Using Information Resources to Enhance Urban Markets

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USING INFORMATION RESOURCES TO ENHANCE URBAN MARKETS

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[1] "*Valuing Neighborhoods—Driving Change"* (Washington: Brookings Institution) is particularly relevant, and frequently referenced in this paper. See also, Robert Weissbourd and Perpetual Motion, "Banking on Technology: Expanding Financial Markets and Economic Opportunity" (Washington: Brookings Institution, 2002); John Weiser and Simon Zadek, "Conversations with Disbelievers: Persuading Companies to Address Social Challenges" (New York: Ford Foundation, 2000).

ABOUT THE URBAN MARKETS INITIATIVE

The Urban Markets Initiative (UMI) at the Brookings Institution Metropolitan Policy Program aims to improve the quality of the information available on urban communities and use it to unleash the full power of those markets while connecting them to the economic mainstream. Information influences investment decisions made in communities every day—whether to open a new store, to expand a warehouse, a bank's decision on personal and business loans, or a family's decision to purchase a new home. When information to make these decisions is not accurate, available, or accessible to urban investors, urban markets fail to thrive.

We gratefully acknowledge the ongoing support of Living Cities (www.livingcities.org) for the Urban Markets Initiative.

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Living Cities: The National Community Development Initiative is the founding funder for the Urban Markets Initiative. Living Cities is a partnership of leading foundations, financial institutions, nonprofit organizations, and the federal government committed to improving the vitality of cities and urban communities.

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ABSTRACT

This paper focuses on the role of information resources in enhancing market performance, particularly in enabling markets to expand to underserved urban areas. Better information and information tools can be used strategically to increase productivity, shift consumer demand or reduce transaction costs and risks—each of which can cause markets to shift to include more inner city assets and people, improving both the neighborhood and the regional economy. Specific examples—ranging from improving credit scoring data in order to expand financial products, to creating better labor force certification in order to expand hiring—are explored, along with key lessons from practitioners about effectively using information resources for community development.

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I. INTRODUCTION

This discussion paper focuses on the increasing importance of information resources[2] both as a significant barrier to market functioning in inner cities and as the key to enhancing markets to better include the assets of inner-city neighborhoods. These resources increasingly constitute more of the value added in wealth creation across the economy, and they have become a primary driver and enabler of market mechanisms. Developing information resources can help advance market-based investment in lower-income neighborhoods, reconnect isolated people and places to the mainstream economy, and redeploy undervalued and underused assets.

The paper opens with a brief background on market-based community economic development, examining how recent trends in this field have highlighted the importance of better understanding markets and the opportunities to expand markets to include inner-city assets. These issues are explored in more fully in a companion paper.[3]

The second section analyzes the role that information plays in markets and the heightened importance of information resources in the knowledge economy. It explores how particular types of information can enhance productivity, reduce exchange costs, or otherwise enable specific market activity to expand to previously underserved people and places. This section also highlights the role of dynamic information resources as the very medium of market activity.

The third section focuses on applying these observations, referring to current innovations in the field and illustrating how information resources can be used to enhance markets for neighborhood economic development. This section also discusses which types of information resources are more likely to be effective market-enhancing levers. The paper concludes by suggesting possible implications for practice, policy, and further research.

Like its companion paper, this discussion paper attempts to bring together the worlds of community development and economics, and in doing so inevitably fails to do justice to either. It is

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[2]The term information resources refers broadly to a continuum of data, knowledge, and tools. Data are the raw material of information: facts about a variety of characteristics and behaviors of a given place, population, or entity. Knowledge arises from the analysis of data to identify, explain, measure, evaluate, or otherwise better understand social, economic, and political phenomena. Tools include systems for gathering, generating, sharing, accessing and acting on information (data and knowledge). That you paid your mortgage last month is data; your credit score is knowledge; the system that automatically gathers the mortgage payment data, updates your score, and makes it available to creditors is an information tool. We are not carefully distinguishing information and technology here, or pure information (the content) and the structures or systems that enable and facilitate information flows (the medium or the container of information). Although the systems that help process and transmit information faster and at lower costs are distinct from the information they contain, they are in many ways codependent and inherently define each other. The significance of the distinction deserves much further attention, but is not critical for our present purposes, so they are collectively included in the phrase "information resources."

[3] See companion paper, "Market-Based Community Economic Development."

hoped, however, that the ideas presented here reveal the major opportunities that arise from collaboration between professionals in these two worlds, and that both will be engaged to clarify how market functioning in inner cities can be improved.

II. BACKGROUND: MARKET-BASED COMMUNITY ECONOMIC DEVELOPMENT

As community development practitioners have increasingly focused on asset-based development,[4] interest in the *economics* of community development has grown. Interest is particularly strong in enhancing markets -- the ways in which assets get deployed and converted to value in our economy. Focusing on enhancing markets, in turn, requires looking beyond neighborhoods to understand how neighborhood assets fit in as components of larger economic systems.

The assets of inner-city neighborhoods are often unrecognized or undervalued, as inner-city neighborhoods are isolated from the larger market systems that define the mainstream economy. The lost economic opportunities translate into concentrated poverty in these neighborhoods and, at the same time, into reduced economic performance of the larger city and regional economies, which fail to realize their full potential. In this respect, market-based community economic development seeks to align equity and efficiency goals: markets can be enhanced and operate more efficiently (for both the larger economy and the underdeveloped neighborhoods) if they include underused assets— people and places often left at the margins of the wealth creation process.

The focus on making markets work better has highlighted the key role of information in market efficiency, particularly with respect to inner-city neighborhoods. The fundamental information and knowledge that allow markets to work are simply unavailable for many inner-city communities. Indeed, the available (mis)information contributes to continuing misperceptions of these areas.[5] Information imperfections are an important reason for the isolation of lower-income communities; remedying them can help reconnect inner-city neighborhoods to mainstream markets and generate new opportunities for wealth creation.

The role of information is best understood in the context of the factors that determine market operations. As discussed in the companion paper, markets can be understood by examining three essential components: production, exchange, and consumption. The production, or supply, side of the market creates the products and services, and the consumption, or demand, side of the market determines the quantity of goods and services demanded at any given price. The existence of the market itself relies on another function, a trading or exchange function. Any exchange of goods and services depends on the interaction between producers and consumers—their ability to find one

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[4] The term assets is used very broadly to encompass a wide spectrum of things and circumstances (ranging from factors of production to untapped consumer markets) that create opportunities for or embody wealth creation or other positive development outcomes. For a more detailed discussion of the varied definitions and their different uses by economists and development practitioners, see the companion paper, "Market-Based Community Economic Development." For asset-based development generally, see John P. Kretzmann and John L. McKnight, Building Communities from the Inside Out: A Path toward Finding and Mobilizing a Community's Assets (Chicago: The Asset-Based Community Development Institute, 1993).

[5] See, e.g., Robert Weissbourd and Christopher Berry, "The Market Potential of Inner-City Neighborhoods: Filling the Information Gap" (Washington: Brookings Institution, 1999); Eric Scorsone and Stephan Weiler, "New Markets as Informational Asymmetries," Economic Development Quarterly 18 (3) (2004); and Section III.B in this paper.

another, offer and evaluate goods, and agree to terms of the transaction. Trade is how the producer finds the consumer, learns preferences to better tailor goods, and offers products. Trade is also how the consumer chooses among competing goods. The exchange function is affected by transaction costs, including finding costs (for the producer and consumer to connect) and measurement costs (for each to evaluate the other or its product), and by costs of assessing the risk inherent in every transaction.

Basic neoclassical microeconomic theory focuses little on this trading or exchange function because of simplifying assumptions that producers and consumers have perfect information, and that there are no transaction costs. More recent developments (discussed below), however, suggest the utility of focusing separately on this exchange function,[6] precisely because, in the real world, highly imperfect information results in prohibitive finding and measurement costs that impair urban markets' functioning. Information thus can play a vital role in enhancing the exchange function of markets.

Within this framework, "enhancing markets" refers to changing the conditions of production, exchange, and consumption in ways that allow markets to expand to new people, assets, or places. For instance, production can be enhanced by improving the productivity of the firm, consumption can be enhanced by increasing the income of the consumer, and exchange can be enhanced by reducing transaction costs. This, in turn, means that more people and assets will become actively engaged in the market, production will be more efficiently converted into value, existing market opportunities will be exploited, and new market opportunities will be created.

This market-based approach builds on a convergence of interests between businesses and economic development practitioners. Enhancing market functioning in inner-city neighborhoods provides new business opportunities that in turn improve the quality of life of inner-city residents. This approach can also mutually engage practitioners and economists. The focus of economic development practitioners on economic assets (housing, employment, etc.), and on attracting investment in assets has piqued their interest in economics and in how wealth is created. With a renewed interest in economic geography, the field of economics has also begun exploring more carefully how markets operate in particular places. In this context, bringing together the market expertise of economists with the development expertise of practitioners can yield significant insights for both fields, and it could effect real change in inner-city communities.

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[6] Our focus on enhancing markets primarily is aimed at producers, and we find that this exchange function can often be viewed as a cost of production. For example, ATMs allow banks to provide more access, reaching more customers less expensively, and so reduce the costs associated with customer acquisition and service. If landlords have better information on prospective tenants, rental costs associated with screening can be reduced. Similarly, credit scoring reduces the cost of evaluating prospective borrowers. Each of these can be viewed as lowered production costs, or broken out as a special category related to the exchange function.

III. THE POWER OF INFORMATION TO ENHANCE MARKETS

A. Information Is a Fundamental Driver of Economies and Markets

Information has always been a critical element in the flow of economic activity, and specifically in the operation of markets: it determines risk and transaction costs, and drives business, consumer, and policy decisions. Before analyzing these roles in detail, it is useful to briefly understand just how fundamental information is to economics more broadly.

An economy can be defined as a system that addresses the basic problem of allocating resources to match production capacities and consumer demands. The market can be viewed as the core vehicle for carrying out this process. In this (still largely theoretical) context, information is the key to the coordination problem, guiding producers and consumers in their individual decisions to result in optimal allocations. Information is also central to identifying and deploying critical assets. With perfect information, all factors of production are efficiently used, their relative risks and costs are known, and all market opportunities are exploited. Quite literally then, "information makes markets work."[7]

Another critical role of information relates to the geographic dimension of the economy. The exchange of useful information among firms near one another (also referred to as "knowledge spillovers") generates agglomeration economies that contribute greatly to productivity and economic growth. Indeed, urban economists point to this type of information flow as one of the main reasons for the existence of cities and for the importance of urban centers in the rise of production networks and commercial enterprises.[8]

One of the core assumptions of neoclassical microeconomic theory is that of "perfect information." In a perfect (theoretical) market, where there are no information costs and market knowledge is complete, asset deployment and investment happens naturally. This assumption implies that buyers and sellers know everything there is to know about one another and about the quality of the goods being traded in the market. Economists rely on this assumption to build the simple model of supply and demand in the case of perfect competition, and to show how ideal markets work.

When microeconomic theory is applied to real markets, though, information is far from perfect; in fact, imperfections seem to be the norm. This realization is at the base of a new branch of economics (referred to as information economics) that challenges the core assumptions of

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[7] Karen Eggleston, Robert Jensen, and Richard Zeckhauser, "Information and Communication Technologies, Markets, and Economic Development." In G. Kirkman et al., editors, The Global Information Technology Report: Readiness for the Networked World New York: Oxford University Press, 2000), p. 71.

[8] See, e.g., Robert Lucas, "On the Mechanics of Economic Development," Journal of Monetary Economics 22 (1988): 3–42; Woodruff Smith, "The Function of Commercial Centers in the Modernization of European Capitalism: Amsterdam as an Information Exchange in the 17th Century," Journal of Economic History 44 (1984): 985–1055.

neoclassical economics and seeks to model the ways in which markets cope with imperfect information.[9] Joseph Stiglitz, among others, has pointed out numerous examples in which imperfect and incomplete information creates markets that are inefficient at allocating resources, developing products, pricing those products or reaching customers.

In this view, information becomes one of the most important elements for economic consideration. For instance, the lack of information, or the fact that one side of the market knows more than the other, can drastically increase the cost of transactions and ultimately cause severe market failures. Consequently, pockets of demand remain unmet, possibilities of production are never explored, and valuable assets remain untapped. Indeed, much of the observed "isolation" of inner city residents, assets, and neighborhoods can be understood as market information imperfections. Examining the role of information in the different components of markets begins to reveal how these failures can be remedied.

B. Information Can Enhance Markets by Shifting Production, Consumption, or Exchange Functions

The market framework summarized above (and further discussed in the companion paper) can be used to elucidate the critical role of information in every component of the market, but particularly in the production and exchange functions. This understanding reveals how information can be used to enhance markets to better include inner cities, and it suggests a strategic approach to using information resources for market-based community economic development.

1. Production: Information Increases Productivity and Reduces Costs

The production of a given good depends on the firm's cost structure and on its production possibility frontier.[10] It follows that information can influence production in two ways: by increasing productivity, or by reducing costs. Information can increase productivity (the ratio of output to cost) by enhancing the production process. For instance, a new process management system that streamlines production can increase the amount that can be produced at the same cost. Information can instead reduce costs, for example, by allowing a firm to more accurately understand and track inventory, enabling the company to better predict demand, reduce inventory, and save. These information enhancements can translate to companies offering more credit to a previously marginal customer segment, to more affordable housing, or to greater employment.

Information resources play several distinct roles in the production side of the market. Information is often itself a factor of production, an input. The value of human capital—the skills,

[9] In fact, several of the most recent Nobel prizes in economics have been awarded to economists such as Joseph Stiglitz, George Akerlof, and Michael Spence for their research on the role of information in markets. For an overview of information economics see Joseph Stiglitz, "Information and the Change in the Economics Paradigm," Nobel Prize Lecture (2001).

[10] Production possibility frontier refers to "the set of all combinations of inputs and outputs that comprise a technologically feasible way to produce." Quoted in Hal R. Varian, Intermediate Microeconomics (W. W. Norton 1999), p544.

education, and talents of the workforce—depends, in part, on the information and knowledge embedded in the labor force, increasing productivity. Information also can be an output, as part of the value embedded in the product (the computer monitoring systems in a new car) or it can be the product itself (a book, or word processing software).[11] Finally, information can also be part of the production process, either increasing productivity or reducing costs. In this case, information plays a critical and expanding role in increasing production efficiencies, as in the case of "just-in-time" production, total quality management systems, or streamlining operations between a producer and a vast network of suppliers. In contrast to information as an input (or output), information as an inherent part of the production process plays a special, more dynamic role (discussed further below) as a process enabler.

2. Consumption: Information Influences Preferences and Demand

The demand for a good depends on the price of that good (and on the price of its complements and substitutes) and on the income and preferences of the consumer. Although information cannot directly affect income, it can have an effect on a consumer's preferences, determining the quantity and quality of the goods and services that he or she is willing to buy. By changing consumer behavior, information can have a significant effect on the market as a whole. For instance, as more information about the health effects of different foods became available, people more often made product choices based on the reported nutritional value of their food. Ultimately, food producers responded by developing healthier products and marketing them based on their nutritional characteristics.[12]

The market for financial services (and in particular retail banks) provides another example of how information can influence consumption. Lack of financial literacy may be one of the reasons why some inner-city residents are less likely to use retail banks (if they are unaware of the relative benefits of checking or savings accounts). In this case, programs providing better information on the benefits of using a retail bank are designed to increase demand, and, in turn, increase these services in inner-city neighborhoods.

[11] Economists are now paying a great deal of attention to these information products, given that they have peculiar economic properties (such as not having diminishing returns) that set them apart from other products. See Carl Shapiro and Hal R. Varian, Information Rules: A Strategic Guide to the Network Economy (Boston: Harvard Business School Press, 1999). In this paper, though, the general role of information as a product is of less interest. Although specific neighborhood information products can be assets and create real value, information as a product generally does not as clearly relate to the topic of enhancing markets. Types and roles of information are further discussed below.

[12] Nutritional labeling on food products can also be considered an example of addressing measurement costs in the exchange function (see below).

3. Exchange: Information Determines Transaction Costs and Risk

The effect of information on the exchange function is especially important given that exchange depends greatly on information. It is in the exchange function where market failure often occurs with respect to inner-city assets. The role of information in this function is also more complex and requires a more elaborate analysis.

The exchange function is defined as the ability of buyers and sellers to find one another, evaluate the quality of the goods, and agree to terms of the transaction. Each of these aspects of exchange involves an additional "transaction" cost to both buyers and sellers. Such costs include both "finding costs" and "measurement costs," each of which can be significantly reduced by the availability of information. Every transaction also entails a certain degree of risk: buyers and sellers must accurately evaluate this risk in their decision to complete the transaction, and information plays a crucial role in that assessment, making possible transactions that would not otherwise take place.

Finding costs are the costs that buyers and sellers incur as they seek one another out. Stigler offers a compelling analysis of the role of information in reducing finding costs.[13] According to Stigler, price variation among sellers of identical goods is a measure of the lack of information in the market: the less information about the number of sellers and their prices, the greater range of prices for a particular good. In turn, if the price of a good varies significantly from seller to seller, buyers must spend more time canvassing different sellers for the lowest price, thus incurring high finding costs. On the other hand, with more information, prices vary less because sellers must compete for buyers who know what each seller is charging. Further, buyers do not need to embark in a costly search for the best price. It follows that information results in less price dispersion and in lower finding costs.

An important component of sellers' finding costs is "market access costs." To identify and reach suitable buyers, sellers must often use costly market analysis and marketing. The availability of specialized and reliable market intelligence and of rich market networks (the opposite of isolation) makes it possible to develop and deliver more customized products, and select better locations more efficiently and with less cost. One of the reasons businesses do not locate in inner-city neighborhoods proportional to the market opportunity is precisely the lack of good market intelligence on these communities. For instance, retailers tend to have less accurate data and models for estimating the purchasing power of lower-income communities, resulting in gross underestimates of potential returns on investment. As a result of the lack of good information and models (as well as more limited networks), retailers have much higher finding costs for these communities. More accurate market information would allow the sellers to take advantage of the market opportunity presented by inner-city neighborhoods, and at the same time reduce the finding costs of the buyers in these communities, who would no longer have to travel to other neighborhoods to do their shopping.

[13] George J. Stigler, "The Economics of Information," The Journal of Political Economy 69 (3) (1961): 213–225.

To complete a transaction, not only must buyer and seller find one another, but the buyer must also evaluate the quality of the good or service. This entails a measurement cost.[14] For the majority of market transactions, the seller knows more about the good he or she is selling than the buyer does. If the buyer wants to know more, he or she must devote additional time and resources to this effort, i.e. incur a measurement cost. This imbalance in knowledge is known as asymmetric information.[15] If the measurement costs are too high, asymmetric information can result in the disruption of the market because lack of information will prevent the trading parties from agreeing on a price.[16]

The labor market is a common example of asymmetric information. It is very difficult for employers (the buyers, in this case) to assess the productivity of a worker before hiring; the measurement costs for detailed evaluation are too high. As a result, firms may substitute broad proxies (such as where a prospective employee went to college) for individual measurement, or may try to avoid measurement costs by relying on personal networks. As applied to inner-city labor markets, measurement costs, all else being equal, might lead firms to refrain from hiring a certain demographic group altogether, adopting social background as a proxy for productivity. In effect, stereotyping is made necessary as a result of inability to attain sufficient information on individuals, or even narrower segments, within a group.[17] Alternatively, inner-city residents may not be privy to the networks that employers may use to avoid measurement and finding costs. Networks, and particularly social networks, are also extremely important to the supply side of the labor market, given that informal and personal contacts play an important role in connecting potential workers to available jobs.[18]

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[14] Measurement costs are present in all market transactions. They particularly lead to serious market failures (and present economic development opportunities) in the case of asymmetric information.

[15] The most famous example of asymmetric information is provided by George Akerlof in his study, "The Market for Lemons: Quality Uncertainty and the Market Mechanism," Quarterly Journal of Economics 89 (1970): 488-500. In the market of used cars, the seller has a pretty good idea of the quality of the car he is selling, while it might be very difficult for the buyer to determine the car's quality. The seller is willing to sell a good car for $2,000, and a lemon for $1,000. The buyer is willing to buy a good car for $2,400, and a lemon for $1,200. With perfect information, good cars would be sold at a price between $2,000 and $2,400, and lemons would be sold at a price between $1,000 and $1,200. In the case of asymmetric information, though, the buyer would not know whether the car was good or a lemon. Consequently, the buyer will be willing to pay only an average price of $1,800 (which is the expected value of the car with a 50% chance of it being a lemon). At this price, only lemons will be offered for sale, while good cars will never be sold. This kind of market failure is called "adverse selection," and occurs when bad products drive the good ones out of the market.

[16] For examples of the ways in which markets try to remedy information asymmetries, see Michael Spence, "Job Market Signaling," The Quarterly Journal of Economics 87 (3) (1973): 355–374; and Richard Arnott and Joseph Stiglitz, "Equilibrium in Competitive Insurance Markets with Moral Hazard." Working paper 3588 (Cambridge, MA: National Bureau of Economic Research, 1991).

[17] This process of statistical discrimination occurs when people are not hired because of the characteristics of the group to which they belong, and not because of their personal characteristics. For a compelling discussion of statistical discrimination in the labor market, see Lester C. Thurow, Generating Inequality: Mechanisms of Distribution in the U.S. Economy (Basic Books, 1975).

[18] For an analysis of labor market imperfections in the inner city and in particular of the role of networks and information flows, see William T. Dickens, "Rebuilding Urban Labor Markets: What Community Development Can Accomplish." In Ronald F. Ferguson and William T. Dickens, eds., Urban Problems and Community Development (Washington: Brookings, 1999).

This lack of information is one of the reasons why labor is often underemployed in inner-city markets (as well as why employers are less likely to locate in inner-city neighborhoods). If employers had better information about the productivity of inner-city workers (such as credible and reliable certification of skills), they could more efficiently and profitably hire more employees from and bring more businesses to the inner city.

In addition to finding and measurement costs, every market transaction involves risk.[19] Much like finding and measurement costs, risk is also a function of information.[20] Although information can never completely eliminate risk, it can significantly reduce it. In everyday business practice, it is vital to acquire as much information as possible—up to the point where the marginal cost of knowing a bit more does not outweigh the savings from the risk reduction.[21]

Financial products provide a clear example of the role of information in assessing risk. A lender must accept the risk that the borrower might default on the loan, and consequently charges an interest rate that compensates for that risk. To the borrower, the interest rate is the price of the loan and will vary depending on how risky the transaction is deemed to be by the lender. Risk (and consequently interest rate) is a function of how credit-worthy the borrower is, which in turn is determined by the lender, based on a range of available information, such as credit history, employment, and so forth. The more information available to the lender, the more accurately the price of the loan will reflect the risk. There will always be some risk, and an interest charge, but the price of the loan can be affected by the quality of the information for assessing risk, thereby allowing the lending market to make more loans at lower prices.[22]

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[19] Although measurement costs get at the aspects of risk related to the quality of the good, there are other aspects of risk that depend on the characteristics of the trading partners and on the conditions under which the transaction takes place. Therefore, risk is broken out here as a distinct dimension.

[20] The more information one has, the better one can assess the risk in a given transaction. However, regardless of how much information can be gathered, residual risk always exists owing to external factors that cannot be controlled by the trading parties. For this reason, economists distinguish risk from uncertainty. When all the odds about a possible state of the world are known, there is still risk, but there is no uncertainty. For example, in the game of dice, more information allows the player to know the odds of various outcomes, and to better evaluate how or whether to play. The information reduces uncertainty but does not eliminate the underlying risk in any particular throw of the dice.

[21] Businesses view information quite differently than academics or policymakers, and they are acutely aware that no perfect information exists, and that the cost and time incurred in acquiring incrementally better information can be substantial, and not worth the effort. In effect, if a business, on the one hand, can obtain a bit more information that will allow its estimate to be 70% reliable instead of 65% reliable, this has enormous value; the business does not need perfect information. On the other hand, it may not be worth the cost or delay to try to achieve 75% reliability.

[22] Although information has a tremendous effect on the efficiency and performance of financial markets, clearly other dynamics enter into the equation. See Joseph Stiglitz and Andrew Weiss, “Asymmetric Information in Credit Markets and Its Implications for Macro-Economics,” Oxford Economic Papers 44 (4) (new series) (1992): 694-724. For instance, in situations in which economic rationality does not always apply, such as in the public sector or in highly subsidized urban markets or in the case of race and class prejudice, increased information might not necessarily lead to increased efficiency. See Joseph Stiglitz, “Distinguished Lecture on Economics in Government: The Private Uses of Public Interest,” Journal of Economic Perspectives12 (2) (1998): 3–22.

Finally, the role of networks is particularly important in facilitating the flow of information and improving the exchange function.[23] Networks can reduce finding and measurement costs for buyers and sellers, and facilitate the exchange of a wide array of goods and services.[24] The repeated interactions that take place through networks also play a crucial role in reducing risk and uncertainty, given that over time they allow trading partners to build relationships and mutual trust.[25]

Information thus takes several forms, playing different roles, helping both buyers and sellers. Certifying the particular skills of inner-city residents would reduce employers' measurement costs and lead more businesses to hire from and locate in these neighborhoods. Creating better employment networks and job banks would enable employees to more readily find jobs. Market analysis reduces finding costs and allows firms to identify new pockets of demand, expanding their businesses and serving previously neglected communities. Better credit scoring systems would result in more precise risk assessment, allowing financial institutions to further serve lower-income customers. Information resources can thus provide analysis, certification, assessment, or access; they can more efficiently locate and connect consumers and producers, reduce costs, increase the pace of transactions, or improve market transparency. As discussed below, one of the tasks facing this emerging field is to better inventory the types of information resources and their respective roles in enhancing varied market functions.

In all of these different ways, better information resources can improve market functioning, helping reconnect inner-city neighborhoods to mainstream economic activity, benefiting both inner-city communities and the overall performance of the economy. Inner-city workers can find jobs, residents with improved access to credit can begin accumulating assets (bank accounts, homes), and they can gain easier access to retail and other services. At the same time, markets can begin leveraging assets (labor pools, market opportunities) that were not being productively deployed, generating more wealth.

So far, the focus has been on the traditional role of information, a role information has played throughout the existence of the market system. Information is as crucial today in reducing the risk of investments, driving down the cost of transactions, allowing buyers to find sellers and vice versa, as

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[23] Networks can encompass varied structures—information technology, social and economic relationships, and so forth—that facilitate the flow of information between individuals or organizations. As discussed above in the distinction between information and information technology, the network structure is distinct from the information it contains, although they inherently define each other. Although we refer here to the structure and the information collectively, and they are included as information resources, the distinction and its significance bear further exploration. For a discussion of different types and functions of networks, see Peter Plastrik and Madeleine Taylor, "Network Power for Philanthropy and Nonprofits" (Boston: Barr Foundation Network Research Project, 2004).

[24] The case of the labor market, discussed above, is one example. For a discussion of the role of networks in business to business relationships (and particularly in small business operations), see Joseph Cortright and Patricia Scruggs, Portland Small Business Needs Assessment (Portland, Impresa, Inc., 1996).

[25] For discussion of the effect of networks on economic efficiency, see Albert-Laszlo Barabasi, Linked: The New Science of Networks (Cambridge, MA, Perseus Publishing, 2002); Michael J. Piore and Charles F. Sable, The Second Industrial Divide: Possibilities for Prosperity (Basic Books, 1984); Peter Calthorpe and William Fulton, The Regional City (Washington: Island Press, 2001); and John Seeley Brown and Paul Duguid, The Social Life of Information (Boston: Harvard Business School Press, 2000).

it was a century ago. In the economy of the 21st century, though, information is more important than ever.

C. The Knowledge Economy Places an Additional Premium on Information

The "knowledge economy" refers to the increasing role of information resources in value creation and market functioning.[26] Knowledge has become perhaps the most important factor of production, and information and knowledge (and their enabling technologies) are becoming more important across all economic sectors,[27] transforming the basis for competitive advantage. As a result of these transformations, the importance of specialized information to enhance markets has grown significantly.

In a sense, what defines and moves markets and economies *is* information: specialized intelligence on everything from investment opportunities to niche consumer markets. What has changed in the knowledge economy is that globalization and flexible product specialization have placed a premium on information resources and enhanced the capacity to develop them.

From manufacturing to service industries, more and more of the value added in production, product, and delivery flows from specialized information.[28] A new Mercedes has more computing power than the average personal computer. Federal Express is not only a delivery service but an *information* service—customers can track their packages anywhere in the world with a couple of clicks of the computer. The company's key asset, which enables it to deliver anywhere on time (and to generate revenue), is its information system. The extent to which value creation has shifted toward information content is highlighted by Alan Greenspan's observation that, although the U.S.

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[26] "Knowledge Economy" is commonly used to refer to several distinct phenomena: (1) innovation; (2) the growth of the information sector; and (3) the increasing role of information and knowledge. The first, innovation, is not a new phenomenon; innovation has always been a key driver of economic growth. However, it is possible that the rate of innovation may be affected by the other knowledge economy changes. The second, the increase in the information sector, presents some definitional issues. The information sector is sometimes viewed narrowly as dot-coms and information technology companies (and so seen as a transitional change, whose "bubble" has now burst). However, it is increasingly used more broadly as referring to sectors heavily dependent on information and information functions. See Matthew Drennan, The Information Economy and American Cities (Baltimore: Johns Hopkins University Press, 2002). Conceived broadly, this sector is significantly increasing as a component of the economy. Finally, information and knowledge (and their enabling technologies) are becoming more important across all sectors in ways which represent the biggest change in the underlying economy. This broadest use is the primary focus here. For further discussion, see Robert Weissbourd and Christopher Berry," The Changing Dynamics of Urban America" (Boston: CEOs for Cities, 2003), available online at www.ceosforcities.org.

[27] For recent research on this point, see Weissbourd and Berry, "The Changing Dynamics of Urban America."

[28] Consider the shift in the automobile industry. Henry Ford mass-produced, then mass-marketed the Model T. Today, Ford Motor Company wants to know exactly what model, features, and color a customer wants, then tailor makes a car to fit the bill. In such an environment, in-depth customer knowledge and access are critical: we have moved from a "product-push" to a "customer-pull" economy. The most common explanation of this shift stems from the observation that advancement in technology (most notably the invention of the microchip) drastically reduced the cost of processing and storing information, enabling customized design and delivery of products and services for smaller market niches, and placing a premium on niche market information and access. More generally, today's market rewards adaptability, as flexible firms face lower costs and are more efficient. Adaptability, in turn, depends on intangibles such as firm structure and information flows.

gross domestic product has quintupled during the last 50 years, its physical weight has barely increased.[29]

As discussed above, the flow of information is critical to the efficiency of markets. In the knowledge economy, social and business networks play an important role in facilitating the flow of information, by connecting assets and investors, providers and customers, producers and suppliers. These networks themselves, from customer management systems to neighborhood platforms,[30] are also increasingly information tools. Meanwhile, our systems for gathering, analyzing, and transmitting information have changed. The Internet enables worldwide connections that were unthinkable just a decade ago and significantly lowers the cost of acquiring information.

A factor that further contributes to the increasing importance of information resources is the growth of intangible assets such as brand equity, innovative organizational process, customer networks, and information resources such as intellectual property, databases, and software.[31] This growth if intangible assets has important implications for the role of information, for two reasons. First, intangibles are more often information-based, and often can themselves be considered information resources (for example, intellectual property or networks). Second, the value of intangibles is inherently more difficult to measure, thus requiring better information; it is more difficult to evaluate the market value of a lawyer's services than of a printer cartridge. Consequently, measurement costs can be particularly high for transactions that involve intangibles. In a world in which such a high percentage of value is driven by intangibles, information is more vital than ever to reducing measurement costs and improving the overall functioning of markets.

In short, as markets become more flexible, specialized, and faster-paced, and products become more information based, the role of information in enhancing markets has never been greater. This greater role has important implications for inner-city neighborhoods, posing new challenges and presenting new opportunities. In the so-called "information age," the lack of reliable market information on low-income communities and their assets is a particularly dangerous trend. As market intelligence becomes an increasingly invaluable commodity in business—one that is generally unavailable for disinvested communities—inner-city communities risk being overlooked and underserved. In the information age, we pay attention to what we can measure, and what we

[29] David Wessel, "Greenspan Weighs Evidence and Finds a Lighter Economy," The Wall Street Journal, available at http://anasazi.umsl.edu/FIN455/NonLinear/GreenspanWeighs.htm.

[30] "Neighborhood platforms" refers to a variety of emerging web-based interactive platforms that build neighborhood networks by gathering and sharing local information, and enabling easier exchange between local businesses, institutions, and residents. See, Westmorelandweb.com; The Brookings Institution Center on Urban and Metropolitan Policy and RW Ventures, "*Valuing Neighborhoods—Driving Change*" (Washington: Brookings Institution).

[31] Evidence of the new importance of intangibles abounds. Jonathan Low and Pam Cohen Kalafut, Invisible Advantage: How Intangibles Are Driving Business Performance (Cambridge, MA: Perseus Publishing, 2002), point out that in 1998, for the first time, U.S. corporate investment in intangibles such as brand and training surpassed investment in tangibles such as property, plant, and equipment, and has continued to do so. Margaret M. Blair and Steven M. H. Wallman, Unseen Wealth (Washington: Brookings, 2001), also cite the growth in the service sector as a share of total economic activity and the rapid climb in value of financial assets despite relatively low growth in physical assets.

pay attention to becomes what we value. When less information is available on poorer people and communities, they remain out of sight and, increasingly, out of opportunities.

Along with these challenges, the knowledge economy presents a host of new opportunities. As we have seen, information not only contributes to the functioning of markets, but it also changes the way in which wealth is created. Leaders in the corporate world and mainstream economists have realized this and are rapidly adapting to the new trends. The field of economic development is now moving in the same direction, and beginning to assimilate these lessons and apply them to inner-city markets.[32] New projects and wealth creation can be spearheaded in lower-income communities, much like everywhere else, by leveraging the potential of information resources. Community platforms, smart cards, public access kiosks are only a few of the numerous pilot projects underway, showing how information resources can become indispensable tools of wealth creation in inner-city neighborhoods.[33]

[32] "*Valuing Neighborhoods—Driving Change"*; see also Kenan Patrick Jarboe, "Taking Advantage of the Global Marketplace Using Local Information Assets," paper presented at the Partnerships for the 21st Century, National Economic Development Forum, Washington, D.C., 2001. Available at www.athenaalliance.org/apapers/advantage.html. The community development field, by and large, has only begun this exploration. For example, if intra- and intercorporate processes have become much more efficient as a result of local area networks and similar information resources, might the same be true if neighborhoods developed analogous information resources, such as neighborhood commercial platforms, to make their assets more transparent and accessible? For a parallel between competitiveness in the business world and competitiveness of places (particularly cities and regions), and a discussion of the role of networks as determinants of this competitiveness, see Edward Malecki, "Hard and Soft Networks for Urban Competitiveness," *Urban Studies* 39 (5-6) (2002): 929–945.

[33] These resources, based on new information technologies, have significant market-enhancing potential because they significantly lower the costs of acquiring and disseminating information (as discussed above), and are interactive, dynamic, and transactional. For more detailed illustrations, see "*Valuing Neighborhoods—Driving Change*".

IV. USING INFORMATION RESOURCES TO ENHANCE MARKETS FOR COMMUNITY ECONOMIC DEVELOPMENT

This section moves from theory to the practical implications of leveraging information resources for community economic development. It offers a framework for developing information-based interventions, identifies some of the lessons learned from the field, and briefly presents a set of policy implications and possible lines of further work.

A. Toward Practice: A Framework for Using Information to Enhance Markets

The key elements in strategically using information[34] include:

1. Specifying the development goal, and the market(s) that might be enhanced to achieve it;
2. Analyzing the market components (that is, production, exchange, consumption) that can be influenced to expand market activity to meet the development goal, and the extent to which the barriers or potential enhancements are information based;
3. Identifying the type of information that will have the desired influence; and
4. (Where the hardest work occurs) Developing and incorporating the new information resources to enhance the market functioning.

This framework can be applied to any number of goals and markets. If, for example, the goal is to enhance particular existing markets to better serve and include inner-city neighborhoods, the practitioner could identify the market function that must be improved and the type of information resource that would be most helpful. In particular, it is important to understand whether the problem lies in production inefficiencies or in transaction costs and other exchange barriers. The next step would be to develop and deploy the relevant information resources.[35] The retail market, for instance, could be enhanced by providing retailers with better sales forecasting models that more accurately reflect the purchasing demand of specific consumer segments (reducing finding costs).[36] In the case of the housing market, expanding availability of information on properties and vacant land for sale, and its tax status, could drive down the costs of development (production costs) and increase the number of affordable housing units on the market.[37]

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[34] The companion paper lays out this business planning process in more detail.

[35] A related point is the distinction between neighborhood-based and non–neighborhood-based information resources. Community-based organizations are well positioned to build information resources that are developed in and for the neighborhood, while market actors could focus on information resources that are specific to a given market, but not necessarily to a particular location. Consider the housing market. Software that can help design homes more quickly and at a lower cost is a market enhancing information agent that may lower the cost of housing, but it is not information about the neighborhood, or likely to be developed locally (that is, it does not particularly build from the special neighborhood expertise of a development practitioner). In contrast, an interactive database that tracks and identifies vacant properties, their characteristics, and tax status is an information resource that can be built in and about the neighborhood. Improving this type of information resource would provide development practitioners with more effective levers to improve inner-city markets.

[36] See, e.g., Metro-Edge.com.

[37] See,"*Valuing Neighborhoods—Driving Change*," Appendix B.

The case of financial services offers a good example of how detrimental information imperfections can be for lower-income neighborhoods, and of how information resources can be leveraged to effect economic development. Financial institutions rely on credit scoring systems to determine the credit-worthiness of their customers: these systems compare selected information about the applicant with the performance results of a massive sample of past borrowers. In mainstream financial markets, credit scoring has become increasingly prevalent because it increases the efficiency and productivity of the underwriting process, driving down the costs of lending. It is an information system that reduces the costs of production (by being quicker) and reduces the exchange costs (by assessing risk more accurately), increasing the supply of loans.

However, sufficient credit data are often unavailable to apply credit scoring models to lower-income consumers.[38] In effect, an information imperfection prevents the credit market from serving lower-income consumers as well as it does higher-income consumers. Because of the lack of accurate information on the credit-worthiness of lower-income individuals, financial service providers often cannot reliably evaluate (and so overestimate) the risk of issuing loans to this demographic. This results in higher interest rates and a lack of mainstream financial services in inner cities. Payday loans and predatory lending become the only option available in many neighborhoods.

Remedying these information imperfections would improve the efficiency of the market for financial services and bring great benefits to lower-income communities. This goal could be achieved by making more data available on inner-city consumers and by developing more relevant credit scoring systems. For instance, current credit scoring models rely heavily on mortgage payment history, which is a good indicator in the case of homeowners but not useful for many lower-income people, who are more likely renters. Rent or utility payments would be a better metric, although these factors are rarely included in credit scores.

An interesting initiative that tests this model is a new business called Pay Rent, Build Credit, Inc., which acts as an alternative credit scoring agency. It is developing software to track rent payments (using electronic transfer systems in arrangements with landlords, tenants, and banks), and makes these data available to major vendors and lending institutions.[39] This effort, by creating new information resources for assessing the credit-worthiness of otherwise difficult-to-evaluate borrowers, reduces measurement and risk costs and can enhance the market by allowing lenders to make more loans at lower prices to formerly ineligible borrowers.[40]

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[38] The problem actually has several related components: lower-income borrowers are often underrepresented in the data sets; the data collected rely on conventional measures, such as mortgage payments, which are less available for lower-income borrowers; and sometimes the models themselves are flawed regarding lower-income consumers (or, as a result of the first two challenges, the models are unavailable). See, "*Valuing Neighborhoods—Driving Change*," appendices.

[39] More examples can be found in Figure 1 in J. Pari Sabety and Virginia L. Carlson, "Using Information to Drive Change: New Ways to Move Urban Markets", (Washington: Brookings Institution 2004), available at www.brookings.edu/metro/umi.htm.

[40] See, "*Valuing Neighborhoods—Driving Change*," Appendix B.

Major opportunities exist to reconnect inner-city neighborhood assets to larger markets through improved information resources. Economic efficiency is enhanced and markets are expanded and improved by deploying assets that were previously untapped. At the same time, lower-income communities benefit from the ensuing economic development and wealth creation. Moreover, such development occurs with little need for special subsidies, tax breaks, and other government activity. However, developing the same information resources in lower-income communities that exist in higher-income communities and markets presents some challenges.

B. Lessons from the Field: Harnessing Information Resources

From a practitioner's perspective, the challenge is to identify a particular market and information resource that offers a development opportunity. The work of leading organizations already focused on information resources provides valuable lessons on which types of information resources are more likely to be effective market-enhancing levers.[41] Our previous work reported several of these lessons from the development field, many of which can be tied to the framework presented here.[42]

Practitioners in the field emphasize the importance of being outcome driven. It is more effective to develop targeted information based on an understanding of its capacity to change particular systems and lead to specific development outcomes than to just collect massive amounts of data and assume the data will be used or have an impact.[43] Practitioners also emphasize the need to develop information resources in ways that fit into existing systems so the resources will be used and useful. Above all, they emphasize the importance of making information "actionable." The market-enhancing framework offered here may help create clearer criteria and an analytic process for determining which neighborhood information resources are most likely to meet these goals: to be actionable because they are market levers and process enablers.

Not all information is equally effective. For instance, on the production side, information can be an input, or a factor of production (as in the case of the knowledge embedded in the labor force); or information can be an output, as in the case of a book, a legal brief, or the computing power in a new car. Information as an input and information as an output tend to have a more passive nature. Although they are important sources of value and wealth creation, these forms of information are not inherently market-enhancing agents. As a result, one must be strategic in determining which kinds of passive information will in fact act as market levers. The most important role of information in the production function from a market-enhancing perspective is that of information as a process enabler. A vacant land database or an inventory control software are examples of how information can

[41] In the design phase of the Neighborhood Markets Project, we had the opportunity to identify many organizations that are engaging in this type of innovative, information-based development. "*Valuing Neighborhoods—Driving Change"* describes many of these organizations and their work.
[42] See "*Valuing Neighborhoods—Driving Change*."
[43] On the importance of context to the effective development of information resources, see Brown and Duguid, The Social Life of Information.

dramatically alter the production process and significantly increase productivity, truly acting as a market-enhancing agent.

This quality of information as a process enabler is particularly clear in the exchange function. Here, information plays three distinct roles. It can be a market access resource, such as a customer network or a credit card system, reducing the finding (and other transactions) costs of buyers and sellers. Alternatively, it can be a market intelligence resource, such as a consumer segmentation system, reducing both finding and measurement costs. It can also act as a risk assessment resource, reducing risk, as in the case of a credit scoring system.

Thus, information resources as a true market enabler are more than passive, static events. The most powerful information resources for enhancing markets are rarely simply collections of data or reports. Rather, they are information systems that provide an ongoing, frequently interactive, presence—a lubricant—that continually allows the market to be better informed, deploy assets, and create wealth.[44] For instance, a major innovation in the airline industry is internet-based reservation and ticketing systems. These information tools have dramatically reduced transaction costs and improved the efficiency of the industry, revolutionizing the way in which plane tickets are bought and sold. This information resource has added so much value that, at one point, the shared reservation platform used by most major air carriers was worth more than any of the airline companies for which it was developed.

More generally, without a dynamic flow of information, both throughout the production process and between producers and consumers, markets are crippled and systematically fail to achieve their potential. As community economic developers examine information resources as change agents and as market enhancers, we should be especially interested in the kind of active, dynamic, and transactional resources that more efficiently enable the production and exchange of goods and services in the market.

Finally, in moving from theory to practice, it is important to understand the variety of ways in which information is generated, collected, and made available to urban investors and decision makers. Researchers have developed an "information cycle" framework, showing how information is collected and dispersed, to suggest opportunities and interventions to increase the availability of information, provide more accurate analytical tools, and ultimately enhance urban markets.[45]

Imperfections in information can lodge inner-city neighborhoods in a downward spiral of exclusion, in which isolation breeds isolation, and the information gap that separates these communities from mainstream markets gets only wider.[46] Interventions at each point of the

[44] For an expansive historical analysis of this more fundamental role of information and information technology, see Wade Rowland, Spirit of the Web (Toronto, Somerville House Publishing, 1997).
[45] See Sabety and Carlson, "Using Information to Drive Change."
[46] If the existing information on inner-city markets does not reveal or suggest an opportunity for profitable investment, businesses will not spend resources to acquire more information on those markets. Because information imperfections increase the risks and transaction costs of investing in urban neighborhood assets, a lack of information, in turn, leads to a lack of investment and increased isolation. For an analysis of the

information cycle may help change this pattern by changing the behavior of businesses and investors. Changing the way in which information is reported, collected, analyzed, and disseminated (for instance, by lowering the costs of collecting information or by making more actionable knowledge available) can lower the costs to the individual business and institution and at the same time reveal new opportunities for profitable investment in inner-city assets.

C. Next Steps

Although extraordinary business and development opportunities could flow from developing targeted information resources, much more work is needed in economic development practice, research, and policy advocacy.

First, the need is great for more systematic modeling and theoretical understanding of the role of information in improving market functioning in inner-city neighborhoods. At a general level, more work is needed in the field of economic geography to understand the relation between neighborhood assets and broader economic systems. What markets (if any) operate at the neighborhood level? Which market operations (production, exchange, and consumption) are defined or influenced by neighborhood characteristics, and which characteristics? What are the information resources that allow neighborhood assets to be deployed in the context of the regional economy?

Also, the types of information resources, and their respective roles, should be more accurately categorized. This can be accomplished by exploring the relation between types of assets, types of information, and the roles that information plays in different markets and at various stages of production, exchange, and consumption. An important piece of this research would be a survey of businesses and institutions inquiring which information resources are most valuable and which would have the greatest potential for enhancing their operations. This research could be organized by market area (housing, labor, retail, and so forth), investigating particular markets in more detail, and by market function, focusing on the different roles information plays in the different components of each market.

Further research could also focus on how information technology and resources across the economy are affecting neighborhoods, cities, and regions. Several recent studies suggest that the drivers of economic success and the very role of cities might be changing in the knowledge economy.[47] Information is changing the ways in which agglomeration economies and knowledge spillovers occur, and given that these are two of the main reasons for the existence of cities, these changes might have a significant effect on economic development. At the same time, the new role

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economic dynamics that determine the underprovision of information in inner-city markets, see Scorsone and Weiler, "New Markets as Informational Asymmetries."

[47] See Weissbourd and Berry, "The Changing Dynamics of Urban America."

of information is giving rise to new phenomena (such as functional specialization[48] and other trends) that might affect the economic performance of cities and neighborhoods.

Finally, the role of information in market-based community development has important policy implications, many of which are discussed in the report "Valuing Neighborhoods – Driving Change[49]" and which are at the core of the Urban Markets Initiative. The ability to enhance markets through information hinges on the availability of reliable data for inner-city communities. Policy intervention should therefore aim to standardize and make available data that could have a development impact. In some cases, federal and local governments and government agencies already collect potentially useful data, but the data are either not made readily available or are inaccessible in a useful form. The accuracy, availability, and accessibility of existing data, both at the local and federal levels, should be improved. In other cases, the government could start collecting new data (or increase the frequency of its data collection) on urban neighborhoods and families. Governments could also provide incentives for private data collectors and for data intermediaries (such as market research firms and other private-sector data brokers) to collect and make available (including to neighborhood development organizations) better information resources on inner cities.

In addition to providing better data, governments can focus on the tools and systems that improve access to information by investing in Internet access, software, platforms, and other systems that gather and make available critical information in real time, and in forms useful to businesses and practitioners.

Most important, one of the key benefits of market-based strategies using information resources is that they require less government intervention (and certainly are less expensive) because they harness or catalyze market forces. Governments at the local and federal level should facilitate, encourage and complement, rather than supplant, market-based strategies.

[48] See Gilles Duranton and Diego Puga, "From Sectoral to Functional Urban Specialization. Working Paper 9112 (Cambridge, MA: National Bureau of Economic Research, 2002).
[49] See The Brookings Institution Center on Urban and Metropolitan Policy and RW Ventures, "*Valuing Neighborhoods—Driving Change*" (Washington: Brookings Institution).

V. CONCLUSION

Community development practitioners have realized the importance of actively developing local assets through urban and regional market activity. Consequently, they are paying more attention to the role of information in spurring those markets, thus reconnecting inner-city communities to mainstream economic activity, improving the quality of life of inner-city residents and the efficiency of the economy as a whole.

One critical way to achieve this goal is to focus on information resources. The crucial role that information plays at virtually every level of economic activity makes it an extremely powerful change agent, especially in the context of the current knowledge economy. Information resources determine which assets are deployed or developed, what gets produced, for whom, and at what cost. They can remedy market imperfections, and ultimately drive enormous wealth creation. Indeed, if capital was the missing link in lower-income neighborhoods 20 years ago, it may well be that information is the missing link today.

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