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Toward Lean or Rich? What Performance Benchmarking Tells Us About SME Performance, and Some Implications for Extension Center Services and Mission

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Abstract

Manufacturing output and productivity have bounced back well less in the 1990s than previously believed, especially in smaller shops. Analysis of proprietary data on 2000 firms with fewer than 500 employees maintained by the Performance Benchmarking Service suggests that most smaller shops' relationship to their markets leads them to under-invest in capital equipment and technology. Indeed, nearly all of average small shop productivity advance (2.1% per year, 1967-92) has been the result of sharp increases among only one plant in six. Yet on average these high-productivity shops are losing orders to what we call "low road" and "lean commodity" shops.

Extension centers in the U.S. interact with close to 20,000 shops each year, but too much of their service is in quick-hit projects that appeal primarily to low road shops that seek help to keep from being dropped by their price-squeezing customers. Not surprisingly, these projects result in clients' achieving greater sales and employment growth than non-clients, but not to relative increases in productivity, wages, or profits. A substantially reoriented mix of services, with better matching of projects to more thoughtfully attracted clients, is prescribed as a way for the extension community to make a much larger contribution to productivity and living standards in small shops.

Introduction

Government statistics trumpet the comeback of U.S. manufacturing. Bolstered by foreign direct investment, the current recovery has been, until late 1995, the most investment-led in decades. Even taking account of data revisions that make it clear that manufacturing output has bounced back well less in the 1990s than previously believed, the rate of productivity

advance in manufacturing has rebounded. But the sector's output has not grown enough to stem the continued erosion in its share of the economy. With rapid productivity growth and only modest output growth, it's not surprising that there are today nearly three million fewer manufacturing jobs in the U.S. than in 1979. What is surprising, however, is that rapid productivity growth has not led to any significant increase in real manufacturing wages.

Or is it? When the data are examined by size of plant, it becomes clear that there have been real increases in plants with 500 or more employees. In these larger plants, productivity growth, which slowed from a 4.1% annual pace in the 1947-67 period to a still-respectable three percent rate in 1967-87, has since then been back growing at well over four percent a year. But such plants constitute fewer than two percent of the total, and account for only 45% of manufacturing value-added. The other 98.6% of shops, invisible though they remain to most business observers and nearly all economists, must be performing, on average, much less well if one is to make sense of the aggregate manufacturing performance numbers.

What Do Real Data Tell Us?

Improving how those smaller shops perform is what manufacturing extension is about. To meet its mission, however, the extension community needs to know what's going on in the small-manufacturer population. Its practitioners need to decide which improvements -- with which results for companies, communities, states, and the nation -- are the highest priorities. That decision drives the mix of services that extension centers need to offer and the shops to which they should be actively marketed.

What do real data tell us is going on in smaller shops? That's what this article is about.

It reports on analyses of proprietary data on 2000 firms with fewer than 500 employees maintained by the Performance Benchmarking Service, a unit of the Ann Arbor, Michigan, Industrial Technology Institute. While not, in a statistical sense, a true random sample of all such firms, these data are the nation's only window on the performance of smaller manufacturing shops. The Performance Benchmarking data are compiled through annual surveys completed each year since 1992 by 500-1000 smaller establishments, each of which receives in return for its effort a confidential, customized "benchmarking" report that tells it where it stands on more than 100 metrics compared to other smaller shops with similar production processes, piece prices, order volumes, and customer industries. Analysis of the 3700 records in hand as of April 1996 suggests a consistent, and troubling, story about the hidden underbelly of American manufacturing:

Especially since the late 1970s, many large U.S. manufacturers have contracted out much of their orders to small-firm suppliers. In the 1992-95 period, plants in our database averaged sales growth of 30%, even though manufacturing output rose only 14%. But that 30% was only an average. Like the temporary/contract employees the large firms use to keep their dedicated staffs at stable levels, smaller suppliers bear much of the brunt of upturns and downturns in demand for their customers' products. Small shops' schedule instability has increased dramatically in recent years, as so-called "just-in-time" approaches have reduced the warehousing of inventory that previously acted as a buffer between demand and supply. Thus, while large firms' sales typically rise or fall by 15-25% from peak to trough, many smaller shops' sales gyrate wildly: fully one small shop in four shops saw its sales rise more than 50% between 1992 and 1994, and only half had sales changes, up or down, of less than 25%. As a result, small firms' capacity utilization, and therefore their productivity, also rises and falls wildly.

These huge swings in capacity utilization make it imperative that small shops keep as much as possible of their cost structure “variable,” i.e., composed of unskilled labor time, materials, and other factors of production that can be rented or shed as needed rather than being permanent features of the business. That means minimizing capital investment; otherwise, expensive machinery would sit idle whenever orders fell, driving cost per unit through the roof. Not surprisingly, then, most small shops are much less capital-intensive than their large-plant counterparts. In 1995, the typical small shop placed a replacement value on its equipment stock that averaged just \$24,300 per employee. That’s compared to \$77,300 per employee in manufacturing overall, and a whopping 175,000 in plants with 500 or more employees.

Similarly, where the typical large company spends about two percent of payroll on training shop workers in its large plants, the training investment in a typical small plant employee is less than 0.5% of payroll.

It is thus not surprising that the productivity gap between small and large shops has been ballooning. In 1967, plants with fewer than 500 employees averaged 80% of the productivity of plants with 500 or more; in 1992, the figure was 66%. Most of the widening of the gap can be explained by diverging trend rates of physical productivity growth -- the increase in the number of parts or products that can be made in a given number of labor-hours. But some comes from the fact that small shops’ value added, the numerator of the productivity measure “value-added per employee-hour,” is constantly being squeezed by their customers’ escalating demands for regular price reductions.

Many suppliers have reacted, and are continuing to react, to these capacity management and pricing pressures as one would expect, by trying to minimize variable costs as well as fixed investment. The methods are well-known: union-busting and -avoidance, shutting down mature metropolitan plants in favor of exurban greenfields, freezing or cutting wages,

and in general employing what is sometimes called a “low-road” strategy. In a clear sign of this, 25% of small shops had lower value-added per full-time-equivalent (FTE) employee in boom year 1994 than in still-recessionary 1992; 29% had lower nominal payroll per FTE.

As more and more smaller shops forego the capital investments needed to remain “modern” and, more generally, opt to travel the low road of unskilled labor and skimpy capital investment, the relationship between large and small firms changes. The latter come to be seen as an undifferentiated set of low-cost sources of commodity inputs. Despite all the talk of “partnership” among customers and suppliers, two-thirds of the small shops in our database report that in 1994 they were quoting each job against five or more competitors, up from fewer than half in both 1991 and 1992.

Productivity and Wages

Superficially, this analysis is consistent with today’s academic and policy consensus. The economy’s increasing openness to international trade beginning in the 1970s put less-educated and -skilled American workers into a global scramble for “routine” jobs, with only an educated elite of doctors, lawyers, and other “symbolic analysts” able to hold their own.

But the consensus view also implies falling wages for less-skilled workers and a rending of the tie between productivity and wage growth in all sizes of plants and firms -- and the data do not support this. Our data on manufacturing plants suggests, instead, that (1) there has been virtually no growth in the pay disparity between low- and high-skilled workers; (2) productivity and wages nearly always move together; and (3) both are rising, productivity at about three, and real wages at about one, percent a year.

In the smaller shops, productivity and wages also remained substantially linked, though

somewhat less so than in large plants. What's different is that productivity and wages are flat or falling in roughly half the small shops on which we have data, and in about one-third of that half (i.e., one in six) they are falling far and fast. Our data on more than 100 small metalforming shops (Fig. 1), for example, show that mean productivity was unchanged between 1992 and 1994. The median, however, was six percent lower in 1994, reflecting a higher proportion of lower-productivity shops in the sample. A shop that was in the 75th percentile in 1992 could have maintained its position even with a seven percentage-point drop in its value-added per FTE. However -- and here's the good news -- to stay in the top 10% of the industry from 1992 to 1994, a metalformer would have had to increase value-added per FTE by a whopping 20%. In short, some 15-20% of smaller shops are becoming more productive, and doing so at a rate of nearly 10% per year. In those shops, wages are also rising, though at only about half that rate. Analysis of these high-and-growing productivity firms also reveals them to have uniformly high capital per worker, to pay high wages across their workforce, to use more technology, and to spend much more per worker on technical training. In short, if many if not most smaller shops have opted for a low road recipe of sweated labor and meager investment, these 15-20% have not. By legacy or choice, they are investing in their workers and their facilities.

Before going on further about companies' strategies, simply consider the sheer range of performance within smaller shops within industries. Metalformers making the same products for the same customers may have value-added per FTE of just \$40,000, or of fully \$140,000. Indeed, in every industry the productivity level achieved by the most productive 10% of shops is at least 160% of the industry median. The 75th percentile is invariably twice the 25th percentile value. While less pronounced than for value-added per FTE, the huge dispersion in performance applies to

nearly every metric the database supports, from on-time delivery to scrap rate to inventory turnover.

Moreover, there is no obvious pattern: companies that score in the top quartile on one set of measures are no more likely than other firms to score well on any other given measure. With no shops being "good" or "bad" firms across the board, and with low-productivity shops growing at least as fast as their high-productivity counterparts, what are we to make of the small-firm economy?!

Toward a Theory of Small- Manufacturer Performance

There are patterns in the data, of course, even if they are not obvious. Our analysis of the ways in which performance varies across shops suggests that they may usefully be ranked on three scales. The first, which we call systematic, gives companies points for tracking, among other things, how often faulty parts are made, how long it takes to set up machines to run a new job, and how quickly action is taken in response to equipment breakdowns. Companies can score additional points if they regularly undertake behaviors (work teams, statistical quality assurance, just-in-time delivery, preventive maintenance) associated with improving on cost, quality, and delivery performance.

We call the second scale modern; high scores on it require hardware and software that automate the business, scheduling, manufacturing, and quality assurance functions of the firm. The third and last scale we call distinctive. Points on it are earned by having new, proprietary or design-intensive products, or by being able to perform processing (e.g., ultra-tight tolerance machining) that most shops cannot

Shops' scores on the three scales are modestly correlated, but mostly at the bottom end. That is, about half of smaller shops have low scores on all three of the scales. Clearly,

these are the low-rovers -- unsystematic, unmodern, and undistinctive. About one shop in five scores high on both the modern and distinctive scales, though they are all over the map on the systematic scale. These are the high-rovers. Finally, about one-third of smaller shops look like the mirror image of the high-rovers -- they score high on systematic, but nearly as low on modern and distinctive as the low-rovers. We dub this last group "lean commodity": these are shops that are actively taking steps to improve -- to get "lean." Figure 2 presents a graphical illustration of the three groups. Shops in this lean commodity group focus on rooting out waste as a way to minimize variable costs: such shops require less material (because they scrap fewer parts), less indirect labor (e.g., operators do their own machine setups), and less machinery (preventive maintenance and faster setups mean each machine runs parts more hours) than low-rovers.

These lean commodity shops do many of the things that advocates of "high-performance work organization" admire, but they do them not to become more modern or distinctive. Indeed, they do them precisely as an alternative to the investment that would be required to become more capital-intensive and capable. The proof is in the numbers: because they are not distinctive but instead simply the best-run firms in the huge set of shops quoting relatively easy-to-make "commodity" jobs, being systematic lowers their costs and wins them orders, but neither wages nor productivity improve much in the process. The reason lies in the value-added per FTE metric. Lean commodity shops do not attempt to raise it except by lowering the denominator, and they compete with low-road shops on jobs for which customer price demands constantly attack the numerator. Thus these shops should not be thought of as walking a hybrid or middle road, nor as choosing a second type of high road but instead as the best-managed non-high road players.

The proportion of low-road, high-road, and lean commodity shops varies, of course, by sector (Fig. 3). The 70% of smaller shops that function mainly as suppliers to larger manufacturers (i.e., those that make so-called intermediate goods) are most likely to be low road. The 15% that make so-called capital goods (machines, tooling, etc.) for other manufacturers are much more likely to be high road. Lean commodity shops make up roughly a third of both the intermediate and capital goods populations, and of the 15% that make end-use products (think suitcases, brooms, and the like) as well.

Winning Ugly

Falling average real wages in the shops that provide us with data make clear that the high-rovers are a declining proportion of the small-manufacturer population. Our data suggest that, as measured by value-added per FTE, many high-rovers are losing market share to the lean commodity shops. With low road shops low-ball quoting away their easiest-to-make jobs, managers of better-performing smaller manufacturing companies often must choose whether to join them or fight them. Most opt to join or, only slightly better, to hedge their bets. As depicted by the numbers, the impact is clearly negative for wages and productivity. Moreover, these trends are self-reinforcing, and likely to worsen. As they operate at lower levels of capacity, the high-fixed cost high-rovers become less competitive vis-à-vis the lean commodity shops.

How can it be that "bad" shops are beating "good" shops? Some of the answer has already been presented: the better performers' higher capital intensity makes them more vulnerable to swings in capacity utilization. But to get a full picture of how perilous many high-rovers' position is, consider Figure 4. As it

Selected Data Elements Used in Calculation of Performance Scales

SYSTEMATIC	MODERN	DISTINCTIVE
<p>Formal tracking & routine reports on:</p> <ul style="list-style-type: none"> • Scrap rate by machine • Percent of jobs bumped from schedule (-) • Percent of preventive maintenance performed on schedule <p>Formal program in:</p> <ul style="list-style-type: none"> • Statistical quality assurance • Job scheduling • Machine breakdown prediction 	<p>Percent of machines with computer controls</p> <p>Keyboarded devices per employee</p> <p>Percent of employees using computers or programmable machine controllers</p> <p>Technical training expenditures per shop employee</p> <p>Percent of jobs with machine instructions driven by product data (CAD) files</p>	<p>Percent of sales from:</p> <ul style="list-style-type: none"> • New products • Self-designed products • Assemblies (vs parts) <p>Ratio of tightest tolerance to industry median (-)</p> <p>Number of shops quoting against (-)</p> <p>Ratio of skilled to unskilled shop labor</p>

shows, except in capital goods, high road shops do not only execute jobs that are completely, or even mainly, too demanding for low road and lean commodity shops. Part of how most high road makers of intermediate goods amortize the cost of the equipment that permits them to make some hard-to-imitate products is by seeking out and defending a base of easier-to-make “commodity” product customers. Low road and lean commodity shops compete these orders away from them.

As the high road shops stagnate, shrink, or fail, the U.S. economy changes. With a dwindling base of modern, distinctive suppliers, more large manufacturers are encouraged to treat all purchased inputs as commodities, and therefore to seek six, eight, even ten quotes for each job they subcontract. The likely winners are

the worst of the low-road shops (viz. the efflorescence of sweatshop apparel districts in many cities) and the best of the lean commodity companies. The clear losers? The shops that do precisely what common sense says they should: invest, train, and innovate.

There are other winners too: offshore-based suppliers whose historically less price-based relationship with their major customers has allowed more of them to travel the high road. As some larger firms have begun to make good on their rhetoric of partnering with suppliers on engineering as well as part-making, a lot of high-road work has gone to these Europe- and Japan-based suppliers. Thanks to the weak U.S. dollar, many of these suppliers now have plants in the U.S.; but with much of their engineering and

some of their manufacturing still offshore, the U.S. still loses.

Changing the Mix of High and Low Performers

If in most industries firms can choose among recipes with wildly different mixes of wages, skill, technology, training, and basic management discipline without incurring predictable growth or profitability penalties, markets alone clearly are not offering meaningful incentives for “good” manufacturing behavior. Yet the low frequency of such behavior in the small-shop economy is costly, resulting in lower wages, lower productivity, less technical change, and a composition of output that has too few products that command price premiums in global trade.

Could it be that improved small-manufacturer performance is a classic public good, and hence something that only government policy can address? Most large firms can shop for capable suppliers around the globe, so only a few are likely to expend the resources to invest in a truly capable domestic supply base. (Indeed, Europe-based multinationals are increasingly adopting the price-squeezing American model.) The goal of such policy should be to change the mix of low, lean, and high road shops. Specifically, high road shops need to be helped to get costs down while still retaining high capital intensity. Low road shops should not be allowed to win orders on the strength of low wages and low capital investment. And lean commodity shops should be encouraged to take the risks associated with moving beyond commodity products by investing more in equipment, technology, and product development capability. What set of initiatives might begin to address this trinity of goals, which we might characterize as “leaning the highs,” “blocking out the lows,” and “capitalizing the leans”?

Extension to the Rescue?

The first, and perhaps most important, of these concerns a reorientation on the mission and practice of the manufacturing extension community. Spearheaded by the 60 regional centers coordinated by the Commerce Department’s Manufacturing Extension Partnership, more than 100 state and regional organizations already interact with close to 20,000 shops each year.

But they do so, by and large, under a set of incentives-- the need to show that many shops were served and that they paid market rates for service -- that orients them to smaller, quick-hit projects that are easy to package and sell. This orientation has the effect of inducing centers to offer a mix of services that appeals to low road shops, since such shops dominate the population. For example, a high and rising proportion of extension centers’ services has been in the area of getting smaller companies compliant with the ISO 9000 quality system standard. Analysis of data supplied by nearly 2000 small shops finds no significant quality or productivity payoff to ISO 9000 compliance or certification, though a significant payoff in terms of increased sales. Clearly, manufacturing companies seek certification to keep from being dropped by their customers. Not surprisingly, the companies that fear being dropped the most are those that have the least capability-- the low road shops -- and, indeed, the data show them to be the primary market for ISO 9000 services.

Figure 5 summarizes the lessons from five years spent evaluating the Michigan MTC. It shows that projects that have the effect of improving clients’ scores on the systematic scale often result in clients’ achieving greater sales and employment growth than non-clients. But only projects that increased clients’ scores on the modern and/or distinctive scales led to increases relative to non-clients on productivity, wages, and profits. the message here is disturbing not

only for what it says about the proportion of low road shops in extension centers' client base. It should also sound some warnings with respect to the growing interest in alliances with larger manufacturers interested in extension center help with "supplier development." To the extent that most large firms seek low-price, requirement-compliant suppliers rather than modern, distinctive ones, supplier development and supply base management initiatives are likely to erode rather than enhance the productivity, wage, and profit impact of extension centers. There are, of course, "good" customer firms as well as "good" suppliers; working hand in hand with them to improve the performance of high road and high-leaning lean SME suppliers is much more promising.

What if the centers that make up the manufacturing extension community were to take as their primary mission to nurture the existing high road shops and to increase the propensity of other shops to choose that road as well? What if, to put it another way, the mission were less about taking shops from "fat" to "lean" and more about taking a subset of them from "poor" to "rich"? It would require targeting centers' efforts to helping high-road shops get more systematic, and lean commodity shops to get more modern and distinctive. They have already demonstrated success at getting companies to take actions associated with becoming more systematic, so part of the reorientation would simply require bringing those services to a different, and admittedly smaller, audience.

Getting lean commodity shops to bet the store on the high road would, however, be a much more daunting challenge. Field staff would need to be both technically strong -- able to match technologies to applications -- and strategically sophisticated. Getting a company to replace all of its old, manual equipment with modern, computer-controlled machinery, or to go beyond building products to customer-supplied prints and begin designing new products in-house, is not like selling a pre-packaged quality audit or proposing a modest change in the layout

of the plant to remove a bottleneck. It requires cost accounting and project justification expertise, deep knowledge of the market for and performance of new equipment, an understanding of the requirements of product engineering, and -- perhaps most important -- the ability to relate all of these to the likely markets available to the client shop. But that's precisely what large manufacturers are buying when they spend millions to work with the best partners at McKinsey & Co., Andersen Consulting, or A.T. Kearney, among others. Small shops deserve no less.

As Figure 6 shows, there would be large productivity, wage, and profit payoffs to a reoriented extension mission that focused on getting high-road shops leaner (the arrow labeled "B" in Fig. 4) and helping lean commodity shops get more modern and distinctive (the "C" arrow). Many extension centers today instead help low-road shops retain or win orders; indeed, this is encouraged by evaluating centers with metrics such as sales and employment growth, which mainly express the extent to which non-clients' orders are being reshuffled toward clients. As Figure 6 also shows, these services (the "A" arrow) appear to have little if any impact on productivity and wages, and only a modest impact on profitability.

There are, it seems to me, some fairly low-risk ways to test the viability of extension centers focused on the poor-to-rich transition. Extension center sponsors could encourage the placement of high road manufacturers on centers' boards of directors. They could open a future RFP only to proposals to create (or reorient existing) centers with primary or exclusive focus on product development, new product time-to-market, design for manufacturability, and other services of little use to low-road and low-end lean shops. A critical first step would be to recognize explicitly that getting SMEs "rich" -- raising their productivity and the skills and incomes of their workers as well as their owners -- is the essential public purpose of extension. It would also make the extension mission more defensible:

unlike projects that mainly move commodity work from one shop to another, projects that improve some SMEs' productivity and capability do not decrease the productivity and capability of others. That's because the economy as a whole has plenty of room for making more of what is produced in higher-road ways.

Changing the Rules

Such a reoriented extension mission also faces sizable external obstacles. On the private sector side, many large corporations would rather have low-capability suppliers that lack the distinctiveness needed to stand up to their price-cutting demands. In Washington, a "targeted" strategy is, ironically, even harder to defend in today's political environment than across-the-board business entitlements.. Finally, the entire postwar economic development policy environment -- declining employee power to bid up wages, scarce patient capital, and abundant tax breaks for new relative to old plants -- blatantly encourages and subsidizes the low road. By doing so, it raises the risks associated with choosing or staying on the high road.

Despite all that, four initiatives, only two of them requiring legislative action, could help:

(1) To give an advantage to mature capital-intensive shops vis-à-vis other SMEs, consider an investment tax credit that applies only to machinery placed in plants of fewer than 500 workers that have been in operation since at least, say, 1980. Many large firms might back this "small business" program, since nearly 50,000 small plants are units of companies with more than 500 employees, and these supra-500-employee firms have only 55,000 U.S. factories. Structured in that way, the credit would discourage shutting down older (often urban/metropolitan) plants in favor of rural greenfields. It would also reduce the risks for lean commodity shops taking the leap into greater

capital intensity -- so long as they keep the jobs where they are.

(2) To block the worst low-road behaviors, there should be a higher minimum wage. Any increase will help, though more is better and \$5.15 isn't enough. Consider (just hypothetically, of course) the impact of a \$10 minimum phased in over, say, five years. It would spawn an explosion in labor-saving capital goods, where wages already average nearly \$3 an hour more than in the rest of manufacturing. While manufacturing wages still average 110% of the private-economy average, the sector still hosts more than 2.5 million sub-\$6-an-hour slots. Along the same lines, requiring shops to provide health insurance to all employees would, by itself, shake out hundreds of thousands of sweatshops whose continued viability today limits the growth prospects of many good firms.

(3) Government could encourage the high road in myriad ways that require no legislation. Just as the Baldrige Awards give recognition to companies that make a documented commitment to excellence-cum-leanness, so too could there be programs that recognize outstanding design and engineering accomplishments by SMEs. The point is to create a culture in which definitions of good performance give much greater weight to performance that meets the public's need for capable onshore manufacturing that provides well-paid, skilled jobs to Americans.

(4) To link reward and responsibility in the workplace, a modest deal should be cut between capital and labor, even if they're not ready to agree on much else. Today, business owners have a rational fear that if their plants are unionized, labor costs will rise more than productivity. The deal: make it easier for unions to organize and achieve first contracts, but tie future compensation increases to productivity growth. This would create a powerful incentive for more unions to do what unions in many other nations: develop and provide expertise to the shops whose workers pay dues. Closer links between unions taking on that mission and a

reoriented manufacturing extension community (see above) could accomplish much.

Modest though they seem, even the least ambitious of these proposals faces a tough fight. Manufacturers, like other businesses, today lobby with one voice, so their positions are often least-common-denominator endorsements of anything that keeps labor costs down. But such an approach is really not good for manufacturing or the nation. It is, in fact, an implicit subsidy to low-road firms and hence a relative burden on others. What's needed is a policy that combines support for smaller shops as a whole with incentives that, while formally available to all SMEs, are of little use to managers too weak to resist the low-road temptation. Packaged as an entitlement program for SMEs, it just might have legs. If we're serious about making extension serve its highest public purposes, it's certainly worth the effort to try.

Figure 2

Performance Scales & Manufacturing Strategies

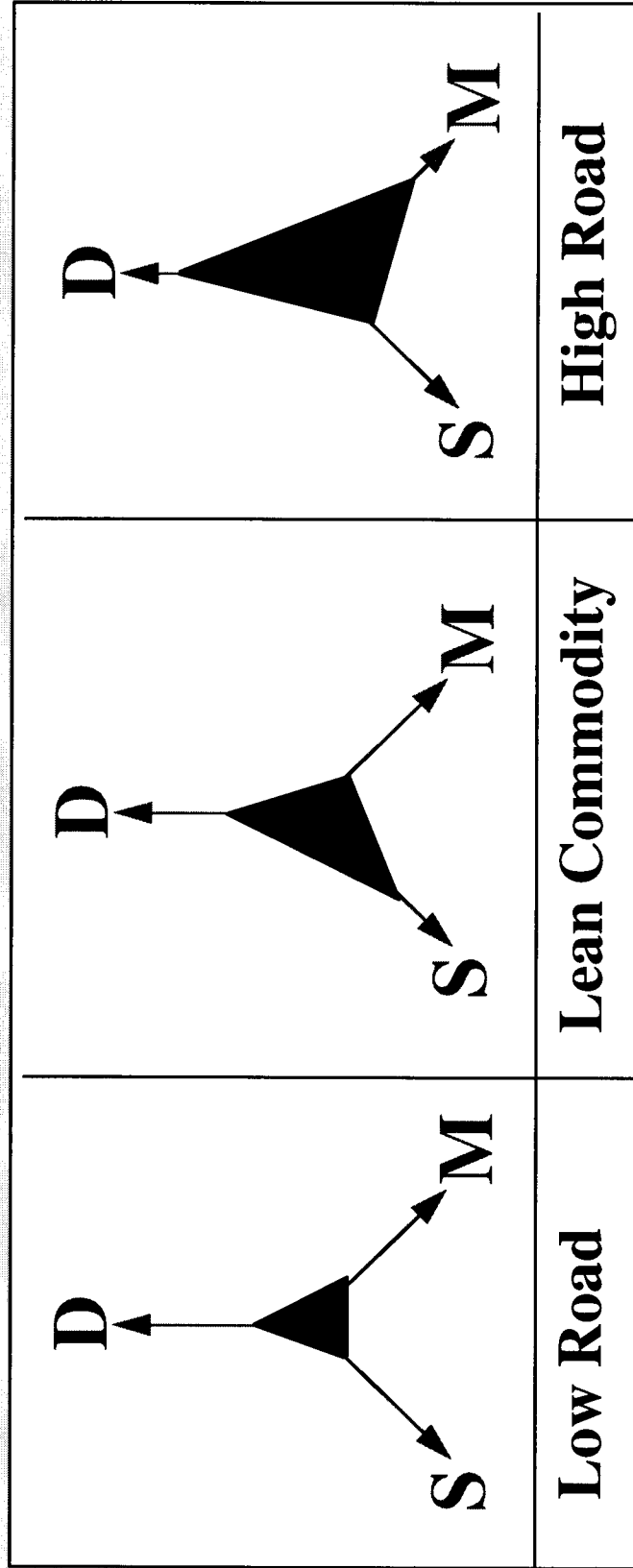
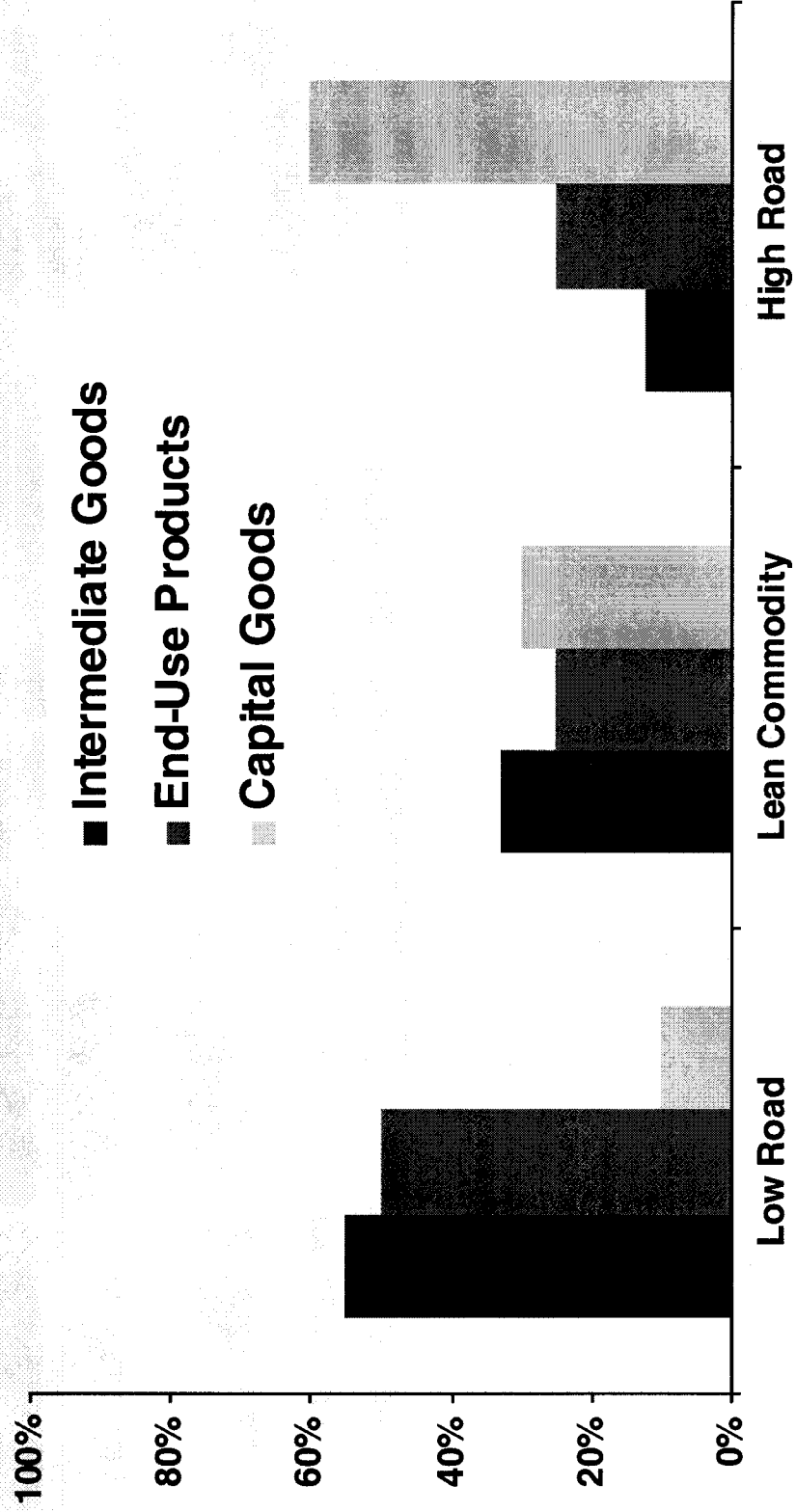


Figure 3

Approximate Distribution of Shops, 1994



Sources of High-Roaders' Vulnerability

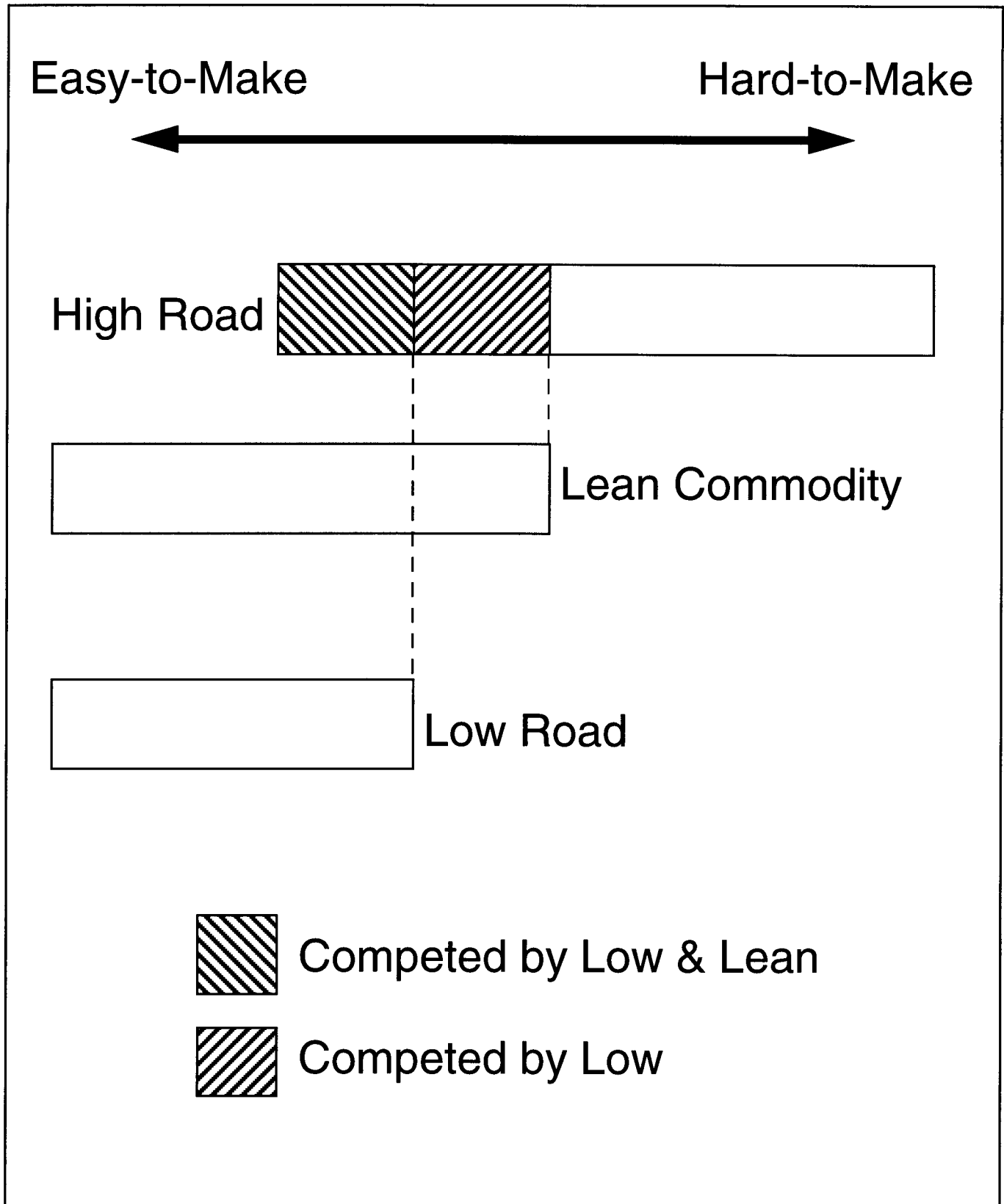
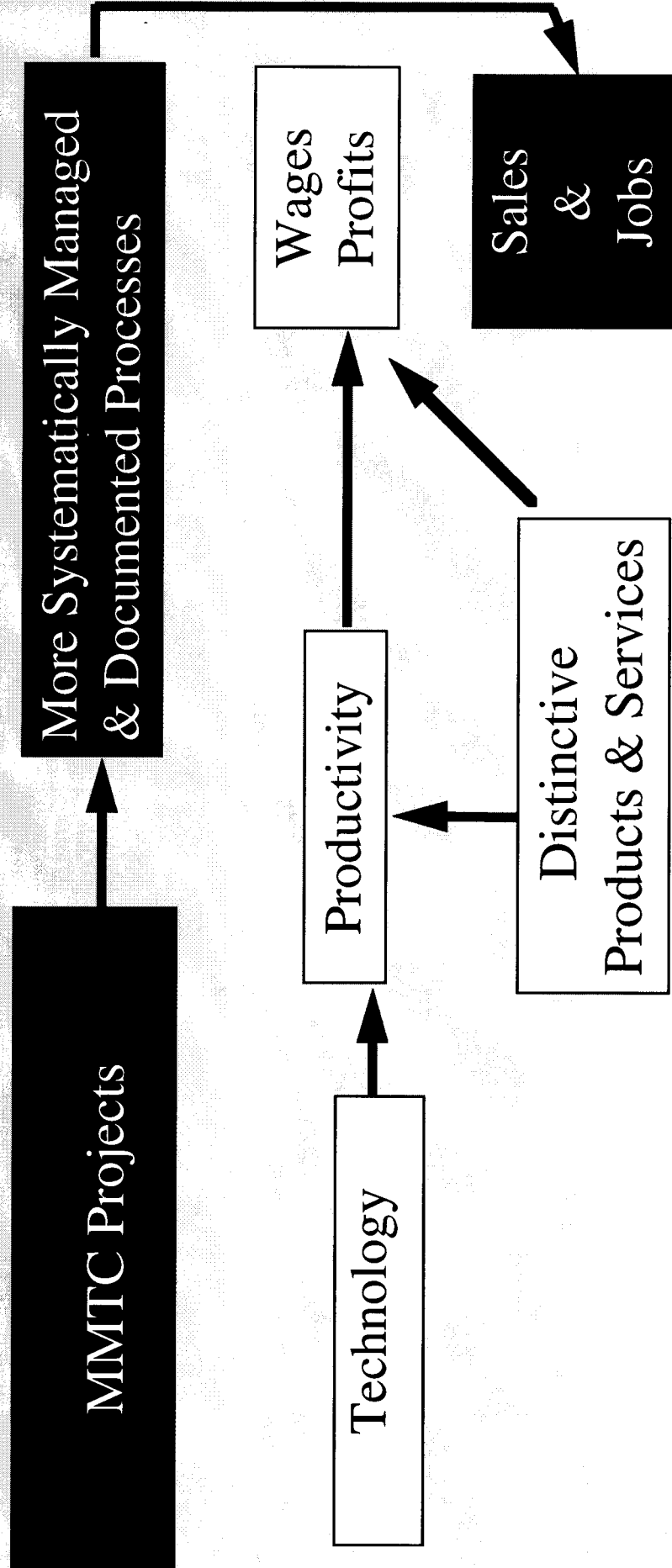
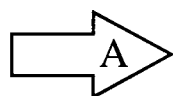
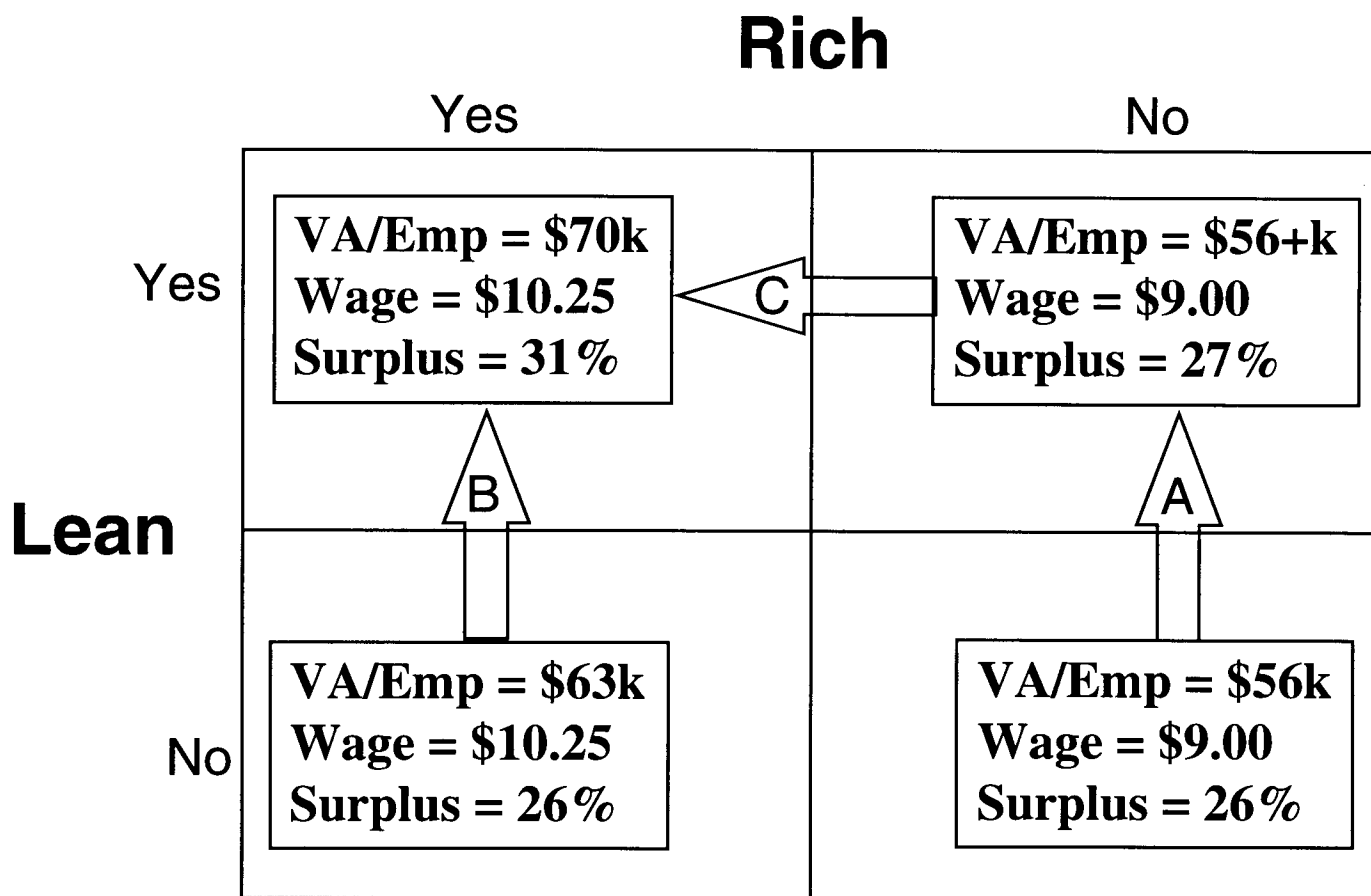


Figure 5

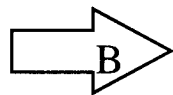
Clear Analysis Findings



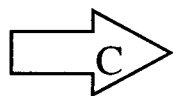
Payoffs to a Reoriented Mission: Examples from Metalformers & Plastics Processors



Current Extension Center Core Service Bundle



Proposed Bundle for Use with High Road Shops



Proposed Bundle for Use with Lean Commodity Shops

Parameters of Manufacturing Performance: Discussion

Burress. Targeting was suggested in the last talk. If you target a type of firm, you get criticized for being unfair, but if you target a type of service you can address the problem of not having enough resources.

Ellington. Its not the amount of resources that's the issue, but improving their effectiveness. What we're preaching is change. The variables in being efficient and effective in change goes beyond industry class. It's the management structure. How do you screen for management structure to get the biggest payback? Not for the Hill but for our own measure of worth.

Luria. You put services out there and certain kinds of companies will want them and certain kinds won't. I'm arguing that much of what we're doing now is actually reducing the net impact.

Burress. Yet, your argument is that the low impact stuff does create jobs.

Luria. For the companies, but the job creation may be zero sum for the country.

Carlisle. From a policy standpoint, we've got 12,000 manufacturers in North Carolina. I can't imagine having the resources to cover all of them. First come, first served doesn't make sense. Research suggests that a small number of firms are responsible for our job growth. It seems that narrowing the range of services could be a way of firms self-selecting.

Oldsman. Its not just the nature of the services, its the magnitude or intensity. You find that the bulk of the companies served do not report or have impacts. This is consistent with the what we find in the MEP. The challenge is to focus on companies. The centers are spending a lot of time delivering very little to a lot of companies. From a fairness perspective, that doesn't make sense. Fairness to whom?

Swamidass. What companies come to the MEP?

Luria. It depends on your strategy.

Jarmin. On average, we find that MEP clients are better performers.

Oldsman. These are companies motivated to improve.

Jensen. Or they've experienced some "nice" random shock. You may, as a system, not be able to achieve targeting.

Oldsman. Agents perform targeting every single day. It is a discretionary thing by agents. I don't think that's a good way to run a program. They do it based on a warm fuzzy feeling they have with CEO. It is not consistent with a program that is trying to get big impacts.

Bury. I've found this very thought-provoking. Given the data set from which these raw analyses came, are we comfortable with the representativeness of the data?

Jensen. We're seeing that the characteristics of the better performing manufacturers (e.g., large, capital intensive, export) are bundled together.

Bury. Is there anything to contradict Dan's analysis.

Oldsman. In the Census, you don't have a lot of data that Dan has. Usually, we don't have good measures of capital stock. We've been playing around with how you develop measures of that when you don't have it. We ought to be pooling data sets to address this.

Jarmin. You shouldn't base the MEP on any one dataset. You don't state something as fact until people with different data sets come up with that. That's the best you can do.

Shapira. In our discussion, some are suggesting that if you help some, it can be at the expense of others. This implies there is a fixed pie, but that might not be true. Over time, the whole distribution can move upwards, even though the may be the same. Are there policies that can move the whole distribution up?

Feller. I'm having trouble putting together the two data sets. The Census Bureau's data suggests that MEP clients tend to be from the upper distribution. The analysis of the Performance Benchmarking data set suggests that MEP clients tend to be from the lower distribution.

Luria. The Census Bureau's analysis ends in 1992, and the Performance Benchmarking analysis starts in 1992. The evidence from Cleveland and Ann Arbor indicates that prior to 1992, the centers were more focused on technology and less on soft quality stuff. The thing that I feel the best about is that the Census people don't see anything weird about what strikes me as a weird distribution. That makes sense to them. I'm not making the argument that we should stop what the MEP is doing. What I'm saying is, it's thought provoking. I'm saying that centers should think about how much ISO 9000 work they are doing. Why is that stuff so easy to sell? What companies are self-presenting to receive this particular service?

Feller. How much of the heterogeneity is due to shrinking large firms that are now small?

Jensen. There's a problem with evaluating these types of things by size. Firms do change in size. The results from other studies show that if you are productive, you grow more. A lot of that growth comes from other firms entry and exit in the distribution. We're trying to talk about how plants change.

Thompson. Should we be asking our clients what they are doing with the changes? If they are solely going to cut jobs, maybe we shouldn't work with them. Does your data support this kind of argument?

Luria. It's not that when you move from here to there, your wages and productivity go down. It's possible that low road and lean commodity manufacturers are subject to lots of price pressure from customers. We are trying to get companies to tell us what their 1995 sales would have

been. What percentage of customers are in state. The next effort is to try to measure the effect on Michigan value-added. At this point, we don't know what that is. My intuition is that relatively intense MEP services delivered to low and lean commodity shops may have benefits, but not to increased sales.

Oldsman. We know that these companies are under strict price pressure, so they are focusing on the denominator and focusing on one aspect of numerator. They are forced to quote on lower gains. What is the extent to which those gains aren't accrued by the MEP client but accrued by customers in terms of higher value-added?

Russell. I express two frustrations. The Luria analysis has been emerging over a two or three year period. We are still mired at the level of chipping and chirping at it. There still is no competitor. Second, in the discussion about targeting, we are concentration on the wrong thing. It is not hard to concentrate services on a small segment, as long as you deliver a reasonable level of services to a large number of customers. It is not hard to make the targeting argument. It's a false issue. It is tied up in the Congress and industrial policy. What is hard is to find the profile of customers to target that are distinctive. It is not hard to focus on tooling, etc. in Michigan, but it is harder in a more heterogeneous economy.

Bury. One of the fears that I have always heard is that we'll never know enough to target well.

Oldsman. Part of this is moot. The forces for self sustainability will force it. Some centers will go for commodity services and some will take the risky road.

Bury. We should allow the market to determine who will pay for services.

Feller. This discussion is reminiscent of federal efforts to stimulate technology. There are rich research traditions about the diffusion of innovation. The findings converge to some extent in some

areas, but not in others. It will be an exercise in frustration to go from econometric studies to prescriptive marketing techniques, because we don't know the characteristics of the firm that will seek to change. We don't have good theories on the search, learning, and assimilation strategies of SMEs.

Luria. I suppose that if one had to look at the quality of what we know, I would reach the same conclusion. I think the technology diffusion stuff is in the worse traditions of academia, because there's a lot of people from a lot of academic disciplines so they can't come to a conclusion. The notion that you can't be prescriptive is bogus; field agents already do that. It's exactly the point that Brad made. The firms most appropriate for targeting are capital intensive, have high training expenditures, pay higher wages, and have higher value-added. Wouldn't it make sense to be monitoring what value-added per employee is before you start an engagement. If \$79,000 is the median value-added, we're trying to push them to \$135,000 value-added. Let's operate with some bias.

Oldsman. Chuck Sabel was arguing for a discursive approach to evaluation. We have these questions. We don't know the answers. We go down a path. We need to be self conscious about what we're learning and prompting the center directors. Evaluation still is not embedded in how the center directors talk about the system. We use a variety of techniques overtime to expand the knowledge. I don't see how you can do any better than that. You can't wait around.

Russell. We have a center that has to work with 35,000 manufacturers. They don't have time to wait.

Jensen. Some of the variables we measure may mean something unobservable, like whether the president is forward thinking. We don't observe that, but the field agent does. If you are going to talk about targeting, then you need to evaluate people.

Gray. I've been surprised at some comments that have concluded that the MEP should move toward targeting. There's a political dimension which I've been surprised has not been an issue. MEP's have to keep their eyes on that, showing a lot of services to a broad base of clients.

Oldsman. You can have a two tiered approach: a low cost delivery mechanism, and an intensive delivery mechanism. That goes on now.

Luria. You could also design the low intensity services partly to feed the numbers and partly to feed the high road services.

Rhoades. There could be a divergence of goals depending on the market. A center making strategic decisions about its market may do something differently. How do we deal with that at a national level? I applaud the way NIST has kept a local system, but I wonder how well you will address national goals with the current localized system.

Russell. This will still be a distributed system. Management will still exist at the local level. Nobody wants to ratchet up the "have to dos" from Gaithersburg, rather this could be voluntary.

