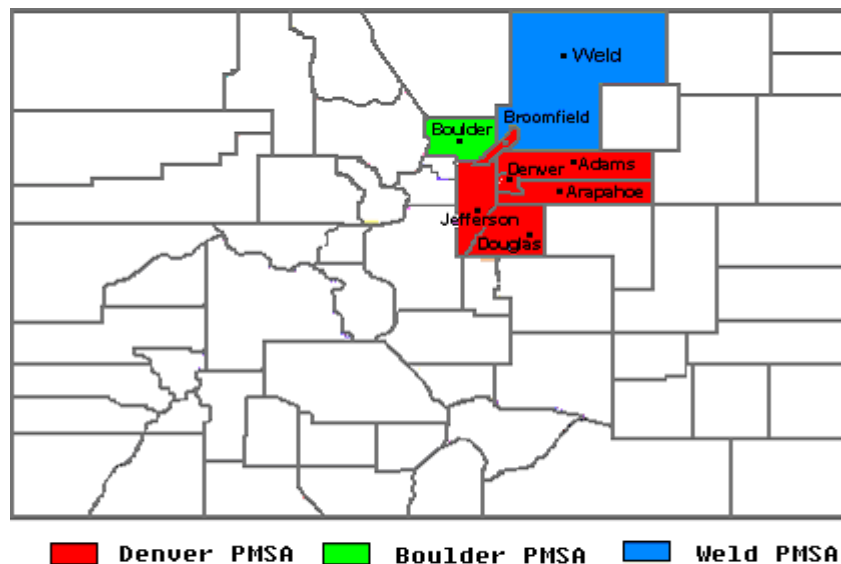


DENVER IN THE GLOBAL ECONOMY:

Report Summary



Prepared for the Denver Mayor's Office of Economic Development and the Pacific Council on International Policy

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A complete copy of the study can be found at <http://www.du.edu/gsis/practicum/report.html> or at www.ColoradoEconomy.com or contact Jim Carpenter, Mayor's Office of Economic Development, 201 W. Colfax Avenue, Department 1005, Denver, CO 80202.

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DENVER IN THE GLOBAL ECONOMY

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SUMMARY

This report traces the diverse ways in which the Denver metropolitan area is integrated into the world economy. In particular, it attempts to detail the ways in which global economic integration currently affects economic life in Denver and is likely to affect it over at least the next decade. It therefore investigates the movement of goods, capital and people across national frontiers and into and out of the Denver metropolitan area and the resulting opportunities and costs that these flows represent.

As in other cities and towns across the country, Denver's civic, business and community leaders today confront an economic landscape that has been significantly altered by these developments. Devising effective strategies to promote rising incomes, viable business enterprises, secure employment and other public and private goals requires understanding the impacts of economic integration.

Internationalization

Over the past several decades, the U.S. and most other nations across the globe have taken dramatic steps to promote deepening international economic interdependence. Not least, they have negotiated myriad agreements (such as the North American Free Trade Agreement) that have reduced and in some cases removed tariffs on goods and services; they have relaxed the controls that historically restricted cross-border flows of long-term corporate investment and short-term financial flows; and they have negotiated uniform intellectual property rights and other business practices.

Over the same period, technological revolutions in transportation, communications and information processing have conspired to shrink the globe. These advances have substantially reduced what economists call "transactions costs," making it far more practical for businesses and other institutions today to expand their reach across national borders and into distant continents. The new information technologies allow large institutions to coordinate complex activities over great distances and to monitor and respond to political, economic, social and cultural developments far from home.

Taken together, these political and technological developments have fundamentally altered the economic landscape for decision-makers across society.

1. Trade flows have grown steadily and the U.S. has been transformed since the end of WWII from a country that produced what it consumed and consumed what it produced, to one that is today deeply dependent on international trade.
2. The creation of internationally linked production chains, usually under the auspices of multinational corporations, has created particularly deep linkages across dispersed communities.
3. International financial flows, in the form of the purchase of foreign stocks and bonds and other financial assets, have grown even faster than trade over the past quarter century.

4. The new information technologies allow for a rapidity and density of communication never before thought possible and the economic effects of this immense flow of data, words and images are only gradually becoming understood.

The rewards for success in this internationalized economy are vast—economic theory contends that international integration and specialization substantially enhances total world economic output, yielding the possibility of improving economic circumstances for all. But the attendant dangers and penalties can also be severe for individuals and their communities, and even entire nations. Indeed, within the U.S. some communities have prospered over the past several decades while others have struggled to respond to the dislocation associated with disinvestment and stagnation.

One reason for this unevenness is the continuing salience of “clustering.” For the past several centuries, firms in the same industry have clustered together in order to benefit from the access to information, skilled labor, suppliers, customers and so forth that close proximity provided. This implies that which avenues forward are available to a community as it internationalizes and which strategies will yield the best results (and which will fail outright) are shaped in part by its already-existing character.

Devising successful strategies at the local level, then, requires a far better understanding of the *particular* ways in which a *specific* community is inserted into the world economy. It requires a careful, locally focused investigation. To address this need, this study reports on the diverse ways that the Denver metropolitan area relates to the world economy. It combines quantitative and qualitative methods and findings; it attempts to reveal some of the myriad direct and indirect pathways by which economic linkages tie Denver to the world beyond.

The Region

Although the study was commissioned by the City and County of Denver, it is charged with looking at the role of internationalization in the entire Denver metro area. The study uses the broad Department of Commerce definition of the Denver Consolidated Metropolitan Statistical Area (CMSA) comprised of Adams, Arapahoe, Broomfield, Boulder, Denver, Douglas, Jefferson and Weld Counties. The creation of Boulder County in November 2001 out of pieces of Adams, Boulder and Denver Counties means that data from the Denver and Boulder Primary Metropolitan Statistical Areas (PMSA) lost historic comparability after 2000.

Methodology

The study begins with a summary of Denver’s historical role in the world economy. It then looks at its role in the regional economy and the contemporary economic structure of the metropolitan area. Then, it turns to an examination of international economic activity and of the companies and organizations that work in the international arena (and their

impact on the region). Finally, it extracts the lessons learned from our examination of Denver's relationship to the world economy.

The study utilizes both primary and secondary data. Primary data are those collected by the research team itself. The primary data source for this study is a series of interviews conducted either in person or by telephone with individuals in the metro Denver community who work in the international sector. Secondary data are those collected by an outside source such as a government agency.

Multiplier analysis is used to trace the impact of metro Denver companies, organizations and individuals that owe their existence to international activities as this impact works its way through the metro Denver economy. It recognizes the interdependence of various sectors of the economy. Activities in one sector spill over into other sectors, stimulating business activity there. Companies that sell their goods and services outside of Colorado generate the largest employment impacts, which make international companies particularly important. This is called basic industry, industry that brings new dollars into the state and the metro Denver region. Companies that pay high salaries have a larger impact than those that pay less. The more employees a company hires, the bigger its impact.

Limitations

As is true in any impact study, this report is limited by the availability of information, both in terms of timeliness and sub-state data collection. Some data that would be useful are only available at the national level: for example, portfolio investment and remittances. Time and financial constraints precluded extensive survey research. Nevertheless, the collaboration of three principal investigators and twelve graduate student interns made it possible to do the most thorough study to date on the extent and impact of internationalization in the metro Denver region.

New Type of International City

At the same time that international economic flows are increasing, ocean ports are diminishing as determinants of a city's linkages with the world economy. This is largely because of technological advances that have substantially reduced the cost of cargo shipment (indeed, the ratio of value to weight of exports has increased steadily over the past several decades), which reduces the relative transactions cost advantage for coastal cities. As a consequence, the international city of the 21st century is no longer dependent on a river or ocean port. Air transportation and state of the art communications technology have become equally or more important. With one of the finest airports in the nation (discussed in the Transportation section) and an important cable and telecommunications infrastructure (discussed in the Overview of the Economy section), metro Denver is becoming a new type of international city.

The Contemporary Macro Scene

In order to understand the impact of internationalization on metro Denver, it is important to understand the economic base of the region. Toward this end the study examines population, employment, income, retail sales and taxes.

Population: According to the 2000 Census, the Denver CMSA had 2,581,516 residents. This was a 2.7 percent average annual increase since the 1990 Census. The Denver PMSA (which excludes Boulder and Weld Counties), which grew 32 percent, was the 6th most rapidly growing metro area in the country with a population of over one million. By July 2003, the Demography Section of the Colorado Department of Local Affairs estimates that metro Denver had added over 147,000 residents, for a total population of 2,745,728. The annual average rate of growth between 2000 and 2003 of 1.8 percent was extremely slow by Denver standards, due to the worst job recession since the 1930s in the local economy.

The metro area is populated with people of diverse ancestry and race. In 1990, Whites comprised 86.7 percent of the metro Denver population. By 2000, this had fallen to 80.6 percent. The Black population declined slightly, to 4.6 percent. The Asian population expanded rapidly, from 4.4 percent to 7.5 percent of the population, while the Hispanic population increased 87.9 percent, from 12.8 percent to 18.5 percent of the population.

Despite its ethnic diversity, 82.9 percent of metro Denver residents reported in the 2000 Census that English was the only language spoken at home. Of the 17.1 percent who spoke a language at home other than English, less than half (8.2 percent) said they spoke English less than “very well.”

Labor Force and Employment: Of the 2,745,728 people residing in the Denver PMSA in 2003, 2,115,525 were age 16 or older and 72.3 percent of these, or 1,529,639, were in the labor force. Unemployment in metro Denver tends to be fairly low, even during recessions. Between 1980 and 2003, it ranged between 7.1 percent in 1987 and 2.4 percent in 2000, with the highest unemployment rates occurring during the regional recession of the 1980s.

Employment growth locally is driven by both the national business cycle and local/regional factors. It soared during the 10-year expansion of the 1990s, the longest in U.S. history, at a 3.3 percent annual rate in the first half of the decade and a 3.9 percent annual rate in the second half. Job growth came to an end in 2001 as the recession took hold and employment declined in 2002 and 2003.

A 2001 Department of Commerce study based on a 1997 study that looked at jobs related to manufacturing exports found that Colorado ranked 23rd among the 50 states in the relative importance of the export industry to manufacturing jobs. In total, over 117,000 jobs owed their existence to exports, 6.8 percent of the state’s private sector jobs.

Economic Activity by Sector: The private sector in aggregate accounts for 86 percent of all employment and wage income in the Denver metro region. Within the private sector, the five largest employment sectors are (in declining importance) retail trade; health care and social assistance; accommodation and food services; manufacturing; and professional and technical services. These sectors account for employment of 589,430 workers, or 43 percent of all employment in the region. The ranking by total wage generation is somewhat different: here the leaders (in declining importance) are professional and technical services; manufacturing; information; finance and insurance; and health care and social services. These five sectors account for \$26,092,130,885 in wages, or 45 percent of total wages earned in the region.

A 2002 study by Deloitte & Touche emphasizes the predominance of high tech industries in Denver. It reports that key industry clusters in Metro Denver include broadcasting and telecommunications, aerospace, software, finance, life sciences, computer storage and peripherals, air transportation, beverage production, and energy.

1. Denver is home to three of the largest 40 media companies in the U.S. (in terms of 2001 revenues): ATT Broadband (3rd); EchoStar Communications Corp. (16th); and MediaNews Group (32nd). Denver has emerged as a leading center of telecommunications in the region and beyond. The largest five employers reporting employment numbers in this sector collectively employed over 22,000 workers in Colorado in 2002, most in the Denver metro region. (Qwest, 13,500 employees.; Comcast Cable, 4,100; Nextel Comm. Inc., 1,800; Level 3 Comm., 1,800; and Time Warner Telecom, Inc., 894.
2. The Denver metro region is also the center of a vibrant concentration of data storage and management firms, the clustering of which gives Denver an important advantage in meeting global competition.
3. The Denver metro region is also site of a rapidly advancing biosciences cluster, the success of which is now a state public policy priority. This sector encompasses pharmaceutical development, medical instrument design and production, plant and animal research (and associated products), and various other biological research and testing. It generates a correspondingly wide range of employment opportunities, from manufacturing, to basic and applied research and development, to medical and veterinary practice. Overall, the sector in Colorado provides salaries that are well above the state's private sector average, and it yields technical advances and commercial opportunities that span many other industries. This sector has a strong base at the University of Colorado (and its Health Science Center), Colorado State University, and National Jewish Medical and Research Center. This activity is highly concentrated within the state. The Denver-Boulder-Greeley CMSA accounts for 80 percent of the state's biosciences employment and 73 percent of establishments.

Inflation and the Cost of Living: Since 1992, inflation in the metro Denver region has outpaced U.S. inflation in general. That changed in 2003, when Denver inflation was only 1.1 percent, relative to a 2.3 percent price increase nationally. The relative disparity in housing cost increases accounts for much of the difference.

While the inflation rate measures the rate of change in prices, the cost-of-living index enables comparisons between various metropolitan areas. It is based on the price of food, housing, utilities, transportation and such, relative to the national average. In the fourth quarter of 2003, living costs in Denver were 104.8 percent of the national average. Housing costs were 110.6 percent of the average. In a comparison of 25 U.S. cities, Denver is the median city of the sample, with 12 cities registering higher and 12 cities registering lower costs of living. *The Economist* calculates an index of the relative living costs in 134 cities around the world. Of the 28 cities reported in the July 2003 index, 23 are more than half as expensive as New York, suggesting they are more costly than Denver.

Income, Spending and Taxes: The rapid inflation of the late 1970s and early 1980s, which peaked at 15.5 percent in metro Denver in 1979, produced spectacular gains in retail sales and personal income. After adjustment for inflation, however, real gains were more modest.

The severe recession of 2001-2003 brought declines in inflation-adjusted retail sales, something occurring previously only in the regional oil/construction recession of 1985-90. Personal income data are available at the MSA level with about a two-year lag. When this study was prepared, data for metro Denver were only available through 2002. The decline in real personal income in 2001 and 2002 was an unprecedented event in recent decades in metro Denver.

Transportation: Over the past decade, and continuing at present, the State of Colorado and the Denver metro region have undertaken vast transportation infrastructure projects. Ground transportation projects are largely directed toward catching up with the rapid population growth of the region over the past decade (to ease congestion on the region's highways), while the air transportation project is forward looking and is designed to position the region for growth over the coming decades.

Denver International Airport (DIA), which opened in early 1995, is now the fifth busiest airport in the country, and the 10th busiest in the world. The airport has five runways of 12,000 feet, and one of 16,000 feet. The latter is the longest in North America and the longest "instrument landing system" runway in the world. DIA also has the greatest potential for growth (in terms of increased passenger and cargo use) of any airport in the country.

Nonetheless, DIA remains relatively underserved by direct international flights, ranking 22nd in the U.S. in terms of scheduled, nonstop international flight departures. Among the ten busiest airports in the country, only one (Las Vegas) ranked behind DIA in terms of its international operations. Today, 2.65 percent of daily flights, and 3.14 percent of departing seats serve 13 international destinations, with approximately 19 nonstop flights per day (though this number fluctuates seasonally). These flights service four countries: Mexico, Canada, England and Germany

DIA ranks far lower in cargo shipments than in passenger traffic. In 2002, Denver ranked 20th in the U.S. in cargo shipments, and 47th in the world in this regard. This pattern is not the result of insufficient cargo shipment capacity at DIA. Ultimately, the decision of many local exporters to ship from Denver by truck and rail rather than by air stems from cost considerations. Denver's central location provides local firms with cheaper access by truck to the major cargo shipping hubs, such as Memphis, Los Angeles, Chicago and San Francisco. This pattern of shipment complicates significantly the assessment of the extent of Denver's exports to world markets.

Rail service has been vital to the Denver regional economy since the 1870s. Today, Denver is served by Burlington Northern Santa Fe Railroad and the Union Pacific Railroad (cargo), and Amtrak (passenger). Union Pacific operates more than 30 trains a day in Colorado and carries freight to all parts of its 23-state system. At present, plans are emerging to construct a new 6,000 acre "integrated multimodal transportation facility" at the Front Range Airport, six miles southeast of DIA, which promises to reduce substantially delays in rail cargo shipments across the metro area.

Ninety percent of the products manufactured in Colorado are shipped to their destination by truck. The region's highway system is therefore central to Denver's integration in the world economy. Denver sits at the intersection of major east-west (I-70) and north-south (I-25) highways, with easy access to I-80 to the north.

Internationalization in the Denver Economy

Although international trade is the first thing that comes to mind when we think about the international aspect of metro Denver's economic base, the latter entails far more than imports and exports. Scores of foreign companies have branches here. International capital flows into the region through the stock and bond markets, venture capital, private equity and other forms of financial investment. People from other countries come to Colorado, as temporary or permanent residents or to vacation, attend school or receive medical treatment. Jobs move overseas as companies outsource to reduce costs and flow into the region when foreigners purchase goods and services in Denver. U.S. investment overseas and the licensing of American technology result in profits and royalties that are repatriated, increasing domestic profits, income and growth.

International Companies: The Denver metropolitan area is now the site of regional and (in some cases) national operations for many international companies. Recent data reveal that there are 98 foreign-owned companies statewide, roughly 85% (or around 83 of these) are in metro Denver. The largest number of foreign companies in the metro Denver are from the UK (with 13 companies), Canada (11), Japan (10), Germany (8) and Australia (8). Together, the UK, Canada and Japan accounted for 60 percent of the total foreign direct investment in Colorado in 2001.

These firms report that they employ from a low of one to a high of 2,900 employees in metro Denver, though roughly 1/3 of them employ 100 or more employees. They produce a wide range of goods and services—from robotics, optical, and meteorological

equipment, to computers and software, to machine tools, to chemical, oil and gas materials and equipment, to food products and food production equipment, to medical supplies and pharmaceuticals, to engineering and construction management services.

International Trade: The five most important destinations for Colorado's exports in 2003 (in declining order) were Canada, Mexico, Japan, South Korea and Malaysia. Canada today is by far the most important consumer of Colorado's goods. Indeed, it imports 23 percent of Colorado's exports, while the next largest importer buys only 9.3 percent of the total. Canada alone imports a greater share of Colorado's exports than the Japan, Germany, France and the UK combined

From 2002 to 2003, there were two notable changes in the destination of Colorado's exports. There was significant growth in Colorado's exports to Mexico and the state's exports to Japan flattened during the same period. These trends meant that Mexico surpassed Japan to become Colorado's second largest trading partner.

During 2002-03, there were also important increases in the relative importance of several East and Southeast Asian nations as markets for Colorado's exports. Among East and Southeast Asian nations, Colorado's exports to South Korea, Malaysia, China and the Philippines grew rather significantly. These increases are particularly notable because they occurred in the context of stagnant exports from Colorado to Europe over the past five years.

In terms of the product composition of Colorado's exports in 2003, the state's most important export is computer and electronic products (accounting for 56.6 percent of the dollar value of the state's total exports), followed by processed foods (10.8 percent), machinery manufactures (7.4 percent), and chemical manufactures (6.5 percent).

Canada has been the number one market for Colorado's exports of computers and electronic products for each year from 1999-2003. From 1999-2003, the majority of Colorado's exports to Canada went to the province of Ontario. In 2003, 62.6 percent of Colorado's exports to Canada went to this province.

International Financial Flows A lack of data makes it particularly difficult to get a precise picture of international financial flows into and out of the Denver metro area or even to the state. The data we do have tell us that in 2001, the UK, Canada and Japan were the most important sources of foreign direct investment to the state. We suspect (but cannot confirm) that these trends hold today, and we note that firms from these countries have a significant presence in Denver and the countries are also important purchasers of the state's exports. Note that interviews with firms and anecdotal evidence suggests that international financial flows of various types are quite significant in Denver, even though publicly available data are not available to substantiate this claim.

We observe a significant "home country" and "backyard bias" in venture capital (VC) activities in the state. VC firms traditionally invest in the region in which they are

located or, if they invest outside that region, require a local lead VC. This is especially true for VCs investing outside their own country.

Wage remittances to Mexico are quite a significant phenomenon in Colorado (and in the U.S., more generally). Mexican immigrants across the U.S. sent home more than \$1 billion every month in 2003, double the amount sent five years ago. The total exceeds the value of tourism or agriculture as a source of foreign income for Mexico. This total is also growing: a recent report finds that the Denver-based Western Union Corporation experienced a 20 percent increase in remittances to Mexico during the third quarter of 2003. Immigrants make up 34 percent of Colorado's Hispanic population (in the year 2000 about 736,000 Hispanics lived in Colorado), suggesting there is a significant flow of remittances from metro Denver to Mexico.

Migration Flows: Immigrants have played an important role in the Denver and Colorado economies for much of the twentieth century. Today, that role is expanding rapidly.

In the 1940s, thousands of Mexican farm laborers came to Colorado under the "braceros" program. The 1970s and 1980s ushered in an era of increasing diversity among immigrants to the Denver area, including Vietnamese and Russians.

Today the largest immigrant population in Denver is from Latin America. In 2000, 57 percent of the foreign born population in Denver was from this region. Asians accounted for 20 percent of the immigrant population; Europeans, 16 percent; and Canadians and Africans, 3 percent each. Almost half of the immigrants from Asia in the Denver metro area are recent arrivals (having arrived since 1990). For Africa, the corresponding percentage is 69 percent; for Latin America, 64 percent. Complicating matters, Asian immigrants are divided into twenty-one distinct ethnic groups that are not cohesive.

"Nonimmigrants" are foreign born people who gain temporary admittance to the United States. Nonimmigrant categories include but are not limited to tourists, business people, temporary workers, students, and exchange visitors. Most data are collected at the state and national levels only. In 2002, 291,764 nonimmigrants visited Colorado. Over 250,000 of these were "visitors"— vacationers and those conducting business. In contrast, there were fewer than 12,000 temporary workers, and about 6,295 international educational exchange students.

According to the Department of Commerce, ITA, Office of Travel and Tourism Industries, Denver ranked 26th in the country among destination cities, attracting 180,000 international visitors, or 1.0 percent of the total who visited the U.S. NAFSA reports that institutions in the Denver metropolitan region hosted 4,754 international students during the 2003-04 academic year. These students contributed \$109,636,000 in direct expenditures to the Denver metropolitan economy.

Job Migration: A by-product of internationalization is the movement of jobs across national boundaries. Foreign companies hire workers in the U.S. to produce goods and services close to where they are sold. U.S. companies bring foreign workers into the

country to fill jobs for which they are unable to find domestic workers. The Internet and low cost telecommunications enable many jobs to be performed anywhere in the world without regard to distance or national boundaries. All of these factors lower the cost of production, reduce the cost of goods and service and free money to be spent on other things.

Outsourcing by Denver metro firms is not a new phenomenon, especially in the manufacturing sector. To take just one example, the Gates Rubber Company was founded in Denver in the early 20th century. It began international manufacturing operations as early as 1954, when it opened a plant in Branford, Ontario.

Our interviews with Denver companies and organizations turned up very little hard data about outsourcing. The topic is far too controversial for firms to be willing to discuss their policies in this regard. There is some anecdotal evidence of contemporary outsourcing by Colorado firms, including a newspaper report that IBM is shifting several thousand high-paying programming jobs to China, India and Brazil, including some from Boulder. Employees report that Qwest has moved jobs in database administration and development to India, Scotland and Ireland (all English-speaking countries to avoid communications problems) to lower costs and provide 24-hour programming capacity (thanks to the time differences).

Outsourcing of jobs by foreign firms to the U.S. – or “in-sourcing,” as it is often called – is the ignored half of the job migration picture and one that creates jobs in Colorado. The City of Thornton reports that Hunter Douglas, a British-owned window fashions manufacturer, is expanding there with plans to hire 2,000. Of the 17,099 direct jobs we identified in Denver-based foreign companies, almost all of the jobs are filled by Coloradans. The companies we interviewed reported that expatriates filled no more than 1-5 jobs.

Multiplier Analysis

In this section, we first determine to the extent possible the number of jobs in Denver due to internationalization. These may be workers employed by foreign firms, the portion of a domestic firm’s employment that is due to its exports or workers in the non-profit or government arenas who owe their jobs to internationalization. These data are very incomplete, so our estimates are only suggestive of the economic impact of internationalization on employment, income, spending and taxes.

Employment: Using the *Denver Business Journal* Book of Lists and proprietary data provided by the World Trade Center Denver, we identified 83 foreign firms in metro Denver that directly employ 17,099. With the help of the World Trade Center Denver, we identified 743 companies in the 8-county region that export from 1-100 percent of their output, with a total of 29,035 jobs due to the export portion of their business. Since this is an incomplete list of the foreign firms operating in the metro area and the companies that export, we feel confident that this number understates the export-related

jobs. When combined with the jobs at foreign owned firms, the lower boundary on direct employment due to internationalization is 46,134.

The Department of Commerce has developed multipliers based on input-output tables for the United States that can be used to determine the indirect and induced jobs flowing from the direct employment in specific industries. Applying the multipliers for each specific type of company where possible and using an average multiplier otherwise, we find an additional 76,774 indirect and induced jobs, for a total of 122,908 in metro Denver due to internationalization.

Internationalization makes a significant contribution to income, retail sales and tax revenues in metropolitan Denver. Based on the 122,908 jobs identified above, internationalization contributes \$5.1 billion in personal income, \$4.2 billion in retail spending and \$367 million in personal state and local taxes to the metro Denver economy.

Other International Linkages

Many Denver metro region institutions other than for-profit businesses have international linkages of one form or another. Some of these provide direct economic linkages between Denver and the world; others may play important though indirect roles in facilitating the flow of goods, finance and people between Denver and countries across the globe.

Direct economic linkages include the region's universities and colleges. These institutions draw students (and family members). Research performed at these institutions in high-tech areas by international and domestic students contribute to local business formation in leading sectors. International students often remain in the city following completion of their studies, taking positions in business and non-business organizations as highly-skilled employees with advanced language and other skills. Research and policy institutes (such as the Center for China-U.S Cooperation and the Institute for the Study of Israel in the Middle East at the University of Denver) serve as magnets for visiting diplomats, political and business leaders and scholars, and thereby promote deepening economic, political and personal linkages between Denver business and community leaders and their counterparts abroad.

Indirect economic linkages are provided by organizations that build relationships between Denver and communities abroad. Examples include ethnic Chambers of Commerce (such as the French-American Chamber), the Sister Cities program and ethnic "Hometown" organizations that bind recent immigrants with their communities back home, especially in Mexico. It is very difficult to measure most of the direct and indirect economic impacts of these non-business linkages, but it is reasonable to assume that their effects are considerable.

Conclusion: What Have We Learned

The foregoing has traced the links between Denver and the world economy. Our chief purpose has been to “map” these linkages as best we can, given data availability, providing local stakeholders with the information and understanding necessary to devise strategies that can best serve their constituencies. In this concluding section we take a tentative step beyond this mapping, to discuss what we see as the chief lessons that might be drawn from the empirical findings that have preceded it.

We list and examine briefly here a wide range of areas and strategies that local officials and other stakeholders might consider as they seek to respond to the challenges and opportunities associated with the internationalization of the Denver economy.

The Extent of Denver’s Integration into the World Economy

This study demonstrates the extent and depth of Denver’s linkages with the world economy. Denver is by now deeply dependent on world markets for final and intermediate goods, exports, finance, technology and labor, and has been for some time. The 83 foreign companies in the metro region that we were able to identify directly employ 17,099 employees (very few of which are foreign nationals); in addition, at least 743 metro Denver firms obtain at least some of their revenue from exports. All told, internationalization accounts for a minimum of 122,908 jobs in the Denver CMSA, which amounts to 9.5 percent of all employment in Denver. This economic activity accounts for a minimum of \$5.1 billion in wages and salary income, \$4.2 billion in local spending, \$199 million in state taxes and \$168 in local taxes.

Denver integration in the world economy is likely to grow appreciably in the future. It now has one of the world’s leading airports, with tremendous capacity for growth at relatively low cost. This was mentioned by almost all companies (and many other respondents) that we interviewed. It has also excellent telecommunications infrastructure. Moreover, it is home to industrial clusters in leading technological sectors that promise to rise in importance in the years ahead, including media, telecommunications, data storage/management, and the biosciences. It has also attracted a highly-competent, experienced and dynamic workforce with skills appropriate to the leading industrial sectors. In addition, many of its businesses are targeting international markets as their chief opportunity for growth. Denver’s time zone helps in this regard, allowing local businesses to operate fairly easily in Europe and Asia.

Capturing the Benefits of Internationalization

None of our respondents (in the for-profit or nonprofit sector) emphasized the possibility or desirability of reversing the recent trend toward deepening integration. While several voiced concerns (about outsourcing of jobs and competition), virtually all discussed what Denver might do to seek the benefits of internationalization, rather than to withdraw from it. As we reported above, several respondents discussed the need for Denver to “get

serious” about positioning itself in the world economy, in order to ensure that it takes full advantage of the opportunities associated with integration.

What kinds of support might be appropriate in this environment? Businesses that are otherwise successful and that are seeking a place in the world economy need several things: 1) relationships with others in related industries (e.g., suppliers, financiers, support service providers, wholesalers and retailers, and final customers); 2) knowledge of market opportunities, regulatory environments, distribution networks, etc.; 3) expertise in the rules and procedures of international commerce, marketing, application of new technologies, etc.; 4) low “transactions costs” so that they can exploit the opportunities that emerge quickly and efficiently; and 5) a highly-qualified workforce with the particular skills needed for success in today’s world economy. These themes recurred frequently in our interviews, and they capture many of the specific concerns and suggestions that emerged in our research.

There is a tendency to associate large business with the world economy, and small businesses with the local economy. But the data and interview responses that emerge in this study indicate that this kind of thinking is incorrect. The 743 Denver companies that earn revenues from exports are not all large—instead, they run the gamut from very large to very small. Many small firms, for instance, provide services to larger local firms that do business overseas, and to foreign firms that do business here. This suggests that strategies to promote internationalization must not overlook the small business sector. Their success is apt to have powerful effects on the local economy. And these firms are often most in need of the kinds of support listed above (as indicated in interviews conducted for this study). They often lack the relationships across the globe (and the means to develop them) that larger firms are able to cultivate on their own; they often also are more apt to lack the knowledge and expertise that are vital to success in world markets. Partly as a consequence of these relative deficiencies, they are apt to face much higher transactions costs than are their larger counterparts. Finally, they may find it more difficult to locate, interview, attract and hire skilled workers, especially those with specialized knowledge. Taking into account that they also often face much more severe budgetary constraints, they may find it difficult to impossible to thrive in international markets without assistance by public and nonprofit agencies.

This implies that local leaders should consider steps to enhance the viability of Denver businesses along these five dimensions. There is no one way to do this, and it is beyond the scope of this report to advocate a particular policy agenda. But some general ideas emerge from the data and interviews for this study. Not least, it bears emphasis that there exist in Denver a wide range of nonprofit institutions that already enjoy deep international linkages, and/or that are positioned to contribute to public policy initiatives that target internationalization. This is important, since public agencies and business associations can have the greatest impact if they manage to leverage their resources through partnerships. Perhaps most important in this regards are the area’s universities. They attract highly-skilled international students in the sciences, some of whom take up positions in the local economy upon graduation. These students also bring language skills and specialized knowledge of their home countries (and regions) that are otherwise in

short supply in the City. But in addition, the universities also facilitate interaction between local business and community leaders, and their counterparts abroad. The Center for China-U.S Cooperation at the Graduate School of International Studies of the University of Denver comes to mind in this regard. Like other institutes, it is already at work building relationships between the Denver community and the world. Given its mission (reflected in its name), it is not difficult to imagine ways in which the city's business and other community leaders can take advantage of its initiatives in ways that address the principal needs of local firms that seek to do business in China. For instance, the regular flow of Chinese officials (from the public and private sector) to the Center can substantially reduce local firms' costs of forming relationships and gaining knowledge and expertise that are vital to success in China.

Those we interviewed generated a long list of support services that would assist them and the communities with which they work in responding to the challenges of internationalization. These included help setting up meetings with foreign officials and business leaders and other networking opportunities, information of all sorts (see above), help in processing visas, opportunities for local and foreign firms to work cooperatively on joint ventures, translation services for foreign nationals in the Denver region (such as at schools, hospitals and other agencies), and a full inventory of public and private agencies in the City that provide services of relevance to them. In the latter regard, many expressed confusion about the kinds of support that various agencies offer, and so they could not take advantage of the help that already existed in the metro region. Several suggested that there is a need for greater coordination between State and City agencies, and among public and private institutions. It became apparent in these interviews that respondents need much more information about the respective services and responsibilities of the various Federal, State and City agencies that promote internationalization. It may also be the case that there is need to take a full inventory of these services—to ensure that there is not unwarranted redundancy, and to explore possibilities for greater cooperation among them. Many business leaders also stressed the need for City and airport officials to continue to pursue the establishment of nonstop flights to more international destinations. Many argued that success in this effort is vital to their ability to compete internationally from a base in Denver.

Need for New Data Collection

Much of the data on international economic integration is collected at the national or state level only, and this complicates greatly the effort to map fully the linkages between Denver and the world economy. For instance, imports and international financial flows are measured at the national level only. There are also no data on outbound FDI and other investments by local companies, or on licensing patterns and the royalties and other income to which they give rise. Even export data, which are reported at the state level, are imperfect (for reasons addressed above). Moreover, with respect to the Denver metro region specifically, there are also important gaps in data collection. For instance, there is no data base that tracks private sector contacts with the Mayor's Office of Economic Development, and so it is impossible to know just what results have occurred as a consequence of many of its initiatives.

Data collection is expensive and sometimes difficult to advocate, especially when public-sector budgets are tight. But there are obvious and important reasons for the City (and State) to consider strategies to enhance data collection. Public policy initiatives that seek to position Denver in the world economy must be informed by comprehensive, high-quality data sets that focus on the particularities of Denver's position in the world economy. As we emphasized at the outset, the effects of internationalization are regionally uneven, and this implies that it is unwise to make inferences about Denver from the situation facing other cities. Denver's strategies must be appropriate to Denver's unique situation. Strategies that fail to target the particular opportunities and challenges of the City are apt to fall short of their goals. This implies that the cost of data collection and analysis might be a wise investment over the long run, insofar as the data enhances the quality of public initiatives to promote the benefits of internationalization.

Our interviews revealed a need for certain business-related information that is not now readily available. For instance (and in keeping with the needs of internationalizing businesses discussed above), firms reported the need for detailed lists of active exporters and importers, with contact information (and opportunities to meet key individuals). Respondents also emphasized the need for Denver-specific consumer and market research, and information on office space and other location information (e.g. which industries are clustered where in the metro area?). Respondents also spoke of the need for information on key actors in their sectors abroad.

Data and information gathering is an activity that lends itself to public-private partnerships, and it is one where leveraging public resources is likely to be achievable. Many firms (and other actors) in the metro region have an interest in seeing an improvement in the extent and quality of research on the linkages between Denver and the world economy. Moreover, given that the firms that engage with the world economy are spread across the metro region (though a detailed geographic mapping by industry would be helpful to demonstrate the interdependencies across the metro region's cities and counties), there are also obvious opportunities in this area for cooperation (and cost sharing) across municipalities (and with the State).

Partnerships

This relates to a broader point: in the promotion of internationalization (and business viability more generally) there is a need and an opportunity for cooperation across the municipalities that constitute the metro region. When a leading firm chooses to locate in any city in the region, the gain spreads far beyond that city's boundaries. This is not just because of the income and expenditure effects (which might substantially redound to the benefit of other cities in the metro region), but also because the presence of this firm is apt to attract (or generate) others, which might locate across municipal borders. The tendency for related firms to cluster, and for a sector to achieve greater competitiveness as a consequence of clustering, weighs heavily in favor of regional cooperation. In short, Denver does not lose when a leading firm chooses Aurora or Littleton rather than 17th

Street. Instead, the entire metro region stands to benefit enormously from the economic success of any one of its constituents.

One important area where partnerships are promising is human resource development. While many respondents indicated that Denver's workforce is highly skilled and agile, several business and community respondents also stressed the need to strengthen this resource. There are many trade schools and institutions of higher education that contribute toward enhancing the skills of Denver's labor force, but they do not always know just what skills are and will be most important in the immediate future. In contrast, firms, business organizations, labor unions and other community institutions generally do have this information—and this suggests the opportunity for cooperative efforts between the region's schools and universities and other stakeholders to ensure that the curriculum provides students with knowledge that will serve them (and the region's employers) well. Such strategies should also target those displaced by internationalization, to ensure that its benefits flow widely through the community.

Integrating New Immigrants

Denver is undergoing an important demographic transition that bears on its linkages with the world economy. During the 1990s, the immigrant population in the Denver metro region grew by 177 percent, doubling the share of immigrants in the region's population. The immigrant community also became more diverse during this period, and more widely distributed across the metro region.

Immigrants are making a substantial impact on the Denver economy---providing labor, capital and new businesses to the local economic landscape. But their rapid integration into the economy cannot be taken for granted. Barriers of language, culture, education and income present difficulties for many immigrants, as we explored above. Additional strategies may be needed to ensure that new arrivals find a place in the economy. On the other hand, the growing ethnic diversity of Denver's population also might provide new opportunities for local businesses to integrate into the world economy—not least, by providing them with employees with language and other knowledge that might help them to gain entry into foreign markets. Finally, the increasing dispersion of immigrants across the metro region implies that responding to their needs might also be an area where municipalities can cooperate.

Targeting Public Resources: Current Patterns, and Emerging Trends

In looking to provide support for internationalization efforts, neither the City of Denver nor the State of Colorado can target all regions of the globe equally, of course. Choices must be made, and this decision-making process would certainly be improved by more comprehensive data collection of the sort discussed above. But the existing data do point to certain patterns and trends that ought to bear on this process. The data summarized above demonstrate the importance of England, Canada and Japan as sources of inward investment, and the importance of Canada, Mexico and Japan as trading partners.

Regarding recent trends, the data reveal that Mexico and certain Asian countries are rapidly emerging as important trading partners for Colorado.

The data on immigration, finance and trade indicate that Mexico is growing in importance for the Denver economy. Mexico is the largest sending country for new immigrants, and that pattern is likely to endure for the foreseeable future. But equally important, it is also among the fastest growing importers of Colorado's exports. Between 1999 and 2003, the State's exports to Mexico grew by 92 percent; at the end of that period, Mexico was the second largest importer from Colorado. Colorado is vitally important for Mexico as well. Although data on remittances are incomplete (see above), it is certain that Mexicans living in Colorado remit large sums to their families at home in Mexico.

The importance of Canada and Mexico as major trading partners fits a pattern that holds worldwide—countries tend to trade heavily with other countries in the same region (Dicken 1993). The same pattern holds for international investment flows—firms tend to locate their affiliates in neighboring countries.

Nevertheless, over the past five years, the State's exports have also been rising rapidly to South Korea, Malaysia, Taiwan, China and the Philippines. The share of Colorado's exports to each of these countries has grown dramatically, in part owing to the rapid absolute growth in exports, and in part owing to the stagnation (and even decline) in exports to Europe and Japan.

These data suggest a two-pronged strategy: targeting those countries that are now the leading destinations of Colorado's exports, and the leading sources for inward investment (especially North America), while also targeting those countries that are growing most quickly as importers and investors. It should be pointed out, however, that this emphasis may overlook countries that are key partners on the trade and investment fronts—those that export to Colorado, and those that receive capital from the State. As revealed in our interviews, both of these might be vital to the success of local businesses (e.g., the importation of components might allow a local manufacturer to remain in Denver) and to the income of many local inhabitants. Unfortunately, data on imports to the State and on capital exports from the State (let alone the metro region) are unavailable and/or inadequate.

Limits to Internationalization: Venture Capital

This study has emphasized the deep linkages between metro Denver and the world economy. These linkages have grown dramatically over the past several decades, to be sure. But there are important limits to internationalization, and these, too, should inform public policy and private-sector strategies. Not all sectors are being internationalized, and not all at the same pace. In important regards place, context and local institutions continue to matter.

In our research the most important sector that demonstrates the limits of internationalization is the venture capital sector. Venture capital exhibits a “home-country” and even what we have termed a “backyard” bias. That is, venture capital firms exhibit a strong tendency to invest in their home regions, and especially, their home states. This suggests that in regards to start-up finance, there is no substitute for the intimate knowledge of local business opportunities—knowledge that is difficult (and perhaps impossible) to achieve from afar.

This implies that despite the apparent internationalization of the world’s financial markets, a city remains dependent for this important kind of finance on its own, local, venture capital institutions. And what is true of venture capital might be equally true of others as well. Some services and expertise that are vital to a community’s economic vibrancy may not be (easily) tradable. To the degree that this is so, it implies that there is a role for public officials in identifying just what are these key untradable sectors, and in identifying steps to ensure that they thrive in the local economy.

With respect to venture capital, public officials might take steps to attract and retain those firms with expertise in the particular industries that are providing the basis for economic vibrancy in the City—such as those leading industries which have or are forming clusters in the metro region. It is notable in this regard that a 2003 study by the Colorado Office of Innovation and Technology emphasized the need for venture capital as a critical piece of the puzzle in developing the region’s emerging biosciences cluster.

Attracting and Retaining Leading Firms and Sectors

In our interviews we learned from many respondents that there is today tremendous competition among cities and states (and countries) to attract business. Some also suggested that the City of Denver does not do much to retain them. Several cited factors such as Denver’s regulatory environment (and its tax on furniture and the City use tax) as obstacles for firms considering Denver as a potential site of operations, and as impediments for local business success.

We did not conduct a corporate location assessment in this research, or a general review of the local business climate, and so we cannot speculate about the significance of these factors. Nor do we offer here a list of steps that the City should take to attract and retain business. But the results of the interviews do suggest that it might be wise for the City to undertake an evaluation of its current strategies for attracting and retaining key businesses in leading sectors, and an assessment of the regional environment for the success of local businesses in world markets. Many steps that would benefit business generally (such as improvements in infrastructure, primary and secondary education, reductions in housing costs, etc.) would also help those businesses that have or are seeking international linkages.