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Preface

A brief disclaimer: this working paper is a case study of the printing and apparel manufacturing industries in San Francisco, originally prepared for the City of San Francisco. Because it was prepared as a report for the city, its principal offering is an empirical look at the two industries. As such, it does not address in detail the broader theoretical context of changes in the nature of production and industrial location. That task remains for another iteration of the study.

The author is grateful for the financial and logistical support of the San Francisco Planning Department in the preparation of this report. In addition, she thanks Miriam Chion and Cheryl Parker for their invaluable research assistance. Michael Teitz, Yuko Aoyama, Chris Benner, and several anonymous reviewers provided very useful comments on different versions of this paper. Of course, the faults of the paper are the author's alone.

The Transformation of Traditional Industries in San Francisco: The Cases of Printing and Apparel Manufacturing

Karen Chapple

Introduction

Manufacturing firms have departed the older central cities of the U.S. en masse since World War II. The industrial exodus from San Francisco is well established, and has occurred in a national context of increased offshore production and plant relocation to suburban areas. The manufacturing sector has been so consistently in decline that it has been easy to overlook a substantial *reverse* in the trend: certain types of manufacturing traditional to San Francisco, specifically apparel manufacturing and printing and publishing, have either grown or stabilized in the city since the mid-1980s, even as formerly key manufacturing sectors such as food processing and fabricated metals continue to depart. Employment in apparel manufacturing has grown 24 percent since 1985, for a total of 13,999 jobs in 1995, while printing and publishing employment has remained basically stable, at 8,186 jobs, in the same period. Altogether, these sectors account for 4 percent of San Francisco employment; apparel manufacturing is the tenth largest economic sector (at the two-digit SIC level) in the city, and printing and publishing is the 18th largest sector. For the latter sector, the focus of this study is printing, rather than newspaper, periodical, and book publishing; commercial printers comprise approximately one-third of the printing and publishing sector.

Both of these sectors have undergone substantial transformation in recent years: they increasingly incorporate new technological processes and manufacture high value-added products. Yet the two sectors vary widely in the extent of their technological transformation, their respective roles in the economy, and the issues they confront in seeking to remain and grow in San Francisco.

High-quality garment production, typically relying on in-house designers and sophisticated engineering technology, comprises a growing segment of San Francisco's apparel sector. However, the majority of apparel manufacturers and contractors continue to produce a high volume of garments for national discount clothing retailers, using a labor-intensive production process that has changed little in the last century. Both the high- and low-end manufacturers rely on a mostly female, mostly low-wage labor force that is overwhelmingly comprised of San Francisco residents. The future of the apparel industry in San Francisco depends largely on supra-local factors, from trade agreements at the international level, such as NAFTA and GATT, to state legislative changes, such as the planned increase of the state minimum wage in March 1998. However, because of its labor-intensive nature, the availability of industrial space near a skilled labor force and adequate public transportation is also key to the industry's growth.

In contrast, the vast majority of printers have switched to an almost entirely electronic (digital) process in order to remain competitive. They produce a variety of printed material for downtown financial and

advertising firms, as well as a growing market in Silicon Valley. Their workforce tends to be high-skilled and high-wage, and the majority of their employees live in San Francisco. Local factors are the key to the prognosis for the San Francisco printing industry: in order to remain and grow in the city, printing firms generally need a location near their client base and adequate space for operations.

The survival and growth of these industries in recent years is due in part to their increasing concentration within two neighborhoods which continue to play a vital role as industrial districts for San Francisco: South of Market (SOMA) and (to a lesser extent) Potrero. SOMA and Potrero provide space for more than half of the city's apparel firms, employing some 10,000 workers. More than 46 percent of the city's printing and publishing firms are located in these two districts, with more than 6,500 jobs. At the same time as these manufacturing sectors have intensified their presence in SOMA and Potrero, these neighborhoods have experienced substantial new office and residential development, as well as conversion of industrial buildings to office and residential use. As land values and rents increase, particularly in SOMA east of Third Street, a number of manufacturing firms have relocated or gone out of business. While some firms move within SOMA or Potrero, many leave the city altogether, because they lose the advantages of transportation access and proximity to the CBD that SOMA provides.

The future of the apparel manufacturing and printing industries is critical to the San Francisco economy for several reasons, including their close links with other economic sectors and their provision of the low-skilled jobs which are increasingly important in the context of welfare reform. Printing firms provide vital services for the leading economic sectors in the city, the finance, insurance, and real estate sector, and the business services sector. Cities with strong links to the national and international economies, such as Los Angeles and New York, have sustained growth in the FIRE and business services sector in part because of the continued presence of commercial printers in close proximity to the CBD. Apparel manufacturers are key employers of low- or semi-skilled workers in the city: they provide more low-skilled jobs (approximately 8,400) than any other sector in the city with the exception of retail. The disappearance of these jobs would substantially increase the population of public assistance recipients in San Francisco.

The city has established a number of policies in support of the manufacturing sector. In the Commerce and Industry Element of its Master Plan, the city's objectives include maintaining and enhancing a diverse economic base; providing expanded employment opportunities for city residents, particularly the economically disadvantaged; and improving the viability of existing industry in the city. To achieve these objectives, the Plan specifically recommends creating a supportive business climate, in terms of transportation access and expansion space; focusing on providing job opportunities for low-skilled workers, particularly those that live in the city; and avoiding public actions that displace industrial firms.

The purpose of this study is to understand the trends in the apparel and printing industries in order to determine what city action, if any, is appropriate to help support these sectors. The study will provide an assessment of the importance of apparel manufacturing and printing for the local economy, their

impacts in the local community, and the challenges they face in maintaining and increasing their presence in San Francisco.

This study utilizes a variety of data sources and research methods to help ascertain the trends and issues in apparel manufacturing and printing. Secondary source data on employment, establishments, and labor force characteristics was compiled from the EDD database, the 5 percent Public Use Microdata Sample from the 1990 U.S. Census, and the 1987 and 1992 U.S. Censuses of Economic Activity. A comprehensive database of apparel manufacturing and printing businesses in the city was developed from a variety of sources, including industry association directories, telephone directories, the San Francisco Tax Collector's database, and the Dun and Bradstreet business database. To provide information on the buildings occupied by industry firms, this database was then linked with the San Francisco Tax Assessor's database. In addition, semi-structured, in-depth interviews were conducted with approximately 25 firms and a half-dozen major industry figures involved in job training, industry associations, or regulatory agencies. The apparel firms interviewed were selected to represent a broad cross-section of the San Francisco apparel sector, including small vertical manufacturers producing for the high-end sector, large budget-line manufacturers, and contractors both small and large, informal and unionized. Printing firms were strategically selected, in order to focus on large commercial printers who utilize traditional industrial space, rather than the quick printers who occupy retail space or the small prepress operations which generally occupy office space.

This paper looks first at apparel manufacturing, providing an overview of changes in the industry and issues it confronts. The next section examines the printing industry. The paper then turns to an examination of locational changes in the industry and competition for space with other land uses, focusing on SOMA, Potrero, and the Mission. The paper concludes with a discussion of the policy implications of its findings, in terms of economic development and land use.

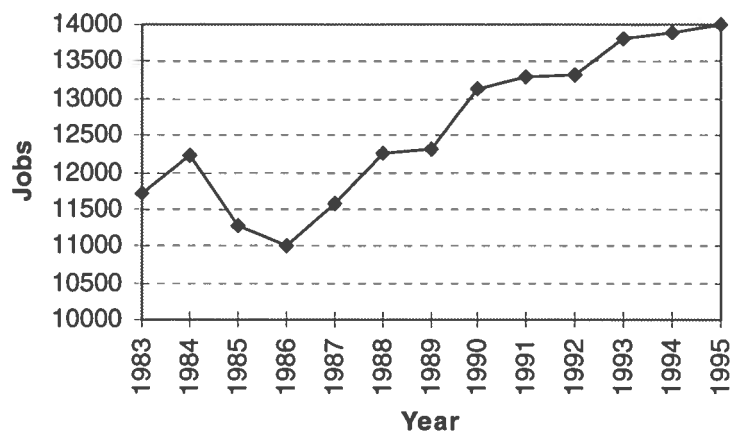
Apparel Manufacturing in San Francisco

1. Overview

The apparel manufacturing sector in San Francisco has experienced substantial growth since the early 1980s. However, employment in the sector has increased faster than the number of firms, indicating a shift in the structure of the industry towards larger firms. Overall, as shown in Figures 1 and 2, the number of firms has increased 10 percent (from 381 in 1983 to 414 in 1994), while employment increased 14 percent (from 11,710 in 1983 to 13,999 in 1995). The number of firms has actually declined from a peak of 463 in 1990; however, the number of medium to large establishments (with more than 50 employees) has increased by almost 50 percent, from 40 to 59.

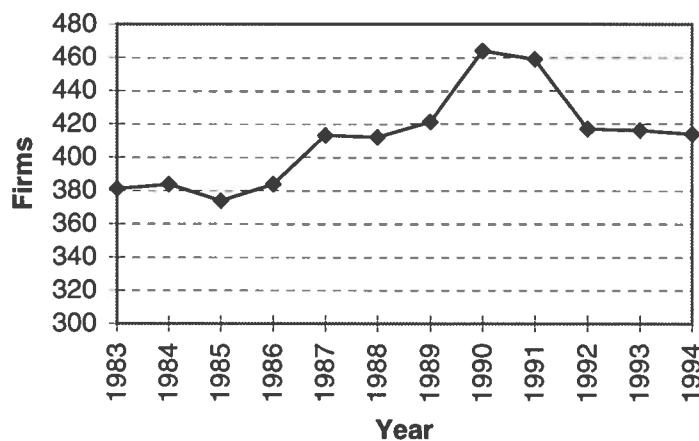
The shift towards larger firms has been accompanied by a substantial shift in the type of manufacturing: while 57 percent of San Francisco apparel firms manufactured women's or girls' apparel in 1981,

Figure 1. Employment in Apparel Manufacturing, San Francisco



Source: California Employment Development Department.

Figure 2. Apparel Manufacturing Firms, San Francisco

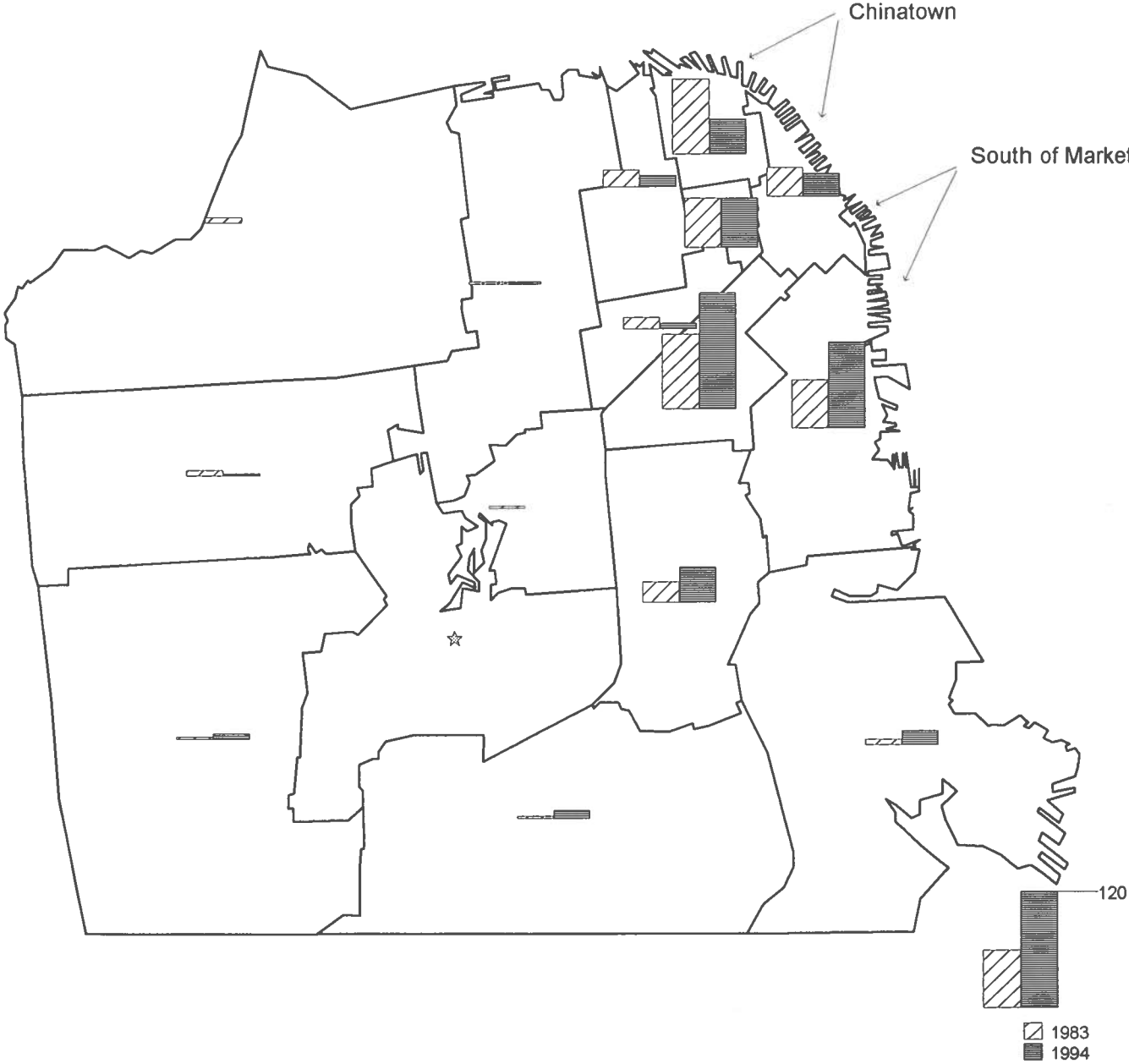


Source: County Business Patterns.

by 1994, 76 percent were in the women's/girls' apparel sector. This shift resulted from both the decline of traditional apparel sectors in San Francisco such as uniform manufacturing and furriers, and the increasing concentration of women's and girls' wear manufacturers in the city.

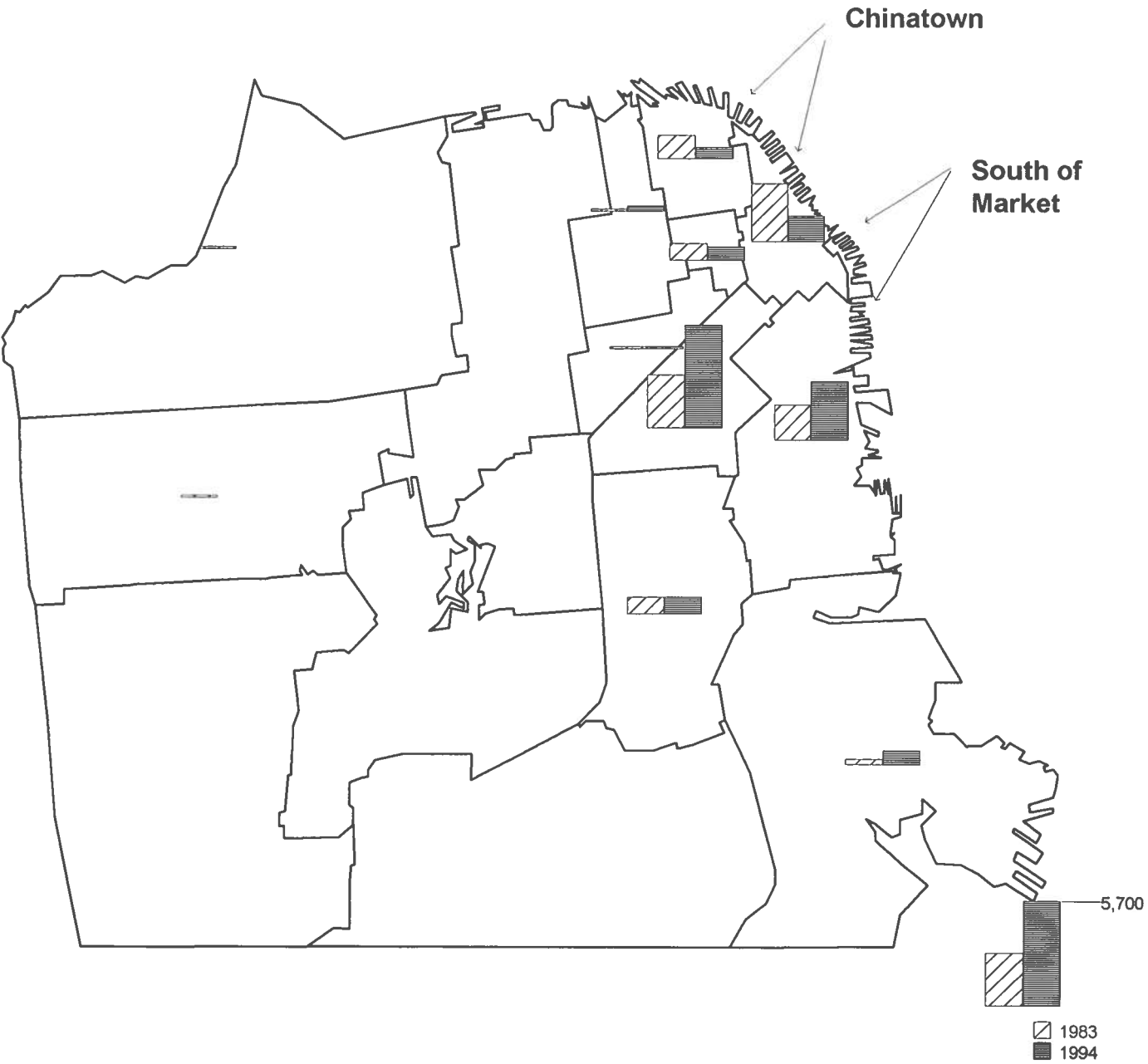
The growth of apparel manufacturing has occurred primarily within SOMA and Potrero, as well as the southernmost area of the Financial District. Overall, the number of apparel firms and employees in SOMA and Potrero doubled from 1983 to 1994, while the steepest decline was registered in Chinatown (Figures 3 and 4). This occurred largely because of the availability of expansion space in these industrial districts; the more successful garment factories have outgrown their space in Chinatown, typically above

Figure 3. Location of Apparel Firms in San Francisco, 1983 and 1994



Source: County Business Patterns, California Employment Development Department

Figure 4. Location of Apparel Employment in San Francisco, 1983 and 1994



Source: County Business Patterns, California Employment Development Department

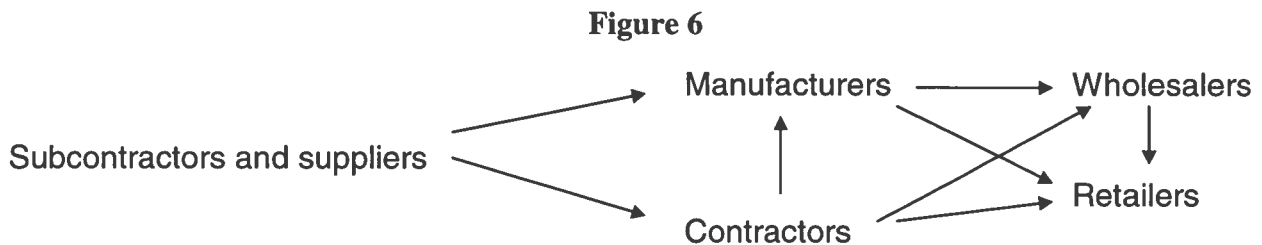
Figure 5. Apparel Manufacturing Firms



small storefronts. At present, 50 percent of all firms are in SOMA/Potrero (Figure 5), but 73 percent of large firms (with more than 50 employees) have chosen to locate in these areas.

2. Structure of Apparel Industry

The apparel industry is comprised of a complex network of manufacturers, contractors, subcontractors, suppliers, and retailers (Figure 6). In essence, the manufacturer designs a product, and produces a sample for retailers. The retailers determine the market demand for a product, and order it in volume from the manufacturer. The manufacturer then produces the product in-house or, more often, contracts out for production. This out-sourcing may consist of minor assistance from subcontractors who specialize in some aspect of the process such as cutting or pleating, or production of the entire garment by one or more contractors. Wholesalers or distributors often come between manufacturers or contractors and retailers; however, manufacturers may also function as wholesalers.



The relationships among these industry segments have changed considerably in recent years, due to the functioning of the apparel industry as a “buyer-driven commodity chain” (Appelbaum and Gereffi, 1994). In essence, the retail end of the business — and the consumer’s bottom line — determines prices. As such, clothing prices have remained flat in real dollars, while costs have risen. The retail sector has consolidated into essentially five mega-retailers (Wal-Mart, Kmart, Sears, J. C. Penney, and the Federated Department Stores), which increasingly assert control over production in order to cut these costs. In addition, the large “vertical” retailers, such as The Gap, which command a growing share of the market, tend to control production entirely in-house. This commodity chain results in the shift of production to offshore garment manufacturers in low-cost locations, typically in the Pacific Rim but increasingly in Mexico, the Caribbean, Central or Latin America. Some retailers also bypass local manufacturers by using contractors for production. Because of this pressure from the retail sector, manufacturers, and often contractors as well, are increasingly turning to offshore production themselves in order to cut their own costs and remain competitive. In addition, some manufacturers have countered by opening their own retail outlets, bypassing the mega-retailers.

Despite the increase in offshore production, U.S. apparel manufacturing continues to play a critical role in the process. The competitive advantage of domestic production is in its ability to fill orders in a timely fashion, its “quick response,” which is driven by its proximity to markets. Retailers may depend on

offshore producers to fulfill the initial order for a product, but if market demand for the product is high, they turn to local manufacturers to furnish the additional volume needed. Domestic producers may be required to turn around a product in as little as two to three weeks; in contrast, minimum turnaround offshore is four to eight weeks at best, and typically several months.

This “calendar need” of the retailer has also forced the manufacturers and contractors to adopt more competitive production processes. Some manufacturers enhance response time by consolidating production in-house, so that they can exert more control over production timing. These “vertical” manufacturers may also use a modular production strategy, using teams to produce entire garments instead of the customary assembly-line process. Contractors compete to fulfill retail calendar needs by maintaining a supply of the necessary raw materials in-house. Historically, the end customer (the retailer or manufacturer) purchased the fabric and notions for the contractor. But as time pressure has increased, contractors have increasingly assumed a greater share of the risk, by purchasing supplies directly.

Over the past 20 years, the principal change in this industry structure is the relationship between contractors and manufacturers. Contractors have always played a role in apparel manufacturing, by supplying specialized skills and supplemental labor when required. Yet as manufacturers increasingly move their production facilities offshore and downsize their domestic operations, they look to contractors to provide them the flexibility to deal with sudden changes in demand. By using contracting networks, manufacturers gain three competitive advantages: they externalize their labor force, so that they no longer have to manage recruitment, training, and maintenance of their workers; they externalize their capital costs, for equipment and, increasingly, fabric as well; and they shield manufacturers from liability to labor laws. Moreover, with a pool of local contracting firms competing against each other for business, manufacturers can more readily find a low bidder for an order (Loucky et al., 1994). The larger contractors have responded to this pressure by resorting to private label manufacturing, which allows them to cut the manufacturer out of the process entirely by producing directly for major retail or catalog labels.

San Francisco is home to a diverse array of actors in the apparel production network, including large retailers, manufacturers, wholesalers, contractors, subcontractors, and suppliers.

Retailers

Two of the largest vertical retailers in the U.S. maintain corporate headquarters in San Francisco: Levi Strauss and The Gap. These companies manufacture only for themselves, and concentrate production offshore; they do not use San Francisco contractors, and even in-house production of samples is increasingly limited.

However, many other retailers in San Francisco maintain close relationships with local manufacturers. In particular, relatively high-quality retailers, from Macy’s and Saks to dozens of small specialty stores, purchase garments designed especially for them, and often produced as well, by local manufacturers. Another retail segment closely linked to the apparel manufacturers are their own retail discount outlets.

Manufacturers

The most important players in the San Francisco apparel production network are the large manufacturers, who generally produce sportswear and women's wear for the mass market, but are diversifying in order to remain competitive. These manufacturers, including firms such as Byer California, Fritzi, Koret, Esprit, and Jessica McClintock, constitute perhaps 5 percent of all apparel manufacturing establishments in San Francisco, but control the vast majority of production in the city because of their reliance on local contractors. They typically employ 200 to 500 workers in-house, and may contract out as much as half of their volume to San Francisco contractors.

Manufacturers of high value-added men's and women's wear constitute an increasingly vital segment of the manufacturing sector in San Francisco. These companies, which typically employ 30 to 100 employees, comprise 5 to 10 percent of all local manufacturing firms. Approximately half of these high-end producers are vertical manufacturers, who design and produce entirely in-house. The remainder offshore most of their production, typically to China or East Asia.

Wholesalers

San Francisco has approximately 80 apparel wholesalers and distributors, in addition to its apparel manufacturers. In general, the wholesale sector has been declining, as the wholesaling function has been assumed by the more competitive manufacturers or vertical retailers. Firms in the wholesale sector play diverse roles; some wholesalers broker the purchase of fabric or other supplies for local manufacturers, while others actually are manufacturers or retailers as well.

Contractors and Sub-Contractors

San Francisco has approximately 330 contractors and sub-contractors, comprising over 80 percent of all apparel manufacturing firms. The vast majority of these contractors rely on the local large manufacturers for their business. However, a large number produce garments for national retailers or mail-order companies. With the exception of a few firms that produce high-quality sportswear or women's wear, the contractors tend to produce relatively low-end garments for the mass market. While the high-end local manufacturers tend to avoid local contractors, the mass market local manufacturers value their San Francisco contractor base, particularly in comparison to Los Angeles: they have long-term relationships with particular contractors, appreciate the high compliance with labor laws, and value the relatively low level of crime in San Francisco.

Sub-contractors tend to specialize in a particular aspect of the production process, from low-skilled tasks like cutting and sewing to more complex jobs such as pleating, smocking, biasing, embroidering, grading, or marking. Sub-contractors are particularly sensitive to downswings in the local apparel industry, as they depend on demand for their specialty from a broad spectrum of manufacturers and contractors.

Suppliers

Approximately 20 suppliers in San Francisco provide thread, zippers, and other notions for contractors and manufacturers. Most of the fabric used in the local apparel industry is actually purchased from firms outside of San Francisco, in the southeastern U.S., Los Angeles, or overseas. Several sewing machine repair shops also provide services for the industry.

3. Apparel Industry Issues

The major issues confronting the San Francisco apparel industry are supra-local factors, including international trade agreements and state legislation; labor conditions; changes in the production process; and locational difficulties within San Francisco.

3.1 Supra-Local Factors

NAFTA

Apparel manufacturers began locating production facilities overseas, particularly in the Asian Pacific Rim countries, in the 1950s and 1960s. But with the passage of the NAFTA treaty in 1994, manufacturers are increasingly attracted to Mexico. As tariffs and quotas on apparel produced in Mexico have been eased or removed altogether, Mexico has gained a competitive advantage over some of its principal competitors in the Asian Pacific Rim. Its proximity to the U.S. makes it a feasible location for either the entire production process or even just the most basic production segments, the garment cutting, sewing, and assembly.

NAFTA has created a new locational dynamic for San Francisco manufacturers and contractors. Mexico attracts San Francisco's large-scale manufacturers of apparel for the mass market, particularly in women's wear, in part because NAFTA lifts restrictions on imports of women's wear from Mexico, but also because women's wear for the mass market requires labor-intensive manufacturing. Apparel manufacturers are particularly sensitive to differences in labor cost because of the labor-intensive nature of the process, and the difficulty of cutting costs elsewhere in the process. With wage rates at as little as \$.68 per hour in Mexico (versus a minimum of \$5.15 in the U.S.), manufacturers are increasingly drawn to contractors there, at least for the manufacture of simpler garments. According to one San Francisco contractor, to make a pair of jeans under a private label here, the labor cost alone is \$8.95. The total cost of the product, labor and fabric, if made in Mexico is \$7.85, and in China is \$9.60, for a slightly higher quality pair of jeans. But with duty and quota added on in China, and freight costs substantially higher, Mexico wins out.

Despite the attraction of Mexico, few manufacturers or contractors are simply shifting their operations there. Preliminary reaction to the opportunities in Mexico has been cautious, as business owners wait to see how successful the new apparel plants are. Many are nervous about the inexperience of Mexican apparel workers, or even simply the anticipated cultural and language differences. Some have already given up on their Mexico facilities because of experiences with low quality and late delivery; Mexico cannot yet fulfill the quick response imperative.¹

Because of these considerations, the most prevalent response to NAFTA among San Francisco industry players has been not to shift operations to Mexico but to open up secondary production facilities there, while maintaining a U.S. home base for operations such as sample-cutting and finishing. While most intend to keep their home base in San Francisco, due to family and cultural ties, some find it more efficient to manage their Mexico facilities from Los Angeles or San Diego.

Another response, especially among larger manufacturers, is to establish a geographic triangle of production: design and sample production in San Francisco, garment-cutting and assembly in China, and finishing in Mexico — thereby avoiding the quota on Asian piece goods. This alternative is particularly attractive to Asian American-owned firms which have ties to apparel factories in China and Hong Kong but wish to realize the cost benefits of a Mexico location.

California Minimum Wage

The minimum wage in California is scheduled to increase to \$5.75 in March, 1998, because of a voter referendum approved in the fall of 1996. Interviews revealed that this planned increase is the predominant concern of the San Francisco apparel industry at this time. A minimum wage increase affects not just the workers receiving the minimum, but their immediate superiors as well, whose wages will increase proportionately. Thus, the contractors who rely on an entirely low-wage, low-skill workforce will experience as much as a 12 percent increase in their payroll expenses (which are generally about 25 percent of all expenses). With profit margins reportedly as low as 5 percent, this one-time wage hike could put many out of business.

As a result, the shift to Mexico production has intensified since the increase was announced. It is widely anticipated in the industry that the new minimum wage will result in as many as half of San Francisco contractors closing their doors, at least in this state. This is undoubtedly an exaggerated small business fear; it is generally accepted among orthodox economists that a 10 percent increase in the minimum wage will result in a 12 percent decrease in employment, and a growing body of literature suggests that the effects of a wage increase on employment are negligible or even positive (Bernstein and Schmitt, 1997; Card and Krueger, 1994; Card, 1992). In any case, it is clear that most want to stay in San Francisco, and will try to cut costs elsewhere to stay in business. This means an increased sensitivity to rent prices, as well as fixed costs such as equipment and fabric.

3.2 Labor Conditions

The last few years have seen an increase in the public awareness of the labor conditions in the apparel manufacturing industry overseas and in the U.S. In San Francisco, a crackdown on contractor “sweatshop” abuses by the federal Department of Labor attracted media attention and resulted in a city-wide cleanup in 1994. Typical violations found under the “hot goods” law included minimum and overtime wage violations and, to a lesser extent, use of child labor.

Subsequently, compliance with labor laws has increased from 61 percent to 80 percent (as compared with 45 percent in Los Angeles). At present, the San Francisco apparel industry is considered the “poster child” of the U.S. Department of Labor. (Commented a contractor on the crackdown by the U.S. Department of Labor: “They just keep coming. I think the guy, he has to make his quota. Maybe he gets paid by the violation.”) The increase in compliance is due in no small part to the development of a Master Agreement between the Department of Labor, the union, and participating manufacturers and contractors. The Master Agreement created a venue for accountability between manufacturers and contractors and made the highly informal process of contracting out for garment manufacture much more formal, by codifying wage and training standards for contractors, as well as contractual responsibilities for manufacturers. Whether or not manufacturers participate in the Agreement, they are increasingly sensitive to federal regulations, because of the potential for fines and negative media exposure. Thus, most local manufacturers will not contract out to shops with violations, and some even hire their own staff of compliance inspectors to ensure that their contractors are obeying regulations.

Despite the climate of strict enforcement in San Francisco, some contractors undoubtedly continue to take advantage of their low-wage labor force. While this study did not focus on labor conditions, interviews yielded secondhand reports of abuses. For instance, one small manufacturer reported being shown several factory spaces for rent to apparel contractors with ceilings too low to stand up. Several contractors suggested that it is not uncommon (among other firms) to compensate workers in cash. This allows employers to pay below minimum wage, while their unreported workers draw unemployment or other public assistance on the side.

A look at the wage structure of the industry shows that for low-skilled jobs it is among the lowest paying of all industries in the city, but compensation for higher-skilled occupations tends to be much higher. (It should be noted that less than 1 percent of San Francisco firms are unionized.) Overall, the average wage among apparel manufacturers is \$8.57 per hour (according to the California Employment Development Department). For low-skilled jobs such as cutting, sewing, pressing, or finishing, contractors commonly pay piece-rate, with a minimum guarantee (of minimum wage). However, larger contractors typically pay higher wages, typically seven to eight dollars an hour, with some benefits, and many manufacturers pay 10 dollars or more an hour and include a variety of benefits such as health and dental insurance, pension plans, paid vacations, and clothing allowances. The salary range for high-skilled workers tends to be much higher, such as up to \$15/hour for marking, \$30/hour for computerized grading, \$30/hour for designing, \$40/hour for pattern-making (according by a survey by the San Francisco Fashion Industries).

The vast majority of San Francisco’s apparel employment belongs in the low-wage, low-skilled end of the spectrum. Sixty percent of all jobs in the apparel sector are occupied by workers with an educational attainment of high school or less, and fully half of all workers in apparel have no high school diploma at all. With an estimated 8,370 low-skilled jobs, the apparel manufacturing industry is San Francisco’s largest employer of low-skilled workers, with the exception of the retail sector. Jobs are typically full-time

and year-round: only 20 percent of all workers worked less than 40 hours per week, and only 25 percent worked fewer than 40 weeks per year.

Overall, the apparel workforce is 74 percent female, and ethnically diverse: 56 percent Chinese, 7 percent Filipino, 23 percent white, and 11 percent Hispanic. However, only 24 percent of the apparel workers were born in the U.S., 50 percent speak English not well or not at all, and the average age of workers is 42. Of the immigrant workers, 43 percent arrived before 1980, an indicator of the stability of the workforce. Compared to other San Francisco workers, workers in the apparel industry are more likely to live in San Francisco: overall 55 percent of San Francisco workers are San Francisco residents, but 77 percent of workers in apparel manufacturing live in the city.

Despite the low wages and compensation for the majority of workers, jobs in apparel manufacturing play an important role in the San Francisco workforce and the economy as a whole. All of the firms interviewed reported high stability and little turnover in their labor force, although seasonal changes in demand result in the shift of some workers among firms. Demand is apparently high among workers for overtime work. Wages are generally increasing, particularly for higher-skilled occupations, because of a shortage of high-skilled labor. In particular for the employees of the Asian contractors, who tend to be older women, jobs in the apparel industry are considered less strenuous and more prestigious than alternative low-skilled occupations in the restaurant or hotel industries. Because of their family responsibilities, they appreciate the flexibility that the industry offers. According to one of the largest contractors in the city: "It is ironic, because most of the Chinese women left the home country for the reasons that the jobs are going back — there are no labor standards, the pay is terrible, the hours are bad. But now the jobs are going there and the women are staying here. And the jobs that *are* here, they're grateful for them. They're considered good jobs."

Job Training and Hiring

Traditionally, job training in apparel manufacturing has been provided on-the-job. However, recent changes in the industry, particular the passage of NAFTA and the advent of new technologies, led a diverse group of industry players to form Garment 2000, an industrial revitalization and workforce development effort. Sponsored by the City College of San Francisco, the U.S. Department of Labor, the San Francisco Mayor's Office, the Union of Needletrades Industrial and Textile Employees (UNITE), and an array of local manufacturers and contractors, Garment 2000 has three missions: (1) workforce development, training individual workers; (2) workplace development, improving the productivity of companies; and (3) deployment of new technologies in the manufacturing process. Garment 2000 provided training to more than 800 individuals in 50 companies in its first year alone, and it continues to work toward diffusing knowledge about engineering technologies and modular production processes, as well as job training. Garment 2000 provides systematic training in basic skills such as stitching, adjusting needles, and repairing sewing machines, as well as modular production and productivity training programs, focusing on speed and quality of output. Interviews revealed tremendous respect for the training and services offered by Garment 2000.

However, many are unable to take advantage of its services because of the logistical and financial difficulties of sending employees to the program during the working day.

The vast majority of hiring in the apparel manufacturing industry occurs by word-of-mouth, as workers let their friends know about job openings as they come up. (Says one production manager: “When I want to hire a new worker, I go to my ladies and ask them to find someone who can sew as well as they do. That’s the quickest way to find someone you know can do the job.”) This informal recruitment strategy is in part why ethnic closure occurs in the industry: recruitment generally takes place among the social contacts of distinct ethnic groups, whether Chinese, Vietnamese, or Latina. In addition, some recruitment occurs via ethnic newspapers, and the trade association, the San Francisco Fashion Industries provides employment services particularly for administrative workers.

3.3 Production Process

Most San Francisco apparel manufacturers and contractors rely on labor-intensive production processes which have changed little in the last century. However, the last few decades have seen the development of more sophisticated technology and processes, which an increasing number of San Francisco firms are adopting.

Technology

Manufacturers who design garments in-house typically rely on computer-aided (CAD/CAM) pre-production systems, which are increasingly affordable to even the smallest companies. For production, state-of-the-art equipment (for instance Gerber Garment Technology) exists in the form of automated cutting and spreading systems. However, that technology is prohibitively expensive for the average contractor, and even San Francisco’s most successful vertical manufacturers have invested little in such equipment.

Another anticipated technological advance is electronic data inventory (EDI), a process through which the bar codes of garments sold by retailers go directly to the manufacturer, allowing much quicker inventory tracking and ordering. As EDI becomes increasingly common, manufacturers will need to develop their ability to respond quickly in production.

The need to develop quick response has also led some to adopt more sophisticated communication strategies. For instance, by using the Internet, manufacturers can monitor the progress of their contracting work, the availability of raw materials, and shifts in consumer demand. In general, however, industry experts suggest that the potential of electronic communication has not yet been fully explored.

Production Process

Traditionally, apparel product quality has been maintained by inspection: manufacturers monitor the quality of individual garments as they are produced, rather than modifying the process to produce consistent improvements in quality. But as the emphasis in the domestic apparel industry shifts from mass

production to higher quality and quick response, some manufacturers and contractors are adjusting production processes, either by introducing sophisticated engineering techniques or by using modular production.

Several of the larger apparel manufacturers and contractors in San Francisco have streamlined production through the use of specification sheets and time-study. Typically, contractors work from manufacturer samples to determine a range of garment sizes. Process engineers eliminate this guesstimate work by developing elaborate spec sheets, through CAD/CAM technology, which provide exact measurements for different sizes. Time-budget studies also enhance worker productivity by creating a more efficient use of production space and tailoring work to individual capabilities.

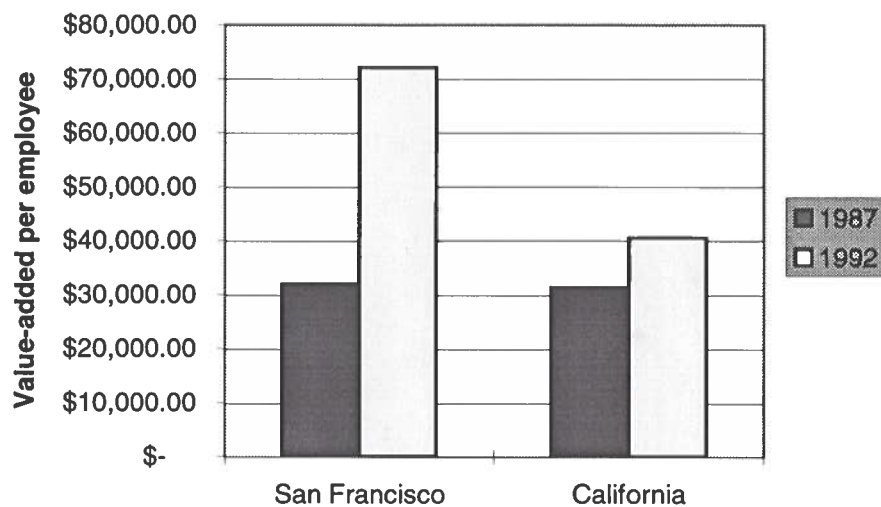
Modular production entails a reorganization of the assembly-line style of production into teams, typically of seven or more workers, who produce one garment at a time from start to finish. Where the traditional “cut-and-bundle” system might take a week to move an order of 100 pairs of pants through the assembly line, one modular team might finish 25 pairs of pants in a day. Teams set their own work schedules and weekly production goals, and each member is trained to operate all the different machines. Because workers stand while they move from machine to machine, the process eliminates health problems associated with sitting. Thus, modular production permits quicker response, by eliminating bottlenecks in the process (as when one person does all the zippers and the next does the buttons); it results in a higher quality product, since more time is spent per garment; and it provides substantial benefits for individual workers in both the ergonomic nature of the work and the increased sense of responsibility.

Despite positive reports of increased productivity from firms in the region which have converted to modular, only three San Francisco firms have incorporated modular production techniques as of yet. Some firms are reluctant to adopt modular processes because of the perceived time and expense — in terms of training time and capital costs — it would take to convert. Others suggest that their workforce would resist for cultural reasons, such as the entrepreneurialism of Hong Kong workers, who don’t want to be penalized for another’s slowness. Even if these difficulties were overcome, some argue that modular production works only for those few firms which need quick response and higher quality, producing small runs of a nonstandardized product that is designed in-house. However, data on value-added indicate that the number of those firms is growing: in 1987, value-added per employee was \$32,000, as compared with \$31,000 in California as a whole (Figure 7). By 1992, value-added per employee had reached \$72,000, while California as a whole lagged at \$41,000. This change suggests that there is a growing number of contractors who fill orders for manufacturers of higher quality apparel, as well as an influx of small high-end manufacturers.

3.4 Location in San Francisco’s Industrial Districts: SOMA and Potrero

As was shown in Figures 3 and 4, the apparel manufacturing sector largely shifted from Chinatown to the South of Market and Potrero neighborhoods in the 1980s and early 1990s, with a net influx of 78 firms. This trend has essentially continued in the past four years: 42 new firms have opened up in SOMA/Potrero, while 50 have closed their doors in the area. Of the 57 apparel firms which have moved within

Figure 7. Value-Added per Employee, San Francisco and California



Source: Census of Economic Activity, 1987 and 1992.

the city in that time, 30 moved within SOMA or Potrero, three left SOMA for other areas, and six moved into SOMA.

This large-scale shift occurred for four reasons: the exodus of other manufacturers from these industrial districts; the type of space that the exodus left; the transportation access to the district; and the U.S. Department of Labor crackdown on smaller garment factories in Chinatown. Between 1983 and 1994, SOMA/Potrero experienced a net loss of 30 industrial machinery/computer equipment manufacturers; 18 food processing plants; 10 manufacturers of fabricated metals; 13 printing and publishing establishments; and miscellaneous other manufacturers. This left a large amount of industrial space vacant in the district. Needing expansion space, apparel manufacturers and contractors were quick to relocate into SOMA/Potrero buildings from Chinatown. The preference of many of these firms is for the multi-story buildings with large floorplates, which provide both the necessary light for intricate apparel piecework and the space to accommodate the growth of this labor-intensive industry. Citywide, the majority (60 percent) of these buildings with floorplates of over 10,000 square feet are located in SOMA or Potrero.

Transportation access is also key to the attraction of SOMA and Potrero as industrial districts. Half of all apparel workers travel to work via MUNI bus, streetcar, or BART; MUNI runs several bus lines along the north-south arterials of SOMA/Potrero. For the contractors moving out of Chinatown, it is critical to relocate to areas covered by MUNI lines running from the residences of workers, mostly in Richmond and the Sunset. Firms which have relocated outside of SOMA/Potrero, particularly in the Bayview/Hunter's Point area, report difficulties in attracting labor because of the problems with public transportation access.

The exodus from Chinatown was in no small part due to the fact that the Department of Labor crackdown concentrated its efforts on the small shops in the area. Forty shops in Chinatown went out of

business due to labor law violations in 1995 alone, and manufacturers are reluctant to contract out to remaining firms in the area because of the belief that regulator attention is still concentrated there.

Another reason to locate in SOMA is the concentration of apparel and apparel-related businesses in the area. For instance, most suppliers and subcontractors are located in the area: in the west SOMA area, there are three places for sewing machine supplies and repairs within three blocks of each other. Conducting their businesses in close proximity, many apparel firm owners are more readily able to share knowledge about production processes and employment needs. The manufacturers who also maintain retail outlets in the area like the convenience of being able to locate their production facilities nearby.

The substantial growth of apparel manufacturing in San Francisco over the past decade was undoubtedly facilitated by the availability of space in the South of Market and Potrero districts. But whether these districts can sustain such growth or even retain their existing firms is increasingly in doubt. Manufacturers and contractors interviewed report increasing difficulty in finding large enough spaces available at market rent for industrial space (approximately 50-80 cents/square foot). According to a field survey of the area, the vacancy rate for industrial space is less than 5 percent (South of Market Foundation, 1997).

The dearth of appropriate space may have resulted from the sale of industrial buildings in the area, and subsequent conversion to office or residential use. At least six apparel firms that went out of business in the last four years were located in buildings that recently changed hands and have since converted to office use. Another two firms (290 jobs) are currently being displaced by the conversion of their buildings to office use. The companies are currently looking for space in other areas of SOMA/Potrero, with little success.

3.5 Location in San Francisco

Location in San Francisco presents a number of advantages to businesses, in addition to a resident workforce experienced in apparel manufacturing and the availability of the SOMA/Potrero industrial districts. Some have cultivated valuable relationships with large local retailers, such as Macy's or Saks Fifth Avenue, which translate into a national presence. Others develop their marketing image around a casual, sophisticated San Francisco look. One San Francisco vertical manufacturer even uses wool from the sheep on his farm in Sonoma County for the production of high-quality sweaters. Supervisor Mabel Teng has even advocated creating a "Made in San Francisco" label as a marketing device to associate local products with the city's desirable image. Some report that their San Francisco location is popular with their clients, since the company representatives like to visit. For the firms specializing in the manufacture of high-quality apparel, a New York or Los Angeles location seems to make more sense, as those cities are associated more with fashion trends in the industry. Yet these business owners enjoy living in San Francisco or nearby, or feel loyalty to their San Francisco workforce.

While there is substantial support in local government for a San Francisco fashion industry, there is a perception around the industry that the city government is not interested in keeping apparel manufac-

turing in the city — or at least the low-wage, low-skill segment of the industry. For instance, one local manufacturer recently applied for an SBA loan through the San Francisco government to help expand in a new location and was told that “we have enough garment manufacturers in the city.” In contrast, the governor of Mississippi wrote to the company offering a \$1 million grant to relocate there.

4. The Future of the Apparel Manufacturing Sector

This section first examines what the appropriate niche might be for the San Francisco apparel manufacturing industry, and then looks at recent trends to determine the prognosis for the industry.

4.1 The San Francisco Niche

San Francisco apparel manufacturers occupy two different niches: traditional large-scale production for the mass market, and high value-added production for the upper-end market. Both sectors have established markets with nationally known retailers. San Francisco’s mass producers manufacture garments for Sears, Target, Mervyn’s, J.C. Penney, among others. San Francisco’s high-end manufacturers sell to Neiman Marcus, Saks, Bergdorf Goodman, Barney’s, Macy’s, Nordstrom, and a vast array of specialty stores in the region, country, and overseas.

Though their products differ, these industry sectors share the pressure to increase response time, as do domestic producers nationwide. Quick response is the industry’s best hope to compete with accelerating offshore production because of the domestic industry’s proximity to markets. For instance, an apparel manufacturer sourcing from China typically orders two-thirds of what is expected to sell and allows six to eight weeks for delivery. For the last third, the manufacturer waits to monitor demand. If it materializes, domestic producers are best equipped to step in at short notice. In particular, producers relying on modular production will be able to put out small runs of a diverse array of styles in a matter of days, rather than weeks.

Local manufacturers agree that quick response is one of the key strengths of a San Francisco location. San Francisco provides not only proximity to markets, but also an established network of experienced contractors and workers able to fulfill orders on short notice. Perhaps best equipped for quick response are San Francisco’s vertical manufacturers, who control the entire production process and have optimum ability in terms of space and capital to keep a large inventory of fabrics at hand.

After the passage of NAFTA, many manufacturers were concerned that this niche for domestic industry would disappear, since Mexico would be able to provide quick response at lower cost. Producers are adjusting gradually to the new free trade environment, and it is difficult to determine how extensively and quickly the new production in Mexico will develop; however, it seems that quick response is not yet Mexico’s niche. Rather, Mexico seems to be claiming an increasing share of production for the mass market, competing with China for the business of San Francisco contractors anticipating the increase in the minimum wage.

It is this threat to San Francisco's low-skill, low-wage sector that has generated interest in creating a large-scale transition to high value-added manufacturing, with the help of innovative public-private efforts like Garment 2000. Despite the compelling nature of this vision, many high value-added and mass-market manufacturers are skeptical. Manufacturers familiar with the high-quality garment sector suggest that San Francisco lacks the image of a high fashion city, as compared with New York and Los Angeles: they point to the difficulty of establishing relationships with their European suppliers and customers. San Francisco not only lacks the fashion image, but the experience as well: high-end manufacturers report extreme difficulty in finding contractors to perform work such as couture and evening dresses. Moreover, business in the high value-added sector is risky at best: established designers have networks of marketing, real estate, and advertising that are difficult for start-ups to compete with, and the market itself is extremely limited. According to a manufacturer of high-quality apparel: "In the 1970s, they said that nobody got fired for buying IBM. Now, Donna Karan and Ralph Lauren have the same security — there's no risk in buying them. But we are hurt by these big lines because we don't have the volume to get in 40 doors at Saks Fifth Avenue."

Manufacturers and contractors who produce for the mass market voice concerns about the potential for a transition to high value-added because of the nature of local contractors. Lacking engineering expertise, contractors compete on the basis of price, not quality; unable to cost products effectively, they turn over rapidly. In the last four years, 120 businesses have gone out of business, while 96 have started up.² With such instability in the business, as well as inexperience at high-quality work, contractors are ill-equipped to make the transition.

4.2 Industry Prognosis

This study has sought to discover why apparel manufacturing has grown in San Francisco, at least until 1995. Secondary source data indicate a substantial increase in employment in the last decade, largely through the growth of medium and large firms in women's and girl's apparel. Yet several industry experts expect extensive job loss in the next couple of years, perhaps as many as 6,000 jobs, or 43 percent of all jobs. It is anticipated that the majority of these jobs will come from local contract shops.

A review of the most recent data available from the San Francisco Tax Collector reveals a net loss of 24 businesses in the last four years, with 380 jobs. However, this data source likely undercounts firms and jobs, because of the large number of informal shops. Additional data was gathered on unemployment among San Francisco residents employed in the apparel industry. This data reveals that there were 2,500 valid applications for unemployment from May 1996 through May 1997. However, it is unknown how many of these workers have subsequently been absorbed by start-up firms or seasonal changes. It is common practice for contractors to lay off and rehire workers according to seasonal shifts in demand.

At least in the short term, it seems likely that the large-scale mass market and the high value-added production will continue to coexist, with a substantial decrease in the low-wage sector and some small growth in the high-end production. Given the slow pace of change in the industry, it seems unlikely that

6,000 jobs will be lost in the near future; a more likely figure is two to three thousand. Under continued pressure from the retail sector, and with the opportunities afforded by NAFTA, the largest local manufacturers will likely increase offshore production. However, their need for quick response will mean continued reliance on a large pool of local low-wage contractors. The contractors that remain will likely be the larger shops, which are better equipped to withstand rapid changes in the market; some of these will likely open secondary facilities in Mexico. While upward pressure on rents, as well as insufficient space, will tend to drive some out of SOMA/Potrero, the effect will be cushioned by softer demand for space, as many firms go out of business. However, demand for larger spaces will likely increase as the average firm size continues to grow.

For the high value-added sector, the future will likely also hold an increase in offshore production. As San Francisco's small high-end manufacturers grow, they will be under pressure to reduce labor costs and shift production overseas. To encourage local production, labor force development is crucial, to counter the continuing shortage of high-skilled labor. For manufacturers who choose vertical production, the availability of buildings with large floorplates, such as those in SOMA/Potrero, is critical. If high-end manufacturers decide to begin relying on local contractors, contractors will experience some upward pressure on their payroll. As a result, they are likely to be even more sensitive to fixed costs and rent. Thus, finance capital to buy fabric and yarn, as well as stability of industrial rents, will become critical to their survival.

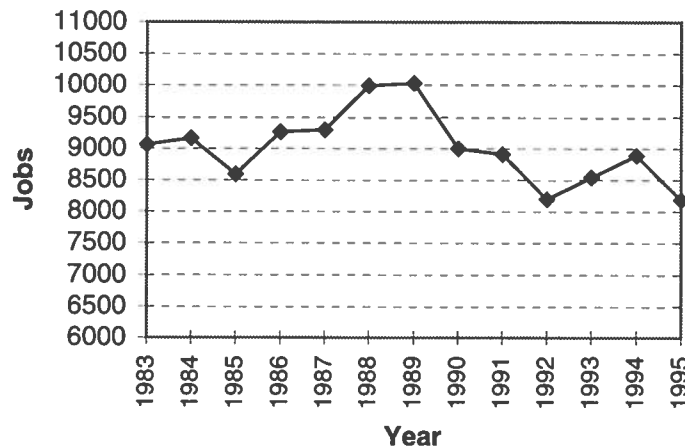
Printing Industry in San Francisco

1. Overview

The printing and publishing sector in San Francisco saw considerable growth in the late 1980s. Since then, it has lost some employment, although the number of firms has remained stable. Overall, as shown in Figure 8, the number of firms has increased 9 percent (from 407 in 1983 to 443 in 1994), while employment decreased 10 percent (from 9,062 in 1983 to 8,186 in 1995). The number of firms has actually declined from a peak of 483 in 1990, while employment has decreased from a high of 10,038 in 1989 (Figure 9); however, the number of medium to large establishments (with more than 50 employees) has increased slightly, from 25 to 27.

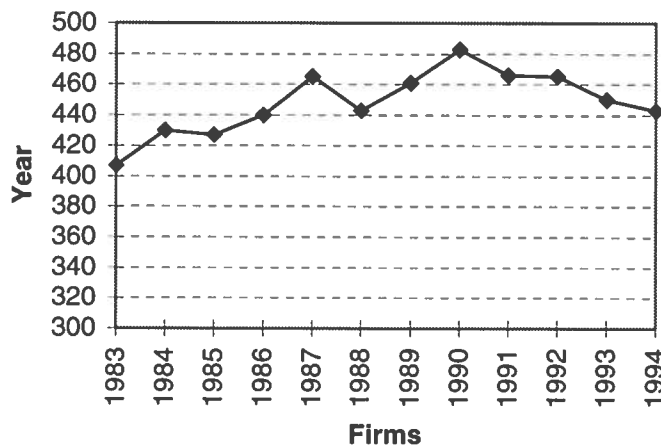
Employment losses occurred disproportionately in printing, rather than publishing, firms: while printing firms accounted for 42 percent of employment in printing and publishing in 1983, by 1994 they accounted for only 33 percent of jobs in the sector. While the city experienced a net loss of only five commercial printing firms in this period, it lost almost 1,000 jobs, or 24 percent of the total jobs in commercial printing. Losses were concentrated in the two types of printers which have experienced great changes in their production processes: traditional (typically letterpress) commercial printing and typesetting.

Figure 8. Employment in Printing and Publishing, San Francisco



Source: California Employment Development Department.

Figure 9. Printing and Publishing Firms, San Francisco



Source: County Business Patterns.

Printing and publishing firms are overwhelmingly concentrated in SOMA, Potrero, and the Financial District (Figure 10), and little change has occurred in their locational distribution in recent years (Figure 11). However, looking only at employment in the commercial printing subsector, Figure 12 shows that such jobs have been overwhelmingly concentrated in SOMA and Potrero alone, and significant job loss (more than 800 jobs, from 22 firms) has occurred in these districts.

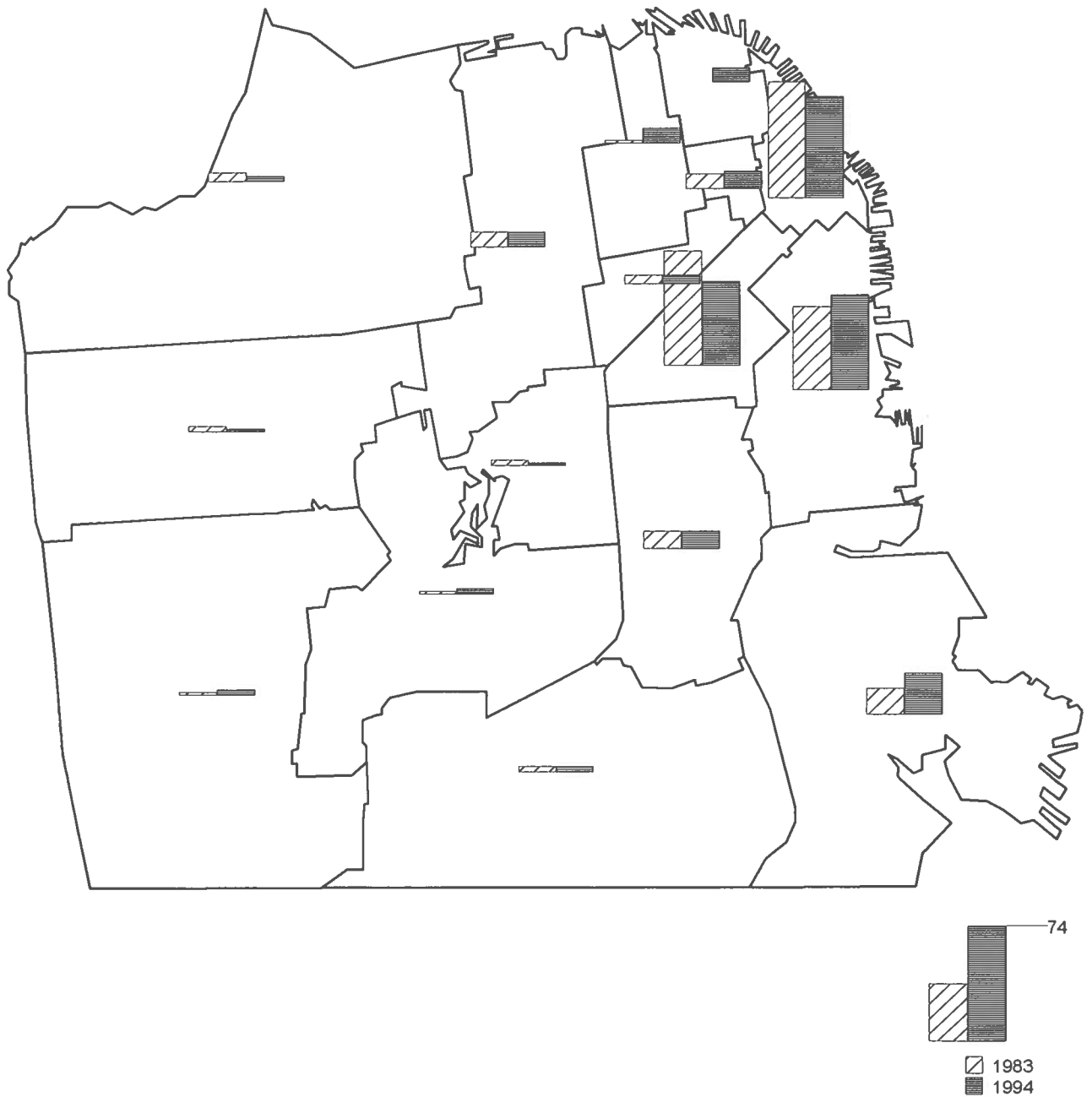
2. Structure of Printing Industry

From the end of World War II until the mid-1970s, San Francisco was considered the printing capital of the western United States. San Francisco printers not only met the printing needs of the downtown banking and insurance industries, but exported a vast array of products, from financial reports to wine and

Figure 10. Printing Firms

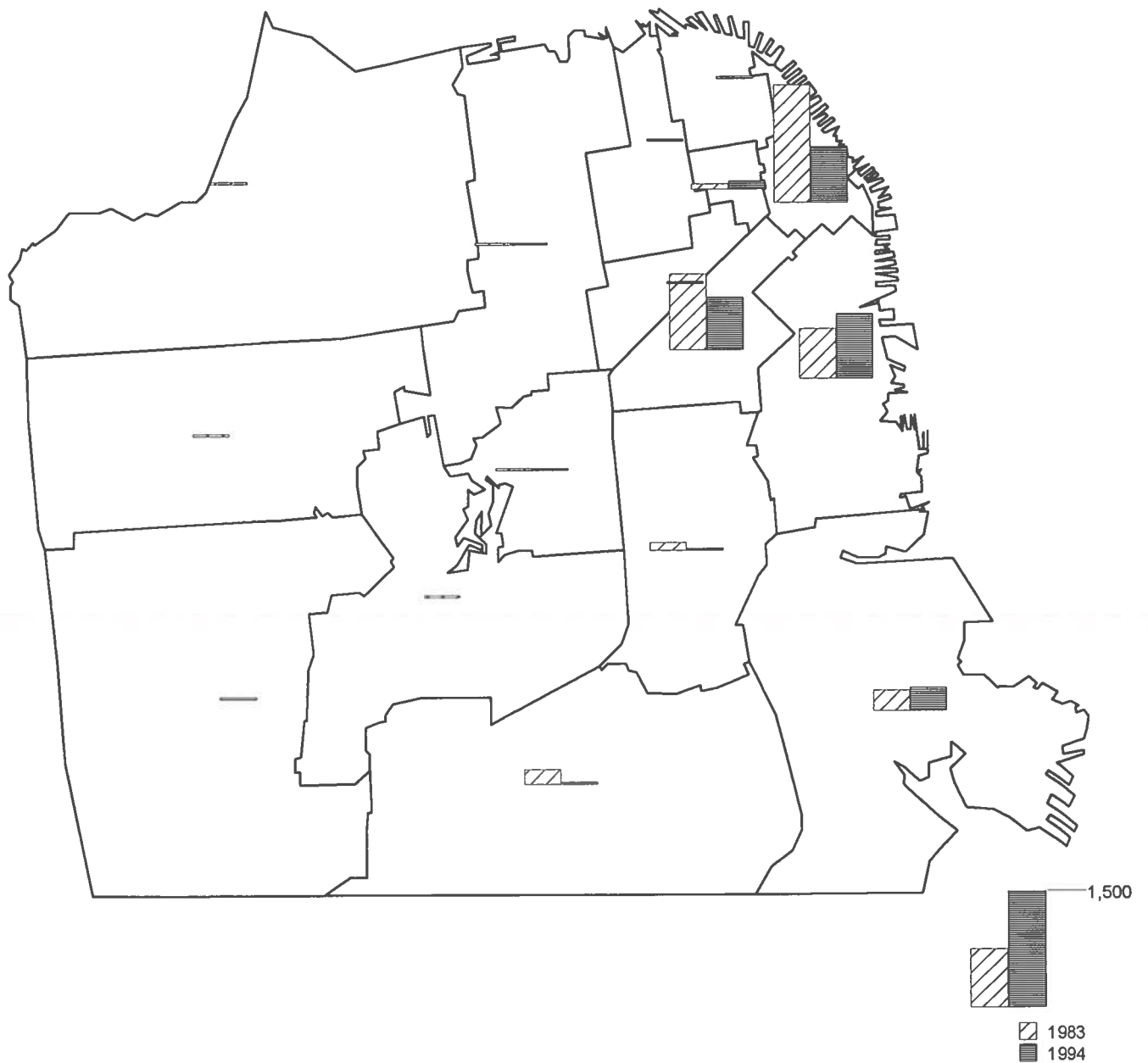


Figure 11. Location of Printing Firms in San Francisco, 1983 and 1994



Source: County Business Patterns; California Employment Development Department; San Francisco Planning Department.

Figure 12. Location of Printing Employment in San Francisco, 1983 and 1994

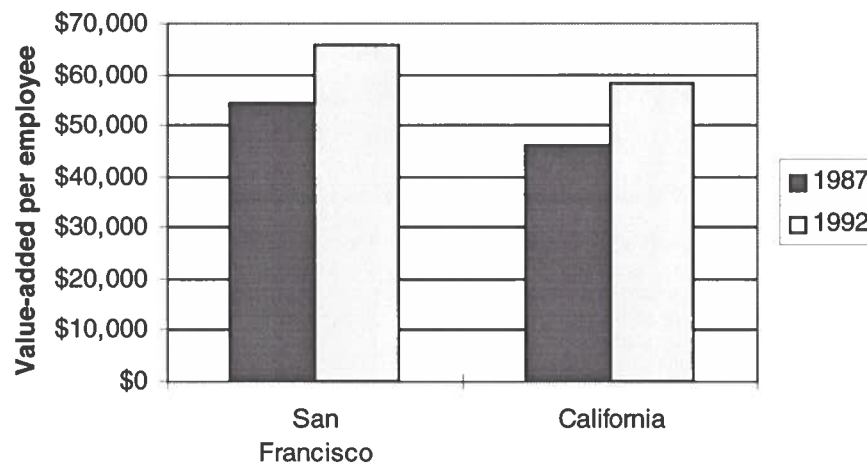


Source: County Business Patterns; California Employment Development Department; San Francisco Planning Department.

can labels, to the entire region. However, three changes reshaped the industry in the late 1970s: changes in the production process; labor difficulties; and the decentralization of corporate headquarters for insurance and other firms.

First, many large commercial printers failed to invest in the equipment which would allow them to adjust to rapid technological changes, in particular the advent of almost entirely electronic (digital) production processes. As a result, newer firms in other regions have increasingly been able to usurp San Francisco's position by competing on the basis of their technological efficiency and speed, which compensate for the greater distance from customers. At the same time, many commercial printers have successfully made the adjustment: in 1987, value-added per employee was \$54,500, as compared with \$46,000 in California as a whole (Figure 13). By 1992, value-added per employee had reached \$65,700, while California as a whole lagged at \$58,200.

Figure 13. Value-added per employee, printing firms



Source: U.S. Census of Economic Activity, 1987 and 1992.

Second, labor costs escalated in San Francisco relative to other regions. While some suggest that this increase in labor costs was due to the power of unions, it should be noted that non-union firms in San Francisco generally pay the same as union scale. Perhaps the most important issue concerning labor was a 15-week printing strike in the early 1980s. During the strike, businesses shifted their printing purchases to Los Angeles — and few shifted back to San Francisco after the strike was resolved.

Finally, corporate headquarters have been decentralizing from the San Francisco CBD since the mid-1970s. In particular, insurance firms, formerly one of the most important clients for San Francisco printers, have moved out to the suburbs. Although they often keep their prestigious downtown San Francisco addresses, they have moved the bulk of their operations out of the city, and they tend to hire either suburban printing firms or, for larger purchases, firms from areas such as Portland, Utah, or Texas.

Driven by the advent of digital printing, the structure of the industry is changing rapidly. There are four types of printers: quick printers, commercial printers, trade shops, and specialty shops. Quick printers are gaining an increasing share of business, mostly by taking smaller print jobs from large commercial printers. Quick printers present a threat specific to San Francisco printers, because of their reliance on jobs with relatively small print runs: local businesses tend to contract out the largest print jobs to discount print firms in other regions of the country, relying on nearby San Francisco firms for specialized jobs under a tight time schedule.

Also eroding the business of larger printers is work done by trade houses, which specialize in particular processes (such as color separations, prepress, embossing, bindery, or letterpress), or specialty shops, which produce specific products (such as advertising, business forms, graphic design, greeting cards, labels, direct mail, carton printing, catalogs, signs, or screenprinting). Many of these trade houses and specialty shops have also branched into the multimedia industry, producing products such as CD-ROMS and web-page development.

Another growing segment of the printing industry in San Francisco is the print brokerage. Print brokers emerged long ago to help clients determine what their printing needs are, since businesses are generally ignorant about the different printing processes. Many of the Bay Area's 400 print brokers are essentially sales representatives from national or international printing companies, who tend to send local business to the Midwest, the South, or Asia. However, some print brokers are small operators who specialize in one aspect of the business, such as graphic design, but assume responsibility for guiding the entire product through the production process, using small local firms for different parts of the process.

The network of printers used by print brokers is also used by the printing firms themselves, who increasingly employ a diverse array of subcontractors for different aspects of the process. According to one of the largest commercial printers in San Francisco: "Our clients don't know how to buy printing, but we do. The most effective way of buying printing is to match the job to the equipment. So we send our clients to many different companies, depending on their needs." Large commercial printers who have invested in digital technology tend to find it most cost-efficient to keep prepress and production in-house, but often subcontract for post-press (finishing and binding). However, different jobs require different types of specialized equipment, and printers often send clients to their competitors who have the appropriate technology for the job. One reason the printing industry can be thus equipment-driven is the strength of the local trade organization, the Printing Industries of Northern California. PINC provides a venue for company networking and promotion, as well as employee recruitment and training.

3. Printing Industry Issues

The four issues central to the San Francisco printing industry are technology in the production process, the availability of labor, the availability of space, and their location in San Francisco.

3.1. Technology

The transition to electronic prepress and digital copy preparation has transformed printing in terms of the organization of the industry, its capital-intensiveness, the preparation of its labor force, its environmental safety, and its space requirements. Most of the companies which could not afford to make the requisite changes have gone out of business; the few traditional printers that survived the recent recession will follow, unless they develop a specific niche.

The transition to digital technology has spawned two contradictory tendencies in organization. On the one hand, the printer may play less of a role in prepress. The advent of desktop publishing and laser scanning has allowed clients to assume responsibility for most of the prepress work, so instead of turning over a hard-copy stack of art boards, with tissue overlays, they simply hand over a disk with one proof. On the other hand, printers increasingly assume the work formerly performed by service bureaus, or prepress facilities, shooting the film to make plates. As the use of direct digital color proofs, which eliminate the film from the process by printing from the digital proof directly to the plate, becomes more common, many prepress facilities are likely to disappear.

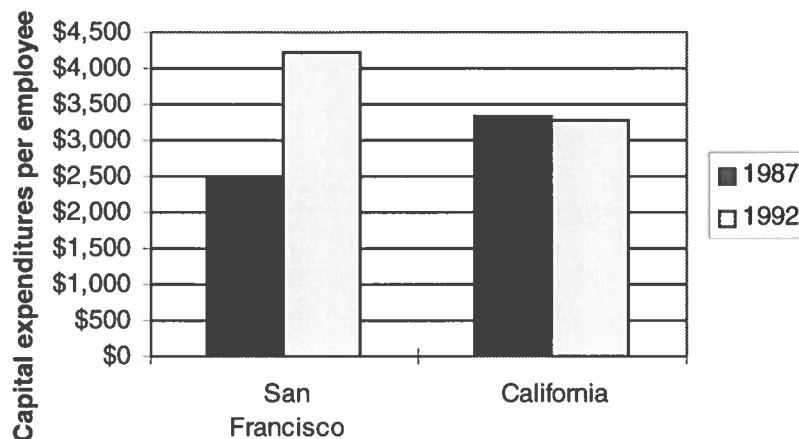
Because of the rapid technological changes in the industry, the capital costs of the business have increased dramatically. Not only is it necessary to invest continually in upgrades of presses for production, but the computers used in prepress only have an 18-month life. As a result, the most successful companies continually reinvest their profits in equipment, and many need to accelerate the depreciation schedule for their capital equipment from 10 years to five years. As shown in Figure 14, many companies have invested substantially in upgrading technology: capital expenditures per employee increased by almost 70 percent from 1987 to 1992 in San Francisco, while they declined in San Francisco as a whole.

As desktop publishing has taken over the prepress work, the educational requirements of prepress have escalated. Formerly, a prepress task such as typesetting could be performed by a blue-collar production worker with a high school education. Nowadays, the prepress workers all have college degrees, and many have attended apprenticeship training programs as well. Changes in technology have also increased the productivity of workers substantially, reducing the size of the labor force and lowering the ratio of production workers to desk employees. According to one of San Francisco's largest prepress operations: "Twenty years ago, we had 120 employees; now we have 54, doing twice the volume. Where we had three workers in production to one in the office, now we have two and two."

The advent of new digital technologies has transformed San Francisco printing into an environmentally safe and clean industry. As film is gradually eliminated from the process, the amount of consumables used is decreasing, and thus the amount of waste generated. The type of plates used is also changing: instead of chemical coatings, increasingly thermal plates, which are exposed by heat, are used.

The technological evolution of the industry has also altered its space requirements. In prepress, laser scanners are replacing strippers, which were much more bulky. Equipment used in production is rapidly becoming more smaller and more efficient, reducing the space needed for the shop floor. With the

Figure 14. Capital Expenditures per Employee, Printing Firms



Source: Census of Economic Activity, 1987 and 1992.

desktop computer managing an increasing share of the work for printers, some of the firms interviewed report increased flexibility in the type of space they need: instead of requiring low-scale industrial buildings with large floorplates, they can locate in smaller industrial structures or even office buildings. However, other firms say they continue to need traditional industrial buildings, because of their ongoing investment in new types of presses, scanners, imagesetters, and other equipment.

3.2 Labor Conditions

Wages in the printing industry follow its tripartite structure, and are generally almost double the wage levels in regions that compete for San Francisco business, such as Utah and Oregon. In the prepress segment, workers tend to make \$20-\$24 per hour; in production, \$26-\$30 per hour; and in post-press, \$8-\$10 per hour. Overall, the average wage is \$21.51 per hour (according to the California Employment Development Department), and it is consistent across firms whether they are unionized or not. While the wages of production workers have remained relatively stable, workers in prepress have seen their wages escalate in the past few years, from about \$16 per hour. This reflects the increasing educational requirements of prepress that come with desktop publishing. In contrast, the post-press occupations are generally semi-skilled; there are no barriers to entry, and wages are actually decreasing: new workers are hired at \$8 per hour, while the former union wage was about \$18 per hour.

The vast majority of San Francisco's printing employment belongs in the medium- to high-wage, high-skilled end of the spectrum. Eighty percent of all workers in printing have attended some college, and only 6 percent have no high school diploma. Overall, the workforce is 60 percent male, and largely Caucasian: 75 percent white, 7 percent Chinese, 8 percent Filipino, 2 percent African-American, and 12 percent Hispanic. The printing workforce is just as likely to live in San Francisco as other San Francisco

workers: overall 55 percent of San Francisco workers are San Francisco residents, but 54 percent of workers in printing live in the city.

Job Training and Hiring

Several different San Francisco educational institutions offer vocational training or computer courses leading towards a career in printing. The City College of San Francisco offers a program in Visual Arts, sponsored in part by non-union companies; the Graphic Arts Institute in SOMA offers a variety of classes in prepress and production; and San Francisco State has a multimedia school. However, the rapid technological obsolescence of much printing equipment in both prepress and production makes it difficult for these schools to maintain state-of-the-art facilities. All of the firms interviewed for this study complained about the difficulty of finding skilled labor. Many solve the problem by recruiting from out-of-state, in areas like Chicago with a high-skilled labor force in printing. Others simply train on-the-job, at high cost. In general, local firms compete intensively with each other for labor, which keeps wages high.

3.3 Location in San Francisco's Industrial Districts: SOMA/Potrero

As was shown in Figures 10 and 11, the industrial districts of SOMA and Potrero house the vast majority of firms in printing and publishing. However, most of the job loss in commercial printing in the last decade — or almost 1,000 jobs — has occurred in these districts. Job loss in printing is concentrated in SOMA/Potrero because of the existing characteristics of its built fabric and the recent increase in new development in the area.

Printers occupy a variety of building types, depending on the nature of their business: smaller quick printers often occupy small storefronts, shops specializing in prepress may occupy office space, and large traditional commercial printers favor industrial or warehouse space. Overall, as in apparel manufacturing, a large proportion (50 percent) locate in buildings with large floorplates (of over 10,000 sf). Unlike apparel, however, printers favor low-scale buildings: 55 percent are in one- or two-story buildings.

The type of commercial printer which tends to locate in these large industrial buildings has been most affected by technological changes in the industry. A number of large commercial printers neglected to invest in digital technology and have gone out of business, unable to compete with savvy new start-ups. Others perceive the new production equipment as requiring more space, or couple their investment in new technology with an overall expansion of the business. Most of these printers move out of San Francisco altogether, usually for suburban areas.

Yet the lure of the suburbs is not the only factor pulling jobs out of SOMA/Potrero. There is evidence of direct and indirect displacement of printing firms by new construction and building conversions in SOMA and Potrero. Such displacement may push firms out of the city altogether because of the difficulty of finding industrial space in a market with a 5 percent vacancy rate for such space.

Direct displacement occurs as buildings are sold to new owners, who raise rents or evict the current tenants, or as buildings are converted to new use, such as live-work units. At least two firms, one with 180 jobs and another with eight jobs, were displaced from their buildings as it was converted to live-work use. Indirect displacement occurs as rents rise and the availability of space decreases in the area, due to the influx of new users. Another cause of indirect displacement is incompatibility of use: for instance, new residents of the area are increasingly likely to object to the noise and trucks associated with industrial businesses, which may operate 24 hours a day. This study found one firm (42 jobs) with operations so hindered by the construction of new live-work units next door, as well as the complaints of new residential tenants unused to industrial neighbors, that it is planning to move; another firm (115 jobs) unable to complete a planned expansion into the building next door because it was outbid by a developer who subsequently converted the building to live-work spaces; and another firm (20 jobs) located in the vicinity of the new ballpark recently went out of business as its building is being converted to restaurant/retail uses accessory to the ballpark.

3.4 Location in San Francisco

Studies of industrial location decisions have generally agreed that the two most important factors for firms deciding whether to relocate are the location of the labor force and the market. City taxes are generally considered to affect location decisions only at the margin; that is, if a firm is considering relocating already, the difference in tax rates between the current and planned locations may push the firm out of the city (Eisinger, 1988). But studies have also indicated that no one factor generally pushes or pulls firms away from their current location. Push and pull factors act in concert, and when the number of reasons to relocate reaches a critical mass, firms leave.

The primary advantage of a San Francisco location for the city's large commercial printers is the proximity of clients located in the CBD. When downtown businesses need quick turnaround, they prefer to use the high-quality printers availability within a ten-minute radius, in SOMA or Potrero. As the ability to compete on-time becomes increasingly important in the global economy, firms are reluctant to waste the one or two days of travel time necessary to send managers to Phoenix or Galveston for a press check, as well as the extra freight time necessary. Many San Francisco firms operate 24 hours a day, six days a week to fill this niche in quick turnaround.

San Francisco's commercial printers typically rely on marketing-related or financial report work from financial corporations with a presence downtown, such as Pacific Bell, Wells Fargo, Bank of America, Charles Schwab, Blue Cross/Blue Shield, as well as the work from the growing advertising sector. However, a growing segment of their business comes from Silicon Valley, which require products as diverse as computer manuals and software or CD-ROM packaging. The growth of South Bay business is one reason firms tend to relocate to San Mateo County. A presence just south of San Francisco, in areas such as

South San Francisco or Brisbane, allows firms to maintain close contacts with their customers in the San Francisco CBD, while cultivating new relationships with clients in Silicon Valley.

Other firms cite the availability of a skilled labor force as the San Francisco advantage. As the premium on skill level rises, local business owners see San Francisco as housing a pool of college-educated, technologically savvy workers. At the same time, they are concerned that escalating housing costs make San Francisco unaffordable for their labor force. Thus, labor force availability also acts as a pull factor for the South Bay.

Thus, San Francisco firms see access to markets and a skilled labor force as both the strength and weakness of a San Francisco location. Less ambiguous are their views on San Francisco regulations and taxes. Businesses complain about the city environmental regulations, which are far stricter than those of neighboring municipalities such as Brisbane. (Says one large commercial printer about the city's environmental regulators: "The state makes the EPA look like wimps, but the city makes the state look like a bunch of yoyos.") In addition, they cite the payroll tax, which in San Francisco is 1.5 percent of payroll for businesses with five or more employees, as a key factor driving businesses to other cities.

4. The Future of the Commercial Printing Sector

4.1 The San Francisco Niche

San Francisco printers occupy a critical market niche. Among all the firms in the Bay Area, they alone dominate business from the CBD. Downtown firms find the services provided by local printers invaluable: the availability of printers in close proximity allows them to demand quick turnaround and gives them the opportunity to conduct repeated press checks as work is in progress. Most local printers have succeeded in meeting this niche because of their location in SOMA or Potrero, their extensive investment in digital technology, and their skilled San Francisco labor force.

4.2 Industry Prognosis

For years, industry experts warned of the advent of the "paperless society." To their surprise, this hasn't yet occurred: shipments from paper mills are at a record high, and many San Francisco firms are booming because of demand from their downtown and Silicon Valley customers. Even though experts foresee decline in key market segments such as manuals, financial printing, and forms, the segments which are growing, such as printing for high-technology and advertising firms, are concentrated in San Francisco and the Bay Area.

Thus, many are optimistic about printing in San Francisco. However, it is likely that the recent decline in commercial printing will continue in the short term, as firms which are unable to adjust to technological changes continue to go out of business. For the firms which are able to compete on technology, the critical issue becomes the availability of space: without large industrial spaces available adjacent to the CBD, these firms are likely to leave the city.

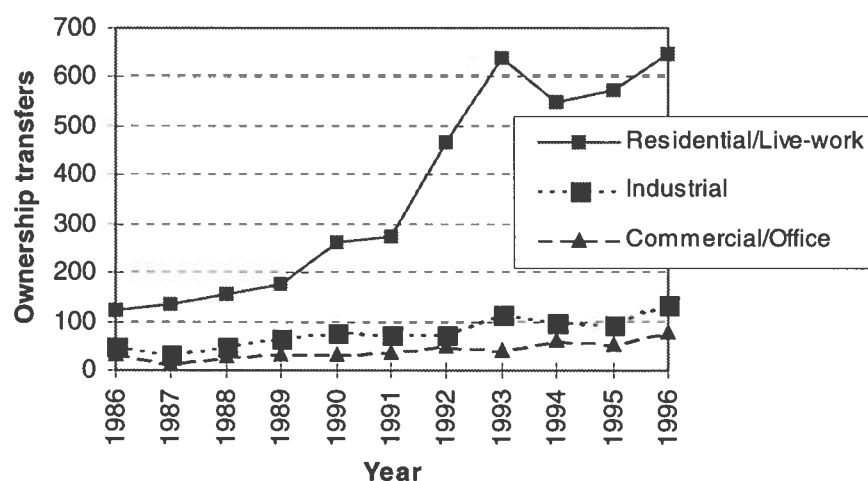
Changes in San Francisco's Industrial Districts

In recent years, the South of Market industrial district has become the prime location for small firms specializing in the multimedia industry or business services. With little conventional office space in the area, these firms tend to occupy converted multi-story industry buildings. Building conversions also accommodate new residential units, which are often built as live-work spaces to conform to the zoning code, but essentially function only as residences. In addition, South of Market has experienced a surge of new residential and live-work development, often on the site of demolished industrial buildings.

As these new users able to pay rents of up to \$2.00 per square foot for converted industrial space, they easily outbid industrial users, accustomed to paying approximately \$.50 per square foot (South of Market Foundation, 1997). The increase in land rent presents a particular difficulty in view of rising labor costs for industrial firms: in order to stay in San Francisco, firms are looking for other areas to cut costs, such as land and fabric.

South of Market's increase in popularity occurred largely after the influx of apparel manufacturers was well-established. As shown in Figure 15, transfers of building ownership have increased dramatically since 1991 in SOMA and Potrero. However, the sales of residential properties vastly outnumber those of industrial buildings, and the sales of industrial properties have generally remained flat.

Figure 15. Transfers of Ownership, South of Market/Potrero

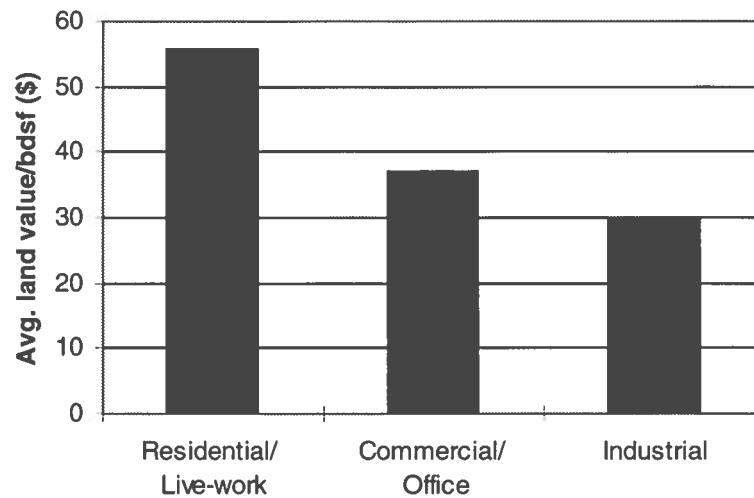


Source: San Francisco Tax Assessor, 1997.

In fact, industrial buildings have been relatively slow to turn over, with an average of about 10 years since the last sale. Only vacant land has had longer average turnover rates. Overall, residential properties have experienced the quickest turnover, with an average of four to eight years between sales.

Across SOMA and Potrero, the lowest land values are found under industrial property. Figure 16 shows the average land value of each parcel in the districts, standardized by building square feet. Industrial land value averages approximately \$30 per square foot of building space. In contrast, the value of land

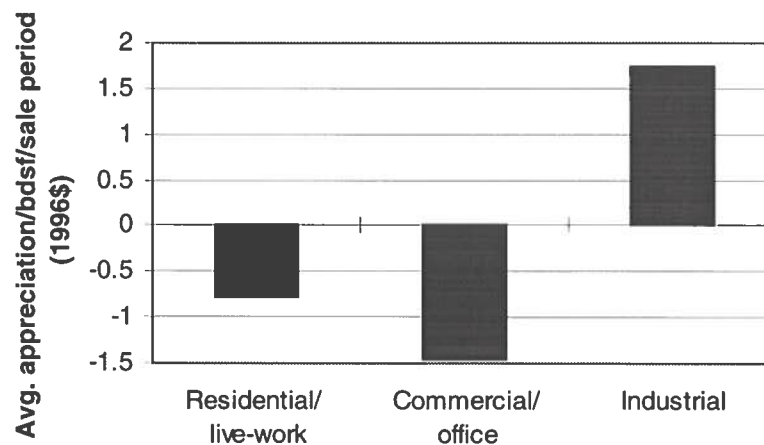
Figure 16. Average Land Value per Building Square Foot



under residential and live-work buildings is much higher, in some cases as much as double the value of the industrial land value (all differences are significant at $\alpha = .05$). This indicates that industrial land uses will have increasing difficulty in outbidding residential uses for space, where zoning permits residential or live-work development.

Appreciation of properties has varied widely across areas and use types. Figure 17 looks at average changes in sale price in 1996 dollars, standardized by building square feet, over the period between sales (which varies among properties), for sales which occurred between 1991 and 1996.³ While industrial property has appreciated across SOMA/Potrero, the highest appreciation occurred in the eastern portion of SOMA/Potrero, the area where the bulk of new development has occurred or is planned (including the new

Figure 17. Average Appreciation per Building Square Foot over Sale Period for Sales Occurring Between 1991 and 1996

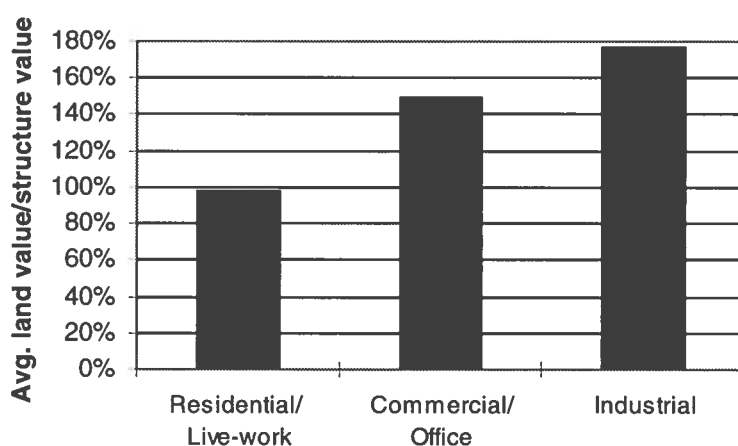


Source: San Francisco Tax Assessor's data, 1997; calculations by the author.

Giants ballpark) (again, all differences are significant at $\alpha = .05$). Some depreciation of office/commercial and residential/live-work property has occurred, particularly in western SOMA, perhaps reflecting the overly inflated real estate prices during the boom of the 1980s.

Figure 18 examines the ratio of average land value to average structure value. Land under industrial buildings is worth considerably more than the structure above (again, all differences are significant at $\alpha = .05$). This finding is not surprising, given the low-cost construction of many of these one- to two-story buildings. In contrast, residential buildings tend to be worth more than the land upon which they sit. The high ratio of land value to structure value indicates a high potential for demolition and land use change, where zoning permits.

Figure 18. Ratio of Land Value to Structure Value



Source: San Francisco Tax Assessor, 1997; calculations by the author.

Overall, this analysis indicates high potential for land use change in the SOMA and Potrero industrial districts, because of the high value of the land underneath industrial property and the marked appreciation in industrial property values. Because most manufacturers hold long-term leases, only a few manufacturers have been displaced so far. However, as leases expire, industrial buildings will likely be converted to uses which can pay higher rents. Thus, pressures on land costs can be expected to increase substantially in the next couple of years.

Conclusion

The vitality of the San Francisco economy is due in part to the resurgence of its light-industrial sector, particularly apparel manufacturing, but also printing and publishing. Light-industrial firms provide a diversity of jobs to the local economy, are linked intimately with other office and service sectors, and constitute one of the highest value-added sectors in the economy.

Apparel industry jobs are particularly important to the San Francisco economy because of the scarcity of low-skilled jobs in the city (defined as requiring a high school education or less) and the potential

difficulty of retraining and rehiring apparel workers. Overall, only 18 percent of jobs in San Francisco are low-skilled, as compared with 32 percent in the Bay Area as a whole. This translates into a high ratio of job seekers to new jobs: there are eight job seekers for every job opening in San Francisco (California Budget Project < 1997). The apparel manufacturing sector provides 8,400 low-skilled jobs and is San Francisco's largest employer of low-skilled workers, with the exception of the retail sector. Since 77 percent of workers in apparel manufacturing live in the city (as compared to 55 percent of all San Francisco workers), they are particularly dependent on public transportation to get to work, and would likely find it difficult to commute to apparel jobs elsewhere in the region. They would also face formidable obstacles in seeking new jobs in San Francisco: in addition to the job scarcity, they lack the necessary language skills. Thus, the loss of jobs in apparel manufacturing would undoubtedly result in a substantial increase in public assistance, through county general assistance and welfare programs, and state unemployment programs.

The future of apparel manufacturing and printing is threatened by several different issues, including land costs, labor costs, and capital costs. City policy intervention which helps to reduce any of these costs would undoubtedly result in a more secure future for these industries. However, intervention such as job training or loans for equipment may not be necessary if apparel manufacturers and printers are actually pushed out of San Francisco by the strong market for other uses, which outbid industrial uses for industrial space in the South of Market. Thus, city policy might best focus on ensuring the availability of adequate, low-cost industrial space within the South of Market/Potrero industrial district.

Several alternatives exist to help preserve industrial space for industrial users: (1) creating an industrial protection zone; (2) subsidizing industrial rents; or (3) making several large, publicly-owned industrial buildings available for industrial users. An industrial protection zone would best be located in an area which encompasses the existing concentration of businesses in the South of Market. The industrial protection zone might be subject to the following regulations:

- Any new development or industrial building conversion in the area would be subject to discretionary review by the Planning Commission.
- Discretionary review would involve environmental review and a study of potential direct and indirect displacement of firms and/or jobs from the proposed development.
- If any firm or job displacement will occur due to the proposed development, developers will be required to locate appropriate replacement space for businesses within the SOMA or Potrero industrial districts.

Subsidizing industrial rents would involve reimbursing landlords of industrial buildings for the difference between market rent for light industrial uses (\$.50/square foot) and market rent for potential office uses (\$2.00/square foot), or approximately \$1.50/square foot. With an estimated two million square feet of industrial space occupied by apparel manufacturers and printers in the South of Market, this program would cost approximately three million dollars per year.

As a long-term solution, the city could provide manufacturers with low-cost space in several buildings already owned by the city in the Hunter's Point Naval Shipyard or other areas. This program would

involve renovating the buildings for manufacturing use, providing new transit access to the CBD hub, and 'persuading a large enough number of manufacturers to relocate to make it a feasible industrial district.

Other ways city policy could help apparel manufacturers and printers include assistance with labor problems and capital costs. For apparel manufacturers, the city might provide financial support to the job training program offered by Garment 2000. Because Garment 2000 specializes in training for higher value-added production, the city might also encourage local high-end manufacturers to utilize the local contractors currently producing goods for the mass market. This would involve creating a cooperative educational effort among industry players, as well as improving communication between contractors and manufacturers, perhaps through the increased use of the Internet to provide quicker response. For printers, the city might provide support to job training efforts by PINC and other industry organizations.

Reducing capital costs would best take the form of establishing a loan program for apparel contractors, especially to purchase fabric. Without the ability to keep a substantial supply of fabric in stock, apparel contractors find it difficult to compete on quick response with large offshore facilities. In addition, a loan program for advanced computer equipment and other machinery would facilitate the transition to higher value-added production. For printers, a loan program would also help defray the costs of adjusting to constant technological changes in the industry.

Whatever the policy response, it is clear that the San Francisco apparel manufacturing and printing industries are in immediate danger without some policy intervention. The growth these industries have experienced cannot be sustained under the present conditions. While some change in the industries is inevitable, due to the globalization of production and the rapidity of technological change, timely policy intervention can at least ease the effects of the transformation on the San Francisco economy and San Francisco residents.

Notes

¹The hesitancy of the San Francisco industry to shift to Mexico is reflected in data on NAFTA-TAA certifications of workers displaced by production shifts, which indicate that San Francisco lost only a couple of hundred jobs to Mexico in the first six months of 1997. In fact, California is experiencing a disproportionately low share of the NAFTA-TAA certifications: with over 10 percent of U.S. employment in apparel manufacturing, it has only 2 percent of the displaced workers. The bulk of NAFTA apparel manufacturing displacement actually is occurring in the Southeast.

²Calculations by the author from the San Francisco Tax Controller's database.

³It should be noted that some of the variation may be explained by inconsistently reported sale prices, as for instance more than one building may be reported in a purchase. However, such differences should be consistent across use types, so the relationships should be relatively accurate.

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