

**ATLANTA'S DIGITAL MUSIC INDUSTRY: IMPLICATIONS FOR
WORKFORCE AND ECONOMIC DEVELOPMENT**

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ATLANTA'S DIGITAL MUSIC INDUSTRY: IMPLICATIONS FOR WORKFORCE AND ECONOMIC DEVELOPMENT

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[To My Superstar and Motivation Siena Arielle]

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SUMMARY

Most research on workforce development has focused on general employment trends and traditional industry. Few researchers have studied the potential workforce development implications of emerging industries particularly in those that have sprung from the digital economy. This thesis focuses upon the digital music industry in the Atlanta region. An economic impact study was conducted to illustrate and define the digital music industry and understand its implications for workforce and economic development. This research is significant because it will enable Atlanta workforce developers to assist in reducing unemployment and educational attainment gaps particularly in disadvantaged neighborhoods. Implications for the state includes creating a workforce development strategy based upon digital music innovation that increases Atlanta's overall competitiveness and quality of life by increasing the high-technology and Information-technology workforces.

Chapter 1: Innovation and New Economy Employment

“This is an intervention. A message from that space in the margin that is a site of creativity and power, that inclusive space where we recover ourselves, where we move in solidarity to erase the category colonizer/colonized. Marginality is the space of resistance. Enter that space. Let us meet there. Enter that space. We greet you as liberators.”

-Bell Hooks

1.1 Introduction

According to *The State of Working Georgia 2005*, published by the Georgia Budget and Policy Institute, young workers, African-Americans, and those with low levels of educational attainment are disproportionately unemployed in Georgia. In fact the unemployment rate for individuals with less than a high school diploma was 9.2%, nearly twice Georgia’s unemployment rate of 4.7%. Similarly, the unemployment rate for African-Americans in Georgia was 7.8%, more than double the 3.3 % rate for white workers in the state.(Coffey, 2005) The report concludes:

“to improve working conditions, Georgia needs to move from 20th century economic development policies to 21st century economic development policies. Strategic investments are needed to educate and train Georgia’s workforce...in order to attract and develop the high-quality jobs of the 21st century.”(Coffey, 2005)

Technology-based economic development programming has been initiated as a strategy in Georgia. Often, these programs are seen as positive triggers for economic growth. However, less is known about their actual affects upon development of a high-tech, high-wage workforce. Bozeman points out:

“...if one’s agenda is closing the income distribution gap, improving the lives of the disadvantaged, addressing the needs of the hard core unemployed, and redressing inequitable educational opportunities, then [technology-based economic development] programs are likely to be seen through quite a different lens.”(Bozeman, 1999)

Bozeman further postulates that Georgia has implemented Technology-based economic development initiatives that have successfully produced economic growth, yet disparities in incomes remain, particularly between the races (Bozeman, 1999).

A potential solution lies in the expansion of the notion of what constitutes technology-based industry. Traditionally, tech-based economic development in Georgia has focused on such industries as telecommunications, logistics, and biotechnology. This thesis seeks to include those fields that intersect artistic creativity with technical innovation. One such industry is digital music. Digital music as employment and training may provide an innovative workforce intermediary strategy that assists in the returns on investment of tech-based economic development.

While technology-based economic development strategies tend to be implemented at the state level, the following thesis will shift the scope of such programming to the metropolitan scale. Figure 1 displays the location of digital recording firms in Georgia, highlighting areas of concentration. As can be seen, the digital music industry in Georgia, while dispersed across many locales in the state is concentrated mostly in the Atlanta metropolitan region.

Capitalizing on the possibilities for digital music can assist in the creation of a “dual agenda” technology based economic development policy that both creates overall economic benefits, and assists in reducing unemployment in marginalized communities (Bozeman, 1999). This research seeks to do just that. The purpose of this research is to develop a plan that employs digital music as a workforce development initiative or strategy.

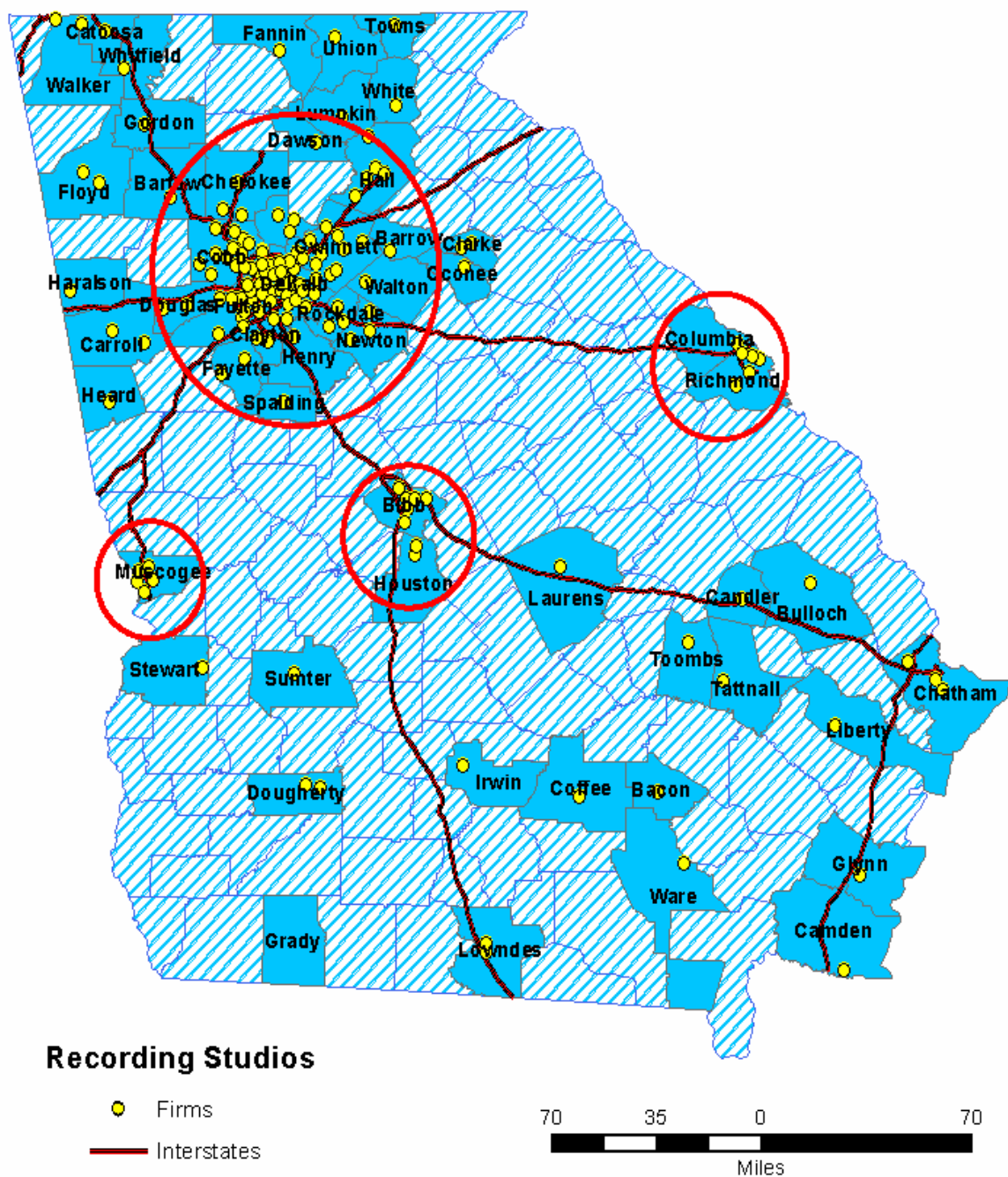


Figure 1: Distribution of Digital Recording Firms in Georgia
Data Source: ReferenceUSA Database

1.2 Digital Music Defined

For the purposes of this research, digital music is defined as music that is digitally constructed. Production within this industry relies heavily upon computer technologies that enable users to develop and alter sounds; creating an immense palette of possible innovation. The digital music industry blends technological innovation, artistic expression, creativity, and information technology management.

Digital music entails music that is produced using computer software and hardware. Music that is manipulated using digital devices must be converted into a digital signal; or from sound into numbers, modified, and then recorded using digital recording software such as Compact Disc or MP3 (Cullinan & Oppenheimer, 2006; Karagiannis, 1999; Pan, 1993; Pohlman, 1996). The particular equipment used by digital music producers varies widely, yet still there are basic equipment requirements for all digital music production. Figure 2 below displays the digital music development process in two dimensions. The red arrows identify the production process using all available equipment for digital music creation. The blue arrow points to the alternative digital music development process that simply enlists production software. Viewing the development process in this manner illustrates the technological equipment needed for this field. It also highlights the accessibility of this field in that producers can decide which types of equipment will fit best with their investment and technical capabilities.

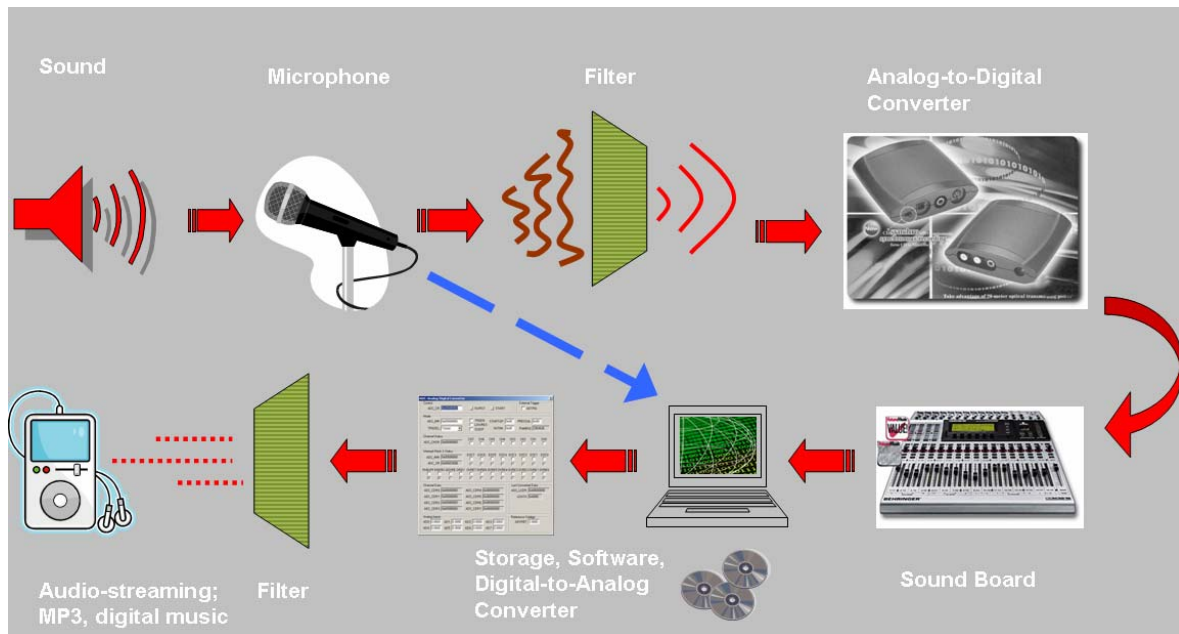


Figure 2: The Digital Music Development Process

Source: Adapted from: (Cullinan & Oppenheimer, 2006; Karagiannis, 1999; Pan, 1993; Pohlman, 1996)

Particular musical genres utilize more aspects of digital music than others. For instance, Electronica, Hip Hop, Pop, Reggae, House, as well as Drum 'N' Base all frequently integrate digital technologies in the sound and compositional production processes. Digital music also entails music that is produced using computer software and hardware. Music that is manipulated using digital devices must be converted into a digital signal; or from sound into numbers. Music that is generated using digital audio technologies includes but is not limited to electronic and computer music. Table 1: Elements of Digital Music, illustrates the features that determine the definition of digital music.

| <i>Digital Music</i> | <i>Not Digital Music</i> |
|---|---|
| Sound Recording using digital technologies during production | Sound Recording using digital file formatting alone (only saved in MP3) |
| Ringtones | Electromechanical instruments, i.e. Electric guitar music |
| Electronic Music | MIDI alone |
| Computer Music | All music on CDs is not necessarily digitally produced |
| Digital Sampling | Turntables and other DJ equipment that manually produces sound |
| Software usage: MIDI (software), Sequencers, Trackers (cheap) | FM/AM Radio |
| Mixing, filtering, equalization done on computer | Analog musical instruments, i.e. synthesizers |
| Audio digitizing card | |
| digital music publishing companies | |
| Online Radio | |
| Digitized musical instruments, i.e. digital synthesizers | |
| Video Game Music | |

Table 1: Elements of Digital Music

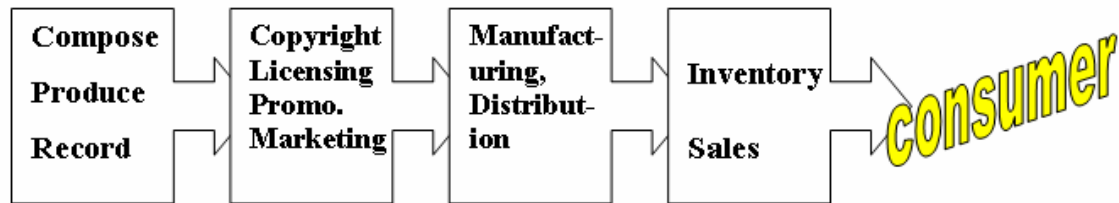
1.3 Recorded and Digital Music Industry: Structure and Technology

Music has been a fundamental aspect of every society. Music is artistic expression for the public good that generates social discourse. In the 20th century music became a profitable commodity. The following section outlines and compares the basic facets of the traditional and digital music industries.

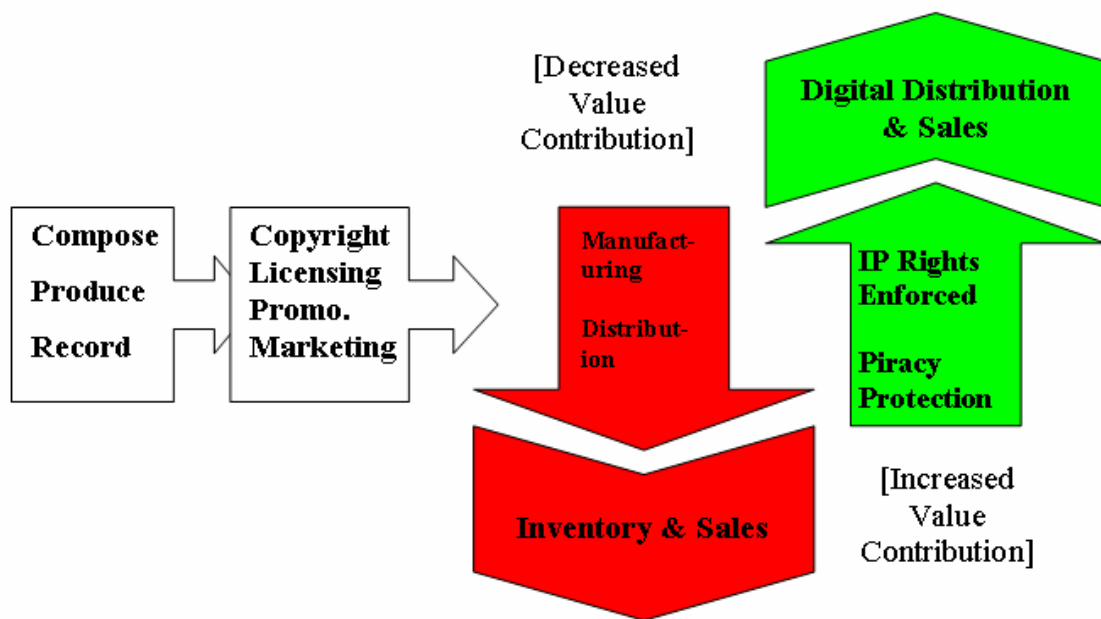
The traditional recording industry mirrors other industry in that there are a few large firms that maintain most of the market share. In fact, since the 1980s, five multi-

national firms make up the majority of the recorded music industry. These firms have been able to exert market control mainly due to the high costs of distribution (Alexander, 1994). However, the advent of telecommunications infrastructure has reduced the costs of distribution, lowered entry barriers and increased entrepreneurship in the field (Alexander, 1994; McLeod, 2005).

The music industry has undergone a shift from vertical integration to that of horizontally integrated production. Figure 3 compares the value chain of the traditional and digital music industry. What distinguishes the digital music industry from the traditional is this alternative value chain. Internet distribution and marketing have decreased costs in the value chain. Digital recording technologies and telecommunications have also enabled reduction in the costs of inventory. The dominant transnational firms have traditionally developed music in a costly closed system where all portions of production have been owned and operated by the firm. The digital music industry has developed as an alternative to this music management model. Digital music firms are characterized by the ability to reduce costs through horizontally integrated business models that enlist project-based labor, internet communications technologies, as well as formal and informal social networking.



Traditional Music Industry Value Chain



Digital Music Industry Value Chain

Figure 3: Traditional vs. Digital Music Value Chain

Source: Adapted from: (McLeod, 2005; Pan, 1993)

1.4 Positioning Atlanta's Digital Music Industry

Atlanta has maintained a solid history in the music industry. The area has been home to numerous artists and producers. Until recently, however, Atlanta artists were not recognized for their contributions to digital music. In fact, the music industry as a whole has only within the last few years begun to track digital sounds. For instance, it was not until 2004 that Billboard began to track digital record sales and internet albums. That year homegrown Atlanta group Outkast had the top Digital Track of the year, selling more singles than that of the top in-store selling artist (Garrity, 2004).

Commercialization of digital music is easily exemplified by the sales of cellular phone ringtones. Ringtone sales continue to increase while in store CD sales continue to falter. In 2005 alone \$600 million worth of music sales were attributed to ringtone sales. Billboard magazine, through Nielsen Broadcast Data Systems, publishes rankings of ringtone sales by artist (Billboard, 2006). The highest selling polyphonic ringtones in 2005 are shown in Table 2. The ringtone songs recorded in Atlanta area recording studios are highlighted.

| Rank | Title | Artist |
|------|---------------------------|--------------------------|
| 1. | “Candy Shop” | 50 Cent |
| 2. | “Lovers and Friends” | Lil Jon & East Side Boyz |
| 3. | “Super Mario Brothers” | Game Theme |
| 4. | “Just a Lil Bit” | 50 Cent |
| 5. | “Drop It Like It's Hot” | Snoop Dogg |
| 6. | “Wait (The Whisper Song)” | Ying Yang Twins |
| 7. | “1, 2 Step” | Ciara |
| 8. | “Halloween” | Movie theme |
| 9. | “Gold Digger” | Kanye West |
| 10. | “We Belong Together” | Mariah Carey |

Table 2: Top 10 Polyphonic Ringtones, 2005

Source: Nielsen Broadcast Data Systems

Reviewing the structure and commercialization of the music industry enables a better understanding of the inherent opportunities for digital music as a whole and Atlanta in particular. Lowered costs of recording equipment and distribution will inevitably allow greater entrance and competition within the digital music field. According to commercial publications, Atlanta is a leader in digital music related outcomes. However, it is necessary to examine Atlanta's digital music industry in greater detail in order to show how this local industry can contribute to both technology based economic development and distributional equity.

Chapter 2: A Review of the Relevant Literature

2.1 Location and Economic Development: Clusters and Regionalism

Scholars have debated the importance of regional location in economic development policy. Certain accounts find that technological advancement, particularly concerning communications and logistics, has rendered distance inconsequential in the global economy (Cairncross, 1997; Friedman, 2005). Yet location as a factor in the competitiveness of business and industry continues to garner attention. Some even consider the location of business as the determinant factor in the competitiveness of industries given the globalization of economic activity (Audretsch, 1998; Ewers, 2007; Florida, 1995; Porter, 2000, 2003; A. J. Scott, 2006; Stam, 2007).

Industrial location is significant to the effectiveness of economic development policies. Innovative activities have been tied to particular localities based on such inputs as infrastructure and incentives (Feldman & Florida, 1994). Studies have shown that local conditions can impede and influence the development of various economic activities (Boschma & van der Knaap, 1999; Glasmeier, Kays, & Thompson, 1993; Suarez-Villa & Han, 1990). Economic geography considerations of industry have converged to develop the notion of industry clusters as a unit of analysis. Moreover, agglomeration study has been viewed as effective to the development of insightful economic development policies (Waits, 2000). Porter has advanced city-region clustering of industry as the heart of successful economic development (Porter, 2000, 2003). In completing numerous studies of agglomeration activities, Porter settled upon a basic foundation on which to build studies of industrial co-location. Accordingly, clusters are defined by Porter as “...a geographically proximate group of interconnected

companies and associated institutions in a particular field, linked by commonalities and complementarities” (Porter, 2000). Figure 4: Porter Diamond Framework; illustrates the factors that Porter finds integral to the competitiveness of regions and industries.

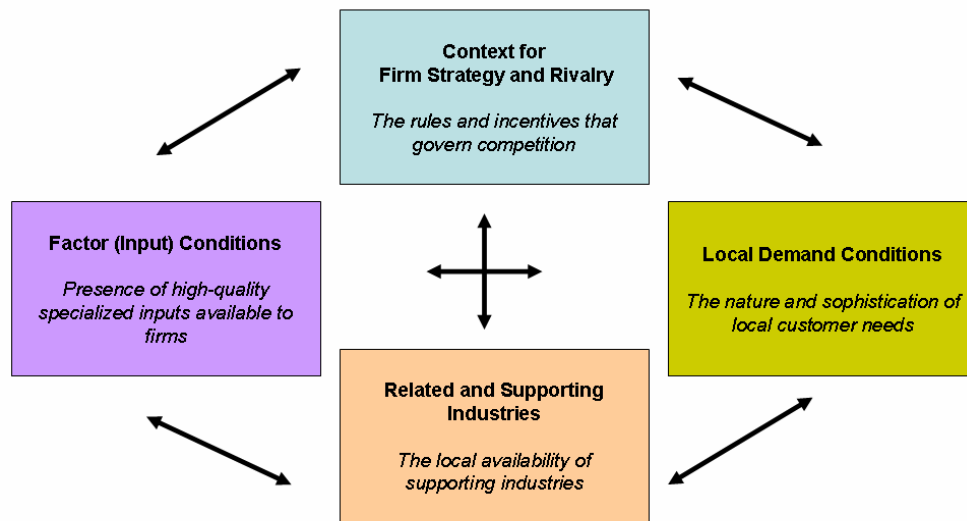


Figure 4: Porter Diamond Framework

Source: (Porter, 2001)

The so-called “diamond framework” provides a useful and insightful basis for the examination of regional clustering as it relates to the identification of not only salient, but emerging industries. Therefore the diamond framework will be utilized in this paper to describe and detail Atlanta’s emerging digital music industry. However, this thesis expands on the industry cluster literature to include consideration of labor market policies, disadvantaged populations, and employability in Atlanta’s digital music industry.

2.2 Workforce and Economic Development in an emergent industry

Workforce development involves the training and placement of workers. To better understand the necessity of beneficial workforce development strategies, it is important to examine varying constructions of workforce development. Labor market research is dominated by two general theories involving workforce development. These are characterized as “supply-side” and “demand-side” theories (Chapple, 2002).

2.3 Supply side workforce development

Accordingly, supply-side workforce development focuses upon the characteristics of those looking for work. Access to social networks and personal human capital are instrumental to successful employment outcomes (Chapple, 2006). Porter offers that successful cluster development is one that acknowledges the importance of personal associations (Porter, 2000). Interestingly, social networks are contingent upon physical job location. Immergluck and McLafferty conclude that local employment creates great benefits for those with lower levels of mobility, youth in particular (Immergluck, 1998; McLafferty, 1992). Reduction in the job-employment mismatch should lead to increased access to employment; however employment location is an insufficient consideration given the effect of demographic distinctions on social networks.

Rather, the proximity of residence to work is also affected by race and gender of those seeking employment. McLafferty finds that proximity of residence to work location significantly affects the employment practices of poor minorities (McLafferty,

1992). For instance, African-American women and men tend to have longer commute times to work than their Latino and White peers in the same industry (McLafferty, 1992). Interestingly, the placement of the digital music industry within telecommunications and information technology may mediate the job spatial disparity given that digital music production can take place within one's residence. This signifies the need to address another portion of the supply-side; human capital attainment.

Human capital reflects the level of educational attainment of individuals. The educational attainment spectrum spans from basic skills, such as literacy, to more advanced job-specific skills sets, those that need training beyond the secondary public school education. Bartik and Hollenbeck discuss skills development in the context of "first-chance" and "second-chance" systems (Bartik & Hollenbeck, 2000). The "first-chance" system encompasses the public school education system, publicly and privately funded post-secondary educational institutions, as well as employer provided training. The "second-chance" system is meant for those that could not complete the first-chance system, often the difficult to employ. Education in this system is primarily publicly funded and involves state sponsored workforce development (Bartik & Hollenbeck, 2000) Moreover, "[m]inority jobseekers tend to rely disproportionately on ...public and non-profit intermediaries." (Chapple, 2006) Wilson argues that "concentration effects" in which the poor and disadvantaged concentrate in particular neighborhoods contributes to reduced human capital attainment and therefore, employment opportunity (Wilson, 1991). Kantor argues that racial discriminatory practices particularly those described by Wilson, are attempts by employers to suppress labor rights. Kantor suggests that racial discrimination against poor Blacks in the workplace occurs because employers want to

hire individuals that will not seek to enforce their employment rights. Kantor decidedly contends with Wilson's view that human capital attainment is what causes discrimination; yet in an attempt to find an alternative explanation for discriminatory practices by employers Kantor effectively frames his argument as one of pride and therefore human capital still. Rather than the poor residents being undereducated as to mainstream employment practices, they are knowledgeable and too proud to work in particular employment settings. Traditional workforce development has been used to assist low-wage and low-skilled workers to find employment in particular industries, regardless of geographical location.

However, with changes in the economy from an emphasis on manufacturing, to one that rests upon knowledge work, the role and strategy of workforce development has been altered (Giloith, 2004). Practitioners within the field as well as organizations that participate in workforce development activities are termed workforce intermediaries. Their role is to assist in both the training and development of workers, while also assisting firms to find qualified employees (Giloith, 2004). With this role intermediaries must navigate their local labor markets to find the firms that need employees. Invariably, knowledge of firm strategies, or the "demand side" is integral to the development of advantageous workforce development initiatives.

2.4 Demand Side workforce development

Fitzgerald and Carlson contend that employability of workforce development clientele is linked to the development and maintenance of career ladders (Fitzgerald & Carlson, 2000). Career ladders offer job-seekers enhanced economic prospects. However, as the article highlights, career ladders are not easily developed by employers, this is reasonable particularly given that the economy is shifting to greater contingency and flexibility in the labor market. It is necessary, however, to understand the impact of firm strategies and labor policy to gain better information about the better labor development policies. The authors find that varying factors lead to the implementation of career ladders, particularly interesting to this research is Fitzgerald and Carlson assertion that knowledge of industry structure is critical to establishing employability within a region. Therefore, for this proposal a useful research question would entail examination of the structure of the digital music industry.

Scholars have posited that firm hiring practices can be inherently discriminatory, in that small businesses tend to hire individuals that come from similar population groups as themselves. Bates concedes that Black owned businesses carry great potential for the labor outcomes of Black neighborhoods by virtue of their propensity to hire inner-city Black residents. Interestingly, the impact of investment in black-owned businesses on “within-group” wage inequality is not discussed in Bates’ article. It is interesting to note that McCall finds that in the high-technology employment, wage inequality is less stark among individuals of similar demographic groups (McCall, 2000; 2001). McCall furthers

that the environmental effects, such as regional labor trends, and neighborhoods determine within group wage inequality (McCall, 2000; 2001). These conceptions provide insights into the workforce development aspects of employability.

Reviewing the literature of competing explanations of where labor policy should focus highlights that both sides of the equation; demand and supply approaches to policy are needed. This suggests the need to focus attention towards workforce intermediation strategies as well as better economic development policies (Gilothe, 2000; Gore, 2005). Bradshaw and Blakely's assertion that local economic development should move away from firm recruitment and small-business investment towards broader investment in regional economic development based on industry is insightful (Blakely & Bradshaw, 1999). However, this argument is in direct contradiction with Bates' community development assertion. Blakely and Bradshaw offer regional economic development that is industry, but not demographic specific, while Bates' findings point to the continued need to take race into account when designing development investments. These articles also point to the need to examine firms when developing labor policy.

2.5 Emerging Industries and Organizational Design

Firm activity in emerging industries is vital to gain an understanding of the market and labor inputs. The environment in which an organization operates determines which organizational strategy is the best fit (Lawrence & Lorsch, 1967; W. R. Scott, 2007). Organizational integration, whether horizontal or vertical, should match that of the environment (Lawrence & Lorsch, 1967). Given that the digital music industry is emerging and not yet completely formalized, two particular organizational theories apply. The organizational design of digital music firms can be classified as either organic or

alternative. Digital music firms classified as organic are those that were created based mostly on opportunity for entrepreneurship. While alternative organization of digital music firms are those that are developed as a critique of the traditional music industry. Most importantly, the organizational design of digital music firms directly relates to labor market outcomes and innovation. Table 3: Organic vs. Alternative organizational characteristics illustrates the similarities and differences between the organizational designs of firms based upon the two theories.

Burns and Stalker address organic forms of organization. Accordingly, organic models of organizing are characterized by horizontal channels of communication as well as knowledge sharing and openness to the external environment (Burns & Stalker, 1961). In the case of digital music firms, there are many examples that support the organic form of organizing as it relates to organizational strategy.

Alternative organizations as discussed by Sirianni and Rothschild-Witt are in themselves products of the environment. Alternative organizations are viewed as critiques of the institutionalized socio-political designs of organizations that create inequality and injustice (Sirianni, 1993). The alternative organization seeks not only to adjust to fluctuations within the environment, but seeks to change the environment itself. In alternative organization decision-making is process-oriented and involves lateral communication to ensure democratic ideals. Roles are explicitly inhibited, thus decisions are presented through time-consuming consensus. Rothschild-Witt argues that the decision-making environment is perhaps more intense for alternative organizations due to their lack of institutionalization (Rothschild-Whitt, 1979; Stinchcombe, 1965). Alternative organizations, due to their lack of institutionalized resources, devote more

resources to management in concert with the notion of the “Liability of Newness” (Stinchcombe, 1965). This provides proof that managerial occupations are integral to the digital music industry.

Alternative and Organic organizations are connected to their environments. However, the type and strength of this connection differs greatly. Organic organizations are reactively tied to the environment, yet maintain an internal core that is buffered from outside forces of change. Alternative organizations on the other hand are responsive to and seek to improve their environment; and are therefore designed without labor division. While this is the purpose of these organizations, the force of outside influence can lead to internal changes due to the lacking formal structure. This is particularly important in the context of digital music given that this industry has recently emerged.

The role of labor in these open systems based organizational types must also be compared. Particularly, similarities and differences between compensation, formality, communication, and learning for labor actors need be addressed.

Comparing the employment attributes of workers based on type of organization provides interesting insights. Workers within alternative organizations are chosen based primarily on personal characteristics and informal attributes. In fact, positions within the organization are not formal in that there are no ranks on which to base compensation. Thus there are no explicit career paths within these firms. Foremost organic organizations employ based on specialized skills and abilities. Such organizations maintain roles that fluctuate from formal to informal depending on the environment, but more importantly, ranks and career paths exist.

Digital music is a rising industry made up of many micro-enterprises and home-based firms. It is a prevalent practice for employees of these establishments to be highly skilled in the digital production of music, yet be tasked to perform additional duties such as those of promotion, and administration.

| ORGANIZATION CHARACTERISTIC | ORGANIC | ALTERNATIVE |
|-----------------------------|--|---|
| Local Market | Unstable and Dynamic | Unstable and Dynamic |
| Labor | Some Specialization | Holistic |
| Compensation | High; Based on Legitimacy Inside and Outside Firms | Low; Less Tangible; Based on Contribution to "better world" |
| Communication | Lateral and Vertical Channels | Pluralistic |
| Adaptability | Based on Experience | Based on Experience |
| Major Concern | Legitimacy | Sustainability |

Table 3: Organic vs Alternative organizational characteristics

Source: Adapted from: (Burns & Stalker, 1961; Sirianni, 1993)

The current environment for the digital music industry is highly uncertain; change occurs rapidly and often. Variability is seen in the work itself in that digital music production is project-based and outputs are governed by the needs of clients (W. R. Scott, 2007). Change is also evidenced by the changing national, state, and local regulatory policies that govern both businesses in general and the digital music industry more specifically. Additionally, technology plays an integral role in the design of organizations (W. R. Scott, 2007) because technology is often the source of environmental change and communication. While there are constant fluctuations in the environment in which such organizations operate, these organizations are able to exist because of the open system and organic foundation that they are built on (Lawrence & Lorsch, 1967). The ability of digital music firms to endure rests upon their ability to

change in accordance with changes in their environment, yet an organizations ability to change also implies an ability to communicate and learn.

Discussing open organizations, communication and learning are linked. Open systems organizations are characterized by their open communication with their external surroundings, which lead to learning at both the individual and organizational levels. Interestingly, both the alternative and organic organizations maintain horizontal lines of communication with in. Alternative organizations are meant to be pluralistic and therefore lines of communication should be completely lateral. Organic organizations however often focus on horizontal communication, but given that role specialization remains, vertical communication exists in tandem. Interestingly, the difference between communication in these organizations highlights a key flaw; lacking formalization of communication can lead to increased coordination costs in the form of lessened learning and abilities of the firm to perform duties. Thus while alternative organizations seek to enable greater communication, this tactic makes them costlier to maintain than organic organizational design.

2.6 Organizational Design and Innovation

According to Cohen and Levinthal, an organization's ability to innovate is dependent on its past ability to learn (Cohen & Levinthal, 1990). The authors argue that an organization is more able to innovate when it has engaged in previous knowledge development and is able to integrate this knowledge into the organization. Due to the formerly discussed organizational design of digital music, it is seen that such organizations have been able to learn and integrate knowledge, not only for the sake of

innovation, but due to the unpredictability experienced in the environment. Digital music production technologies change often, but usually incrementally (Henderson & Clark, 1990). Division in the industry between home-based operations that rely heavily on personal computers, and commercial operations that often utilize digital music specific equipment such as digital sound boards, illustrate the effects of absorptive capacity. For instance, while residentially based recording studios produce creative and unique sounds, it is commercial studios that invest in the latest soundboards that are able to capitalize upon process innovations. Commercial recording studios that invest in innovation building equipment vie for the ability to become training institutions as well. For instance, there is only one commercial recording studio in the Southern United States that offers training in DigiDesign, acclaimed digital music production software and related hardware. Many studios, including those in universities utilize the common ProTools software on PCs. This is important to note given that absorptive capacity is dependent upon an organizations ability to integrate new knowledge cumulatively on existing knowledge development (Cohen & Levinthal, 1990). In other words, studios that utilize DigiDesign are building greater capacity to use any software and hardware tools that are released next. Digital recording studios that have both the latest digital equipment and the ability to learn are those that will innovate. It is not that the firm innovates because it has the equipment, but because the firm has been able to develop the skills and talents necessary to optimize upon the equipment. This notion is integral to understanding the necessity of the creation of economic development incentives that enable firms to develop the capacity to innovate in this field.

It is apparent that the organizational design of digital music firms, one which is often organic, is an efficient means of organizing. The nature of the digital music environment makes the open systems and organic approaches imperative for success of such firms. The ability of a firm to organize optimally in its environment has implications for its ability to both learn and innovate. It seems that digital music production organizations that are the most matched to the variability and change in the environment will be those that are most likely to innovate. Understanding organizational development provides insights into the emergent digital music industry in Atlanta and its contribution to local labor markets.

Chapter 3: Research Questions and Hypothesis

Now that we have discussed the numerous theories that are relevant to this particular subject, it is necessary to introduce the design of this research. This thesis is meant to illustrate that Atlanta's digital music industry is an opportunity for economic development policies to create greater access to new economy employment for disadvantaged populations. We reviewed the determinants of industrial location to demonstrate that digital music is a competitive industry for the regional economy and therefore a worthwhile target of policy-makers. Furthermore industry location and workforce demographics were discussed to highlight the community development implications of digital music in Atlanta. Organizational design was examined to describe innovative capacity and potential labor market outcomes of digital recording firms in the region. Figure 2 illustrates the conceptual model for this research. The following research questions are based upon the previously discussed theories:

1. *Does digital music enable better spatial employment matching?*
2. *Does digital music provide skills necessary for employability within the knowledge economy?*
3. *Can investment in digital music as a workforce development strategy provide community development to marginalized communities?*

For this research I define employability in terms of: human capital attainment in the new economy context, labor market relative to industry, and close proximity between work and home.

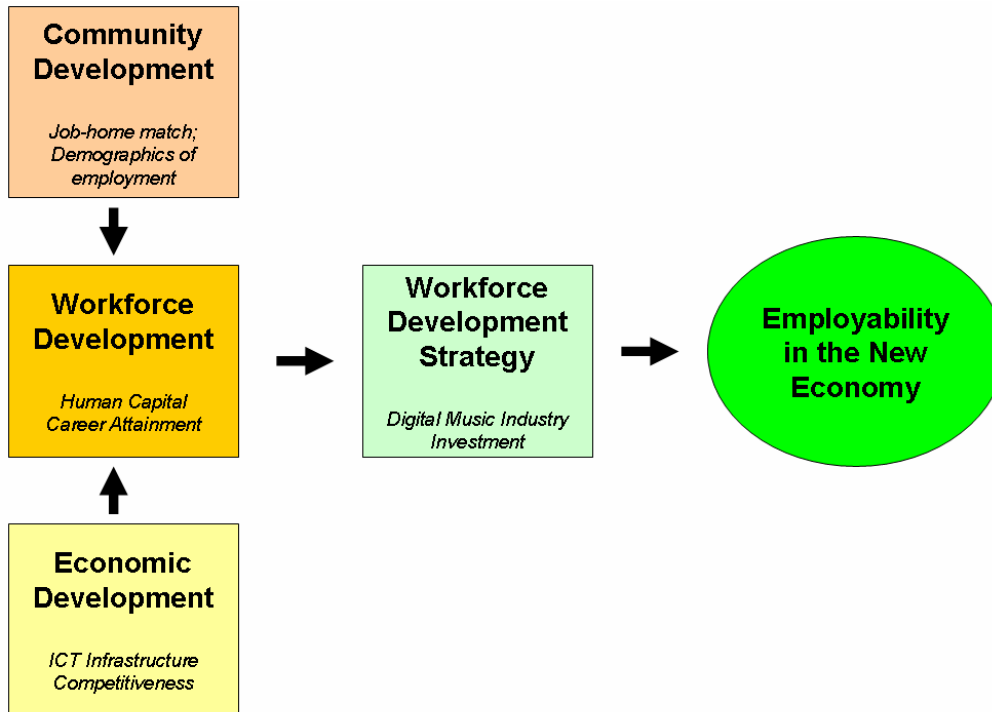


Figure 5: Conceptual Map of Digital Music Strategy Development

3.1 Main Hypotheses

The review of literature uncovered varied research questions that all enabled the formulation of testable hypotheses. The null hypothesis for this research is as follows:

Digital music as a workforce development strategy offers no benefits to disadvantaged populations in overall employability in the new economy.

This hypothesis would suggest that employability of the target population is not enhanced by participation in the digital music industry.

The alternative hypothesis is:

Digital music as a workforce development strategy offers benefits to disadvantaged populations in overall employability in the new economy.

What follows is discussion of the research strategy to be employed to prove or disprove the stated hypotheses.

3.2 Research Strategy

Various methods of data collection and analysis were employed to investigate the digital music industry in Atlanta. Digital music is an emerging field in which traditional industry study techniques offer limited insight. Lacking available data creates a need for a multiple methods approach to the research. The main techniques employed in this research are shown in Table 4.

| <i>Type of Data</i> | <i>Purpose(s)</i> | <i>Source(s)</i> |
|--------------------------|----------------------------|------------------------|
| Patents | Gauge innovation | USPTO |
| Firms | Determine entrepreneurship | ReferenceUSA |
| Employment | Target occupations | BLS, BEA, Census |
| Educational Institutions | Educational opportunities | Varied |
| Venture Capital | Funding, future prospects | PriceWaterhouseCoopers |

Table 4: Data Gathering Methodology

3.3 Limits of Selected Methods

Workforce development involves the development of skills, social-networks, and firms for the purposes of employment. Precise calculation of employment in the industry is demanding at best. First, it is impossible to distinguish exact employment from Bureau of Labor Statistics (BLS) data given that digital music personnel can be classified under many different employment classes. For instance, a major employment facet of digital music is that of audio engineer; however audio engineers can work in television broadcasting as opposed to digital music. Furthermore, the BLS has not developed a separate occupational title for digital music producers, rather industry professionals often self-identify as producers, engineers, or artists themselves. Relative to overall employment, producers, recording, sound, and audio engineers, and music publishers

make up a small portion of employment, nationally; therefore, data on employment in the industry at the metropolitan scale is also restricted due to the small size of the labor market.

Firm size and activities have a significant effect upon the availability and reliability of employment and business data. Firms in digital music span the spectrum from home-based micro-enterprises, to local subsidiaries of large multi-national music firms. Firm data on recording studios were found in the ReferenceUSA database. This data will be employed to locate industry firm location to gauge the proximity of employment to work in digital music firms. Notably, if many such firms are home-based this has implications for community development potential in that access to ICT infrastructure will be underscored as necessary. Additionally, the data on recording studios lacks information pertinent to this study. Accepting Bates' assertion that race of ownership is a key component of labor market participation, it is necessary to gather this information; however, this database lacks such data.

Skills development is also an important factor in workforce development strategies. However, there is not one particular educational track that leads into the digital music industry. Educational attainment in this industry can be found in both formal educational institutions and private employer training. Data on educational institutions that offer coursework in digital music will be gathered from the Georgia Board of Regents, the Georgia Department of Technical Colleges and private education institutions. Still there is little data on firms sponsored education tracks at the metropolitan level; therefore data collection for this variable will also be limited. Most

importantly, this data can be used to develop partnerships for the creation of digital workforce intermediaries.

Chapter 4: Digital Music in the Atlanta Region

4.1 Economic Impact of Atlanta Digital Music Firms

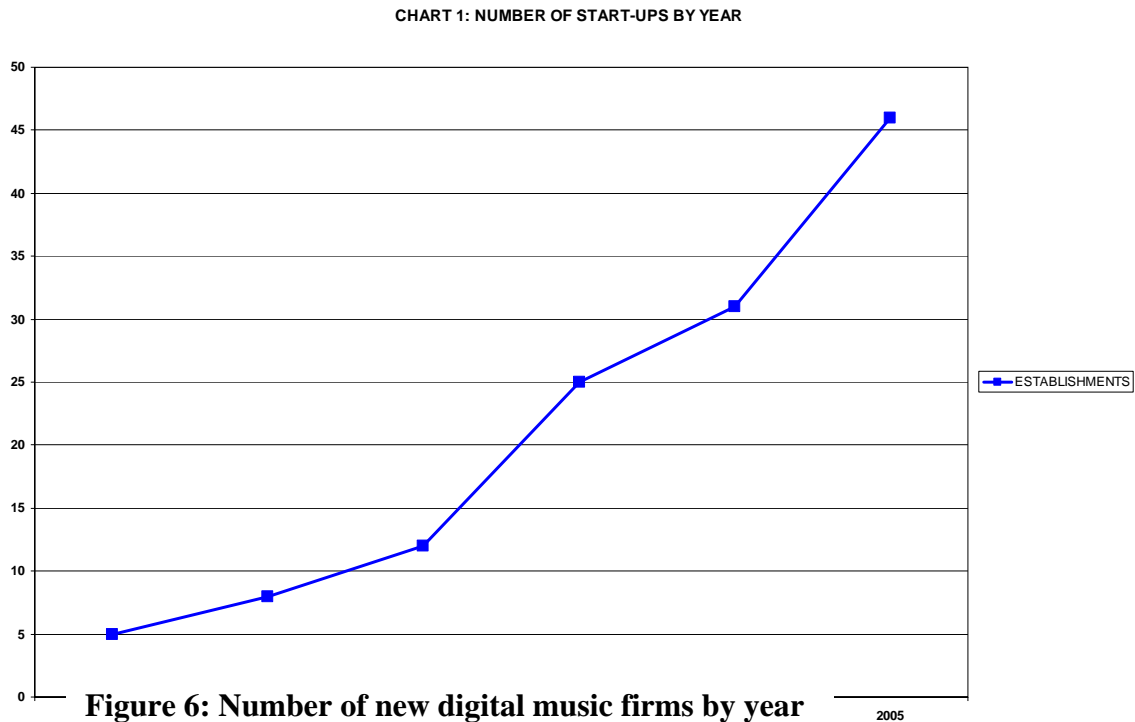
Firm data was gathered on recording studios in order to gain insight into industrial entrepreneurship in the Atlanta region. Digital music firms in Atlanta realized over \$200,000,000 in annual revenues in 2006. Approximately 1025 are employed at digital recording firms in the region. Reviewing firm characteristics revealed interesting characteristics of the digital music industry in the Atlanta metro.

In previous sections, the structure of digital music production was discussed. Alternative distribution was highlighted pointing to the lessened entry barriers for small independent firms. Firm level data illustrates this notion in two ways: organization size by number of employees and business status. Interestingly, over 90 percent of digital recording studios in the Atlanta area employ less than 10. Atlanta's digital music industry is characterized by micro-enterprise firms.

Furthermore, all but 2 of the 208 recording studios in the area have been identified as single locations. While large multinational music corporations are still a presence in the area, the overwhelming majority of recording studios in Atlanta are independent locally based firms. This fact is very important to showcasing the community and economic development potential of this industry. Homegrown entrepreneurship is an important element of sustainable local economic development. Moreover, the sheer number of local recording studios implies that there is a substantial home demand for such services.

Business leadership is another interesting aspect of digital recording in Atlanta. Nearly one in ten recording studios in Atlanta is owned by a woman. This factor is not

surprising given that the music industry in general is male dominated. Yet the male dominated industry coupled with the technology intensity of the field makes it interesting that 10 percent of entrepreneurs in the field are women.



In order to gauge the utilization of technologies by digital music firms in Atlanta, firm data on personal computers (PCs) and tele-work was also examined. Not surprisingly, all of the digital recording firms reported having at least one PC. Nearly one quarter of the recording studios utilize up to 9 PCs, while only a few firms have more than 10 PCs. Given the industry being studied, the fact that the majority of firms report having only one PC points to both technology diffusion and access to capital.

Approximately a third of recording firms in Atlanta is a home-based business. This supports the argument that digital audio recording technologies are creating alternative distribution channels. Furthermore, given the previous discussion about jobs-housing mismatch, the fact that many digital recording studios involve tele-work is promising for reducing this hindrance to effective employment outcomes.

Reviewing the year digital recording firms were established is also insightful. While recording studios in Atlanta date back to the mid 1980s, it is most telling to examine the number of digital music start-ups over the latest five years for which complete data is available. As Figure 7 shows, the number of recording firms established each year has grown exponentially. In fact, by 2005, the Atlanta metro outpaced the Nashville metro in the number of new recording studios established by year.

4.2 Locating Atlanta's Digital Music Industry

Recording studios in the region were mapped to examine spatial distribution and location in the industry. As figure 6 illustrates, recording firms in the Atlanta metro region are widely dispersed while music performance venues are centrally located.

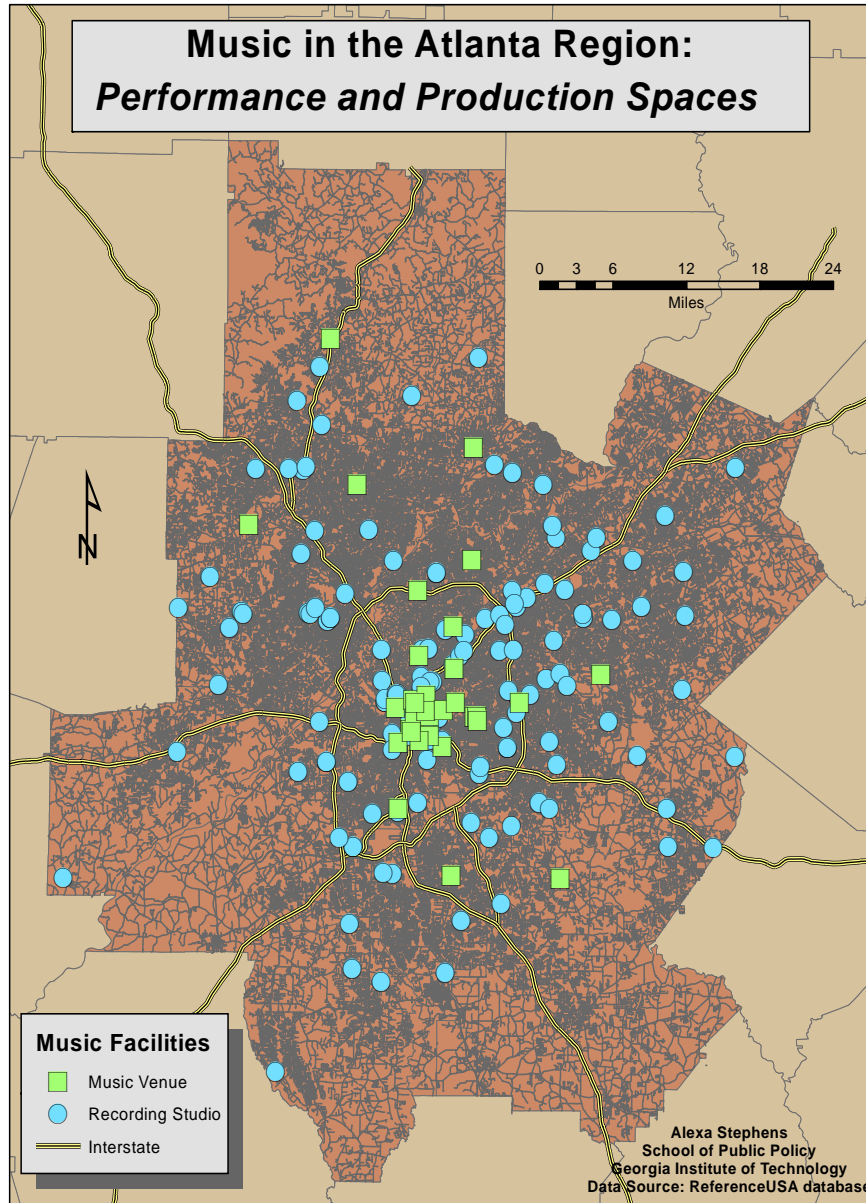


Figure 7: Music in the Atlanta Region : Performance and Production Spaces

Examination of the location of firms points to clustering and regional strengths of the digital music industry. The Atlanta digital recording industry is highly reliant upon telecommunications infrastructure. As Figure 8 displays, digital recording studios in the area are proximately located to telecommunications firms. This illustrates that Atlanta digital music firms are capitalizing on the telecommunications infrastructure presently located within the area.

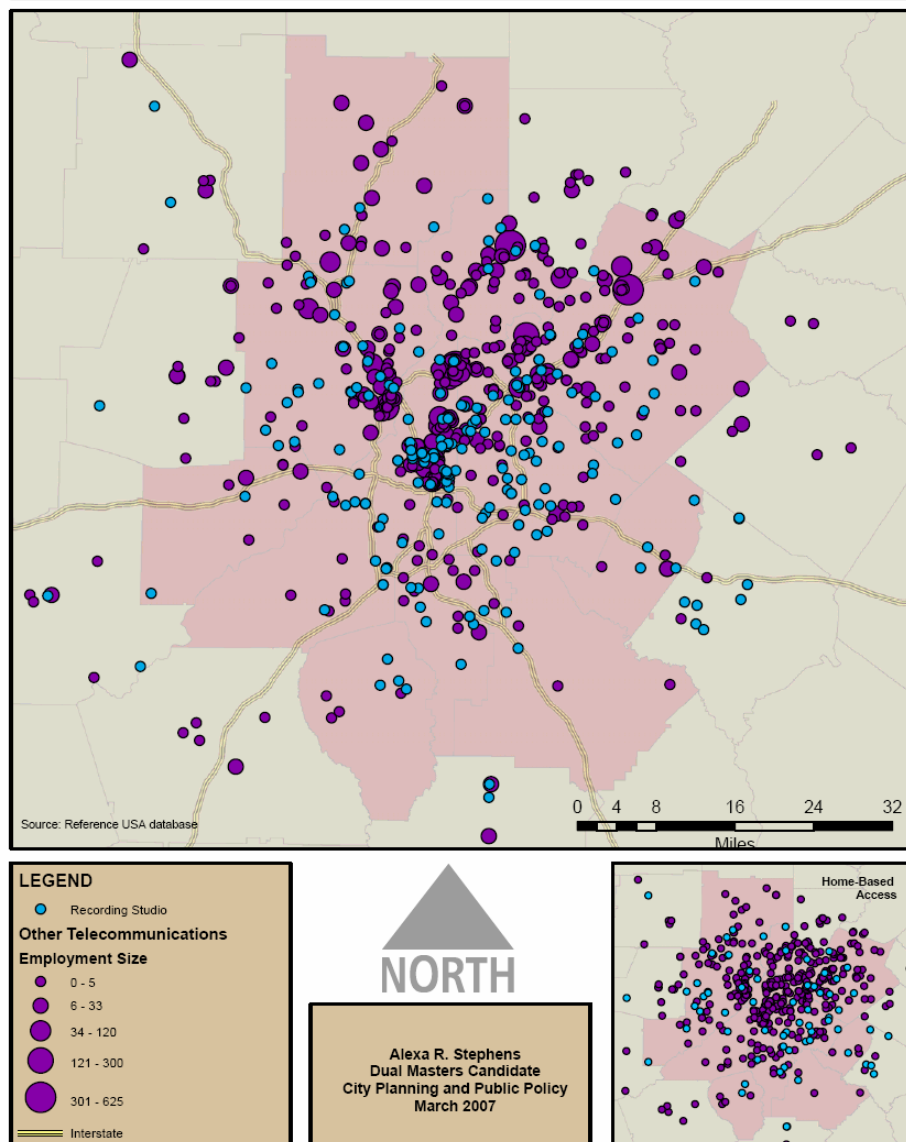


Figure 8: Proximity of Digital Recording Firms to Telecommunications

This thesis is concerned with reducing the employment gap for disadvantaged minorities in the Atlanta area. Figure 7 illustrates the spatial location of digital music firms within the City of Atlanta. The firms are layered on US Census Blocks displaying the percentage of Black residents. This illustrates the opportunities for local workforce development in digital music firms. Moreover, it is plausible that digital music firms in Atlanta are choosing to locate near talent pools, indicating that digital music in Atlanta is a cultural industry emerging from the area's Black population. As discussed in a prior section, firm employment by race often mirrors that of firm leadership. Given this information race of ownership can also be inferred. This figure at the very least illustrates that there is diversity in the race of employees and leadership in Atlanta's digital music industry.

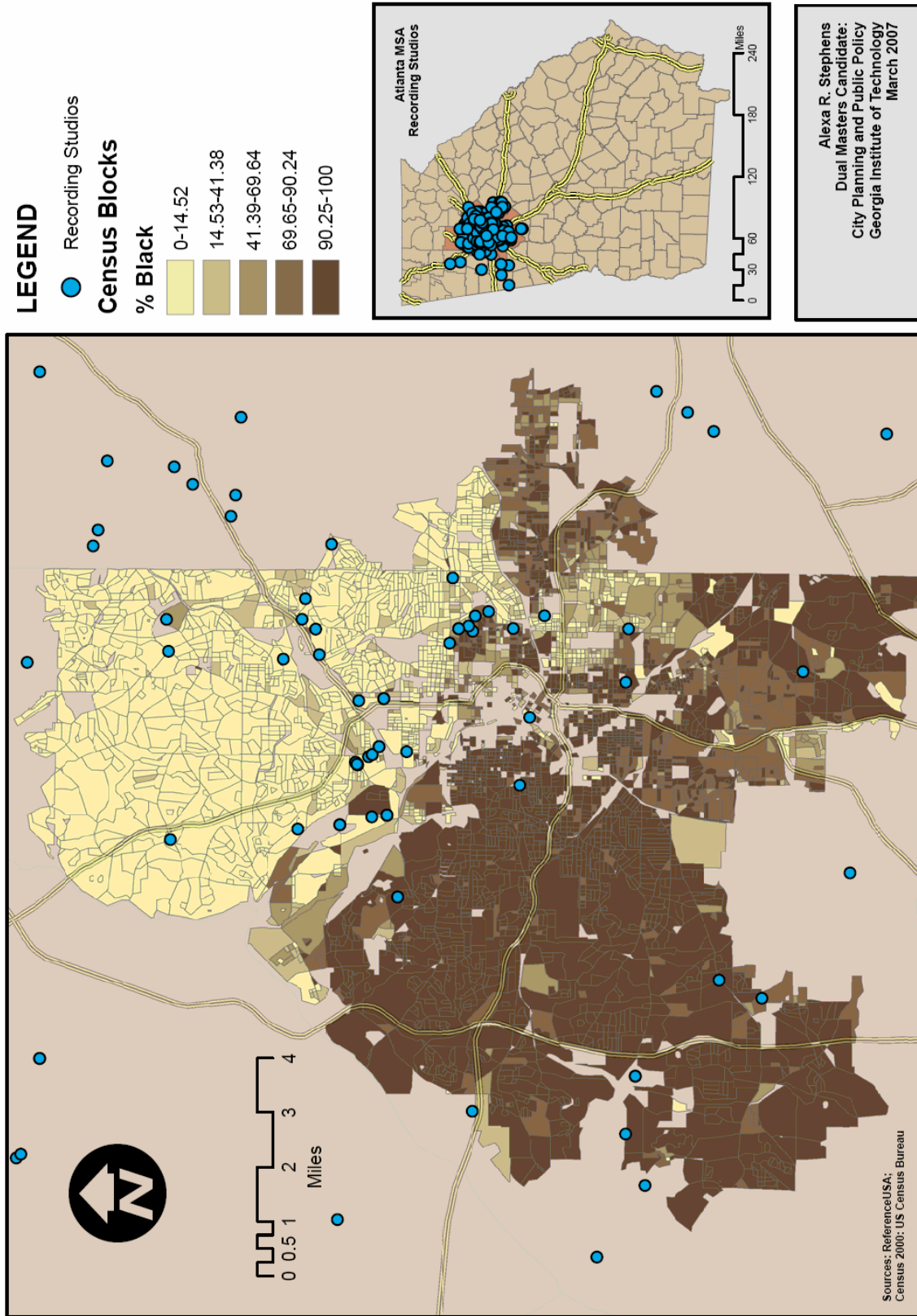


Figure 9: Race and Spatial Location of Digital Music Firms

4.3 Digital Music Employment

Music production is inherently project-based employment. Possible employment within the digital music production industry includes: sound and computer engineering, producers, artists, music publishers, managerial, as well as integrated record production and distribution occupations. For these reasons, employment within the digital music industry can be categorized both under science and technology occupations and information technology occupations (Chapple, Markusen, Schrock, Yamamoto, & Yu, 2004).

Employment analysis was conducted using data from the Bureau of Labor Statistics, Occupational Employment Statistics. Data was used to determine specialization in related occupations in Atlanta. Occupations relevant to the digital music industry in Atlanta include those classified as management, computer and mathematical operations, engineering and architectural services, as well as arts, entertainment, and media employment. Moreover, each of the occupational classes can also be identified as being high-technology and information technology occupations.

Specialization of labor was found through employment of location quotients (LQ) on both the occupational counts and wages for various digital music related occupations. The calculations show that Atlanta specializes in certain related occupation classes.

| Occupation | LQ_2005 | LQ |
|--|-------------|-------------|
| | | Annual Mean |
| Management occupations | 1.51 | 2.77 |
| <i>Advertising and promotions managers</i> | 1.39 | 0.91 |
| <i>Marketing managers</i> | 1.87 | 0.88 |
| <i>Computer and information systems managers</i> | 1.84 | 0.95 |
| <i>Engineering managers</i> | 1.36 | 0.82 |
| <i>Agents and business managers of artists, performers, and athletes</i> | 0.49 | 0.76 |
| Computer and mathematical occupations | 1.48 | 0.93 |
| <i>Computer and information scientists, research</i> | 0.75 | 0.72 |
| <i>Computer programmers</i> | 1.25 | 1.04 |
| <i>Computer software engineers, applications</i> | 1.30 | 0.88 |
| <i>Computer software engineers, systems software</i> | 1.67 | 0.85 |
| <i>Computer support specialists</i> | 1.63 | 0.94 |
| <i>Computer systems analysts</i> | 1.69 | 1.00 |
| <i>Database administrators</i> | 1.18 | 0.96 |
| <i>Network and computer systems administrators</i> | 1.35 | 0.94 |
| <i>Network systems and data communications analysts</i> | 1.85 | 0.91 |
| <i>Computer specialists, all other</i> | 0.99 | 0.86 |
| Architecture and engineering occupations | 0.90 | 0.89 |
| <i>Computer hardware engineers</i> | 0.64 | 0.89 |
| <i>Electrical engineers</i> | 0.87 | 0.93 |
| <i>Electronics engineers, except computer</i> | 1.08 | 0.86 |
| <i>Mechanical engineers</i> | 0.48 | 0.98 |
| <i>Engineers, all other</i> | 0.66 | 0.83 |
| <i>Electrical and electronics drafters</i> | 1.33 | 0.99 |
| <i>Mechanical drafters</i> | 0.42 | 0.82 |
| <i>Electrical and electronic engineering technicians</i> | 1.14 | 0.92 |
| <i>Electro-mechanical technicians</i> | 0.19 | 0.60 |
| <i>Mechanical engineering technicians</i> | 0.42 | 0.91 |
| <i>Engineering technicians, except drafters, all other</i> | 0.87 | 0.79 |
| <i>Surveying and mapping technicians</i> | 1.03 | 0.88 |
| Arts, design, entertainment, sports, and media occupations | 0.80 | 0.96 |
| <i>Producers and directors</i> | 1.08 | 0.78 |
| <i>Music directors and composers</i> | ** | 1.10 |
| <i>Media and communication workers, all other</i> | 0.78 | 1.34 |
| <i>Audio and video equipment technicians</i> | 1.76 | 1.02 |
| <i>Broadcast technicians</i> | ** | 1.04 |
| <i>Sound engineering technicians</i> | 0.77 | 0.71 |
| <i>Media and communication equipment workers, all other</i> | 0.84 | 1.08 |

Table 5: Digital Music Occupations and Payroll Specialization

Source: Occupation Employment Statistics, Bureau of Labor Statistics, 2005

The review of occupational data exhibits the prospects for future growth and competitiveness in the digital music industry given that there is specialization in related occupations. However, it is interesting to discuss the implications of employment outcomes in the emerging field of digital music. By analyzing the current context of labor in the digital music related occupations also distinguishes the workforce development possibilities of the field in relation to anti-poverty efforts. A challenge to many anti-poverty workforce development initiatives is local labor market need. In other words, it is problematic to invest in work with little guarantee of effective employment outcomes. However, given that the occupations necessary to participate in the digital music industry are interdisciplinary and flexible, strategies to incorporate the industry into workforce development strategies should prove fruitful. The skills necessary for the digital music industry are transferable to other fields such as computer engineering, database management, and marketing. Most importantly, the skills and occupations found with in the emerging digital music industry are integral to new economy employment.

4.4 Local Innovation

Given that technological innovation is fundamental to both the present and future of the digital music industry, this study utilized patent data as a measure of knowledge and innovation. Accordingly, data was gathered from the United States Patent and Trademark Office (USPTO) on all patents related to digital music hardware for the Atlanta metropolitan region. Patents were considered to be Atlanta patents based on inventor addresses located within the state.

Based on the patent search, 42 digital music related patents were discovered. Atlanta area inventors have patented in digital audio since the early 1980s. Inventors contributed to the innovation in fields such as sound filtration, MIDI, audio streaming, digital instrumentation, and digital processing. However the majority, 49 percent of patents attributed to Atlanta inventors in digital music technologies are in the form of analog-to-digital conversion hardware. This factor is very telling given that music becomes digital through the use of such conversion software. Therefore Atlanta inventors are contributing innovative ideas to the very foundation of the digital music field.

Reviewing the inventor location gave insights into Atlanta's position in innovation in digital music, yet examination of patent assignee also provided greater understanding of the area's digital music industry. Patent assignee is the individual, firm, or institution that owns the rights to patents. Therefore, looking at patent assignee location displays whether or not the local area is capitalizing on the innovations of its citizens. Notably, not all patents are assigned, inventors can choose to maintain their patents without assigning the rights to others. In this case, 10 of the 42 patents have no

assignee. Of the remaining 26 patents that were assigned to other organizations, 16 were assigned to Atlanta based organizations. Interestingly, most of these patents were assigned to telecommunications related firms. This makes the case for the clustering and interdependence of the digital music and telecommunications industries. While many of the patents were assigned to corporations based outside of the Atlanta metropolitan, it is promising to note that the majority of patents have been captured and contribute to the Atlanta regional economy and innovation systems.

4.5 Digital Music Educational Opportunities

Listings of educational institutions were gathered. Educational institutions in Georgia that have programs or courses related to digital music production were researched in order to assess the educational opportunities and future employment pool within the industry. Data was gathered from the University System of Georgia Board of Regents, as well as, Georgia Department of Technical and Adult Education. Web site searching of all Georgia educational institutions that offered coursework in music revealed those institutions that provide digital music specific programming and coursework. There were 7 educational institutions in the Atlanta region that offered training specifically relevant to digital music. Of these schools, 3 were private institutions and the remaining publicly funded.

The programming and educational tracks available to students vary by institution. There is an evident division between vocational training centered digital music education leading to certification in digital music technology use, and advanced degree training. The institutional programming shows that Atlanta area residents have the ability to gain education in digital music along a spectrum from certification training to graduate

training all in the field. Training pursuits in certification show that the educational opportunities are accessible to both traditional and non-traditional learners. Interestingly these degree programs have emerged fairly recently. For instance, the Georgia Institute of Technology recently expanded its music programming to include offering coursework to lead to the degree Masters of Science in Music Technology. The fact that there is a range of educational opportunities available to those interested in the digital music industry is hopeful as a workforce development strategy.

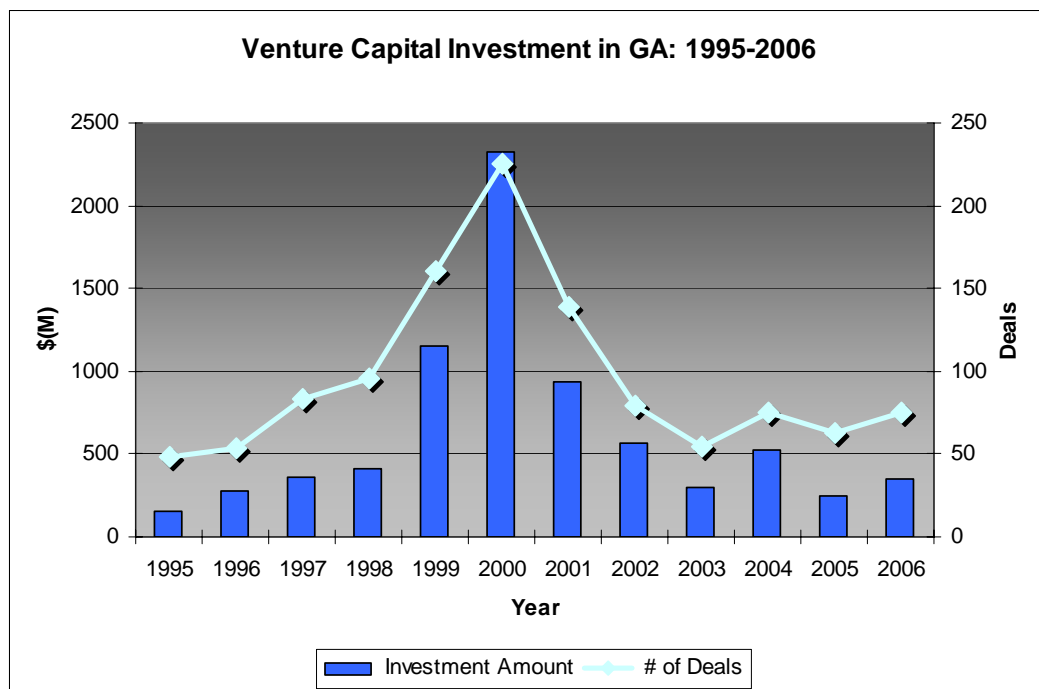


Figure 10: Venture Capital in GA 1995-2006
Source: PriceWaterhouseCoopers

4.6 Digital Music Related Financial Investment

It is important to examine the types of funding available for the industry. Venture capital funding in the media and entertainment, as well as electronics industries was analyzed to exhibit infrastructure investment in digital music. Data was gathered from PriceWaterhouseCoopers.

Venture capital investment is often scrutinized when discussing science and technology investment. In keeping with the premise that digital music is a technology-based industry it was necessary to review such data. Venture capital funding data was limited to the industries that encompass digital music. These industries include: media and entertainment, electronics and instrumentation, networking and equipment, as well as telecommunications. While the venture capital investments information does not necessarily reflect investment in digital music specifically, they do highlight the potential for such investments. Furthermore, venture capital investment also points to the future development of digital music support industries.

Georgia trails only Florida in Venture Capital investments in the south. From 1995-2006 Georgia averaged 84 venture capital deals each year totaling over \$7 billion in funding (see chart 2). Rather than discuss venture capital investment in all of the related fields, attention was paid to the media and entertainment industry investments, telecommunications, and networking and equipment industries. The media and entertainment industry received over \$700 million in funding during this period. Moreover, the industry averages 9 venture capital deals per year. In 2004 alone, nearly \$50 million was invested in Georgia's media and entertainment industry.

The Georgia telecommunications and networking and equipment industries were analyzed to provide information into anticipated growth in these industries that provide support to the digital music industry. Total investment in the networking and equipment industry over the last decade has topped half a billion dollars. However, the number of deals in this industry has decreased over the last few years. The telecommunications industry, not surprisingly, has received over \$1 billion in venture capital investments.

Yet as with the networking industry, this industry has seen a decline in investments. However, although these industries have seen lessened investment, this factor should be viewed as a positive development. The decline in investments points out that these industries are well established and no longer need the same capital as other emerging industries. This also highlights stability within these industries that form the foundation for the future growth of the digital music industry in the state, providing promise for the digital music industry in Atlanta.

Chapter 5: Challenges and Policy Considerations

5.1 Intellectual Property Issues

In the context of the digital music industry the related legal framework must be discussed. In particular, digital music presents a unique challenge in that the industry continues to undergo regulatory changes. Most prominently, the digital music industry lays at the heart of many issues of intellectual property and copyright law. These legal issues are highlighted in this research for a few reasons. First, digital and networking technologies have made it difficult for record labels and artists to control the usage and spread of their music. In fact, new regulations such as the Digital Millennium Copyright Act of 1998 (DCMA) have been implemented to enable owners of copyrighted materials the ability to protect their rights. Additionally, the genres of music that are associated with digital music production are those that utilize such processes as sampling which fuse the works of multiple artists into new musical sounds. Therefore, copyright law is integral to understanding the digital music industry.

Copyrights are used to protect original works from unauthorized duplication performance, and digital audio transmission. Below is a list of some of the rights protected through copyright.

1. “To reproduce the copyrighted works in copies or phonorecords;
2. To prepare derivative works based upon the copyrighted work
3. To distribute copies of the copyrighted work to the public by sale.
4. To perform the copyrighted work publicly by means of a digital audio transmission. (Gordon, 2005)”

Digital music producers are able to capitalize on their production through the use of copyright law. This is done through registration and copyrighting of the master. The music master is the final product developed through the collaboration between the producer, artists, and writers. However, to copyright material, companies must have received the rights from the artists and writers involved. This presents an interesting challenge to digital music producers. As previously stated, the majority of digital recording companies are small independent and horizontally integrated firms. These firms are often limited in their ability to gain the control of works by artists and writers given that they do not necessarily sign such entities to their firm control. In other words, copyright law regarding master recordings favors larger vertically integrated firms that are able to provide the necessary capital to own master recordings.

5.2 Digital Music Laws Briefly

According to Gordon there are 3 statutes that merit attention in relation to digital music. These laws and there descriptions are (Gordon, 2005):

1. Home Audio Recording Act of 1992: Is important to digital recording because it neither inhibits nor allows the copying of music via digital formats. This law is relevant to digital music given that some recording studios are home-based, therefore, blurring the line between infringement and compliance. Greater clarification of this ruling will benefit the digital music industry.
2. Digital Performance Right in Sound Recording Act of 1995:
This act was created explicitly for digital audio streaming. Digital streaming of music requires such broadcasters get permission from the owners of masters of sound recordings.
3. Digital Millennium Copyright Act of 1998:
This act is significant because it allows internet radio streaming of copyrighted music with out the need for webcasters to gain permission from copyright owners.

These regulations have a profound effect upon the digital music industry. Particularly, they create the need for legal services to firms in the industry. Intellectual property laws maintain certain grey areas particularly for small and independent firms.

For instance, these laws cover copyrighted materials; however, they do not give legal understanding to issues of works that have not been copyrighted. A primary example of this issue occurred with a digital recording firm in Atlanta's downtown.

5.3 Digital Music Regulation in Atlanta

January 16, 2007, Atlanta area officers, teamed with the Recording Industry Association of America (RIAA), raided the Aphilliates Music Group, owned and operated by prominent mixtape producer, Tyree Simmons (DJ Drama). Simmons and partner Don Cannon were arrested and charged under the State of Georgia's Racketeering Influenced Corrupt Organization (RICO) law for distribution and sales of un-copyrighted music. The arrest of Simmons illustrates the difficulties and complexities inherent in regulating the dynamic digital music industry. Whereas copyright infringement laws in Georgia make no distinction between illegally copied and non-copyrighted materials, it is note worthy that the raid was led by agents from an artist advocacy organization, the RIAA. Moreover, the confiscated music was originally recorded and produced voluntarily by artists and the DJs. In fact, mixtapes, which are actually unlicensed songs and freestyles on Compact Disk, are an integral portion of the promotion and development of hip-hop artists. According to Sanneh, "...record companies have traditionally ignored and sometimes bankrolled mixtapes..." (Sanneh, 2007). This makes the RIAA's decision to target the Aphilliates Music Group all the more notable. This case exemplifies the contradictions and uncertainty created by digital music regulation.

Chapter 6: Conclusion and Recommendations

6.1 Conclusion: Plurality, Diversity, and Government Support

This research has sought to accomplish parallel activities. Through firm and employment data analysis I have described Atlanta's digital music industry, thereby conducting an industry study. However, the purpose of this study was not only to develop a study of an emerging industry, but to examine the implications of an industry for technology focused workforce and economic development initiatives. In completing these tasks I have found that plurality of industrial perspective, diversification, and government support are essential to the development strategies.

Technology oriented economic development has focused on established industries, reproducing issues of distributional inequity and employment inequality. This paper has shown, through spatial analysis; that investments in the digital music industry can assist in reduction of distributional inequities. Investment in this industry involves foremost recognition of its economic and social contribution to the Atlanta region. Investment also includes attention to the needs of firms within this project-based setting. Finally, capital investment can significantly assist in the development of the industry that adds employment opportunities for Atlanta residents.

6.2 Recommendations for Investing in Atlanta's Digital Music Industry

The following outlines recommendations for advancing the digital music industry in Atlanta:

1. **Industry Specific Workforce Intermediation-** Digital music is inherently a project-based employment industry. This has implications for the regional labor market and public policy in that supporting industries and policies must be available for flexible workers. Policies that are needed for such workers include:
 - ✓ **Education-** Provision of information about educational opportunities in the field.
 - ✓ **Benefits Portability-** Employees in the digital music firms need to be informed of self-employment benefits. Healthcare benefits are often too costly for flexible workers.
 - ✓ **Legal Council-** Entrepreneurs and employees must be kept abreast of the rapidly changing digital music regulations.
 - ✓ **Industry Promotion-** Recognition of the digital music industry as an industry that is distinct and valuable.
2. **Business Assistance-** The digital music industry in Atlanta should be recognized as more than simply another entertainment industry business. Rather entrepreneurs in this field need technology-oriented business development services. Here lays an opportunity for digital music specific business incubation which includes access to venture capital and patent

commercialization services. Moreover, the industry has been shown to include minority owned firms. Business assistance unique to minority and women-owned firms is also necessary.

3. **Educational Collaboration-** Educational access is important to the digital music industry. Foremost, digital music requires the ability to operate complex software and hardware. Institutions that offer coursework in digital music related programming should collaborate with local business to facilitate technology transfer that benefits local economic development.
4. **Infrastructure and Equipment Access-** The digital music industry has emerged due to technological advancements. Atlanta's investment in telecommunications infrastructure should continue. City-wide free wireless internet access would enable additional opportunities for growth of the digital music industry. Moreover, policy-makers should provide low-income and disadvantaged areas with the tools and equipment necessary to take advantage of telecommunications infrastructure. Thus computer laboratories should be an investment that parallels telecommunications infrastructure investments.

APPENDIX A: DIGITAL MUSIC FIRMS

| NAME | CITY | EMPLOYEES | SALES | NAICS |
|--------------------------------|----------------|-----------|--------------------------|----------|
| 1 Life Records | Ellenwood | 1 | Less Than \$500,000 | 51224002 |
| 10th Planet Productions | Marietta | 1 | Less Than \$500,000 | 51224002 |
| 2 High Studios | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |
| 4468 Productions | Snellville | 1 to 4 | Less Than \$500,000 | 51224002 |
| Absolute Recording | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| ACA Digital Recording | Decatur | 1 to 4 | Less Than \$500,000 | 51224002 |
| Acous Tech Music Productions | Atlanta | 9 | \$1 to \$2.5 Million | 51224002 |
| All Day Inc | Rex | 1 to 4 | Less Than \$500,000 | 51224002 |
| All N All Productions | Fayetteville | 1 to 4 | Less Than \$500,000 | 51224002 |
| Allgood Productions Inc | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Alliance Artists LTD | Alpharetta | 1 to 4 | Less Than \$500,000 | 51224002 |
| AMB Recording Studio | Griffin | 1 to 4 | Less Than \$500,000 | 51224002 |
| Arcadia Production & Recording | Norcross | 1 | Less Than \$500,000 | 51224002 |
| ARMUSIC1.COM | Conyers | 1 to 4 | Less Than \$500,000 | 51224002 |
| Atlanta Duplications | Snellville | 4 | \$500,000 to \$1 Million | 51224002 |
| Atlanta Recording Studio | Kennesaw | 1 | Less Than \$500,000 | 51224002 |
| Avatar Events Group | Atlanta | 10 | \$1 to \$2.5 Million | 51224002 |
| B 3 Neighbahood Productions | Jonesboro | 1 to 4 | Less Than \$500,000 | 51224002 |
| B T Post | Atlanta | 8 | \$1 to \$2.5 Million | 51224002 |
| Belden Music & Sound | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Ben Riley Productions | Woodstock | 1 | Less Than \$500,000 | 51224002 |
| Bert Elliott Sound Inc | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Bird's Nest Recording Studio | Covington | 1 | Less Than \$500,000 | 51224002 |
| Bitten Entertainment | Fairburn | 1 to 4 | Less Than \$500,000 | 51224002 |
| Blac Temple Records | Acworth | 1 | Less Than \$500,000 | 51224002 |
| Black Dog Entertainment | College Park | 1 to 4 | Less Than \$500,000 | 51224002 |
| Black Lather Music Production | Stockbridge | 1 to 4 | Less Than \$500,000 | 51224002 |
| Blue Sky Records | Fayetteville | 1 | Less Than \$500,000 | 51224002 |
| Blue Sound Studios | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| BME Recordings | Atlanta | 8 | \$1 to \$2.5 Million | 51224002 |
| Bodyslam Entertainment | Decatur | 1 to 4 | Less Than \$500,000 | 51224002 |
| Bourbon Records | Powder Springs | 1 | Less Than \$500,000 | 51224002 |
| Brick House University | Decatur | 1 to 4 | Less Than \$500,000 | 51224002 |
| Broncove | Douglasville | 1 to 4 | Less Than \$500,000 | 51224002 |
| Butler Sound Studio | Carrollton | 1 | Less Than \$500,000 | 51224002 |
| Captive Sound Recording | Atlanta | 2 | \$500,000 to \$1 Million | 51211003 |
| Caroline Distribution | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Catspaw Productions Inc | Alpharetta | 6 | \$500,000 to \$1 Million | 51224002 |
| Chameleon Trax Inc | Snellville | 2 | Less Than \$500,000 | 51224002 |

| | | | | |
|--------------------------------|----------------|--------|--------------------------|----------|
| Citi Life Recording Co | Norcross | 1 to 4 | Less Than \$500,000 | 51224002 |
| CMO Productions | Marietta | 4 | \$500,000 to \$1 Million | 51224002 |
| Coffeehouse Recording | Stockbridge | 1 | Less Than \$500,000 | 51224002 |
| Communications & Entertainment | Atlanta | 21 | \$5 to \$10 Million | 44311203 |
| COS Mastering | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Crawford Communications Inc | Atlanta | 300 | \$50 to \$100 Million | 51211016 |
| Creative Sound Concepts | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Crossover Entertainment Studio | Atlanta | 6 | \$1 to \$2.5 Million | 51219903 |
| D Lo Entertainment | Snellville | 4 | \$500,000 to \$1 Million | 51224002 |
| Da Booth | Decatur | 1 | Less Than \$500,000 | 51224002 |
| Dagajacc Records | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Definition Music | Oxford | 1 to 4 | Less Than \$500,000 | 51224002 |
| Delores Burgess Music Mnstrs | Stone Mountain | 3 | Less Than \$500,000 | 51224002 |
| Dirty Red Records | Dallas | 1 to 4 | Less Than \$500,000 | 51224002 |
| Dirty South Studios | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Disturbing Tha Peace Rcrdngs | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Diversecity Records | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Dogwood Recording Studio | Conyers | 2 | Less Than \$500,000 | 51224002 |
| Don't Play Productions | Lawrenceville | 5 | \$500,000 to \$1 Million | 51224002 |
| Doo Tyme Recording & Prdctn | Norcross | 1 to 4 | Less Than \$500,000 | 51224002 |
| Doppler Studios | Atlanta | 20 | \$2.5 to \$5 Million | 51224002 |
| Double Edge Records | Covington | 6 | \$500,000 to \$1 Million | 51224002 |
| Down 20 Records | Covington | 2 | Less Than \$500,000 | 51224002 |
| Down Right Records Inc | Ellenwood | 5 | \$500,000 to \$1 Million | 51224002 |
| Drive Records | Stone Mountain | 4 | \$500,000 to \$1 Million | 51224002 |
| Dynasonic LLC | Marietta | 4 | \$500,000 to \$1 Million | 51224002 |
| East End Records | Kennesaw | 1 to 4 | Less Than \$500,000 | 51224002 |
| East End Records | Woodstock | 1 to 4 | Less Than \$500,000 | 51224002 |
| East-A Records | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Eclipse Audio | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Emanon Music | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Exocet Productions Inc | Chamblee | 4 | \$500,000 to \$1 Million | 51224002 |
| Forward Marketing | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |
| Four Kings Inc | Atlanta | 15 | \$1 to \$2.5 Million | 51224002 |
| Frankly Phenominal | Stone Mountain | 7 | \$1 to \$2.5 Million | 51224002 |
| Glenn Shick Mastering | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| God's Strength Records | Atlanta | 13 | \$1 to \$2.5 Million | 51224002 |
| Grand Hustle Entertainment | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Greentree Farms Records | Decatur | 1 to 4 | Less Than \$500,000 | 51224002 |

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|--------------------------------|------------------|--------|--------------------------|----------|
| Grimey Records Production Co | Norcross | 2 | Less Than \$500,000 | 51224002 |
| Gues Whoz Ent | Lithonia | 4 | \$500,000 to \$1 Million | 51224002 |
| Gunsmoke Records | College Park | 1 | Less Than \$500,000 | 51224002 |
| Haywood's Recording Studios | Atlanta | 1 | Less Than \$500,000 | 56199001 |
| Higher Ground Media Group | Oxford | 2 | Less Than \$500,000 | 51224002 |
| Hit City Music | East Point | 1 | Less Than \$500,000 | 51224002 |
| Igloo Digital Mastering | Riverdale | 1 to 4 | Less Than \$500,000 | 51224002 |
| In Control Records | Alpharetta | 12 | \$1 to \$2.5 Million | 51224002 |
| Inspedia LLC | Suwanee | 1 to 4 | Less Than \$500,000 | 51224002 |
| Island Gruve Music Works Inc | Decatur | 1 | Less Than \$500,000 | 51224002 |
| J R Ball Records | Conley | 2 | Less Than \$500,000 | 51224002 |
| Jimmy Studios | Decatur | 3 | Less Than \$500,000 | 51224002 |
| Johnson Brothers Recording Std | Covington | 1 | Less Than \$500,000 | 51224002 |
| Johnson's Recording Studio | Covington | 1 to 4 | Less Than \$500,000 | 51224002 |
| Jumping Bug Productions | Lilburn | 1 | Less Than \$500,000 | 51224002 |
| Just Ahead Recording | Cartersville | 1 to 4 | Less Than \$500,000 | 51224002 |
| Knock Hard Productions | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Lakefront Studios | Loganville | 2 | Less Than \$500,000 | 51224002 |
| Lamp Music Studio | Whitesburg | 1 | Less Than \$500,000 | 51224002 |
| Ledbelly Sound Studio | Canton | 2 | Less Than \$500,000 | 51224002 |
| Loft Recording Studio-Atlanta | Marietta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Magick Lantern | Atlanta | 14 | \$1 to \$2.5 Million | 51224002 |
| Majestic Flava Entertainment | Norcross | 2 | Less Than \$500,000 | 51224002 |
| Mastering Manhood | Mableton | 1 to 4 | Less Than \$500,000 | 51224002 |
| Mastering Music Through Tech | Jonesboro | 1 to 4 | Less Than \$500,000 | 51224002 |
| Maxwell Sound & Video | Atlanta | 7 | \$1 to \$2.5 Million | 51224002 |
| Maxwell Sound Studios | Decatur | 1 to 4 | Less Than \$500,000 | 51224002 |
| Mayfield Recording | Austell | 1 to 4 | Less Than \$500,000 | 51224002 |
| Mc Mix Recording | Smyrna | 2 | Less Than \$500,000 | 51224002 |
| Melisma Productions Inc | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Mercyless Records | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Meta-Versal-Media | Kennesaw | 1 to 4 | Less Than \$500,000 | 51224002 |
| Milk Money Consulting Inc | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Mindzai Multimedia LLC | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |
| Mo Better Recordings | Lithonia | 1 | Less Than \$500,000 | 51224002 |
| Mojo Davis Music Productions | Decatur | 1 | Less Than \$500,000 | 51224002 |
| Multi Music Studios | Covington | 1 to 4 | Less Than \$500,000 | 51224002 |
| Music Factory & Recording | Clarkston | 1 to 4 | Less Than \$500,000 | 51224002 |
| Music Mogul Group LLC | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Musicline Group | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| New Breed South | Fayetteville | 1 | Less Than \$500,000 | 51224002 |
| Nickel & Dime Studio | Avondale Estates | 1 to 4 | Less Than \$500,000 | 51224002 |
| Night Sky Music | Griffin | 1 to 4 | Less Than \$500,000 | 51224002 |
| Nocahoma Records | Powder Springs | 1 to 4 | Less Than \$500,000 | 51224002 |
| North Georgia Dance & Music | Dacula | 2 | Less Than \$500,000 | 61161011 |

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|------------------------------|----------------|--------|--------------------------|----------|
| Nu Millennium Distribution | Stone Mountain | 1 | Less Than \$500,000 | 54187005 |
| Olivers's Music | Jonesboro | 5 | \$1 to \$2.5 Million | 45114006 |
| On Production Studio | Decatur | 1 | Less Than \$500,000 | 51224002 |
| Osiris Studio | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Outback Studio & Consulting | Powder Springs | 1 to 4 | Less Than \$500,000 | 51224002 |
| Ovapoints Entertainment | Austell | 1 to 4 | Less Than \$500,000 | 51224002 |
| Paradise Studio Inc | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Patch WERK Recording Studios | Atlanta | 13 | \$1 to \$2.5 Million | 51224002 |
| Peep Dis Entertainment | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Phiyah Phiyah Records | Marietta | 3 | Less Than \$500,000 | 51224002 |
| Pine Straw Recording Studio | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |
| Platinum Records | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Princess World Entertainment | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Pro Records Inc | Marietta | 1 | Less Than \$500,000 | 51224002 |
| Psallo Music & Recording Inc | Jonesboro | 1 to 4 | Less Than \$500,000 | 51224002 |
| Purple Ribbon Records LLC | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| R M Audio | Atlanta | 2 | Less Than \$500,000 | 51224002 |
| Rare Air Studios | Alpharetta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Raw Deal Records Studio | College Park | 4 | \$500,000 to \$1 Million | 51224002 |
| Red Room Recording | Marietta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Red Swan | Atlanta | 2 | Less Than \$500,000 | 51224002 |
| Reveal Audio Svc | Marietta | 1 | Less Than \$500,000 | 51224002 |
| Revolution Studios | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Rex Trax Inc | Lawrenceville | 1 | Less Than \$500,000 | 51224002 |
| Riot Atlanta | Atlanta | 35 | \$10 to \$20 Million | 51211003 |
| RKM Sound Studios | Marietta | 2 | Less Than \$500,000 | 51224002 |
| Roadrunner Records | Atlanta | 2 | Less Than \$500,000 | 51224002 |
| Rockhouse Recording Studio | Adairsville | 1 to 4 | Less Than \$500,000 | 51224002 |
| Sam's Tape Truck | Atlanta | 6 | \$500,000 to \$1 Million | 51224002 |
| Saucy Jack Records | Pine Lake | 1 | Less Than \$500,000 | 51224002 |
| Seeing Claret Records | Atlanta | 2 | Less Than \$500,000 | 51224002 |
| Sharper Productions & Record | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Shawn Delacy Ent | Lithonia | 2 | Less Than \$500,000 | 51224002 |
| Silent Partner Productions | Atlanta | 8 | \$1 to \$2.5 Million | 51224002 |
| Silent Sound Studios | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Sir James' Palace | Decatur | 2 | Less Than \$500,000 | 51224002 |
| Smith's Recording Studios | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| So So Def Recordings Inc | Atlanta | 10 | \$1 to \$2.5 Million | 51224002 |
| Soap Box Studios | Atlanta | 11 | \$1 to \$2.5 Million | 51224002 |
| Sojo Music Inc | Alpharetta | 1 | Less Than \$500,000 | 51224002 |
| Sonica Recording | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Sony Music Inc | Atlanta | 30 | \$2.5 to \$5 Million | 51224002 |
| Sonybmg Distribution | Atlanta | 30 | \$2.5 to \$5 Million | 51224002 |
| Soul Smuggler Productions | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |

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|-------------------------------|----------------|--------|--------------------------|----------|
| Sound Lab | Smyrna | 3 | Less Than \$500,000 | 51224002 |
| Soundbyte Inc | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |
| Sounds Atlanta | Atlanta | 5 | \$500,000 to \$1 Million | 51224002 |
| Southern Tracks Recording Std | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Spotlight Sound Studios | Alpharetta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Sta Bizzi Entertainment | College Park | 1 to 4 | Less Than \$500,000 | 51224002 |
| Stankonia Studios | Atlanta | 4 | \$500,000 to \$1 Million | 51224002 |
| Star Vision Intl Records | Conyers | 4 | \$500,000 to \$1 Million | 71119009 |
| STR Recording | Powder Springs | 1 to 4 | Less Than \$500,000 | 51224002 |
| Studio 1117 | Bowdon | 3 | Less Than \$500,000 | 51224002 |
| Studio Executive Solutions | Duluth | 6 | \$500,000 to \$1 Million | 51224002 |
| Studio K Recording | Tucker | 1 to 4 | Less Than \$500,000 | 51224002 |
| Summum Studio | Lawrenceville | 1 | Less Than \$500,000 | 51224002 |
| Thomas Music Studios | Marietta | 1 to 4 | Less Than \$500,000 | 51224002 |
| Titanium Recording Studios | Clarkston | 1 to 4 | Less Than \$500,000 | 51224002 |
| Tree Sound Studios | Norcross | 10 | \$1 to \$2.5 Million | 51224002 |
| Tretrous Productions | Stone Mountain | 1 | Less Than \$500,000 | 51224002 |
| True Light Productions | Decatur | 1 to 4 | Less Than \$500,000 | 51224002 |
| Twelve Oaks Recording | Smyrna | 4 | \$500,000 to \$1 Million | 51224002 |
| Two High Studios | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| U S Records | Doraville | 1 to 4 | Less Than \$500,000 | 51224002 |
| Underground Recording Studio | Riverdale | 5 | \$500,000 to \$1 Million | 51224002 |
| Universal Entertainment Group | Tucker | 1 to 4 | Less Than \$500,000 | 51224002 |
| Unknown Records | Alpharetta | 1 | Less Than \$500,000 | 51224002 |
| Unseen Productions | Winston | 3 | Less Than \$500,000 | 51224002 |
| Vagabond Productions | Fayetteville | 4 | \$2.5 to \$5 Million | 51223001 |
| Vault | Smyrna | 8 | \$1 to \$2.5 Million | 51224002 |
| Virtuoso Productions | Atlanta | 1 to 4 | Less Than \$500,000 | 51224002 |
| W Music Records | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Whippoorwill Sound Inc | Smyrna | 1 | Less Than \$500,000 | 51224002 |
| Whirling Dervish Inc | Duluth | 1 | Less Than \$500,000 | 51224002 |
| White Dog Studios | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Who Dat Productions | Atlanta | 3 | Less Than \$500,000 | 51224002 |
| Wolff Brothers Post | Atlanta | 15 | \$1 to \$2.5 Million | 51224002 |
| Woodpile Audio | Tucker | 1 to 4 | Less Than \$500,000 | 51224002 |
| World Talent Records | Lilburn | 1 | Less Than \$500,000 | 51224002 |
| Yellow Rose Entertainment | Atlanta | 1 | Less Than \$500,000 | 51224002 |
| Zac Recording | Atlanta | 1 | Less Than \$500,000 | 51224002 |

APPENDIX B: DIGITAL MUSIC EMPLOYMENT

Table displays Competing definitions of high-technology and information-technology employment.

| <i>Authors</i> | <i>Sponsors</i> | <i>Elements of High-Tech</i> |
|-----------------------|------------------------------|---|
| Atkinson & Gottlieb | Progressive Policy Institute | Electronics manufacturing, software and computer-related services, telecommunications, data processing and info services... |
| AEA and NASDAQ | AEA & NASDAQ | Electronics manufacturing, communications services, software services <i>SIC= 737*, 48**</i> |
| Cortright & Mayer | Brookings Institution | Computer and Electronic product manufacturing, software publishers, Info services & data processing services, computer systems design and related services <i>NAICS=334*, 5112*, 514*, 5415*</i> |
| DeVol | Milken Institute | Engineering, R&D services <i>SIC= 871*, 873*</i> |
| **Chapple & Markusen | Econ Dev. Quarterly | Engineering (general), Computer Programmers, <i>OES=13017, 22126, 22127, 22199, 22999, 25102, 25103, 25105, 25111, 25999...</i> |

Source: Adapted from: (Chapple, Markusen, Yamamoto, Schrock, & Yu, 2004); Occupational Employment Statistics, Bureau of Labor Statistics

**Includes managers with science and engineering backgrounds as well as certain groups of computer professionals. -Excludes technicians.

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