Where income inequality is lower, firms face a relatively larger class of (somewhat) homogeneous (with respect to income) consumers to which to cater their goods and services. This would tend to make marketing efforts (advertising, etc.) more efficient, because they can be aimed at a wider population. Marketing efforts in counties of greater income inequality will tend to be narrower and more focused, and likely, more expensive per person reached, since they are aimed at smaller groups.

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Firm Value and the Debt/Equity Choice

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INTRODUCTION AND BACKGROUND

According to Compustat, since the beginning of the century there have been about 1,650 firms per year that on average have reported no long-term debt (including capitalized lease obligations). Gopalakrishnan (1994) indicates about 30 percent of such unlevered firms will issue debt within a year and maintain it for a prolonged (if not permanent) period of time. Larger firms without long-term debt, however, are a rarity as shown by Agrawal and Nagarajan (1990) who find only 104 such firms listed on major U.S. stock exchanges. This suggests that most managers, at least for larger firms, behave as if value can be added by choosing some positive debt level when financing their operating assets.

Theoreticians offer various formulas to support the managerial decision to issue debt. The forerunner of this line of research is Modigliani and Miller (1963), referred to as MM. They derive a gain to leverage (G_L) formulation in the context of an unlevered firm issuing risk-free debt to replace risky equity. For MM, G_L is the corporate tax rate multiplied by debt value. The applicability of MM's G_L formulation is limited, as it implies that financial executives issue unrestricted amounts of debt. Extensions of MM consider a variety of leverage-related wealth effects (most noteworthy, the effects stemming from personal tax, flotation costs, bankruptcy, agency, and asymmetric information considerations).

Empirical researchers offer differing opinions concerning the strength of leverage-related effects. While early researchers (Warner 1977; Miller 1977) suggest such effects may be unimportant (at least for larger firms), later investigators (Altman 1984; Cutler and Summers 1988) contend otherwise, indicating such effects would be significant if quantified. Graham and Harvey (2001) offer support for leverage-related effects, but restrict this support by

noting there is little evidence that executives are concerned about some effects (i.e., asset substitution, asymmetric information, transactions costs, free cash flows, and personal taxes). Regardless of the significance of leverage-related effects, some researchers (Graham and Harvey 2001; Pinegar and Wilbrecht 1989) indicate that firms may be more concerned with an amount of debt that gives flexibility for future opportunities. Other researchers (Fischer, Heinkel, and Zechner 1989; Kayhan and Titman 2004) downplay the need for debt flexibility by offering evidence for the role performed by tax and bankruptcy cost effects. In a pioneer study, Hull (1999) presents event study evidence consistent with leverage-related effects determining an optimal debt level.

Given the presence of debt in the capital structure of most firms and the empirical evidence concerning leverage-related effects, we need usable equations to quantify these effects. This paper aims to fill this void by offering G_L formulations that quantify leverage-related wealth effects. This is done through perpetuity G_L formulations that make explicit how changes in equity and debt discount rates affect firm value. To the extent changes in such discount rates can be accurately estimated along with values for other relevant variables (e.g., growth and tax rates), the G_L formulations given in this paper can be used to measure the dollar impact of a proposed capital structure change. Consequently, it is possible for financial executives to make a debt/equity choice that maximizes firm value.

TRADITIONAL PERPETUITY GAIN TO LEVERAGE FORMULATIONS

This paper's G_L formulations are rooted in and developed within the no growth perpetuity framework of MM (1963) and Miller (1977). This section reviews these G_L formulations and their extensions. It ends by indicating the need to incorporate discount rates in G_L formulations.

The MM Gain to Leverage Formulation

MM analyze the valuation impact of a debt-for-equity transaction. The simplifying conditions explicitly or implicitly used in their analysis include:

- (i) two security types (an unlevered firm with risky equity that issues risk-free debt)
- (ii) only corporate taxes (no personal taxes on income from either equity or debt)

- (iii) level perpetuities (which can approximate any series of unequal cash flows)
- (iv) no growth (depreciation each year equals investment to keep the same amount of capital)
- (v) no imperfections (i.e., no leveraged-related effects such as flotation costs, bankruptcy costs, agency effects, or asymmetric information effects)
- (vi) equivalent return classes (the CAPM had not yet been developed).

Given these conditions, MM argue that G_L is the exogenous corporate tax rate (T_c) times the value of perpetual risk-free debt (D) such that

$$G_L = T_c D. \tag{1}$$

D is the chosen perpetual interest payment (I) divided by the exogenous cost of capital on risk-free debt (R_f). As D increases, MM posit that there is an increase in the rate at which risky equity is discounted. However, no quantitative application is made of any net negative impact on firm value of the increase in equity's discount rate. Similarly, no detailed valuation analysis is made of the G_L ramifications if debt is risky. However, if debt is risky, then we have

$$D = \frac{I}{R_D} \tag{2}$$

where $R_D > R_f$ with R_D now an increasing function of debt.

While there are other forms of financing that might affect the debt/equity choice, little attention is given to these forms. For example, one form that might affect the choice is long-term lease financing. Because any such lease payment acts like debt by lowering the firm's taxable income and increasing its financial risk, however, it resembles debt and can be treated as part of D . This is true for any off-balance-sheet items that behave like debt.

Extensions of the MM Formulation

Those extending the G_L equation of MM (Baxter 1967; Kraus and Litzenberger 1973; Kim 1978) assume risky debt. They argue that increasing debt levels are associated with increasing bankruptcy costs, so an optimal debt level exists where the negative bankruptcy costs effect offsets the positive tax shield effect. Increasing levels of debt can cause firm value to fall for reasons other than

bankruptcy costs. For example, Jensen and Meckling (1976) examine a wider range of leverage-related costs that they call agency costs. Regardless of corporate tax shield and bankruptcy considerations, net agency effects can impact G_L . For example, increasing debt can initially cause net gains owing to the reduction in owner/manager monitoring costs, but can eventually lead to net losses, due to the escalation in costs caused by restrictive debt covenants.

Drawing from the work of Farrar and Selwyn (1967), Miller (1977) assumes personal taxes and extends (1) such that

$$G_L = [1 - \alpha]D \tag{3}$$

where $\alpha = \frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})}$ with T_{PE} and T_{PD} the personal tax rates applicable to income from equity and debt, and D now equals $\frac{(1 - T_{PD})I}{R_D}$. For Miller, costs related to the increase in debt (in particular, bankruptcy costs) are inconsequential, so the effect of personal taxes alone offsets the effect of corporate taxes. For example, Miller argues that $\alpha \approx 1$, and thus $G_L \approx$ zero (e.g., $G_L = [1 - \alpha]D \approx [1 - 1]D \approx 0$). Regardless, as $[1 - \alpha]$ in (3) takes on values smaller than T_C , then G_L in (3) becomes less than G_L in (1). Even if $[1 - \alpha] = T_C$, G_L in (3) is less than G_L in (1) if $T_{PD} > 0$ since D in (3) is adjusted for personal taxes and now equals $\frac{(1 - T_{PD})I}{R_D}$ instead of just $\frac{I}{R_D}$.

Even if Miller is correct, the signaling theory (Leland and Pyle 1977; Ross 1977; Myers and Majluf 1984) suggests that an increase in a firm's debt-to-equity ratio can lead to an increase in firm value. For example, Myers and Majluf (1984) argue that if managers are better informed than outside investors, firms are more likely to retire equity when it is undervalued. Thus, a debt-for-equity transaction would signal positive news in the sense underpriced securities are being retired (in addition to any other positive signal the firm conveys about future cash flows covering larger interest payments). Empirical research (Copeland and Lee 1991; Hull and Michelson 1999) offers evidence consistent with debt-for-equity transactions signaling positive news (including the conveyance of reduced risk, as seen in lower betas and thus reduced required rates of return). Thus, signaling theory suggests exchanging debt for equity can cause $G_L > 0$ to hold even if there are no other leverage-related effects.

Ensuing G_L extensions of MM (DeAngelo and Masulis 1980; Kim 1982; Modigliani 1982; Ross 1985) consider a variety of leverage-related costs and show that an optimal debt level exists, even when personal taxes are recognized. Leland and Toft (1996) extend the closed-form results of Leland (1994) to a

much richer class of possible debt structures, permitting the study of the optimal amount of maturity of debt. Leland (1998) attempts to provide quantitative guidance on the amount and maturity of debt, financial restructuring, and optimal risk strategy. The G_L extensions are characterized by the inability to make explicit how changes in equity and debt discount rates impact firm value, within a model that financial managers might find useable.

FORMULATIONS THAT INCORPORATE DISCOUNT RATES

In this section, practical G_L formulations are derived for managers making their debt/equity choices. These equations consider the impact of equity and debt discount rates on an unlevered firm in three situations: (i) no personal taxes and no growth, (ii) personal taxes and no growth, and, (iii) personal taxes and constant growth.

Gain to Leverage Formulation without Personal Taxes

A G_L formulation that includes discount rates can be derived from the definition that G_L is levered firm value (V_L) minus unlevered firm value (V_U). We have

$$G_L = V_L - V_U \tag{4}$$

where V_U and V_L are defined below and the general MM conditions described earlier hold.

V_U is the same as unlevered equity value (E_U). E_U is the uncertain perpetual after-corporate-tax cash flow available to unlevered equity of $(1-T_C)C$ divided by the exogenous unlevered equity discount rate (R_U). We have

$$V_U = E_U = \frac{(1-T_C)C}{R_U} \tag{5}$$

where C is the perpetual before-tax cash flow available to unlevered equity owners with $R_U > R_D$ if the firm chooses to issue debt. Note that C assumes all expenses are cash expenses so that before-tax cash flow equals taxable income.

V_L is levered equity value (E_L) plus debt value (D). E_L is the uncertain perpetual after-corporate-tax cash flow available to levered equity of $(1-T_C)(C-I)$ divided by the endogenous levered equity discount rate (R_L). We have

$$E_L = \frac{(1-T_C)(C-I)}{R_L} \tag{6}$$

where $R_L > R_U$ with R_L positively related to debt (e.g., the cash flow to equity

owners becomes less certain as debt increases). Inserting (6) and (2) into the definition $V_L = E_L + D$ gives

$$V_L = \frac{(1-T_C)(C-I)}{R_L} + \frac{I}{R_D} \quad (7)$$

where $R_D = R_F$ only if debt is risk-free debt (as MM assume or as the CAPM suggests when a debt beta is assumed to be zero, which is often the assumption). Regardless, the derivation of the G_L formulation below is unimpeded if R_D is endogenously determined by the debt-level choice such that $R_D > R_F$ holds.

The G_L formulation for an unlevered firm issuing debt can now be derived. After substituting (7) into (4) and noting $V_U = E_U$, Appendix A shows

$$G_L = \left[1 - \frac{\alpha R_D}{R_L} \right] D + \left[\frac{R_U}{R_L} - 1 \right] E_U \quad (8)$$

where $\alpha = (1-T_C)$.

The first component, $\left[1 - \frac{\alpha R_D}{R_L} \right] D$, is always positive if $D > 0$ since $\frac{\alpha R_D}{R_L} < 1$. If $D = 0$, then this component is zero. The second component, $\left[\frac{R_U}{R_L} - 1 \right] E_U$, is always negative if $D > 0$ since $E_U > 0$ and $\frac{R_U}{R_L} < 1$.

If $D = 0$, then $R_U = R_L$ and the second component (like the first) will also be zero when $D = 0$ holds. Thus, if $D = 0$ then (8) implies that $G_L = 0$. But if $D > 0$ then (8) can be either positive or negative, depending on which component has the greatest absolute value.

The first component is similar to the traditional G_L formulations except it is multiplied by a value less than one (e.g., $\frac{R_D}{R_L} < 1$), causing the component to be more positive than the traditional G_L formulations. In looking at the second component, we can see that G_L can be viewed as being related to how much the increase in debt negatively affects outstanding equity through the percentage increase in its discount rate. This relationship is consistent with the intuitive notion that as leverage increases risk (and thus the required rate of return), the value of the firm should fall accordingly.

Gain to Leverage Formulation with Personal Taxes and Constant Growth

When personal taxes are considered, we can show (as in Appendices A and B)

that G_L can still be expressed as (8) if definitions for V_U , E_L , and D are modified to incorporate personal tax rates. For example, we still have

$$G_L = \left[1 - \frac{\alpha R_D}{R_L} \right] D + \left[\frac{R_U}{R_L} - 1 \right] E_U$$

for (8), only now we have:

$$\alpha = \frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})}; \quad V_U = E_U = \frac{(1 - T_{PE})(1 - T_C)C}{R_U}; \quad D = \frac{(1 - T_{PD})I}{R_D}; \quad \text{and}$$

$$E_L = \frac{(1 - T_{PE})(1 - T_C)(C - I)}{R_L}. \quad \text{Keeping the first component positive (when } D > 0) \text{ is now a bit more complicated. This is because, for } \frac{\alpha R_D}{R_L} < 1 \text{ to now hold, restrictions must be placed on } T_C, T_{PE}, \text{ and } T_{PD}, \text{ and these restrictions depend on values for } R_D \text{ and } R_L.$$

Just as the Miller (1977) G_L formulation given in (3) reduces to the MM formulation given in (1) if $T_{PE} = T_{PD}$, so this paper's G_L formulation given in (8) reduces to (1) if $R_U = R_L = R_D$ and $T_{PE} = T_{PD}$. With definitions for α , V_U , E_L , and D modified to include personal tax rates, equation (8) reduces to the Miller formulation given by (3) if $R_U = R_L = R_D$. These reductions reflect the MM derivational procedure that assumes equality of discount rates when denominations (discount rates) are ignored in the factoring process.

Appendix B derives a G_L equation when both personal taxes and constant growth are considered. Constant growth implies a current dollar growth in after-tax cash flows (δ_g), which we define as

$$\delta_g = (1 - T_{PE})(1 - T_C)(C - I)(\gamma_L^{Target}) \tag{9}$$

where γ_L^{Target} is the growth rate when the firm achieves its targeted (desired optimal) amount of interest paid. To derive this G_L equation, definitions for V_U and E_L must be modified as follows:

$$V_U = E_U = \frac{(1 - T_{PE})(1 - T_C)C}{R_U - \gamma_U} \quad \text{and} \quad E_L = \frac{(1 - T_{PE})(1 - T_C)(C - I)}{R_L - \gamma_L}$$

where γ_U is the growth rate if the firm is unlevered and γ_L is a growth rate for a given levered situation. For the unlevered growth rate (γ_U), we have

$$\gamma_U = \frac{\delta_g}{(1 - T_{PE})(1 - T_C)} \tag{10}$$

For the levered growth rate (γ_L), we have

$$\gamma_L = \frac{\delta_g}{(1 - T_{FE})(1 - T_C)(C - I)} \quad (11)$$

where $\gamma_L > \gamma_U$, since $C > (C - I)$ and δ_g is fixed. We can note that γ_L increases as I increases with δ_g and C fixed. Also, $\gamma_L = \gamma_L^{\text{Target}}$ when the target leverage ratio is achieved.

With γ_U as the growth rate for the unlevered situation and γ_L the growth rate for a given levered situation, Appendix B shows that

$$G_L = \left[1 - \frac{\alpha R_D}{R_L - \gamma_L} \right] D + \left[\frac{R_U - \gamma_U}{R_L - \gamma_L} - 1 \right] E_U \quad (12)$$

where (12) reduces to (8) if there is no growth such that $\gamma_L = \gamma_U = 0$. Note that the first component can become negative if $\alpha R_D > (R_L - \gamma_L)$ holds, while the second component can become positive if $(R_U - \gamma_U) > (R_L - \gamma_L)$ holds. This can occur for large amounts of debt where γ_L becomes large causing $(R_L - \gamma_L)$ to become small.

APPLICATION USING COMPANY DATA

This section presents our application, which considers Australian Gas Light Company (AGL Co.), a major retailer of gas and electricity with about three million customers. We attempt to determine G_L if the suggested target debt/equity choice is reached and whether this is optimal. We gather market and company data from independent sources that include a firm offering audit, tax, and advisory services (KPMG International) and one offering brokerage services (State One Stockbroking Ltd.). To compute G_L , we will use equation (12) with all monetary values given in Australian dollars (A\$).

Market and Tax-Rate Data for Application

On http://www.ipart.nsw.gov.au/papers/KPMG_February_04.pdf, we find a 48-page report on AGL Co., where KPMG estimates values for variables that affect AGL Co.'s valuation. In Table 1, we give KPMG's suggestions (as of February 2004) for market and tax-rate data.

KPMG gives no estimates for personal tax rates, so we turn to another approach that uses knowledge of imputation credits (λ). Under the Australian imputation tax system, domestic equity investors receive a taxation credit for dividends paid out of after-tax firm returns. In essence, an imputation tax system offsets the

corporate tax advantage of debt in a manner analogous to when equity owners have a lower tax rate than debt owners ($T_{PE} < T_{PD}$). KPMG suggests that $\lambda = 0.4$ and that T_C (for equity owners) is effectively reduced to a lower rate (T_E). As seen in Table 1, using the average of the computations given by KPMG, we get Average $T_E = 16.317\% \approx 16.32\%$. Using this value to estimate the personal tax rates, we proceed by noting that $\alpha = (1 - T_E) \approx 1 - 0.1632 \approx 0.8368$ or about 83.68%. This value for α can be equated with a number of values for T_{PE} and T_{PD} (when $T_C = 30\%$) including the two we use in our application: $T_{PE} = 4.77\%$ and $T_{PD} = 20.34\%$. As seen in Table 1, for these two values, $\alpha \approx 83.68\%$.

We should point out that after-personal-tax values for E_U , D , E_L and V_L when $T_C = 30\%$, $T_{PE} = 4.77\%$, and $T_{PD} = 20.34\%$ will differ from those when T_C (given by

Table 1
MARKET AND TAX RATE DATA

$$R_R = \text{Real Rate} = 3.42\%$$

$$R_{INF} = \text{Inflation Rate} = 2.17\%$$

$$R_F = \text{Risk-Free Rate} = R_R + R_{INF} + (R_R)(R_{INF}) = 3.42\% + 2.17\% + (3.42\%)(2.17\%) = 5.6642\%$$

$$M_{PREM} = \text{Market Premium} = (R_M - R_F) = 6.00\%$$

$$T_C = \text{Corporate Tax Rate} = 30.00\%$$

$$\lambda = \text{Imputation Tax Credit} = 40.00\%$$

$$T_E = \text{Effective Tax Rate} = T_C(1 - \lambda) = 30\%(1 - 0.4) = 18.00\%$$

$$T_E = \text{Effective Tax Rate} = \frac{1 - T_C}{1 - [T_C(1 - \lambda)]} = \frac{1 - 0.3}{1 - [0.3(1 - 0.4)]} = 0.14634 \text{ or } 14.634\%$$

$$\text{Average } T_E = (18.00\% + 14.634\%) = 16.317\% \approx 16.32\%$$

$$\text{Average } (1 - T_E) = 1 - 0.16317 = 0.83683 \approx 83.68\%$$

$$T_{PE} = \text{Personal Tax Rate on Equity Income} = 4.77\%$$

$$T_{PD} = \text{Personal Tax Rate on Equity Income} = 20.34\%$$

$$\alpha = \frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})} = \frac{(1 - 0.0477)(1 - 0.3)}{(1 - 0.2034)}$$

$$= 0.83682 \approx 83.68\% \approx \text{Average } (1 - T_E)$$

$$(1 - \alpha) = (1 - 0.83682) = 0.16318 \approx 16.32\% \approx \text{Average } T_E$$

$T_E = 16.32\%$, $T_{PE} = 0$ and $T_{PD} = 0$. However, if we look at before-personal-tax values for G_L , the reductions in after-personal-tax values for E_U , D , E_L and V_L caused by using $T_{PE} = 4.77\%$ and $T_{PD} = 20.34\%$ will be overcome from the standpoint of getting values before lowered by paying personal taxes.

Beta and Cost-of-Capital Data for Application

As seen in Table 2, the annual report for AGL Co.'s fiscal year ending June 2004 indicates its current book $\frac{D}{E}$ ratio ≈ 1.0 where D is total liabilities and E is shareholders' equity. The values suggested by KPMG for betas and costs of capital are assumed to correspond with this book debt/equity choice of 1.0. To get AGL Co.'s cost of debt, we begin by noting that KPMG estimates a debt margin of 1.75%, which, absent other costs, suggests a debt premium (D_{PREM}) of 1.75%. As seen in Table 2, this premium implies the debt beta (β_D) = 0.2917. Using the CAPM, we get the cost of debt (R_D) $\approx 7.41\%$, which is the midpoint of KPMG's range estimated at 7.21% to 7.61%. KPMG suggests AGL Co.'s levered beta (β_L) = 1.05. Using the CAPM, this value for β_L implies its cost of levered equity (R_L) $\approx 11.96\%$.

Table 2
BETA AND COST OF CAPITAL DATA

Current Book	$\frac{D}{E} =$	$\frac{\$3,241,500,000}{\$3,153,000,000} \approx 1.0$	implies $\frac{D}{V} = 0.5$ and $\frac{E}{V} = 0.5$
	$D_{PREM} =$	Debt Premium = $\beta_D(R_M - R_F) = \beta_D(M_{PREM}) = 1.75\%$	
	$\beta_D =$	Debt Beta = $D_{PREM} / M_{PREM} = 1.75\% / 6\% = 0.291667$	
	$R_D =$	Cost of Debt = $R_F + \beta_D M_{PREM} = 5.66421\% +$ $0.291667(6\%) = 7.41421\% \approx 7.41\%$	
	$\beta_L =$	Levered Equity Beta = 1.05	
	$R_L =$	Cost of Levered Equity = $R_F + \beta_L M_{PREM} = 5.6642\% +$ $1.05(6\%) = 11.9642\% \approx 11.96\%$	
	$\beta_U =$	Unlevered Equity Beta = $\frac{\beta_L + [\beta_D(1-T_C)(\frac{D}{E})]}{1 + [(1-T_C)(\frac{D}{E})]}$ $= \frac{1.05 + [0.291667(1-0.3)(1.0)]}{1 + [(1-0.3)(1.0)]} = 0.737745$	
	$R_U =$	Cost of Unlevered Equity = $R_F + \beta_U M_{PREM} = 5.664214\%$ $+ 0.737745(6\%) = 10.0907\%$	

KPMG indicates, regardless of any formula chosen, B_D should not be assumed zero when computing the unlevered beta (β_U). Given $T_c = 30\%$, the current book leverage ratios ($\frac{D}{E} = 1.0$, $\frac{D}{V} = 0.5$, and $\frac{E}{V} = 0.5$), $\beta_L = 1.05$, and $\beta_D = 0.29$, Table 2 uses the formula given by Hamada (1972) to get $\beta_U = 0.7377$. Using the CAPM, this value for β_U implies the cost of unlevered equity (R_U) = 10.0907%.

Given the data in Table 2, we can try to estimate betas (and thus R_D 's and R_L 's) for various debt-level choices. For simplicity, we consider only nine $\frac{D}{V}$ choices, with each choice given in book values (before market adjustments caused by a positive G_L). We determine each choice based on the number of shares retired. This is accomplished by noting AGL Co. has outstanding levered shares (N_L) of 456,000,000. Given N_L and current book $\frac{E}{V} = 0.5$, we can estimate the number of shares if the firm were unlevered (N_U). As shown in Table 3, we have

$$N_U = \frac{N_L}{\text{CurrentBook} \frac{E}{V}} = \frac{456,000,000}{0.5} = 912,000,000.$$

From this N_U value, we can get the number of shares retired (S_R) for each debt-level choice. For example, if $\frac{E}{V} = 0.9$, then $\frac{D}{V} = 0.1$ and AGL Co. would retire $S_R = (\frac{D}{V})(N_U) = 0.1(912,000,000) = 91,200,000$ shares. Similarly, we can compute S_R for any debt-level choice. For each choice faced by an unlevered firm, the value of the debt issued (D) should *ceteris paribus* equal the dollar amount of the retired shares where $D = P_U(S_R)$ with P_U the unlevered share price (which can be viewed as the current market price minus any gains to leverage).

Based on our nine $\frac{D}{V}$ choices from 0.1 to 0.9, we can attempt to construct nine corresponding β_D 's and β_L 's from which we can compute R_D 's and R_L 's needed in our G_L formulation. We begin by estimating debt betas (β_D 's). The estimation process is based on the observation that we have two β_D 's endpoints and a β_D interior point. This is seen below.

For the first endpoint when $\frac{D}{V} = 0$, we have $\beta_D = 0$.

For the interior point when $\frac{D}{V} = 0.5$, we have (from Table 2)
 $\beta_D = 0.2977$.

For the second endpoint when $\frac{D}{V} \rightarrow 1.0$, we have $\beta_D \rightarrow \beta_U = 0.7377$.

Concerning the latter, we see that as a firm approaches an all-debt situation with all shares retired, it must legally revert to an all-equity firm and the unlevered beta of 0.7377.

Using linear interpolation, we can estimate the β_D 's for each book $\frac{D}{V}$ choice from 0.1 to 0.9. We can then use the CAPM to get each corresponding R_D . We show the β_D and R_D values below.

Debt Betas & Costs of Debt for Book $\frac{D}{V}$ Choices from 0.1 to 0.9

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
β_D	0.058	0.117	0.175	0.233	0.292	0.381	0.470	0.559	0.649
R_D	6.01%	6.36%	6.71%	7.06%	7.41%	7.94%	8.48%	9.02%	9.56%

For β_L 's, we have only one endpoint ($\frac{D}{V} = 0$, $\beta_L = \beta_U = 0.7377$) and an interior point ($\frac{D}{V} = 0.5$, $\beta_L = 1.05$), ruling out linear interpolation for all choices.

Given β_D 's and β_U , we use Hamada (1972) to estimate β_L 's. Estimates using this equation break down as we approach high debt levels, however, because the β_L 's values generate the same small linear increase of 0.06245 for each successive book $\frac{D}{V}$ choice from 0.6 to 0.9. Because its linear relationship treats the latter incremental increases in debt as equally risky, the Hamada equation clearly cannot accommodate any expected rapidly increasing levels of financial risk as we reach extreme debt levels. Thus, for the last two choices, our application uses β_L 's of 1.42 and 2.00 instead of the linear values given by Hamada (1.23735 and 1.29980). β_L 's of 1.42 and 2.00 represent an increase of about 20% and 40% over respective previous β_L 's, and are deemed a more acceptable attempt to capture the increasing levels of financial risk. The decision to start increasing β_L 's for the eighth and ninth debt-level choice is consistent with the target leverage ratio that is set for AGL Co. so as to avoid undue financial distress. It remains for future researchers to try to find a formula for β_L supporting the observation that firms do not strive for extremely high levels of debt.

Below we show the β_L 's and R_L 's for the book $\frac{D}{V}$ choices from 0.1 to 0.9 with the CAPM used to compute R_L 's.

Equity Betas & Costs of Equity for Book $\frac{D}{V}$ Choices from 0.1 to 0.9

	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
β_L	0.800	0.863	0.925	0.988	1.050	1.112	1.174	1.420	2.000
R_L	10.47%	10.84%	11.21%	11.59%	11.96%	12.34%	12.71%	14.18%	17.66%

Data Related to Unlevered Situation and Market Target $\frac{D}{E}$ for Application

Given R_L 's and R_D 's for the nine debt/equity choices, we can get E_U and E_L by estimating values for C , γ_L^{Target} , P_U , I , δ_g , and γ_U . We get the perpetual before-tax cash flow for unlevered equity owners (C) from <http://www.stateone.com.au/documents/research/agl.pdf>, which gives earning before interest and taxes plus depreciation/amortization (EBITDA). For the years from 2003 to 2006, the average EBITDA suggests that $C = \$905.2$ million.

Next, we estimate the growth rate for an unlevered situation (γ_U). We begin by trying to determine current dollar growth in after-tax cash flows (δ_g) as given by (9) where $\delta_g = (1-T_{PE})(1-T_C)(C-I)(\gamma_L)$ with γ_L defined as the levered growth rate when the firm achieves its targeted amount of interest paid (e.g., $\gamma_L = \gamma_L^{Target}$). Noting that KPMG indicates that AGL Co.'s target $\frac{D}{E}$ ratio is 1.5 (which we take as the market ratio since KPMG uses the word "market" when describing the weights from this choice), we proceed to estimate the future growth rate for after-tax cash flows given this target. We settle on $\gamma_L^{Target} = 5.4\%$. This estimate is consistent with data suggested by State One and AGL Co. reports. For example, State One (December 2004) estimates that the net profit after tax will change from \$320.8 million in June 2003 to \$370.4 million in June 2006. The implied growth rate in after-tax cash flows = $\gamma_L = \left(\frac{370.4}{320.8}\right)^{\frac{1}{3}} - 1 \approx 5.5\%$. A similar value is found ($\gamma_L \approx 5.3\%$) if we take the average of the growth in dividends from June 2003 to June 2006 and the standard formula where the growth rate equals retention rate times required rate of return.

To proceed with estimating δ_g , we next need to compute the interest paid (I) when $\gamma_L = 5.4\%$. As will be demonstrated later in Table 5, it is for the seventh debt-level choice, when 70% of unlevered shares are retired (book choice of $\frac{D}{V} = 0.7$) that we attain the market target $\frac{D}{E} \approx 1.5$ ($\frac{D}{E} \approx 2.33$ from a share standpoint). As we will show later, $I = \$493,093,903$ for this choice. Using equation (9), Table 3 shows that $\delta_g = \$14,834,558$. This estimate is reasonably close to State One's average increase in NPAT for 2003-2006 of about \$15.7 million, if adjusted for personal taxes. Given this value, we can now use (10) to solve for γ_U where we obtain $\gamma_U \approx 2.46\%$. Given γ_U , we can proceed to compute the unlevered equity value (E_U). Table 3 shows that $E_U = \$7,906,124,561$. On a before-personal-tax basis, $E_U = \$8,302,136,471$. Dividing this by the number of unlevered shares (N_U), we compute the stock price for the unlevered situation (P_U) and get about \$9.10, as shown in Table 3.

Table 3
**DATA RELATED TO UNLEVERED SITUATION
 AND TARGET MARKET $\frac{D}{E}$**

N_L = Number of Shares when Levered with Current Book

$$\frac{D}{E} \text{ is } 1.0 = \mathbf{456,000,000}$$

N_U = Number of Shares when Unlevered =

$$\frac{N_L}{\text{Current Book } \frac{E}{E}} = \frac{456,000,000}{0.5} = \mathbf{912,000,000}$$

C = Estimated by Average EBITDA (2003-2006) = **\$905,200,000**

Target Market $\frac{D}{E}$ = Suggested Market Target Debt/Equity Choice = **1.5**

$\gamma_L = \gamma_L^{\text{Target}}$ = Estimated Growth Rate in After-Tax Cash Flows for
 Target Market $\frac{D}{E}$ = **5.4%**

I = Interest Paid for Targeted Levered Situation = **\$493,093,903**

$$\delta_g = (1 - T_{PE})(1 - T_C)(C - I)\gamma_L^{\text{Target}} = (1 - 0.0477)(1 - 0.3)(\$905,200,000 - \$493,093,903)0.054 = \mathbf{\$14,834,558}$$

$$\gamma_U = \frac{\delta_g}{(1 - T_{PE})(1 - T_C)C} = \frac{\$14,834,558.46}{(1 - 0.0477)(1 - 0.3)\$905,200,000}$$

$$= 2.458432\% \approx \mathbf{2.46\%}$$

$$E_U \text{ (After Personal Taxes)} = \frac{(1 - T_{PE})(1 - T_C)C}{R_U - \gamma_U} = \frac{(1 - 0.0477)(1 - 0.3)\$905,200,000}{0.100907 - 0.02458432}$$

$$= \mathbf{\$7,906,124,561}$$

$$E_U \text{ (Before Personal Taxes)} = \frac{\$7,906,124,561}{(1 - T_{PE})} = \frac{\$7,906,124,561}{(1 - 0.0477)}$$

$$= \mathbf{\$8,302,136,471}$$

$$P_U \text{ (Per Share Unlevered Market Price)} = \frac{E_U}{N_U} = \frac{\$8,302,136,471}{912,000,000}$$

$$= \mathbf{\$9.10322}$$

Company Data Related to Market Debt/Equity Target for Application

Given δ_g and P_U , we can now compute the interest paid (I) for each debt-level choice given that $I = R_D(D)$ where as described earlier $D = P_U(S_R)$. Because we have unlevered the firm where $N_U = 912,000,000$ and $P_U = \$9.10322$, we can view each debt-level choice for our unlevered firm as $D = P_U(S_R)$ where S_R is the number of shares being retired for that choice. Since $S_R = (\frac{D}{V})(N_U)$, we have $D = P_U(\frac{D}{V})(N_U)$. Inserting this expression for D into $I = R_D(D)$, we get $I = R_D(P_U)(\frac{D}{V})(N_U)$. Although the details are omitted, we can note that from this relationship, we solve for the earlier value for $I = \$493,093,903$ for the seventh debt-level choice. This is because we can create a quadratic equation where I is a function of $T_C, T_{PE}, C, R_D, R_U, \gamma_L^{Target}, N_U,$ and S_R , all of which are known.

With our firm unlevered, we can now illustrate the computation I for any debt-level choice from this unlevered condition, which is the condition assumed to apply when using (12). Consider the first choice where book $\frac{D}{V} = 0.1$ and $R_D = 6.0142\%$. We have: $I = R_D (P_U)(\frac{D}{V})(N_U) = 0.06014214(\$9.10322)(0.1)(912,000,000) = \$49,930,825$. Similarly, we can compute I for all choices. For the seventh choice, we can verify that $I = \$493,093,903$ for book $\frac{D}{V} = 0.7$. We have: $I = R_D (P_U)(\frac{D}{V})(N_U) = 0.084848(\$9.10322)(0.7)(912,000,000) = \$493,093,903$. As seen in Table 4, this interest payment corresponds very closely to the target market debt/equity choice of 1.5.

After computing I for each debt-level choice, we can use (11) and compute γ_L for each choice. For example, for the first choice, we get

$$\gamma_L = \frac{\delta_g}{(1 - T_{PE})(1 - T_C)(C - I)} = \frac{\$14,834,558.46}{(1 - 0.0477)(1 - 0.3)(\$905,200,000 - \$49,930,825)} = 2.601956\%$$

We obtain the following γ_L values for the nine choices: 2.602%, 2.783%, 3.016%, 3.318%, 3.725%, 4.370%, 5.400%, 7.270%, and 11.637%. The growth rates begin increasing much more rapidly as $I \rightarrow C$, causing the first and second components of (12) to flip signs.

Given γ_L for each debt-level choice, we can use (12) or (4) to get G_L for each corresponding choice. We do this in Table 4 for the seventh debt-level choice and show that $G_L = \$479,507,782$ on an after-personal-tax basis. The table also shows that this choice corresponds with a target market $\frac{D}{E} \approx 1.5$ when computed on that basis.

Table 4
**COMPANY DATA RELATED TO
 MARKET DEBT/EQUITY TARGET**

(Values for Market Debt/Equity Choice = 1.5
 which is Book Debt-Firm Value Choice = 0.7)

$$R = \text{Unlevered Shares Exchanged} = \frac{D}{V} N_U = 0.7(912,000,000) = \mathbf{638,400,000 \text{ shares}}$$

$$\text{Book } \frac{D}{V} = \text{Book Value Leverage Choice Given by Shares Retired} = \frac{R}{N_U} = \frac{638,400,000}{912,000,000} = \mathbf{0.7}$$

$$D \text{ (Before Personal Tax)} = \text{Amount of } E_U \text{ Retired} = P_U(R) = \$9.10322(638,400,000) = \mathbf{\$5,811,495,529}$$

$$I \text{ (Interest Paid)} = R_D D = 0.084848(\$5,811,495,529) = \mathbf{\$493,093,903}$$

$$E_L = \frac{(1-T_{PE})(1-T_C)(C-I)}{R_L - \gamma_L} = \frac{(1-0.0477)(1-0.3)(\$905,200,000 - \$493,093,903)}{0.12713626 - 0.054} = \mathbf{\$3,756,195,004}$$

$$D \text{ (After Personal Tax)} = \frac{(1-T_{PD})I}{R_D} = \frac{(1-0.2034)(\$493,093,903)}{0.08484802} = \mathbf{\$4,629,437,339}$$

$$\text{Target Market } \frac{D}{E} \text{ (On Before Personal Tax Basis)} = \frac{\$4,629,437,339 / (1-0.2034)}{\$3,756,195,004 / (1-0.0477)} = \mathbf{1.473 \approx 1.5}$$

$$G_L \text{ using (12)} = \left[1 - \frac{uR_D}{R_L - \gamma_L} \right] D + \left[\frac{R_U - \gamma_U}{R_L - \gamma_L} - 1 \right] E_U = \$135,068,376 + \$344,439,406 = \mathbf{\$479,507,782}$$

$$\text{1}^{\text{st}} \text{ Component} = \left[1 - \frac{uR_D}{R_L - \gamma_L} \right] D = \left[1 - \frac{(0.836819)(0.08484802)}{0.12713626 - 0.054} \right] \$4,629,437,339 = \mathbf{\$135,068,376}$$

$$\text{2}^{\text{nd}} \text{ Component} = \left[\frac{R_U - \gamma_U}{R_L - \gamma_L} - 1 \right] E_U = \left[\frac{0.10090685 - 0.024584323}{0.12713626 - 0.054} - 1 \right] \$7,906,124,561 = \mathbf{\$344,439,406}$$

$$V_L \text{ (After Personal Tax)} = E_L + D = \$3,756,195,004 + \$4,629,437,339 = \mathbf{\$8,385,632,343}$$

$$G_L \text{ using (4)} = V_L - V_U = \$8,385,632,343 - \$7,906,124,561 = \mathbf{\$479,507,782}$$

RESULTS FOR ALL NINE DEBT-LEVEL CHOICES

Conditions of our application are formally stated below so as to include values for key variables.

- (a) Debt is risky with $R_D > R_F = 5.6642\%$, and R_D is positively related to debt.
- (b) Tax rates are relevant with $T_{PE} = 4.77\%$, $T_{PD} = 20.34\%$, and $T_C = 30\%$.
- (c) Uncertain perpetual before-tax cash flows to unlevered equity:
 $C = \$905,200,000$.
- (d) $\gamma_L^{\text{Target}} = 5.4\%$ is the rate when target market $\frac{D}{E}$ approximated:
 with current dollar growth (δ_g) = $\$14,834,558$.

(e) An unlevered firm with risky equity faces a finite set of perpetual debt-for-equity choices with $R_L > R_U = 10.0907\%$.

Table 5 reports results for ten key variables when financial managers face the nine debt choices. Panel A reports after-personal-tax results (where applicable), while Panel B focuses on before-personal-tax results. Again, the before-personal-tax results are important because they can minimize inaccuracies in the after-personal-tax results that might result if personal tax rates are closer in value than what we use.

Each panel has two bold-faced rows. The first is for the current situation where $\text{book} \frac{D}{V} = 0.5$, while the second is for $\text{book} \frac{D}{V} = 0.7$, which is where G_L is maximized for both panels. As seen in the last column of Panel B, it is also the row nearest the market target $\frac{D}{E}$ of 1.5. For this row, we get $G_L = \$1.4537$ billion on a before-personal-tax basis (which is what the market sees). For this row, dividing E_L by the number of outstanding shares (N_L), we get a share price $\approx \$14.42$. For example, with $\frac{D}{V} = 0.7$ (or $\frac{E}{V} = 0.3$), we have $N_L = \frac{E}{V}(N_U) = 0.3(912,000,000) = 273,600,000$ shares giving the market share price as:

$$P_{\text{Before Personal Tax}} = \frac{E_L}{N_L} = \frac{\$3,944,340,023}{273,600,000 \text{ shares}} = \$14.4164 \text{ per share.}$$

This is less than the average market price at the time of this writing (\$13.83 in January 2005). Thus, \$14.42 can be considered a prediction of the future price (absent effects beyond those stemming from the increased debt) if the market target is achieved.

The prediction of the stock price at the time we begin estimating values for our variables (February 2004) can be computed for the first bold-faced row, where $N_L = 456,000,000$ shares. We have:

$$P_{\text{Before Personal Tax}} = \frac{E_L}{N_L} = \frac{\$5,075,687,792}{456,000,000 \text{ shares}} = \$11.1309 \text{ per share.}$$

This price is consistent with both the average price of \$11.06 for AGL Co. for February 2004 and for the average price of \$11.29 from the 2003 annual report (7/1/03 to 6/30/04).

G_L on a before-personal-tax basis in Panel B is greater than the after-personal-tax basis in Panel A; personal taxes are subtracted from G_L in Panel A. The

Table 5
**APPLICATION OF GAIN-TO-LEVERAGE FORMULATION
 FOR A REAL WORLD FIRM ASSUMING RISKY DEBT,
 PERSONAL TAXES, AND CONSTANT GROWTH RATE**

Panel A. On After-Personal-Tax Basis with Currency in Billions of Australian Dollars

Book $\frac{D}{V}$	R_D	R_L	1 st *	2 nd *	G_L	D	E_L	V_L	Market $\frac{D}{E}$
0.1	0.0601	0.1047	0.2381	-0.2324	0.0056	0.661	7.250	7.912	0.091
0.2	0.0636	0.1084	0.4484	-0.4165	0.0318	1.323	6.615	7.938	0.200
0.3	0.0671	0.1121	0.6245	-0.5467	0.0777	1.984	6.000	7.984	0.331
0.4	0.0706	0.1159	0.7547	-0.6106	0.1440	2.645	5.405	8.050	0.489
0.5	0.0741	0.1196	0.8167	-0.5825	0.2341	3.307	4.834	8.140	0.684
0.6	0.0795	0.1234	0.6555	-0.3338	0.3217	3.968	4.260	8.228	0.932
0.7	0.0848	0.1271	0.1351	0.3444	0.4795	4.629	3.756	8.386	1.232
0.8	0.0902	0.1418	-0.4850	0.8208	0.3358	5.291	2.951	8.246	1.793
0.9	0.0956	0.1766	-1.9447	2.1058	0.1611	5.952	2.115	8.067	2.814

Panel B. On Before-Personal-Tax Basis with Currency in Billions of Australian Dollars

Book $\frac{D}{V}$	R_D	R_L	1 st *	2 nd *	G_L	D	E_L	V_L	Market $\frac{D}{E}$
0.1	0.0601	0.1047	0.3857	-0.2441	0.1417	0.830	7.614	8.444	0.109
0.2	0.0636	0.1084	0.7422	-0.4374	0.3049	1.660	6.947	8.607	0.239
0.3	0.0671	0.1121	1.0630	-0.5741	0.4888	2.491	6.300	8.791	0.395
0.4	0.0706	0.1159	1.3354	-0.6412	0.6942	3.321	5.676	8.996	0.585
0.5	0.0741	0.1196	1.5363	-0.6117	0.9246	4.151	5.076	9.227	0.818
0.6	0.0795	0.1234	1.5028	-0.3505	\$1.152	4.981	4.473	9.454	1.114
0.7	0.0848	0.1271	1.0920	0.36170	1.4537	5.811	3.944	9.756	1.473
0.8	0.0902	0.1418	0.5767	0.8619	1.4386	6.642	3.099	9.741	2.143
0.9	0.0956	0.1766	-0.8205	2.2113	1.3908	7.472	2.221	9.693	3.364

*Component

difference is sizeable as seen when comparing the maximum G_L value of \$0.4795 billion in Panel A with the corresponding maximum value of \$1.4537 billion in Panel B. In looking at Panel B, we can also point out that, due to the increase in equity that accrues from G_L , the book $\frac{D}{E}$ of 2.333 (from a share standpoint) is reduced to a market $\frac{D}{E}$ of 1.473. This is near the target of 1.5.

While the maximum G_L is achieved in both panels with the seventh debt-level choice, it does not necessarily follow that the panels will agree. It may be even more likely that the after-personal-tax G_L can be achieved for a different debt-level choice than the before-personal G_L . If decisions are actually made on what is best for investors, the firm might choose the debt level where G_L is maximized on an after-personal-tax basis. However, absent perfect knowledge about personal tax rates and given our restriction to nine debt-level choices (where this restriction tends to underestimate the maximum G_L and the optimal $\frac{D}{E}$), it appears that the firm's maximum G_L on a before-personal-tax basis will occur within a $\frac{D}{E}$ range of about 1.4–2.0. This range is consistent with values reported by <http://www.bizstats.com/currentratios.htm>. For example, BizStats give a debt-to-equity ratio of 1.79 for U.S. gas production and distribution utilities.

Although both G_L components experience change in signs as more debt is added, this is not necessarily always the case. Absent a large value for δ_g that leads to large values for γ_L for high debt levels, we would expect the first component always to be positive and the second always negative.

LIMITATIONS OF APPLICATION

Four limitations face our application, as is usual in all models that rely on accurate estimates of values for variables. First, personal tax rates were not directly known. This limitation was ameliorated through use of an effective tax rate and analysis of before-personal-tax values. Second, most firms are levered. Thus, to apply our G_L formulation, we have to unlever our firm in an attempt to estimate the number of shares outstanding (N_U) if it had no debt. From here we determine book debt-to-equity choices. Given these choices and the unlevered price (P_U), we can determine how much debt will be issued for each choice. The application depends on accurate estimation of N_U and P_U , which may not always be the case.

Third, we encountered a roadblock when computing betas. For example, we had to interpolate from endpoints and a midpoint to get reasonable β_D 's for each debt-level choice. From there we proceeded to get β_U and then obtain β_L 's for

the nine debt-level choices, using standard formulas. However, unless adjusted upward, the β_L computations for higher debt levels would suggest that firms aim for extremely high leverage targets, which we do not find in the real world. This limitation (in getting sufficient estimates for at least some betas) caused us to make intuitive ad hoc assignments for levered equity betas at higher levels of debt. Future research needs to explore other ways of estimating betas and costs of capital, as suggested by researchers who offer alternatives methods (Fama and French, 1997; Lally, 2004).

Finally, the application had to estimate a current dollar level of growth (δ_g), based on a chosen growth rate at the target debt/equity choice. Using Excel, we were able to solve for δ_g and the interest paid (I) at the market target debt/equity choice, based on values for other variables.

SUMMARY STATEMENTS

This paper derives G_L formulations based on definitions for unlevered and levered firm values. Such formulations include discount rates for unlevered equity, levered equity, and debt. The inclusion of these rates makes it possible for G_L values eventually to decrease with increasing debt levels. Three G_L formulations for an unlevered situation are offered to aid managers (making the debt/equity choice) and educators (explaining the ramifications of the debt/equity choice).

The application used market and company data for AGL Co. to show how managers can use the G_L formulation with personal taxes and constant growth to understand how the debt/equity choice can influence firm value. While this paper's model (like any model) relies on accurate estimates of values for variables, the model's optimal G_L was able to conform to the recommended market target $\frac{D}{E}$ of 1.5 by assuming escalating values for levered equity's beta at higher levels of debt.

This study is important for several reasons. First, prior research offers formulations that are difficult for practitioners in that they do not fully address the role of discount rates, and tend to be unrealistic by including variables that are virtually immeasurable (e.g., direct and indirect bankruptcy costs and agency costs). As such, financial managers are hard-pressed to find them useful. To the extent changes in discount rates are easier to estimate, this paper's G_L formulations offer more practical potential.

Second, the practical application in this paper suggests a wealth-maximizing debt/equity choice where the actual choice can depend on taxes and growth rates, in addition to changes in discount rates. The application produces results that strengthen general conclusions of prior empirical and theoretical research, that increasing levels of debt can cause G_L to begin falling. The increase in G_L , followed by a decrease, can be explained through the interaction of many factors (e.g., taxes, bankruptcy costs, and agency effects) that together determine a firm's optimal debt/equity choice.

In conclusion, the G_L formulations found in this paper reaffirm, synthesize, and extend prior G_L formulations, while opening up a fresh vista from which to view the debt/equity choice faced by managers. This vista offers a practical vantage point in that capital structure decision-making can be based on formulations that include variables heretofore not fully utilized.

Appendix A

G_L FOR UNLEVERED FIRM WITH NO PERSONAL TAXES

Proof of equation (8): For the situation of an unlevered firm when only corporate taxes are considered, substituting (7) into (4) and noting $V_U = E_U$ gives

$$G_L = \frac{(1-T_C)(C-I)}{R_L} + \frac{I}{R_D} - E_U.$$

Multiplying out the first component, noting $\frac{I}{R_D} = D$, and rearranging:

$$G_L = D - \frac{(1-T_C)I}{R_L} - E_U + \frac{(1-T_C)C}{R_L}.$$

Multiplying the second component by $\frac{R_D}{R_D}$ gives

$$-(1-T_C)\left(\frac{R_D}{R_L}\right)\frac{I}{R_D}, \text{ which is } -(1-T_C)\left(\frac{R_D}{R_L}\right)D, \text{ and factoring out } D:$$

$$G_L = \left[1 - (1-T_C)\left(\frac{R_D}{R_L}\right)\right]D - E_U + \frac{(1-T_C)C}{R_L}.$$

Multiplying the last component by $\frac{R_U}{R_U}$ gives $\left(\frac{R_U}{R_L}\right)\frac{(1-T_C)C}{R_U}$, which is

$$\left(\frac{R_U}{R_L}\right)E_U, \text{ and factoring out } E_U.$$

$$G_L = \left[1 - (1-T_C)\left(\frac{R_D}{R_L}\right)\right]D - \left[1 - \frac{R_U}{R_L}\right]E_U.$$

Setting $\alpha = (1-T_C)$ and noting $-\left[1 - \frac{R_U}{R_L}\right]E_U = +\left[\frac{R_U}{R_L} - 1\right]E_U$ gives

$$G_L = \left[1 - \frac{\alpha R_D}{R_L}\right]D + \left[\frac{R_U}{R_L} - 1\right]E_U.$$

Q.E.D.

(8)

Appendix B
 **G_L FOR UNLEVERED FIRM WITH
PERSONAL TAXES AND CONSTANT GROWTH**

Proof of equation (12): Assume constant growth such that $\gamma_L > \gamma_U > 0$ and

personal taxes such that $V_U = E_U = \frac{(1 - T_{PE})(1 - T_C)C}{R_U - \gamma_U}$

and $E_L = \frac{(1 - T_{PE})(1 - T_C)(C - I)}{R_L - \gamma_L}$.

Substituting $V_L = E_L + D = \frac{(1 - T_{PE})(1 - T_C)(C - I)}{R_L - \gamma_L} + D$ into (4) and

noting $V_U = E_U$ gives: $G_L = \frac{(1 - T_{PE})(1 - T_C)(C - I)}{R_L - \gamma_L} + D - E_U$.

Multiplying out the first component and rearranging:

$$G_L = D - \frac{(1 - T_{PE})(1 - T_C)I}{R_L - \gamma_L} - E_U + \frac{(1 - T_{PE})(1 - T_C)C}{R_L - \gamma_L}.$$

Multiplying the second component by

$$\frac{(1 - T_{PD})R_D}{(1 - T_{PD})R_D} \text{ gives } - \left(\frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})} \right) \left(\frac{R_D}{R_L - \gamma_L} \right) \frac{(1 - T_{PD})I}{R_D},$$

which is $-\left(\frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})} \right) \left(\frac{R_D}{R_L - \gamma_L} \right) D$, and factoring out D :

$$G_L = \left[1 - \left(\frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})} \right) \left(\frac{R_D}{R_L - \gamma_L} \right) \right] D - E_U + \frac{(1 - T_{PE})(1 - T_C)C}{R_L - \gamma_L}.$$

Multiplying the last component by $\frac{R_U - \gamma_U}{R_U - \gamma_U} = 1$ gives

$$\left(\frac{R_U - \gamma_U}{R_L - \gamma_L} \right) \frac{(1 - T_{PE})(1 - T_C)C}{R_U - \gamma_U}, \text{ which is } \left(\frac{R_U - \gamma_U}{R_L - \gamma_L} \right) E_U, \text{ and factoring out } E_U:$$

$$G_L = \left[1 - \left(\frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})} \right) \left(\frac{R_D}{R_L - \gamma_L} \right) \right] D - \left[1 - \frac{R_U - \gamma_U}{R_L - \gamma_L} \right] E_U.$$

Setting $\alpha = \left(\frac{(1 - T_{PE})(1 - T_C)}{(1 - T_{PD})} \right)$

and noting $-\left[1 - \frac{R_U - \gamma_U}{R_L - \gamma_L} \right] E_U = + \left[\frac{R_U - \gamma_U}{R_L - \gamma_L} - 1 \right] E_U$ and gives

$$G_L = \left[1 - \frac{\alpha R_D}{R_L - \gamma_L} \right] D + \left[\frac{R_U - \gamma_U}{R_L - \gamma_L} - 1 \right] E_U.$$

Q.E.D.

(12)

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Understanding Organizational Culture: A Key to Professional Success

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INTRODUCTION

More than two thousand years ago, an Athenian demonstrated the importance of a topic that continues to be salient for employees and corporations in the 21st century. The topic was organizational culture; the Athenian was Pericles. The occasion was a funeral oration in which Pericles reminded the Athenians of their shared values in an attempt to unify them in the midst of a war with Sparta. Pericles understood the power that resides in communicating about culture (Clemens 1986).

Corporate culture continues to be important in business operations. “Smart executives...realize that it affects the bottom line” (Clemens 1986, p. 164). Another point often made is that “corporate culture can become a unique differentiator or, in fact, a strategic advantage” (Stinnett 2001, p. 27). Culture has also been correlated with corporate leadership; recent research “links the effectiveness of individual leadership to a corporate culture that supports longterm success. Researchers have discovered that lower ratings of organizational culture were associated with a greater likelihood that the leader would become derailed” (Schettler 2003, p. 19).

Organizational culture deserves our attention. This paper describes lessons learned from recent business stories of culture change. It explores ways that new hires can assess the culture of a prospective employer and how experienced employees can develop the ability to read their organization's culture and adapt to changing expectations. By attending to culture, business school graduates will improve their chances for job security and professional success.

DEFINING ORGANIZATIONAL CULTURE

The foundational features of organizational culture include “an organization's mission and goals, values and beliefs, procedures and rituals, scope and space, roles and relationships, methods of reward and recognition, language and communication style, leadership design and approach, and identity and image” (C.H. Dodd 2004, pp. 24–25). To identify these qualities, Dodd recommends analyzing the stories, metaphors, and behaviors of the organization's members and leaders.

This recent definition reflects previous discussions about organizational culture. Deal and Kennedy's early book, *Corporate Cultures: The Rites and Rituals of Corporate Life* (1982), included the oft-cited, informal definition of culture from “Marvin Bower, for years managing director of McKinsey & Company...he described the informal cultural elements of a business as ‘the way we do things around here’” (p. 4). Peters and Waterman (1982) also referred to shared “values and practices” when they discussed successful companies and their organizational cultures (p. 26).

HOW CULTURE AFFECTS ORGANIZATIONAL PERFORMANCE

Organizational culture is often cited as an important factor in a company's performance. This is particularly true when things go wrong. For example, in 1991, a commuter plane crashed in Texas and killed 14 people. The cause of the accident was attributed, at least in part, to a “culture that would encourage sloppy maintenance” (“Board says” 1992).

A more recent example is the grisly crash of a Staten Island ferry that killed 11 and injured dozens. For months after the October 2003 accident, reports emerged about mismanagement, inattention to safety, on-duty crew card games, and even retaliatory beatings. “It's a classic case of a culture in which attentiveness to the small details that make things safe was lost,” said John Kaehny, executive director of Transportation Alternatives, a watchdog group (Weissenstein 2004, p. A2).

Recent, highly publicized business debacles are said to have reflected “failed corporate cultures” (Want 2003, p. 14). For example, a culture of “pushing limits” (Raghavan, Kranhold, and Barrioneuvo 2002, p. A1) created an environment at Enron that eventually resulted in a collapsed business. Want (2003) cites other debacles including “Arthur Andersen... Worldcom, Tyco, Global Crossing, Providian Financial” as well as examples in the nonprofit and governmental sectors of the economy. No company is exempt from the chaos or negative effects of a “neglected or underperforming” culture (p. 14).

One of the most tragic examples of a failed organizational culture involves the U.S. space program. After analyzing the Columbia space shuttle’s break-up during re-entry in February 2003 over Waco, Texas, the Columbia Accident Investigation Board chronicled the factors that contributed to the tragedy. Because NASA’s culture made safety a low priority, the board urged changes in NASA’s culture, which insisted on sticking to deadlines, adhering to schedules, and resisting criticism from external sources (CAIB 2004). Ironically, these descriptions are reminiscent of the discussions about NASA’s culture after the Challenger exploded upon take-off in the late 1980s (Tompkins 2005).

Conversely, a positive performance is often said to reflect strong leadership and a productive corporate culture. Peters and Waterman (1982) observed, “The excellent companies seem to have developed cultures that have incorporated the values and practices of the great leaders and thus those shared values can be seen to survive for decades after the passing of the original guru” (p. 26).

Currently, three companies provide examples of the power of culture. Southwest Airlines, “the only profitable airline among the nine U.S. majors, owes much of its success to an extraordinary culture that binds and motivates workers” (Trottman 2003, p. B1). Another example is Microsoft: its “famous work-hard-and-get-rich-quick culture...has minted thousands of millionaires” (Guth 2003, p. B1). Finally, the Phoenix Suns basketball team is currently enjoying a resurgence of energy and pride because of the culture created by its owner Robert Sarver. “‘He’s young and fun and enjoying the game of basketball,’ guard Casey Jacobsen says of the banker and real estate mogul. ‘We’re made for each other’” (Boeck 2005, p. C1).

These positive and negative examples are dramatic, life-and-death stories of organizational culture’s consequences, but also of how it affects the daily behaviors and careers of workers.

HOW CULTURE AFFECTS INDIVIDUAL CAREERS

A young auditor who worked for Arthur Andersen in the 1980s learned how a clash of cultures can affect a career. After the Berlin Wall came down, the auditor and some friends sold chunks of the famed landmark. When officials at Andersen learned of his entrepreneurial efforts, the auditor was given the choice of resigning from the firm or discontinuing his business. The auditor chose to resign and admitted that he was probably “too imaginative” for the staid culture of Andersen (Berton 1989, p. B1).

Similarly, entertainer Janet Jackson’s behavior during the 2004 Super Bowl half-time show had serious, negative consequences. Her behavior was not aligned with the culture of the organization sponsoring the half-time show. During her performance, Jackson bared one of her breasts. This behavior was described as conflicting with the family-oriented culture the National Football League was trying to promote (M. Dodd 2004, p. C1). When Jackson would not apologize for the incident, CBS rescinded her invitation to appear at the Grammy Awards show (Soriano 2004, p. D2). In addition, Jackson’s behavior so angered singer Lena Horne—whom Jackson was supposed to portray in a television movie—that her participation in the film project was cancelled (Marsteller 2004).

Organizational culture also shapes communication behaviors. For example, culture determines what topics are talked about or written about, whom employees talk to, and what channels of communication (conversations, memos, e-mails) are used. An MBA student told one example of how culture may influence channel choice. His boss, an accounting manager, routinely communicated by silently placing a Post-It note on the student’s computer monitor, even when the student was sitting right there. In this case, the departmental culture supported the manager’s choice to communicate over a written channel rather than use a face-to-face conversation to discuss an issue.

Culture can also influence nonverbal behavior—what employees wear or carry, how close or far apart they stay when interacting, or how quickly they walk down the corridor. In some companies, managers are expected to work at home on the weekends; consequently, their culture dictates that they carry conspicuously bulging briefcases when they leave on Friday afternoons. Conversely, in other companies, dragging work home may be considered a sign of inefficiency; so managers loudly share their plans for golfing, entertaining, or sailing all weekend.

The same nonverbal symbol may be acceptable in one culture and unacceptable in another. Sam Walton, founder of Wal-Mart, was well known for his folksy style. Perhaps symbolically, his favorite vehicle was an old pickup truck. However, in at least one Midwestern company, parking spots are assigned according to the type of vehicle—employees who drive old pickup trucks (or similarly modest vehicles) are forbidden to park close to the building, for fear that customers or other visitors may get the impression that the company is not financially sound.

The “take away” point is that all companies have their own cultures, and if an employee is not “in sync” with the culture, people notice. “Companies have unique personalities, or cultures. Someone who succeeds in one won’t necessarily do well at another” (Lancaster 1998, p. B1). The challenge is to assess a company’s culture accurately.

ASSESSING ORGANIZATIONAL CULTURE

Job candidates, as well as newly-hired employees, can benefit from accurately assessing organizational cultures. This assessment may be difficult, however, because the cultural norms are not explicitly stated or included in a company manual. Talking to current and former employees may yield information about a company’s culture. In addition, the employment process presents opportunities to understand an organization’s culture.

Job candidates should ask questions that will reveal the culture of their prospective employer. A Kansas City executive search consultant (Stafford 1998, p. D1) suggests the following questions:

- What are the three most important categories on the organization’s performance evaluations?
- Can you describe someone who was recently promoted and tell me why that person was promoted?
- Who held this job previously and where is that person now?
- What do you know about the organization now that you didn’t know when you joined it?

The answers to these questions can help potential employees decide whether they will fit in well with the culture of the company. For example, if one of the

categories on the annual performance evaluation includes community service, the job candidate understands that the company values volunteer activities. If the candidate has no interest in community service, this company may not be the place for that candidate. A misfit can have serious consequences; a good fit creates satisfied employees.

Once hired, employees need to watch and listen to others to understand the culture. Observe what employees wear, how they transmit information, and how they behave. Listen to the stories told about and by company executives and about company “heroes.” Watch behavior in meetings to see whose comments are valued. Notice what behavior is rewarded. Barring ethical issues, new employees would do well to mimic behavior that is recognized and rewarded.

Assessing a company’s culture is important for an employee’s mental health and productivity; conversely, not understanding the culture of a company can be frustrating. Consider the example of Diane Davidson, who went to work for W. L. Gore & Associates after previously working in “a very traditional male-dominated business—the men’s shoe business’ . . . ‘When I arrived at Gore, I didn’t know who did what. I wondered how anything got done here. It was driving me crazy.’” Davidson was frustrated until she understood the culture of her new company. Because she was successful in adapting to the culture, she “went on to oversee the sales force and product development” for one of the company’s product lines (Deutschman 2004, p. 59).

As Davidson’s experience illustrates, success often depends upon identifying and adhering to cultural norms. “People who want to get ahead within their own companies . . . need to understand . . . what makes their culture tick” (Deal and Kennedy 1982, p. 17). Earley and Mosakowski (2004) label this ability “*cultural intelligence* or *CQ*” (p. 139). They link professional success to the ability to decipher and adapt to cultural norms: “Successful managers learn to cope with different national, corporate and vocational cultures” (p. 139). Successful employees usually behave in a manner that mirrors the corporate culture.

Only the outstanding performers in a company are allowed to deviate from cultural norms. “The chances are very slim for any single person who is out of step with the culture to make it to the very top” (Deal and Kennedy 1982, p. 17).

WHY ORGANIZATIONAL CULTURE CHANGES

Thus far we have explored the impact of culture on organizational performance

and on individual careers. We have also offered strategies for assessing an organization’s culture so that a prospective or current employee can identify and adhere to cultural norms. But culture is not static; it changes. Thus, we next examine the most common forces behind organizational culture change: changes in the larger society, organizational restructuring, and changes in leadership style. Finally, we suggest some strategies for surviving organizational culture changes.

On a macro level, contemporary organizations are experiencing major culture change. Organizational theorists such as Max Weber (1978) and Stewart Clegg (1990) tracked the evolution of organizations in diverse economic and political settings and proposed global models. Briefly, the authoritarian, bureaucratic model for U.S. businesses appears to be declining, and a new organizational form has been ascendant since the 1980s. The table below was developed by the authors to summarize some differences between so-called modern and postmodern organizations.

	Modern	Postmodern
Management Style Rules	Hierarchical Goals, values	Flexible
Boundaries Defined duties, departments	Clear Team approach	Unclear
Values Uniformity Competition	Efficiency Mission Cooperation	Effectiveness
Communication Formal Written	Top down Informal Oral, face-to-face	Participatory

The rigid organizational patterns of a modern organization that dominated manufacturing in the early 20th century, commonly known as the Industrial Age, have been shown to be less effective in the current Information Age. The postmodern model, by contrast, enables organizations to be flexible and adapt quickly to fast-paced environments and ever-changing customer demands in contemporary businesses. Rather than cling to hierarchies of power and responsibility, postmodern organizations rely on the team approach, where decentralized, cross-functional workgroups are authorized to make decisions and

implement them. Postmodern organizations are mission-driven; their values are touchstones for decisions and directions. Communication channels are open, networked, and rapid so that everyone in the organization continuously has access to information (Bergquist 1993; Lyotard 1995; Hatch 1997).

The postmodern model is being adopted by small businesses and multinationals, profit and nonprofit, public and private organizations (Lyotard 1995). Examples of major corporations that are succeeding in the transformation include General Electric, Procter & Gamble, and Edward Jones.

While some organizations gradually evolve in response to societal expectations, economic imperatives, and rapidly-changing market demands, others have change thrust upon them by corporate takeovers, mergers, and other major restructuring events. The next section presents examples of companies that underwent sudden, dramatic corporate culture change.

LEADING A CULTURE CHANGE

How an organization changes its culture from modern to postmodern is a complex, painful process. An organization's leadership team sets the objective, and the workforce is expected to make it happen. Witness IBM, which transformed itself under the stewardship of Lou Gerstner. When Gerstner was named CEO in 1992, IBM's stock was listed at \$12.72. Its mainframe revenue was off \$5 billion, and the operating units were breaking up. By 2002, Gerstner had turned IBM around. Its stock was listed at \$120.96, and net income was \$7.7 billion.

How did he do it? Gerstner describes how he transformed IBM's culture from a traditional, monolithic corporation to a post-modern, thriving team environment in his book, *Who Says Elephants Can't Dance?* He says, "I came to see...that culture isn't just one aspect of the game – it *is* the game.... In the end, my deepest culture-change goal was to induce IBMers to...think and act collaboratively, as hungry, curious self-starters" (p. 182).

One obvious way IBM's culture changed during Gerstner's tenure was the dress code (Gerstner 2002). As most business people know, the formal IBM look consisted of a navy business suit, crisp white cotton shirt, and silk tie. Gerstner abolished that standard in 1995, arguing that employees should dress according to the customers and their colleagues in the laboratories—in short, an informal business casual style.

Another culture change was IBM's jargon. In the early 1990s, employees had their own vocabulary. When they wanted to improve a presentation, they "swizzled" it. When they "boiled the ocean," they were willing to use any means to get something done. Layoffs were "Management-Initiated Separations," as in "I've been MISed." And business units were called LOBs ("lines of business"). Gerstner called for plain language in all IBM communication events. As a start, he changed LOBs to the more commonly understood "divisions."

Under Gerstner, IBM employees were asked to make major changes in their work behavior, not just changes such as those described above. Nevertheless, Gerstner argues in his book that the minor changes contributed greatly to creation of the new culture, which allowed the more fundamental changes to take root.

A second interesting example of corporate transformation is the investment banking powerhouse, Credit Suisse First Boston. The company experienced wrenching structural changes when John Mack took the helm in 2001. He restored accountability to the firm, cut executive compensation, and emphasized teamwork and unity where formerly chaos and fiefdoms had reigned. He established an ethical culture with very strong compliance and set a code of conduct. These changes exemplify the postmodern organization described above. Mack believes that culture is the key to success. "It's how people work together as a team to serve clients. That's all about culture. Culture, management, and teamwork – that's the only way you can do it" (Fandray 2004, p. 41).

It is one thing when a leader mandates culture changes, but quite another when the organization actually changes. And what happens to the employees during the transformation? Quite often, job security disappears; each position's value is reassessed in the new structure. Layoffs follow. After the first wave of layoffs, when all the incompetents and redundant personnel have been let go, the next wave probably includes all those who are a poor fit. Why? Because it is human nature—leaders surround themselves with similar people, who reflect the leadership's values and beliefs about the right way to do things. At IBM, for example, CEO Gerstner oversaw a reduction of 35,000 people during the first year (Gerstner 2002).

Frequently, corporate mergers can illustrate the importance of organizational cultures. Hewlett-Packard provides a chilling example of what happens to

employees during periods of culture change. The old “HP Way” had dominated the 1970s and 1980s. The culture was a collegial, family-style, lifetime-employment, innovative atmosphere that had given birth to the management philosophy of MBWA (managing by walking around). When HP merged with Houston-based Compaq in 2001, the culture was suddenly replaced by a new, multinational, highly competitive environment. Twenty-one thousand people lost their jobs in the first year after the merger (Pimentel 2001).

The HP/Compaq merger is not unique. “The failure to take into account corporate culture has rendered too many mergers ‘dead on arrival’ or crippled their ability to fulfill their potential” (Want 2003, p. 14).

SURVIVING A CULTURE CHANGE

Just as employees need to understand a company’s culture in order to “fit in,” so these same employees must be adaptable and able to adjust when the culture changes. As shown, when organizations go through major restructuring, the culture usually changes dramatically, and employee behavior that was once considered optimal may now be inappropriate. Failure to recognize and adapt to changing expectations may result in demotion or even job loss.

One of the authors recently observed employee resistance to culture change at a multinational biotech firm. The company is privately held, and its identity is not revealed here by request. After a merger, the company’s executive team envisioned restructuring toward the postmodern organizational model as their goal. The new model had been repeatedly described and prescribed to the workforce through the managerial hierarchy.

After 10 months, however, managers complained that their employees were “not evolving” as expected. Managers described the employees to the consultant as “lazy, comfortable, deadwood.” They were perceived as being “afraid to get in trouble, quiet, nonparticipatory, and passive in meetings.” In short, they were stuck in the 20th century model. Instead, managers said, employees were now expected to be “engaged,” to be interactive with team members, and to be more “customer focused.” When pressed to identify specific behaviors rather than attitudes that the managers were hoping for, they developed a short list of effective communication strategies for employees that are common to the postmodern organization model.

The consultant designed and delivered a training centering on those “key

communication skills”: interpersonal communication, active listening, asking questions, nonverbal communication, sharing ideas and opinions, and teamwork. The result? Most of the seminar attendees escaped the massive firings that took place less than a month later.

The HP/Compaq merger discussed earlier provides another example of how companies use training programs to help employees understand and adapt to changing cultures. Webb McKinney, a chief organizer of the integration process, summarized the old Compaq culture as “fire, ready, aim,” while he described the old HP way as “ready, ready, ready.” The key attempt, he says, was to get to “ready, aim, fire” philosophically and intellectually (Perlow and Kind 2004, p. 8).

One solution was to require all 155,000 people in the organization to attend “Fast Start,” a one- to two-day session, within 30 days of their new teams being launched. Fast Start “was an attempt to engage people around the culture” (Perlow and Kind 2004, p. 22), ease the transition, and explain the new business model of the combined companies. After attending the program, employees were expected to “shut up and eat it,” an expression used by another member of the integration team to explain that adapting to the new culture was not optional. “Shut up and eat” meant that employees did not have the luxury of “ordering off a menu.” Instead, their job was to understand and implement executive decisions that reflected the new culture (Perlow and Kind 2004, p. 9).

However, employees are not the only victims of cultural change. Again, HP provides a rich example of the power of culture. In February 2005, the HP board fired CEO Carly Fiorina, and more than one observer noted that the board’s action was based, in part, in Fiorina’s inability to understand the HP culture and adapt to it (Rivlin & Markoff, 2005). “Ever since its founding...HP has represented the triumph of a special brand of entrepreneurialism....It’s an engineering-driven culture that values teamwork and rewards ideas and inventions, not pedigrees. In truth, Fiorina was battling HP’s storied culture from the day she arrived” (Elgin, 2005, p. 31). Unlike Gerstner, Fiorina was not successful; ultimately, she did not understand the power residing in the HP culture.

CONCLUSION

The moral of the story is that Pericles' focus on organizational culture is still important; organizational culture and culture changes cannot be ignored. To survive and to be successful, employees must be able to do the following:

- Identify the prevailing cultural norms
- Fit into the prevailing organizational culture
- Be sensitive to changes in culture
- Adapt when the culture changes

Lou Gerstner, like Pericles, clearly understands the power of culture. As Gerstner points out in his book, "Management invites the workforce itself to change the culture" (2002, p. 187). Refusing the invitation is not an option.

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U.S. Commercial Banks' Real Estate Financing: An Examination of Antebellum Banking History

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INTRODUCTION

A real estate loan, known as a mortgage loan, is made on real estate collateral (urban or rural, residential or business) in which a mortgage is given to secure the payment of principal and interest. Currently, commercial banks' real estate lending is classified under two broad categories: residential real estate loans and commercial real estate loans.

Residential Real Estate Loans: Commercial banks' financing of residential real estate is geared towards the purchase or improvement of one- to four-family residential homes. Financing of such a residence is secured by collateral of the home and is a secure investment.

Commercial Real Estate Loans: A bank's lending on commercial real estate is classified into four categories:

- (a) Construction and land development
- (b) Multifamily residential
- (c) Farmland
- (d) Commercial or nonfarm nonresidential

Currently, commercial banks' investment in real estate loans is an important item in total financing. In 1990, commercial real estate lending as a percentage

of total assets was 11.78 percent; in 1995, it was 9.93 percent. In 1996, commercial banks contributed 22.7 percent of the real estate market. Out of \$4,774 billion total mortgage debt outstanding, commercial banks' combined contribution to real estate financing was \$1,087 billion. Commercial banks are, thus, important players in real estate financing. Savings and Loan Associations (S & Ls) are also important players in the real estate market. In the 1970s, S & Ls primarily and significantly invested in long-term residential loans and faced a crisis.

The natural questions that deserve research are: Is the current real estate investment behavior of the banks a revolutionary development or an outcome of the evolutionary process of prudent management? Is the current real estate investment consistent with the history of commercial banks' portfolio behavior?

Why Study this Topic?

This study is important for several reasons.

(i) The commercial banks of the United States have a long history and heritage. They have witnessed progress and prosperity for a period of over 100 years. The historical roots and the heritage of U.S. commercial banks' participation in real estate loan financing deserve an in-depth exploration. To our knowledge, there has been no study at all in this historical field. This study looks into the early economic history of various authors such as: Knox (1990), Klebaner (1990), Redlich (1968), Hammond (1957), Golembe (1978), Hubbard (1969) and Myers (1931). This study also examines the contemporary texts: Luckett (1980), Jaffee (1989), Miller and VanHouse (2004), Ritter and Silber (1996), and Mayer, Thomas and Duesenbery (1981). After searching the literature of economic history and contemporary textbooks, this study finds no evidence of such a study in this context for the period 1780–1840.

(ii) This paper is important to the context of current real estate portfolio management of commercial banks and S & Ls. The comparison of investments in real estate loans (with respect to total assets and loan portfolio) with the historical standards of the early 19th century can help commercial banks and S & Ls perform better in the future. This study, thus, provides lessons, and has implications for the management of the present commercial banks and S & Ls.

(iii) This study provides an important insight into the development of financial institutions, real estate financing and commercial banks in the United States of America, in particular during 1780–1840.

This period is selected for two reasons. First, it was the earliest period in American history when the commercial banks began to emerge, and second, it was the first banking period when commercial banks of America were required to obtain charters from the federal and state governments. During this period, there were two types of banks—federally chartered banks and state chartered banks—operating side by side.

The focus of this paper is twofold: it traces the history and development of U.S. commercial banks' real estate loans and tests whether there are differences in financing real estate loans between U.S.-chartered banks and state-chartered banks. The study of the differences in real estate financing has policy implications for the management of commercial banks and S & Ls in 2005.

HISTORICAL DEVELOPMENT

The development of the U.S. commercial banks before the end of chartered banking may be divided, according to Redlich (1968), into two distinct periods: the first phase of banking (1780–1811) and the second (1816–1840). A description of the development of real estate financing by the U.S. commercial banks during these periods follows.

First Phase of Development (1780–1811)

The history of American banking began with the establishment of the Bank of North America, the first organized bank in the United States. The bank commenced its operations on January 7, 1782. “The institution had its origin, as a banking company without a charter, in a meeting of the citizens of Philadelphia on June 17, 1781” (H. Ex Doc 3) with a subscription to the amount of £300,000. The intention was to support the army, which was on the verge of mutiny. According to Robert Morris, the superintendent of the Congress, however, the bank was intended to be the “principal pillar of American credit” that would “facilitate the management of the finances of the United States” (Elison 1901). The act of incorporation of perpetual duration granted to the bank was repealed in 1785, but the bank continued its business under the Act of Congress until 1790. The bank loaned \$400,000 to the U.S. government and \$80,000 to the state of Pennsylvania. The examination of the record of this bank shows no evidence of participation in real estate loans.

The most prominent bank of this period was the First Bank of the United States. It was the first federally chartered bank in the United States. The bank was proposed by Alexander Hamilton, the first Secretary of the Treasury, on

December 13, 1790; capital was fixed to \$10 million. Hamilton’s plan, substantially unchanged, was adopted by the Congress on February 25, 1891. The bank was a fiscal agent of the U.S. government. Its charter expired on March 4, 1811. The first phase of the antebellum banking ended with the demise of the First Bank of the United States in 1811.

The condition report of the First Bank of the United States shows two balance sheet statements, for the years 1809 and 1811. This report, presented in Table 1, reveals the following:

- (i) The commercial banks of the United States were engaged in real estate financing as early as 1809.
- (ii) There was no clear demarcation between the categories of loans to non-consumption and non-mercantile activities. They were lumped into one category known as real estate loans, as opposed to current divisions of real estate loans outlined in the introduction of this paper. These loans were issued on real estate collateral, urban or rural, residential or business, in which a mortgage was given to secure the payment of principal and interest.

Major Resources:	January 1809 (millions of dollars)	January 1811 (millions of dollars)
Loan and discounts	15.00	14.58
United States bonds	2.23	2.75
Other United States debts57
Due from other banks	.80	.89
Real Estate	.48	.5
Notes of other banks		3.9
Specie	5.00	5.01
Total Assets	23.51	24.18
	(Controller of the Currency Report 1876)	

The record of the balance sheet shows a real estate value of \$480,000 (or .48 million) and \$500,653 (or .50 million) in 1809 and 1811 respectively. This was the first historical record of the federally chartered commercial banks' participation in real estate financing.

The real estate value of .48 million and .50 million of the bank should be interpreted very cautiously. The amount might consist of property owned by the bank—probably for its own use, because the amount is only two percent of the total assets. Or, the amount might really mean a real estate loan. Given the mercantile philosophy of the bank during the period, very short term lending, according to Redlich (1968), a two percent investment in real estate was a significant amount of loans in a risky investment.

In addition to the Bank of the United States, there was also evidence of the state-level banks' participation in loans on land mortgage. The Union Bank of Boston, in the early 1780s, was required to make one-fifth of its loans to agricultural parties ranging from \$100 to \$200. All fourteen banks that obtained charters from the state of Massachusetts during the period of 1802–1803 were required to “make one-eighth of their loans to agriculture” (Klebaner 1990). In Pennsylvania, each of the forty-one banks incorporated in 1814 was required to lend up to one-fifth of its capital in real estate to farmers, in particular, for a year at a six percent interest rate. In addition to banks, private loan offices used to make loans on mortgage security. Charleston Land and Loan Bank of Carolina provided loans in the amount £52,000 (Klebaner 1990)¹.

Thus, the examination of the historical records of the early phase of American banking (1780–1814) shows that there was an involvement in real estate loans. However, there were neither records of classification of real estate loans nor a record of large real estate loans using today's standard. Aggregate data of real estate loans at national level was almost absent.

Second Phase of Development

The second phase of the U.S. commercial banks began with the establishment of the Second Bank of the United States, in 1816. The U.S. Congress extended the charter of the bank for a limited period of twenty years, expiring on March 3, 1836. The capital was fixed at \$35,000,000, seven million of which was to be subscribed by the U.S. government; the remaining stock was to be subscribed by

¹ Dollar figure is not possible because no exchange rate was established.

individuals and corporations. The bank was a fiscal agent of the U.S. government. It should be noted, however, that the bank was not purely a private commercial bank in which the government owned one-fifth of the capital.

An examination of the balance sheet of the Second Bank of the United States shows that the bank systematically participated in real estate loans during 1822–1840. Before 1822 there was no evidence of real estate loan participation by the bank, except in 1819. This nonparticipation could be explained by the American economic situation: during the period 1815–1820, the U.S. economy had experienced “the worst stage of the monetary troubles which began with the suspension of specie payments in 1814, and continued till the general crash of 1819–‘20” (OCC Report 1876, p XI).

According to Redlich (1968), during the second phase the American banking industry “still consisted essentially of what it had in the first” (Redlich 1968, p. 43). That is, there was no fundamental change in the character and activities of the commercial banks. Banks were engaged in the business of discounting real and commercial paper, lending to state and national governments, issuing notes, and keeping deposits.

Additional Developments

During the second phase of American banking, the second quarter of the 19th century in particular, the United States underwent rapid socioeconomic changes. The United States witnessed rapid population growth, from 14.37 million in 1834 to 23.18 million in 1850, a growth rate of 61.3 percent (U.S. 7th Census). There was also tremendous development in river, canal and railroad transportation, particularly in the East and Midwest. The steamer service between Lake Erie and Lake Michigan was introduced.

Due to the population and transport development, the United States witnessed rapid urban development and increased sales of town plots and agricultural lands. The demand for bank loans to finance these activities increased throughout the United States. The banks of the period did not miss the opportunity to meet the increased demand for real estate loans. The records of real estate loan financing of the Second Bank of the United States show that the total real estate financing increased from \$563,480 in 1822 to \$1,228,630 in 1840.

Private and state banks were active in financing long-term real estate loans. Some banks in the North did not like such loans, because of the difficulty in receiving prompt payment at maturity. Yet in Charleston, South Carolina, the Bank of South Carolina provided extensive loans on real estate in 1839.

In the 1830s, Cincinnati banks preferred loans on real estate to trade bill loans. When the speculators who invested in the development of the city could not repay the loans, the Second Bank of the United States foreclosed on and sold almost the entire city. This happened on only two occasions (Klebaner 1990).

The property banks of Louisiana made extensive loans on urban real estate and performed commercial banking functions during 1827.

In Arkansas, the first Real Estate Bank was founded in 1836 to aid and promote agricultural interests. The hope of increasing land values in Arkansas led to the establishment of the first commercial banks in 1838.

In many states like Alabama, Mississippi, and Louisiana, the subscribers of the land and property banks gave property as a mortgage for their stock (Klebaner 1990). The statewide distribution of real estate loans by the state-chartered commercial banks in 1819 is given in Table 2, which reveals that the total real estate loans issued by the commercial banks of the United States (state banks and the Second United States bank, combined) were \$3,043,915.99 in 1819. The state-chartered commercial banks provided 74.43 percent of the total.

An extensive number of real estate loans were issued in Massachusetts, Pennsylvania, Virginia, and the District of Columbia. The total loans of these states were \$1,404,702, which is 62 percent of the total real estate loans issued by the state commercial banks. These were the states with early migrants who were eager to build up real estate.

The development of commercial banks and their real estate loans during the second phase of the U.S.-chartered banking period is presented in Table 3.

The examination of the aggregate balance sheet of the commercial banks found in the U.S. House Ex. Documents and the two tables (Table 2 and Table 3) provides the following revelations:

(i) There was no clear division of real estate loans such as residential and non-residential loans, nor was there any division such as loans for construction and

Table 2
**DISTRIBUTION OF REAL ESTATE LOANS
 IN THE UNITED STATES IN 1819**

States and Territories	Real estate loans (thousand)
Maine	\$90,780.59
New Hampshire	\$51,112.93
Massachusetts	\$421,230.37
Vermont	\$-----
Rhode Island	\$137,474.69
Connecticut	\$10,988.00
New York	\$-----
New Jersey	\$2,200.00
Pennsylvania	\$351,537.02
Delaware	\$91,684.51
Maryland	\$2,925.16
District of Columbia	\$301,970.54
Virginia	\$330,965.64
North Carolina	\$109,620.00
South Carolina	\$76,341.57
Georgia	\$11,700.00
Alabama	\$4,675.00
Mississippi	\$32,338.00
Tennessee	\$40,423.58
Kentucky	\$6,367.62
Ohio	\$92,999.70
Indiana	\$2,656.19
Illinois	\$175.00
Missouri	\$11,667.38
<hr/>	
Total of the state banks	\$2,262,923.40
Total of the U.S. banks	\$780,992.59
<hr/>	
Aggregate	\$3,043,915.99

Source: House Executive Document No3 (45-2)

loans for land development. All loans to construction and land development were lumped into one category, known as real estate loans.

(ii) The average real estate loan during the period 1834–1840 per state bank was \$32,388.37. The average real estate loan issued by the federally chartered bank during 1822–1840 was \$32,982.84.

Table 3
**GROWTH OF BANK AND
 REAL ESTATE LOANS, 1822–1840**

Year	Second U.S. Bank		State Bank	
	# of Bank	Real estate	# of Bank	Real estate
1822	1	\$563,480		
1823	1	\$62,6674		
1824	1	\$1,302,551		
1825	1	\$1,495,150		
1826	1	\$1,848,354		
1827	1	\$2,039,226		
1828	1	\$2,295,401		
1829	1	\$2,345,539		
1830	1	\$2,886,397		
1831	1	\$2,629,125		
1832	1	\$2,136,525		
1833	1	\$1,855,169		
1834	1	\$1,741,407	506	\$10,850,090
1835	1	\$1,760,632	704	\$11,140,167
1836	1	\$1,486,561	713	\$14,194,375
1837	1	\$816,855	788	\$19,064,451
1838	1	\$1,061,663	829	\$19,075,731
1839	1	\$1,054,523	840	\$16,607,832
1840	1	\$1,228,630	901	\$29,181,919

Source: U.S. House Ex. Doc. No 111, 26th Congress.

(iii) The average capital of the federal bank was significantly higher than that of the state banks: \$35,000,000 for the federal bank, compared to \$20,000,000 for the state banks.

(iv) The average investment in real estate loans as a percentage of total assets for the federally chartered bank was 1.8 percent, compared to 2.79 percent for the state chartered banks.

(v) The average real estate loan as a percentage of the total loans for the state-chartered banks was 3.68 percent, compared to 2.67 percent for the federally chartered bank.

The examination of the portfolio behavior of the banks indicates that state-chartered banks' loans for real estate were higher in terms of investment as a percentage of total assets and total loans than were the loans of the federal bank.

COMPARISON OF REAL ESTATE FINANCING BETWEEN FEDERAL AND STATE COMMERCIAL BANKS

Methodology

Because federally chartered and state-chartered commercial banks were not equal, in terms of assets, numbers, and real estate loans, this paper uses the ratio method. The advantage of using financial ratio analysis is that it compensates for firm size differences.

Two types of ratio data are used in this study: (i) Real estate loan as a percentage of the total asset (RLTAR) (ii) Real estate loan as a percentage of the total loan (RLTLR). The variables are defined as follows:

RLTAR= (Real estate loan/Total Asset). The higher the amount of real estate loans as a percentage of total assets, the greater the liquidity and asset risk. Because real estate loans are long-term and not convertible into cash in the short run, a higher ratio of RLTAR means banks are aggressive and risk-prone.

RLTLR= (Real estate loan/Total Loan). The higher the amount of real estate loans as a percentage of total loans, the greater the liquidity and asset risk. Because real estate loans are long-term and not callable in the short run, the higher the ratio of RLTLR, the higher the risk for banks.

RLTARU = Real-estate-to-total-asset ratio of the Second Bank of the United States

RLTARS = Real-estate-to-total-asset ratio of the State Bank

RLTLRU = Real-estate-to-total-loan ratio of the Second Bank of the United States

RLTLRS = Real-estate-to-total-loan ratio of the State Banks

Statistical Tools

In order to examine whether there were differences in real estate loan financing behaviors between the federal bank and the state-chartered banks, an equality of

mean test is performed. Additionally, in order to double-check the accuracy of the test results, the paper uses ANOVA (Analysis of Variance).

The null hypothesis, $H_0 : \mu_{fb} = \mu_{sb}$ is tested against the alternative hypothesis,

$H_a : \mu_{fb} \neq \mu_{sb}$ where μ_{fb} = mean of federally chartered bank (Second Bank of the U.S.) and μ_{sb} = mean of state-chartered banks.

The null hypothesis is set to reject the equality of the two means. If the null hypothesis is rejected, there is a difference between the two means. The inference about the null hypothesis is made by comparing the test statistics and the critical value, $t_{\alpha, df}$. If the test statistics are greater than $t_{\alpha, df}$, the null hypothesis (of the equality of two means) is rejected.

The statistical significance of the test is provided by a high t and F-statistics. The *p-value* provides support for confidence. The lower the *p-value*, the higher the confidence level for the statistical significance of the test.

Data

All data have been obtained from the various House Executive Documents. Real estate data for the Second Bank of the United States are available from 1822 through 1840. Because the real estate loans data for the state commercial banks are found from 1834 through 1840, this paper uses the data for the period from 1834 to 1840 in order to make the two samples equal in size. As the sample size

Variables	Mean RLTARU	Mean RLTARS	Method	Test Statistics	P-value
RLTAR	0.01818	0.02790	t-test	2.992	0.01
RLTLR	0.02671	0.03682	t-test	2.772	0.04

is less than 30, the t-test is performed.

RESULTS

The results of both t-test and ANOVA are provided in Tables 4 and 5.

An examination of t-test in Table 4 indicates that there was a significant difference in the real estate portfolio behavior between the state and federally

Table 5
RESULTS OF ANOVA TEST FOR EQUALITY OF
MEANS BETWEEN U.S. AND STATE BANKS

Variables	Mean	Mean	Method	F-statistics	P-value
	RLTARU	RLTARS			
RLTAR	0.01818	0.02790	ANOVA-F	8.95	0.01
RLTLR	0.02671	0.03682	ANOVA-F	5.186	0.04

chartered banks. The null hypothesis of equality of mean for both variables—RLTAR and RLTLR—is rejected. This shows that there was a significant difference in the real estate loan behavior of the federal and state-chartered banks. This is supported by high t-values of 2.9 and 2.7. The low p-values indicate that the differences are statistically significant.

These results are supported by the ANOVA test presented in Table 5.

An examination of ANOVA test in Table 5 indicates that there was a significant difference in the real estate portfolio behavior between the state and federally chartered banks. The null hypothesis of equality of mean for both variables, RLTAR and RLTLR, is rejected. This is supported by a high value of the *F statistics*—8.95 and 5.18—for RLTAR and RLTLR respectively. The low p-values indicate that the differences are statistically significant.

The higher mean for two variables—RLTARS and RLTLRS—for the state-chartered banks indicates that the state-chartered banks were more risk-prone than the federal bank. There are several plausible reasons behind such differences. They are as follows:

- (i) The Second Bank of the United States was a *de facto* central bank for the country. It was the sole fiscal agent of the U.S. government. It had to have high morals and reputation. Therefore, the bank’s attitude toward risky investment (such as in real estate) was cautious and prudent. This was reflected by low mean values in both the variables, RLTAR and RLTLR.
- (ii) The state-chartered banks had the blessing and backing of the state governments behind them. This support, along with the great demand for real estate loans at the local level, encouraged the state-chartered banks to undertake risky investment in ventures such as real estate financing and the issuing of excessive notes.

CONCLUSIONS

During the period of early commercial banking history, there was no clear demarcation between the various categories of loans. Loans to non-consumption and non-mercantile activities were lumped into one category, known as real estate loans.

The historical records of the United States commercial banks indicate that the commercial banks were participating in real estate loans as early as 1809, though their systematic involvement in real estate financing did not begin until 1822. The increased involvement in real estate loans was regularly noticed during 1822–1840, the second phase of U.S. commercial banking.

In the 1830s, many banks in South Carolina, Indiana, Alabama, Mississippi and Louisiana actively participated in real estate loans.

During the first quarter of American banking, the majority of real estate loans were issued in Massachusetts, Pennsylvania, Virginia, and the District of Columbia. The total loans of these states amounted to \$1,404,702, which represents 62 percent of the total real estate loans issued by the state commercial banks in 1819.

Examination of real estate loan behavior between federally and state-chartered banks reveals that the state-chartered banks were more aggressive in real estate loan financing than the federally chartered banks. The state-chartered banks had a higher percentage of real estate loans—both in terms of assets and number—than the federal bank. The state commercial banks issued 3.6 percent of their total loans in real estate financing, compared to 2.6 percent issued by the federal bank.

Neither federal nor state-chartered banks invested more than five percent of their assets in any year during 1818–1836. This is in contrast to real estate investments by the S & Ls in the 1970s, when the S & Ls had significant investments in long-term loans.

This study may be extended by exploring portfolio behavior of all banks in the Free Banking Era.

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Midwest Housing Price Appreciation: Economic and Financial Issues Regarding Affordability

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INTRODUCTION

Housing prices have continued to advance in the United States, with the biggest increases occurring in some of the fastest growing regions of the country. This nationwide growth in housing prices has exceeded the overall rate of inflation and has led to controversy regarding their level and sustainability. This article examines recent trends in housing price affordability nationally, regionally, and in select State of Missouri metropolitan areas. The article also contrasts conditions that suggest continued housing price stability as opposed to those that may indicate a housing price bubble.

Baker, writing for the Center for Economic and Policy Research, argues that the run-up in housing prices, which has exceeded inflation by more than one-third over the last nine years, is unsustainable. He points out that housing price increases have historically moved with the overall inflation rate. He further suggests that the demand for housing as an investment will slow as the “baby boom” cohort matures and leaves the labor force through retirement. Finally, he notes that since interest rates are at or near 45-year long-term lows they can only rise, which will reduce buyers’ abilities to afford the increasing costs of financing (Baker 2002).

The Joint Center for Housing Studies argues that for the 10-year period ending in 2001, the home price index rose nearly parallel with household income. They also assert that a continued rapid rate of household formation, coupled with low interest rates, should sustain housing price increases (Joint Center for Housing Studies of Harvard University 2003).

While the housing affordability and housing bubble debate continues at the national level, it may be more useful to look at regional and specific-location differences and to identify imbalances or changed fundamentals in those areas. Table 1 provides a snapshot of housing price changes in the top ten metropolitan areas, showing the highest median housing appreciation rates between the second quarter of 2003 and the second quarter of 2004. Not surprisingly, 9 of the 10 locations are in the coastal states of California and Florida. Las Vegas, the only inland location, had the top rate of appreciation, at 52.4%, with all other areas experiencing 25% or more in price increases.

Table 2 focuses on the West North Central area of the Midwest region, as defined by the U.S. Bureau of the Census, which includes 13 metropolitan areas. Although all areas reported price increases, they were much more moderate, ranging from a high of 10.6% in Minneapolis/St. Paul to less than 1% in Davenport/Moline/Rock Island/IA, IL.

According to the National Association of Realtors (NAR), the Midwest showed the lowest amount of appreciation at 7.1% among regions of the country, while the Northeast experienced the greatest overall increase in housing prices, at 17.6%. Still, these numbers are impressive when compared with the low inflation rate in the economy. Therefore, the question might be posed, can these rates of housing price inflation be sustained or is this giving rise to a bubble, which could lead to falling housing prices as the economy goes forward? Moreover, a decline in housing prices could affect other sectors of the economy, if consumer spending is choked off as consumers feel less wealthy because of reductions in home equity. A slowing in home sales could also result in declines in new housing construction.

Indeed, the real estate sector of the economy is replete with examples of excesses, which have resulted in bubbles and major corrections. An example in the recent past of unsustainable price increases in the real estate sector includes the office space explosion in the early 1980s. This situation resulted from extremely favorable federal tax shelter treatment while simultaneously

Table 1
**TOP TEN METROPOLITAN AREAS WITH HIGHEST
 MEDIAN HOUSING APPRECIATION RATES, SECOND
 QUARTER, 2003 OVER SECOND QUARTER, 2004**

Metropolitan Area	Quarter 2, 2003	Quarter 2, 2004	% Change
Las Vegas, NV	\$177,100	\$269,900	52.4%
Orange County, CA	\$472,500	\$655,300	38.7%
Riverside/ San Bernardino, CA	\$212,600	\$294,500	38.5%
San Diego, CA	\$407,000	\$559,700	37.5%
Los Angeles, CA	\$336,200	\$438,400	30.4%
Sarasota, FL	\$203,900	\$264,800	29.9%
Ocala, FL	\$88,400	\$112,300	27.0%
Sacramento, CA	\$243,000	\$308,600	27.0%
W. Palm Beach/Boca Raton/ Delray Beach, FL	\$233,600	\$294,000	25.9%
Miami/Hialeah, FL	\$216,000	\$271,900	25.9%

Source: National Association of Realtors at <http://www.realtor.org/Research.nsf/Pages/HA>

benefiting from the then newly acquired authority of saving and loan associations to finance nonresidential properties.

Many factors contribute to price stability with orderly advancing prices in any local housing market. Low interest rates and liberal financing terms have driven many markets in recent times. The faltering of the stock market, together with low yields in certificates of deposit and other investment vehicles, has increased pressure on the real estate market, especially the housing sector, as a “safe haven” for investment dollars.

A proliferation of first-time homebuyer programs and an increase in low-income housing programs have also led to increased housing demand and pushed up the percentage of households owning homes nationwide, to a near all-time record

Table 2
**WEST NORTH CENTRAL AREA OF THE
 MIDWEST REGION MEDIAN HOUSING
 APPRECIATION RATES, SECOND QUARTER,
 2003 OVER SECOND QUARTER, 2004***

Metropolitan Area	Quarter 2, 2003	Quarter 2, 2004	% Change
Minneapolis/St. Paul, MN, WI	\$197,100	\$218,000	10.6%
Wichita, KS	98,500	105,800	7.4
Cedar Rapids, IA	122,900	131,900	7.3
Fargo/Moorhead, ND, MN	116,800	124,200	6.3
Des Moines, IA	134,400	141,800	5.5
KANSAS CITY, MO, KS	144,700	152,100	5.1
SAINT LOUIS, MO, IL	123,300	128,800	4.5
Omaha, NE, IA	128,200	133,200	3.9
Topeka, KS	100,700	103,700	3.0
Waterloo/Cedar Falls, IA	93,100	95,400	2.5
Sioux Falls, SD	126,800	129,700	2.3
Lincoln, NE	132,900	135,300	1.8
Davenport/Moline/ Rock Island, IA, IL	107,200	107,900	0.7

*Source: National Association of Realtors at <http://www.realtor.org/Research.nsf/Pages/HA>
 The West North Central Area of the 12-state Midwest Region as defined by the US Bureau of the Census includes North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa and Missouri. The East North Central Area includes the states of Wisconsin, Illinois, Indiana, Michigan and Ohio.

high of 69.2% in the second quarter of 2004. The Midwestern Region had the highest ownership rate at 74.2%, with the West Region the lowest ownership percentage at 64.5% (U.S. Bureau of the Census). Declines in unemployment and increases in per capita disposable incomes have also created additional demand for owner-occupied housing. Favorable laws providing tax shelter benefits in the form of interest and property tax deductions and capital gain

exclusions for qualified long term ownership sales have also added to market demand. In addition, favorable age distribution of the U.S. population contributes to demand, as the older household age groups have the highest incidence of homeownership.

FACTORS CONTRIBUTING TO ORDERLY HOUSING PRICE INCREASES

Low interest rates, coupled with liberal financing terms, have been cited as the primary forces driving the housing market and sustaining recent price increases. Consumers have not only taken advantage of low fixed interest rate mortgage loans, but have also taken out adjustable interest rate loans (ARMs), which have provided even lower monthly payments in recent years. Secondly, a proliferation of first-time and low-income homebuyer programs providing assistance with down payments, subsidized interest rates, interest rate rebates, forgiveness of principal, credit counseling and other program features have added to the demand for housing.

FACTORS UNDERMINING ORDERLY HOUSING PRICE ADVANCES

A number of variables tend to undermine housing price stability and limit price increases. Expected future interest rate increases will limit the amount of debt at any payment level that can be afforded. Economic theory indicates that as interest rates rise, credit tightening on the supply side often occurs, resulting in more stringent underwriting standards, and consequently eliminating some less qualified borrowers. Additionally, borrowers who have taken out adjustable interest rate mortgages (ARMs) may find their monthly payments increasing to a level that is difficult to meet, leading to defaults and foreclosures, resulting in adding housing supplies to the market. The Second Quarter 2004 National Delinquency Survey, conducted by the Mortgage Bankers Association, showed that the Midwest region had the highest current mortgage foreclosure rate at .57% versus .39% nationwide, and has had a high rate for several years. Shocks in life-cycle costs (e.g., hazard insurance, property taxes, utility and maintenance costs) may likewise erode the ability to purchase housing. Negative consumer expectations about growth in the economy may play an additional role in housing market price trends. Statistics also reveal that homeownership is at an all-time high, with the Midwest region showing the highest homeownership rate (Sindt et al. 2004). Consequently, demand may slow in the future, which could

tend to dampen price increases given no major immediate cutbacks in new construction.

THE NATIONAL AND REGIONAL HOUSING AFFORDABILITY INDEXES

Across the United States, median prices of existing single-family housing tracked by the National Association of Realtors have steadily risen at a pace exceeding inflation. Nationally, median home prices rose 15% between 2001 and 2003, while inflation (measured by the consumer price index) increased less than 4%. Also, changes in state and local economic conditions play a large role in the change in housing prices from year to year.

Affordable housing is necessary for the long-term sustainability of housing prices. A rule of thumb regarding affordability that is discussed in many real estate principles textbooks limits the maximum purchase price of a home to three times current gross annual income. Another measure states that a maximum of 28% of gross annual income should be devoted to annual housing expenses (Sindt et al. 1993).

A more analytical and popular measure of affordability is an index that gauges the amount of income a typical family needs to meet the qualifying mortgage payment on a typical median-priced single-family home. The National Association of Realtors (NAR) publishes both a monthly and annual composite Housing Affordability Index (HAI). An index value of 100 indicates that a household with the prevailing median income has the minimum income needed to qualify for an 80% loan to value ratio mortgage on the median priced house, assuming a down payment of 20%. Although other down payment assumptions could be used, the 20% down payment assumption conforms to the requirement of the secondary mortgage market giants Fannie Mae and Freddie Mac (Sindt et al. 2004). Moreover, Federal Housing Finance Board data show that for December 2004, the typical 30-year conventional loan was accomplished by a 21% down payment (Federal Housing Finance Board 2004).

Table 3 shows that from 2001 through July of 2004, the composite affordability index across the U.S. peaked in 2003 and has dropped slightly since then. The July 2004 NAR index was calculated using a median priced existing single-family home of \$191,300 and a median family income of \$55,128. Purchasing a \$191,300 house with a 20% down payment of \$38,260 requires a mortgage loan

in the amount of \$153,040. A mortgage with an effective interest rate of 5.93% (which includes an allowance for points and fees and other costs of acquiring a mortgage) amortized over 360 months resulted in monthly debt service of \$911, or \$10,932 annually. The \$10,932 divided by the \$55,128 median income results in a 19.8% total annual debt service payment as a percentage of gross median annual income. Since the annual debt service is assumed to be limited to 25% of family income, which is within the range of national lending underwriting guidelines, four times the annual debt service results in a “minimum” median income of \$43,728 to purchase the median price house. Dividing \$55,128 by \$43,728 and multiplying by 100 gives the index value of 126.1, as indicated in Table 3. Thus, for the second quarter of 2004, a family earning the median income of \$55,128 would have roughly one-fourth more income than the minimum necessary to purchase the \$191,300 median value house. Stated alternatively, and using the NAR HAI assumptions, a median family income of \$55,128 would be sufficient to purchase a \$241,250 house.

**Table 3
U.S. AND REGIONAL COMPOSITE HOUSING
AFFORDABILITY INDEX***

Year	United States	Midwest	Northeast	South	West
2001	135.7				
2002	135.0				
2003	140.5	177.9	139.7	134.7	108.2
2004**	126.1	160.3	124.5	123.2	89.3

*Source: National Association of Realtors at <http://www.realtor.org/Research.nsf/Pages/HA> . The composite index is a weighted average of fixed and adjustable interest rate mortgage loans.

**Preliminary for July 2004.

The NAR HAI also tracks affordability by regions. According to the 2003 HAI, the Midwestern region was the most affordable, at an index of 177.9. The least affordable region was the Western Region with an HAI of 108.2. Preliminary index numbers for the second quarter 2004 indicates that the Midwest continues to be the most affordable region while the West continues to be the least affordable at 89.3.

METROPOLITAN HOUSING AFFORDABILITY INDEXES

Both the Kansas City and Saint Louis metropolitan areas experienced increases in median single-family housing prices from 2001 through the second quarter of 2004, as shown in Tables 4 and 5. These data show an overall increase of 3.3% in the Kansas City metro area and an increase of 3.0% in the St. Louis metro area.

Table 4
ST. LOUIS METROPOLITAN AREA HOUSING
AFFORDABILITY INDEX, 2001-2004

Year	Median Price S-F Home ¹	Mortgage Rate ²	Monthly P&I Payment	Payment as a % of Income	Median Family Income	Qualifying Income	Affordability Index ⁴
2001	\$116,200	7.08%	\$623	13.2%	\$56,306	\$29,904	188.3
2002	\$117,000	6.61%	\$598	12.6%	\$56,840	\$28,704	198.0
2003	\$121,200	5.79%	\$568	11.9%	\$57,374	\$27,264	210.4
2004p	\$128,000	5.96%	\$615	12.7%	\$57,913	\$29,520	196.2

¹ Data for median sale price of existing single-family homes, National Association of Realtors Data. Preliminary data for July 2004.

² Topeka Federal Housing Finance Board, at fhfb.gov/MIRS/mirstbl6.xls, Table 6. The interest rate reported is the effective rate for the St. Louis Metropolitan Area. Second Quarter 2004 data are preliminary.

³ Data from Table P101, Median Family Income, Past 12 Months, for St. Louis, MO from U.S. Bureau of the Census American Factfinder located at <http://factfinder.census.gov/servlet/DTTable?> The 2001 and 2004 figures are estimated.

⁴ Authors' calculations using an application of the methodology established by the National Association of Realtors© Housing Affordability Index (HAI).

HAI Methodology

Using the HAI methodology developed by the NAR (detailed in the previous section), a composite housing affordability index was constructed for the State of Missouri Metropolitan Areas of Kansas City and Saint Louis. The HAI for each metropolitan area was created by using the annual (2001–2003) data and quarterly (for the first half of 2004) median sales price data collected by the National Association of Realtors. The data cover each metropolitan statistical area as defined by the U.S. Office of Management and Budget. The median family income data were obtained from the U.S. Bureau of the Census American Factfinder for the specified years. The mortgage interest rate series employed was the annual effective rate calculated for each metropolitan area, provided by the Topeka Federal Housing Finance Board.

Table 5
KANSAS CITY METROPOLITAN AREA HOUSING AFFORDABILITY INDEX, 2001-2004

Year	Median Price S-F Home ¹	Mortgage Index ²	Monthly P&I Payment	Payment as a % of Income	Median Family Income	Qualifying Income	Affordability Index ⁴
2001	\$135,700	6.92%	\$716	14.8%	\$57,876	\$34,389	168.3
2002	\$137,400	6.52	\$696	14.3%	\$58,461	\$33,418	174.9
2003	\$144,200	5.79	\$676	14.0%	\$57,802	\$32,455	178.1
2004p	\$152,100	5.82	\$716	14.6%	\$58,802	\$34,368	171.1

¹ Data for median sale price of existing single-family homes, National Association of Realtors Data. Preliminary data for July 2004.

²Topeka Federal Housing Finance Board, at fhfb.gov/MIRS/mirstbl6.xls, Table 6. The interest rate reported is the effective rate for the Kansas City Metropolitan Area. Second Quarter 2004 data are preliminary.

³Data from Table P101, Median Family Income, Past 12 Months, for Kansas City, MO, KS,, from U.S. Bureau of the Census American Factfinder located at <http://factfinder.census.gov/servlet/DTTable?> The 2001 and 2004 figures are estimated.

⁴Authors' calculations using an application of the methodology established by the National Association of Realtors© Housing Affordability Index (HAI).

The Kansas City and St. Louis HAIs

Tables 4 and 5 provide HAIs for the Kansas City and St. Louis metropolitan areas. Compared to the U.S. and Midwest region, the Kansas City and St. Louis HAIs were more affordable in each of the years analyzed. Median sale prices in the St. Louis area trended lower than in Kansas City during the time period; therefore, given that median family incomes and costs of mortgage funds were relatively comparable in the two metropolitan areas, it is understandable that the HAIs in the St. Louis metro were slightly higher, indicating greater affordability.

EFFECT OF INTEREST RATE SHOCKS ON HOUSING AFFORDABILITY

Across the nation, housing prices remained buoyant through the 2001 recession and have continued their advance since then. The investment flight from the stock market has helped to maintain prices of housing. The economic fundamentals of a lower unemployment rate in 2001 (compared with a decade earlier) also gave strength to the housing market. The more recent advances in housing prices have left housing affordable in all regions but the West.

In areas of the country experiencing demand-pull inflation, where new housing

starts are lagging, it is often due to lack of vacant lots or problems with appropriately zoned raw land. In other areas of the U.S., new construction competes with existing home sales, dampening price advances in existing homes (Baker 2002). The NAR has projected new single-family housing starts to approach 1.65 million in 2004, which would be just short of the all-time high of 1.67 million starts in 2003. This continued construction boom, while adding to the supply, also pushes up the average composite price of all houses sold.

Advances in mortgage interest rates could have the most significant impact on housing affordability, and therefore, on effective demand. As shown in Table 6, the HAI drops from 9% to 10% for every 1% increase in mortgage interest rates above 6%. These figures assume no significant change in either median housing price or median family income from the current levels. For example, at the U.S. median price of an existing single-family home in 2003 of \$170,000 and a median family income of \$52,273, an HAI of 100 is produced at an interest rate of 8.95%, or about 3% above the current prevailing effective interest rate nationwide.

Table 6
HAI SENSITIVITY TO CHANGES IN EFFECTIVE
INTEREST RATES, BY LOCATION, 2003 DATA*

Location	Median Priced Existing Home**	Median Family Income***	6% Interest Rate	7% Interest Rate	8% Interest Rate	9% Interest Rate	HAI = 100
United States	\$170,000	\$52,273	133.6	120.3	109.1	99.5	8.95%
Kansas City	\$144,200	\$57,802	174.0	157.0	142.3	129.8	12.2%
St. Louis	\$121,200	\$57,374	205.73	185.3	168.1	153.2	14.6%

*Authors' calculations using an application of the methodology established by the National Association of Realtors© Housing Affordability Index (HAI).

**National Association of Realtors Data, 2003.

***American Factfinder, Bureau of the Census, Table P101, 2003 Data.

For the Kansas City metropolitan area, the effective rate would have to increase in excess of 12% to drop the HAI to 100. Similarly, the St. Louis metropolitan area would experience an HAI of 100 only when the effective interest rate reached 14.6%.

The data, therefore, suggest that existing housing in the Midwest region continues to be the most affordable and insulated from some of the extreme price pressures that are found on the east and west coasts. Within the Midwest

region, the Kansas City and St. Louis housing market data have shown moderate price increases, without any major price swings. With an HAI that is roughly double that of the West region, it is unlikely that housing market prices will change dramatically or that a bubble could result in this market.

SUMMARY AND CONCLUSIONS

This paper has reviewed national, regional, and select metropolitan area statistics with regard to housing affordability. A housing affordability index for both the Kansas City and the St. Louis metropolitan areas was constructed for comparative purposes. An analysis was also performed that projected changes in the affordability index, with incremental interest rates increases. Other things being equal, interest rates would have to nearly double before the HAI in either the Kansas City or St. Louis metro areas would drop to 100, the minimum level at which the median priced existing house could be afforded by the family with an annual median income, assuming a 20% down payment.

The national housing market is a composite of characteristics unique to local market areas and as such conceals regional, state and local differences. That is, supply and demand for new and existing homes at the local level interact to set the equilibrium price and quantity demanded. Real estate prices may fluctuate dramatically in the short run, as effective demand can change much more rapidly than supply, causing problems with housing affordability as prices spike upwards.

Housing affordability indexes are useful to compare affordability of housing in various markets with similar characteristics. They are less useful from an aggregate standpoint, as the index is derived from differing levels of median housing prices and median family incomes. Median housing prices are not strictly comparable among geographic areas and neither are median family incomes, with regard to purchasing power at various locations. The HAI is also limited with regard to housing price differences, because only existing median housing prices were used in the analysis. It is likely that HAI results would differ for high-end or low-end housing prices and especially for new construction.

The housing affordability index at the national level provided an indication for the most part, that housing is still affordable. The HAI in the Midwest region, when compared with others in the U. S., showed the most affordable median housing price relationships to median family incomes. Not surprisingly, the

Kansas City and St. Louis HAIs, within the Midwest region, were found to be even more affordable.

In summary, a national housing bubble seems extremely unlikely, as a large part of the U.S. continues to show acceptable HAIs. Isolated areas of the east and west coast are likely to see adjustments, especially if interest rates begin a steady climb upward. Even in those areas, however, adjustments may be dampened if population increases, together with gains in family incomes, place continued pressure on the housing stock. It is unlikely that prices in these high cost areas will drop precipitously, however, as purchasers who see their equities eroded by depressed housing prices may lengthen their holding period and ride out short-term market price fluctuations. Gauging by national standards, as indicated by the HAI, housing is extremely affordable in the Kansas City and St. Louis areas. Historic and present economic characteristics of these markets indicate an orderly growth in the housing sector with little chance for housing price bubbles to develop.

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Book Reviews

Cowboy Capitalism: European Myths, American Reality

by Olaf Gersemann

Reviewed by Dr. Ben Collier

I must confess that this book has put me into an unfamiliar position. As an economist, I am accustomed to criticizing the work of economic journalists, even those representing economically sophisticated publications such as *The Wall Street Journal*. This is because their efforts usually have the effect of perpetuating whatever economic myths are currently fashionable. Olaf Gersemann, however, is an exception. In his book, *Cowboy Capitalism: European Myths, American Reality*, he covers a number of widely held perceptions (particularly in Europe) about economic conditions in the United States. Using logic and readily available economic data, Gersemann shows how these perceptions are a combination of distortions, half-truths and outright myths. In the process he gives American readers insights as to how America and its economic policies are viewed by many Europeans.

The perceptions Gersemann considers are varied and too numerous for me to cover here (besides, I don't want to take away your joy in reading them for yourself), but to mention just a few they are:

- Declining living standards and the increase in consumer debt in the U.S.
- The growth of poverty and income inequality in America
- The growth of low-skill, low-wage U.S. jobs
- The increase in the number of workers with multiple jobs
- The high cost of medical care in the U.S.

From the end of World War II through the mid-1970s, Europe made so much progress in employment and real per capita income that the gap with the United States was nearly closed. Since then, however, the economic performance of Europe (measured by a number of conventional indices) has fallen due to, in large part, economic policies adopted by their governments, particularly those of Germany, France and Italy. Yet despite this disparity with the United States' own economic performance, Europe has chosen not to adopt the U.S. as a role model.

Instead, Europe has embraced a system with a strong role for the central government, rather than the decentralized, "cowboy-style" approach favored by Americans. Whether it is a policy of high marginal tax rates on income, or government regulations on business start-ups, retailing, health care or labor markets, Europe has chosen a very different path from the United States. And one of the consequences has been the inability of Europe to adapt to rapidly changing economic conditions (caused, in part, by recent technological innovations), leading some observers to coin the term "Eurosclerosis."

I highly recommend this book not only for the insights it offers of the European perspective of the United States (shared by some Americans), but also for its cogent analysis of European and U.S. economic policies. And though it has much to offer American readers, Gersemann's true audience is his fellow Europeans, particularly European policy makers. By failing to embrace an American style of "cowboy capitalism", Europeans are condemning their economies to second-rate results.

Dr. Collier teaches economics at Northwest.

The 18 Immutable Laws of Corporate Reputation

by Ronald Alsop

Reviewed by Steven B. Gilbert

The commission, investigation, media coverage, and miniscule prosecution of multiple corporate transgressions in the early 2000s have influenced a litany of books and articles about the irresponsibility of some corporations. Such conduct has been a goldmine for academics and publishers alike. One more treatise supplementary to the inventory is Ronald J. Alsop's *The 18 Immutable Laws of Corporate Reputation: Creating, Protecting and Repairing Your Most Valuable Asset*. It is a deserving work for academics interested in the province of corporate responsibility and the senior management practitioner alike. The book is replete with substantive recommendations to support his important positions and his thoughts are validated with numerous, detailed anecdotes, from those who have floundered in practicing what are thought as, and what we all inherently should consider to be, otherwise prudent corporate behaviors. In the commotion of all the malfeasance of corporate administrators, Alsop reasons toward the most basic of corporate assets that has become damaged by these transgressions—corporate reputation. Herein he shepherds us, in three separate sections, into the formulation, preservation, and renovation of this indispensable corporate characteristic.

Alsop apportions the first section of the book to the magnitude of corporate reputation and how we can and should create it. According to Alsop, Law One of corporate reputation is to simply explicate techniques to accentuate it. This advances the benefits of generating and maintaining loyal customers willing to pay a premium price, spawning higher credit ratings, escalating and sustaining high employee morale, supplying a magnet for talented executives and employees, augmenting relationships with regulatory institutions, building

positive relationships with local communities, peremptorily bargaining with advocacy groups, and, finally, flourishing the all-important notion of brand recognition and loyalty. What tenets of a business could be more important than these? The linchpins of corporate success are found through its reputation. From a responsibility perspective, why more executives do not focus on reputation is little understood by either the author of the book or of the review.

In the protection of reputation arena, Alsop suggests Law Nine—Stay vigilant to ever-present perils. With the evolving dynamics of business pursuant to today's global markets and economies, the number of specially-interested stakeholder groups is increasing and they are bound to put additional pressure on the firm's delicate reputation mechanisms. Firms today need to subscribe to the realities of a full-time reputational 'watch dog'; perhaps in the form of a formal and rigorous Public Affairs department.

The concluding section of the book is dutiful to crisis management-type allegory and recommendations. Because firms face crises every day, to greater or lesser degrees, Alsop offers Law Seventeen—Remember: being defensive is offensive. Endeavoring to shift blame, thrashing others, letting silence prevail, assailing the media, and evading apology and contrition are not fashionable formulae to gain or regain the public's confidence and trust.

In all, the book is an advantageous read. For academics, it provides useful information to support responsible thinking in the corporate setting, if for no other reason than its descriptive and illustrative prowess. Although in no way intellectual or cerebral, this rudimentary read affords a number of anecdotes beyond those we are accustomed to hearing and reading about of late. The greatest value of this work may be for practitioners. These laws of reputation are unadorned and straightforward, to the point that it would be hard for readers to understand why any senior manager could not or would not subscribe to any of these fundamental principles, on a daily basis. A quick read of the book, and the other fifteen laws, by those in accountable corporate positions, should help bring a dose a managerial reality back to their responsibilities and the importance of creating, protecting, and repairing corporate reputation.

Mr. Gilbert teaches Business & Society and Negotiations classes at Northwest.

The Pentagon's New Map: War and Peace in the Twenty-First Century

by Thomas P. M. Barnett

Reviewed by Steven B. Gilbert

Don't let the title mislead you. This is not a book exclusively about strategic deployment programs for our military in future conflicts. It is not a book about how to fight the 'war on terror'. It is not a book about the war in Iraq. It is much more immense and penetrating than that. The cover flap mentioned Thomas Friedman, Samuel Huntington, and Francis Fukuyama, so this reviewer immediately became interested in knowing if the book was about more than military tactics; and it was.

Thomas P. M. Barnett is a former strategic military analyst for the Department of Defense and currently a senior strategic researcher and professor at the U.S. Naval War College. The thesis of the book is much more than modifying the strategies of the U.S. military in future conflicts. The fascinating element of the book is how Barnett, in seeking the appropriate strategy for our military engagements in the future, discovered that there exists a link between the United States military effort in the future and the concept we call economic globalization, in other words, a military/market nexus, if you will. In fact, he was working with Cantor Fitzgerald, whose offices were in the World Trade Center, when his notions began to crystallize. Barnett's central premise is that the U.S. Department of Defense, since the end of the Cold War, has continued to strategize in anticipation of a new, colossal 'near-peer' threat. The focus, therefore, has been a strategy of confrontation with China at the nuclear level. This strategy, according to Barnett, is misguided.

The notion of such a potentiality seemed reasonable to this reviewer, but Barnett wants us to consider other possibilities. In analyzing conflict in the world, particularly where American troops have recently been or are involved, Barnett has determined that there are two dichotomous camps. He calls the first "the

Functioning Core”—those countries that are interconnected through the flow of people, energy, money, and security (typically American-provided security). Such countries are those that are now engaged in what we call globalization—the U.S., Australia, Canada, Mexico, Western Europe, Israel, Japan, South Korea, and, by the way, China. These countries are not likely to be adversaries in the future. Globalization, free markets, and free trade operating under specific and understood ‘rule sets’ will prevent this potentiality. The other side of this relationship is where we are likely to have future conflict requiring military engagement—what he calls “the Non-Integrating Gap.” These are the countries that do not or cannot participate in globalization. A look at the “new map” clearly delineates the gap. Our country is fighting a war in one such country now. The Middle East, Southern Asia, North Korea, parts of South American, all of Africa, excepting South Africa, are part of the gap. The challenge, according to Barnett? Integrate the gap into the core. This, regrettably, is where we must focus on the military and military operations.

The strategy of the U.S. military must change. When conflict erupts, there is no military more capable of handling battles around the world than ours and there seem to be few world policymakers who understand the importance of expanding globalization, and the success and advancement it brings to all people and all states, than U.S. policymakers. We, therefore, will continue to be security providers for the world. To accomplish this, the military must reconfigure itself into two distinct operating platforms: the Hobbesian Leviathan function—the one that will attack with brute force to bring down regimes like Saddam Hussein’s (the historical function) and the Kantian “System Administrator” function—the one that will provide peacekeeping functions, similar to what the UN and NATO are supposed to do (the new strategy), although both perform with spotty records recently.

The book provides an alternative way to think about world events. As rogue nations begin to fall out of the gap (Iraq/Afghanistan), we will be left fighting rogue individuals (Osama bin Laden). Barnett’s writing is not only profound, but he writes with humor, for such a serious subject, and his thesis, taken in the context of expanding democracy, capitalism, freedom, liberty, and the prospect of ending war, exhibits an appreciated mode of optimism for a desired “future worth creating.” This book is a must-read for those interested in politics, economics, foreign policy, globalization, and business.

Mr. Gilbert teaches management courses at Northwest.

Guerrilla Marketing: Secrets for Making Big Profits from Your Small Business

by Jay Conrad Levinson

Reviewed by Lisa Phillips

In *Guerrilla Marketing*, Jay Levinson reveals hundreds of tips (he refers to them as your “marketing arsenal”) that sound like nothing more than common sense marketing or maybe even ‘Marketing 101.’ Even so, this national bestseller has secrets to success to benefit the small business owner and should be considered a “must read” by those in the corporate marketing arena, too. The practical nature of *Guerrilla Marketing* sets it apart from the multitude of marketing books available.

Levinson takes a “nontraditional” approach to marketing. He considers it an investment whereby time, energy and imagination are the three barriers to success. *Guerrilla Marketing* is carefully organized into five sections: The Guerrilla Approach to Marketing, Mini-Media Marketing, Maxi-Media Marketing, Nonmedia Marketing, and Launching Your Guerrilla Marketing Attack.

The first section is dedicated to an overview of what exactly the concept of guerrilla marketing is, with five of its ten chapters dedicated to Levinson’s secrets to successful marketing. It is a nontraditional approach wherein money is not the primary ingredient—this is what separates the small business owner from the corporate marketing department. Still, the practical ideas and lessons should be applicable to a business of any size. The trouble isn’t applying these secrets or principles at the corporate level; it’s figuring out how to do so in the abyss of corporate structure and its many layers of authority.

In the second section, Mini-Media Marketing, Levinson discusses the most nontraditional marketing methods: canvassing, personal letters, circulars, classified ads and more. This is where he expects guerrillas to shine in their marketing endeavors, where you can really tell the guerrilla from the corporate marketing manager. The guerrilla has time to succeed in these inexpensive methods (virtually unpracticed in the corporate environment) and has the ability to do so in his or her immediate surroundings.

The third section, Maxi-Media Marketing, covers the more traditional mass marketing methods including television, radio, and direct marketing. Levinson reveals more secrets to saving money when investing in these more expensive methods. He often reminds the reader about the importance of testing each method and offers ways to do so in almost every chapter. The guerrilla is to be sure his investment is a wise one; one that has proven successful.

Nonmedia marketing methods like sampling, seminars and trade shows are discussed in his fourth section. Again, he provides an arsenal of secrets to success including the power of referrals and follow-up. Wrapping up the book is a short section on launching your guerrilla marketing attack. Levinson begins with the importance of knowing your customer or target customer with a discussion on psychology, and ends with a step-by-step guide to whether your business is ready for expansion.

Although seemingly simplistic, *Guerrilla Marketing* synthesizes a broad range of material and the result is an overview that has raised awareness of important marketing techniques that are not dependent on the size of the marketing budget. Levinson's unconventional ideas will have the reader raising an eyebrow and questioning the traditional methods that many are accustomed to practicing. The lessons here have even been adapted into the college classroom as a supplement and sometimes a replacement to the "traditional" marketing textbooks. Written with the small business owner in mind, *Guerrilla Marketing* contains invaluable business advice that has been adopted by marketers everywhere. In a quick read, Levinson has captured the spirit of marketing in this book in a revolutionary way.

Ms. Phillips teaches marketing courses at Northwest, having recently escaped the "abyss of corporate structure."

Winning with the Employee From Hell: A Guide to Coaching and Motivation

by Shaun Belding

Reviewed by Christopher Thacker

Insightful management books are a rare find. Luckily, Shaun Belding's book, *Winning with the Employee From Hell: A Guide to Coaching and Motivation*, is an exception to that unfortunate norm. Belding's main goal is to teach readers how to resolve unacceptable employee performance with his holistic approach. Specifically, Belding notes three primary sources of undesirable employee behavior: company policy, management, and the employee himself. Company policy and management are external sources directly controlled by the company. Belding diagnoses flaws in these two and prescribes the relevant remedies. His concise synopsis of these two external sources provides an adequate foundation for the remainder of the book, which focuses on discovering and resolving employee-centric issues that create undesirable performance.

Belding suggests a dual focus to address certain employee-centric issues: managers should first discover the underlying causes of unacceptable employee performance and then draft specific responses based upon those underlying causes. To do so, managers should first speak directly with the employee in question, rather than make uninformed assumptions. Then, Belding recommends managers follow a particular motivational coaching process: set goals, observe performance, assess performance, and respond appropriately based on the unique nature of the situation. Cleverly labeled as SOAR, this is one of several acronyms Belding sprinkles throughout the book to help readers remember key points.

According to Belding, not all employee-centric issues are equal; he classifies troublesome employees as either “performance challenges” or “personality challenges.” The former need coaching to overcome their inability or unwillingness to perform as required. The latter need coaching or some other managerial intervention to overcome their unproductive attitudes or interpersonal skills, despite meeting minimum performance requirements. Belding believes the performance challenges react most favorably to traditional SOAR coaching. In contrast, some personality challenges respond to traditional SOAR coaching while others do not, since a manager may never find the deep psychoanalytical causes of an employee’s personality challenge. As a result, Belding suggests a different managerial approach to personality challenges: tailor the response to the adverse impact created. To this end, he divides personality challenges into two subcategories: employees who create a substantially negative impact on the entire team, and those who affect primarily either themselves or management. Belding contends that many of these “employees from hell” are actually decent employees who are simply unaware of their unacceptable performance, so management’s job is to help these employees help themselves. Still, he clearly believes managers should remove those few employees who really are from hell, including those who lie, steal, cheat, or sabotage.

The book will not appeal to those seeking revolutionary managerial concepts, as the book’s major weakness is its dearth of new ideas. However, Belding’s holistic approach and concise, insightful writing are the book’s greatest strengths. Readers will appreciate the many hypothetical dialogues Belding creates, between manager and employee, to illustrate his methods. His humor will catch and retain your attention as well.

Nearly every businessperson can and should read this book. For example, a novice manager would appreciate the book’s solid foundation, while an expert manager would appreciate a healthy review of frequently forgotten fundamentals. Perhaps most importantly, an employee would appreciate the opportunity for a self-critique, after reading the numerous examples of unacceptable employee performance.

Mr. Thacker is an MBA student at Northwest.