TITLE: **POST-COLD WAR MILITARY CONVERSION IN THE US AND RUSSIA: A COMPARATIVE APPROACH**

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POST-COLD WAR MILITARY CONVERSION IN THE US AND RUSSIA:

A COMPARATIVE APPROACH

by

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SUMMARY[1]

This paper argues that the prevailing view that military conversion in Russia would be more difficult than in the US is not justified, because while in the US defense firms have had tremendous difficulties competing with established civilian firms, defense firms in Russia are relatively well positioned to enter Russia's civilian markets. The relative advantage of Russian defense firms is due to the fact that Russian civilian firms are not that different from their defense counterparts and, therefore, present relatively weaker competition to the converting firms than is the case in the US.

It also presents some empirical evidence to support that argument. While the available data are far from perfect, the results indicate that despite enormous defense expenditure cuts over a short period of time the economic performance of Russia's regions is only relatively weakly correlated with the regions' dependency on MIC. In particular, Russia's (negative) elasticities of income growth with respect to the share of MIC employment in the region were approximately 4 times greater by absolute value than the respective US elasticities, while the annual rates of defense expenditure cuts in Russia have been 6 to 8 times greater than in the US. This suggests that by itself the military conversion process in Russia may present less of a problem than in the US. At the same time, this may be the case mainly because the military conversion difficulties in Russia are insignificant relative to the problem of conversion of the entire Russian economy from socialism to markets.

[1]Compiled by the staff of the National Council from the Conclusions section of this paper.

I. Introduction

Defense industries in the post-Cold War environment, in both the East and West, share many unique characteristics and problems with each other including the daunting challenge of conversion from military to civilian production as defense budgets are reduced. In recognizing these similarities, it should also be noted that the organization, incentives and performance of defense firms in both the East and West deviate significantly, but perhaps similarly, from that of civilian firms found in market-based economies. After examining this competitive gap in the West, many analysts have in general questioned the economic feasibility of defense conversion in market-based economies. The conversion experience in the West has been repeatedly illustrated with the now famous remark from a Martin Marietta executive who noted that the West's record at defense conversion had been unblemished by success.

Most analysts have gone on to discount the feasibility of effective defense conversion in the East as well and have, in fact, predicted an even worse outcome there based on the additional, overshadowing handicap of having to convert state-owned or only recently privatized firms that carry the legacy of the Soviet-type economy and operate in the difficult environment of economic transition. For example, Paukert and Richards state:

> "In principle, conversion in centrally planned economies involves the same issue of reallocating resources from defense to civil activities. However, the allocative mechanisms differ, with market economies relying on private ownership and price signals in the markets for goods and services, and for factor inputs of land, labor, capital and enterprise. In centrally planned economies, allocative decisions involving what to produce and how are made by the State's central planning agency. The former USSR, though, is now in a transitional stage, moving from a centrally planned to a market economy which creates even greater problems for conversion and adjusting to defense cuts."[1]

John Tedstrom in an earlier study, reiterates that thought by pointing out that if the experience with "conversion" poses formidable problems in the relatively vital western economies, it must be doubly difficult in the reforming, centrally administered Soviet system where economic and business officials lack the advantages afforded by developed markets.[2] Expanding on this line of thought, John Battilega writes:

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[1] Liba Paukert and Peter J. Richards, Defense Expenditure, Industrial Conversion and Local Employment (Geneva, ILO, 1991), quoted in UNIDIR, Economic Aspects of Disarmament: Disarmament as an Investment Process (United Nations, New York, NY, 1993), 61.

[2] John E. Tedstrom, "Towards Understanding of the Soviet Conversion Effort", (Radio Liberty Inc. working paper, February 27, 1990), 1.

> "The magnitude of the change required within a Russian enterprise before it will be able to successfully produce non-defense products in a market economy is enormous. The change is also enormous for companies in the United States, but still a lesser order of magnitude than in Russia. US companies must change to meet new markets, new product lines, new market cultures, and new company infrastructure requirements -- a daunting task, but still one that is being attempted against the backdrop of a well-developed market economy and business infrastructure. They can appeal to market forces to help them sort out alternatives. In Russia, no equivalent infrastructure exists, and market forces are not yet at work. "[3]

Bertelli and Marlin also note that better infrastructure, social welfare, and labor mobility, all characteristic of western economies, give the West a comparative advantage with respect to conversion.[4]

These analysts, as well as many others, are drawing upon the western conversion experience and either stating or implying that, because Russia is not a developed market economy and is currently undergoing a wrenching transformation, the conversion process has to be that much more difficult, if not hopeless. A closer look, however, places these types of arguments into question. To a large extent, western defense firms have had difficulties converting to civilian production because their corporate culture, as well as much of their physical and human capital, are ill-suited for the conventional marketplace and therefore cannot compete with existing relatively efficient civilian firms. While Russian defense enterprises possess many remarkably similar market handicaps, their principal competitors, the large Russian civilian enterprises, are closer in nature to defense enterprises than to efficient market firms.[5] In a sense, both civilian and defense-related firms in Russia need to undergo conversion to markets. While this does not bode well for the Russian economy in general, the Russian defense-related enterprises and the factors of production they employ should not find themselves at a significant disadvantage in the civilian markets. In fact, in some respects Russian defense-related enterprises may be better positioned to compete in an emerging market economy than their civilian counterparts, as defense firms are more used to responding to the needs of the customer, have a reputation for relatively high

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[3] John A. Battilega, " Institutional Change in Russia from the Perspective of Defense Enterprise Managers" (A Conference paper presented at the US Air Force Academy, Spring, 1994), 2, 3.

[4] Domenick Bertelli and John Tepper Marlin, Defense Conversion in Russia, (New York, NY, Conversion Information Center, Council of Economic Priorities, August 1993), 10.

[5] The scarcity of direct foreign investment thus far and difficulties with massive importations imply that the Russian domestic market for most goods and services will grow out of the development of competent domestic enterprises. Also, the small start-up firms probably will not be able for some time to compete with large enterprises in mass industrial production.

quality output, and at least in the beginning of transition, possessed a skilled work force and relatively modern equipment.

Most of the paper's arguments refer to converting defense *firms* either in the US or in Russia. Essentially the same considerations, however, apply to the factors of production, particularly labor, employed at these firms. In other words, even though we often refer to a firm, we examine mostly factors affecting conversion in the broad sense rather than the so-called *physical* or *product* conversion where firms convert as going concerns. We chose the firm as a point of reference simply because it summarizes the characteristics of its factors of production.

This paper takes a comparative approach to the issue of defense conversion. The next two sections examine the differences between defense-related and civilian firms in both the US and Russia. Section 2 evaluates the environment in which converting firms operate in each country. Section 3 compares firm-specific factors presumably affecting the ability to convert. Section 4 presents a formal illustration for examining the conversion decision made by firms. Empirical evidence based on the comparison of region-level data is presented in Section 5. Section 6 presents concluding observations.

II. The Broad Economic Environment: Exogenous Factors

The difficulty of firm-level conversion is generally determined by two sets of factors -- those outside the control of the converting firm (exogenous or environmental factors), and those within its control (endogenous or firm-specific factors). Environmental factors include the degree of competition in consumer markets, the development of retail and wholesale distribution networks, the state of the financial system and capital markets, both domestic and international, as well as the condition of the legal infrastructure. Also, government conversion policy is an important, largely exogenous factor that influences the ability and incentives of firms to convert. Firm-specific factors include various characteristics of corporate culture and corporate governance, and the quality of both the available work force and physical capital. We begin by addressing the influence of some of the exogenous factors on the relative ability of the Russian and US defense-related firms to convert.

A) Competition in consumer markets

Some observers have noted that Russian defense-related companies will have an easier time converting than their western counterparts, because the paucity of civilian products in Russia provides a better opportunity for entry than the saturated western consumer markets. While the US companies seeking to diversify are likely to find a number of existing firms already operating in their

chosen market: a converting enterprise in Russia is more likely to encounter significant "unsatisfied demand".[6] This situation gives certain advantage to converting firms in Russia relative to their western counterparts who are likely face strong competition from incumbent firms.

B) Retail and Wholesale Networks

The underdeveloped nature of distribution networks in the Russian economy is sometimes said to hinder conversion efforts. Thus, Forte and Deutch, in speaking of Russian defense enterprises attempting conversion, state that: "Plant managers, at least for the near term, must try to operate in an economy lacking many of the tools required for successful market operations." In particular, they mention "...a poorly developed retail distribution network and the lack of wholesale industry, which will hamper efforts at converting enterprises to find outlets for their goods...."[7]. Certainly this seems to work against the converting enterprise as it must find markets for its newly developed goods. However, since all firms in Russia face this same inadequate distribution system together, the firms undergoing defense conversion are not disadvantaged by this. In fact, one could make the case that relative to their US counterparts, Russian converting firms are in an advantageous position. After all, the incumbent civilian firms in the US already have good access to the distribution system, while the defense firms generally do not. Due to the underdeveloped nature of distribution systems in Russia, the existing access to them does not provide much of an advantage to Russian civilian firms. In addition, one must recall that there was a significant amount of civilian-use goods produced within the Russian defense industry such as cameras, radios, televisions, bicycles, refrigerators, VCRs and many other products.[8] The previous exposure to regional and local distribution networks for these goods has given the management of the Russian defense-related firms some useful experience. By contrast, most US defense enterprises lack this type of extensive civilian production experience which would normally bring with it access to retail and wholesale networks. Those US firms that engage in civilian production, such as Boeing and Ford, have usually separated defense and commercial structures completely in order to be commercially competitive within the US.

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[6] See, for example, "Russia Plans Review Panel to Halt Illegal Arms Exports by High Officials," in Aviation Week and Space Technology, March 2, 1992, 23 and Almquist, Peter Foreign Conversion - Supporting Material For Adjusting to the Drawdown - Report of the Defense Conversion Commission, February 1993.

[7] Nicholas Forte and Shelley Deutch, "Defense Conversion in the Former U.S.S.R.: The Challenge Facing Plant Managers in The Former Soviet Union in Transition (Volume 2) Study paper submitted to the Joint Economic Committee of the Congress of the United States of America, May 1993, 731.

[8] Central Intelligence Agency, The Soviet Weapons Industry: An Overview, 1986, 3.

C) Financial System

A pervasive problem encountered by all economies in transition has been an underdeveloped capital market. Again, however, the difficulties with obtaining investment capital in Russia affects both civilian and defense enterprises' ability to restructure. In fact, Russian banks might view lending to defense-related firms as a safer bet because the government is presumably more likely to come to the rescue of a defense firm than of a civilian firm. Also, western governments may have an added incentive to provide conversion capital to some segments of the Russian defense industry out of fear that critical human and physical assets might otherwise migrate to less friendly countries. Meanwhile, converting firms in the US probably represent a greater risk for lenders and are likely to be at a disadvantage vis-à-vis established civilian firms with respect to obtaining financing.

D) Government Conversion Policies

At least since 1985 the US government has largely followed the laissez-faire approach.[9] While this may be the best economic policy from society's point of view, as the cost of subsidies would probably exceed the benefits of additional conversion, such a policy does not facilitate firm-level conversion. At the same time, until the end of 1993 the Russian government had been subsidizing defense-related firms on a substantial scale. Subsidies, of course, could provide a disincentive for vigorous conversion effort, particularly if the government cannot credibly commit to ending them after a certain point. But they also give Russian defense firms an additional opportunity to restructure for competition in the civilian marketplace. It is unclear which effect of subsidies has been more important and in any case, the subsidies have decreased sharply in 1994 and 1995.[10] Also, the subsidies apparently were only enough to prevent the subsidized firms from total collapse. In this sense, they probably encouraged conversion of resources, particularly human capital, if not conversion of the enterprises as going concerns.

III. The Plant-Specific, Microeconomic Environment: Endogenous Factors

In this section we turn to some of the most commonly referenced firm-specific factors affecting the ability of defense firms to convert.

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[9] Note, however, that some weapon system contracts were extended under political pressure and the government also provided some regional adjustment funds. Most of the US aid tended to be after layoffs had taken place rather than before.

[10] According to "1995-1997 Conversion Program Examined", in FBIS-SOV-95, 22 September 1995, 45; 67 percent of the planned conversion funds for 1993 were provided to Russian defense firms undergoing conversion, while in 1994 only 13% was forthcoming. For the first eight and a half months of 1995 no conversions funds were received by these firms due to the friction between the Central Bank and the Ministry of Finance.

A) Lack of Cost Consciousness In Production

In both countries defense firms have a pattern of production costs that is quite distinct from that of a typical civilian firm. More important, defense firms are generally viewed as paying little attention to costs, whether it be due to cost-plus pricing usually employed by US contractors or the soft budget constraints so characteristic of former Soviet enterprises, among other things. In this regard, Russian defense firms appear to be worse offenders than their US counterparts. Moreover, defense production in Russia was concentrated in very large plants, many of which were multi-purpose facilities. These plants seem to be considerably larger than plants in the US, because component plants were frequently located together with the main plant. Vertical integration was meant to insure against the uncertainties of the supply network, but it also tends to work against the cost consciousness needed in converting to civilian production.[11] Maintaining these facilities is enormously costly in terms of overhead and excess capacity. In addition, inadequate accounting systems make it difficult for Russian defense firms even to measure their costs appropriately. All these factors suggest that Russian defense firms are particularly ill-prepared for operating in a market environment.

If we compare defense enterprises with their civilian counterparts in the respective countries, however, a different picture emerges. As Table 1 suggests, the distance between defense and civilian enterprises is significantly greater in the US than it is in Russia. As a result, Russian defense enterprises undergoing conversion should have an easier time competing, at least with the established civilian firms, if not with the newly created start-ups.

[11] Central Intelligence Agency, The Soviet Weapons Industry: An Overview, 30.

TABLE 1
COMPARISON OF COST FUNCTIONS AND FACTORS DETERMINING COST CONSCIOUSNESS OF DEFENSE AND CIVILIAN ENTERPRISES IN RUSSIA AND THE US

Characteristics of Traditional Defense Enterprises in Russia	Characteristics of Established Civilian Enterprises in Russia	Characteristics of Traditional Defense Firms in the US	Characteristics of Incumbent Civilian Firms in the US
High fixed costs per unit of production due to specialized nature of the output and soft budget constraints	Fairly high fixed costs per unit of production due to soft budget constraints	High fixed costs per unit of production based on specialization and cost plus contracting	Much lower fixed costs, with constant attempts to reduce them
Variable costs that are fairly stable	Variable costs that are fairly stable	Variable costs that may fluctuate	Fairly stable variable expenses
Generally declining average variable costs as output increases	Generally declining average variable costs as output increase	Generally sharply declining average variable costs as output increases	Flatter average variable costs as output increases
Relatively stable profit margins due to soft budget constraints	Relatively stable profit margins due to soft budget constraints	Relatively stable profit margins based on cost-plus contracting	Profit margins comparatively less stable then defense firms
Profits have meaning mostly in the accounting sense of the word	Profits have meaning mostly in the accounting sense of the word	Profitability often based on cost plus standard markup formula	Profitability is very important and depends mainly on firm s efforts and market conditions
High Degree of Vertical Integration to Prevent Defense Critical Supply Disruptions	Vertically Integrated Whenever Possible to Minimize Supply Disruptions	A Fair Amount of Vertical Integration to Ensure Security, But Also Out-Sourcing	Out-Sourcing More Common to Keep Down Costs

B) Organizational Structure

Spechler and others argue that in addition to cost consciousness, the characteristics reflected in Table 1 also influence the firm's organizational behavior and culture, the relative size and standing of departments within the enterprise, employee-manager relations, production methods chosen, flexibility of equipment, supervisory methods, and so on.[12]

[12]Spechler, Martin C., "Conversion of Military Industries in the Successor States of the Former Soviet Union," in The Former Soviet Union in Transition (Volume 2) Study Paper submitted to the Joint Economic Committee of the Congress of the United States of American, May 1993, 725.

In general, the defense firms in both the US and the FSU, were principally designed for weapon system production, a function that the firm which completely converts, will have to abandon. The original function of the defense firms, however, created a legacy of organizational characteristics that often may be more difficult to change than the firm's product. Table 2 sketches some of the basic differences in the types of markets served by defense and civilian enterprises and some of their resultant organizational characteristics.[13] Certainly the transformation required of converting firms in terms of organizational change will be extremely difficult regardless of the country, but the gap between the organizational and market characteristics of civilian and defense firms is considerably smaller in Russia, suggesting that Russian defense firms have a relative advantage over their US counterparts in terms of their ability to convert from military to civilian production.[14] In fact, Russian defense firms may actually have a head start on their domestic competition, due to their greater experience with quality control.

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[13] Tables 1 and 2 are based on a chart found in both Spechler, 726 and JPRS-UMA-93-033, "Joint Ventures in the Military-Industrial Complex: Problems and Prospects", 10 September 1993. The author took the comparison between defense and civilian enterprises presented in these articles and applied them to both the US and Russian cases separately.

[14] While Table 2 presents only a partial list of market and organizational differences between defense and civilian firms in the two countries, adding other characteristics would not violate the same general conclusion.

TABLE 2
COMPARISON OF ORGANIZATIONAL AND MARKET CHARACTERISTICS BETWEEN DEFENSE AND CIVILIAN ENTERPRISES IN RUSSIA AND THE US

Characteristics of Traditional Defense Enterprises with Russia	Characteristics of Incumbent Civilian Enterprises within Russia	Characteristics of Traditional Defense Firms within the US	Characteristics of Incumbent Civilian Firms within the US
One client with unlimited resources	Many state-owned clients with unlimited resources (soft budget constraint)	One client with unlimited resources	Many customers with limited resources
Client's selection limited or nonexistent	Client's selection limited or nonexistent because of shortages and planned links between enterprises	Client's selection is fairly limited due to the high fixed costs	Client has wide selection
Client determines production volume and operational characteristics	The state determines production volume and some operational characteristics	Client determines production volume and operational characteristics	Manufacturer himself identifies market requirements
Performers strive for best level of quality and reliability that is achievable in mass quantities, sacrificing cost savings	Performers strive for high quantity with marginal concern for quality, safety and reliability	Performers strive for high level of quality, safety and reliability, often sacrificing cost savings	Main performers are very aware of the tradeoff between quality and costs
Client exercises continuous, tight control directly in production	Client exercises limited statistical quality control	Client exercises continuous, tight control directly in production	Statistical quality control
Production cycles are standard, production is stable and there are few modifications	Production cycles are standard, production is stable and there are almost no modifications	Production cycles are standard, production is stable and there are few modifications	Production cycles are indeterminate and there are many product modifications
Mandatory secrecy	Technology may be passed on but organizational structures often create obstacles	Mandatory secrecy	Technology may be transferred to partners or licensed
High Degree of Vertical Integration to Prevent Defense Critical Supply Disruptions	Vertically Integrated Whenever Possible to Minimize Supply Disruptions	A Fair Amount of Vertical Integration to Ensure Security, But Also Out-Sourcing	Out-Sourcing More Common to Keep Down Costs

C) Marketing

Both US and Russian firms will face serious marketing and sales problems in the conversion process. Government contracts in the West and central plans in the FSU were supposed to dictate the choice of suppliers and schedules of deliveries in the past. Conversion implies that these firms must evaluate and promote market demand on their own.

US defense firms have an absolute advantage because they have more reliable market statistics and have a large pool of experienced marketing agents who could be hired to assist or direct the firms' marketing endeavors. As Popper points out, marketing departments of Russia's converting defense firms are frequently nothing more than a handful of young engineers who speak foreign languages.[15] The same author, however, observes that marketing has a limited meaning in most transitioning economies in general. We again conclude that Russian converting firms may be at a relative advantage in this area as well because their domestic competition is in the same starting position in terms of experience, whereas western converting firms face stiff, experienced and savvy marketing competition.

IV. A Formal Illustration

Thus far it has been argued that Russian defense-related firms may be at less of a relative disadvantage when it comes to the sheer ability to convert to civilian production when compared to US defense firms. The goal of this section is therefore to illustrate this argument formally by using a fixed coefficient technology framework. The structure presented focuses on the relatively different states of internal competition that defense and civilian firms face within Russia and the US.

Before actually specifying the framework, it might be helpful to think graphically about the central issue. In order to compete in the US civilian goods market, the defense-related firm has to arrive at the level of efficiency of existing civilian firms, who often have much greater competitive experience in the market. Figure 1 depicts what the market for US civilian goods might look like. In addition, note that the demand curve for civilian goods in the US intersects the flat portion of the marginal cost curve, which reflects the presence of some excess capacity in the production of civilian goods in the US. Therefore, in order to survive, entrants must produce at

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[15] Steven W. Popper, "Conversion, Regional Economies, and Direct Foreign Investment in Russia," in The Former Soviet Union in Transition (Volume 2) Study paper submitted to the Joint Economic Committee of the Congress of the United States of America, May 1993, 779.

least as efficiently as the incumbent civilian firms whose efficiency is measured by MC^*_{us}. Consider now the civilian goods market in Russia (Figure 2). The demand curve in this market intersects the vertical portion of the supply curve, thus reflecting a shortage of capacity to produce what is needed in Russia's civilian goods sector. Thus defense- oriented firms that enter Russia's civilian market can be successful as long as their marginal costs lie below MC^*_r. This reflects the fact that even a relatively high cost firm could still make a profit in Russia, given the capacity shortage and the comparable inefficiencies of Russian firms already in the civilian goods market (i.e. MC^*_r might be rather high to begin with).

Figure 1
US Civilian Goods Market

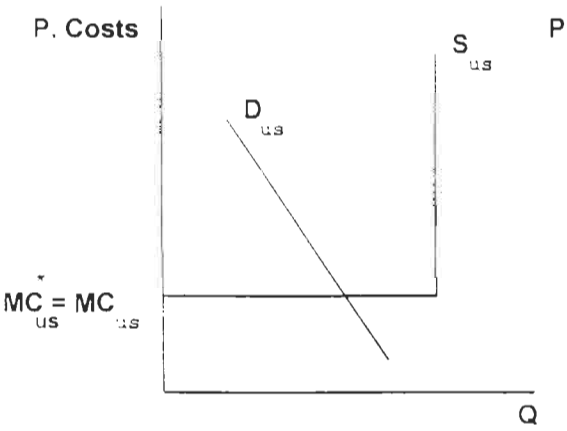
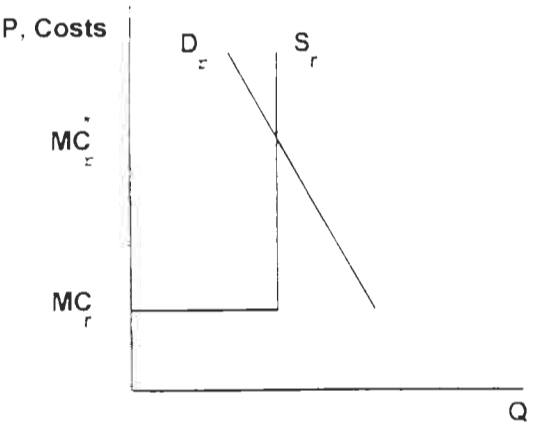


Figure 2
Russian Civilian Goods Market



Similar arguments can be formalized by first considering the case of civilian production in two sectors, the civilian sector and the defense sector. Without considering the US and Russia separately at this time, fixed coefficient technology is used to describe the civilian production of both sectors.

$$Q_c = C \cdot Min(L_c, K_c) \qquad (1)$$

$$Q_d = D(x_L, x_K) \cdot Min(L_d, K_d) \qquad (2)$$

Q_C represents civilian output of the civilian firm, while Q_d represents the civilian output of the defense-related firm. Capital (K) and labor (L) are

the productive inputs in these Leontief production functions. Notice that the units of capital are chosen in order to arrive at technology as in (1) and (2). The coefficients C and D represent output multipliers for civilian firms and defense-related firms respectively. It should be noted that while C is given, D is a function of both x_K and x_L which represent conversion expenditures per unit of converted capital (K_d) and conversion expenditures per unit of converted labor (L_d), respectively. Equation 3 below indicates that if defense-related firms do not make conversion expenditures, then no civilian goods will be forthcoming. Conditions 4 and 5 indicate that while higher conversion expenditures may lead to a greater amount of output generated, at some point diminishing returns to conversion expenditures must set in.

$$D(0,0) = 0 \tag{3}$$

$$\frac{\partial D}{\partial x_i} > 0, \quad \text{where } i = K, L \tag{4}$$

$$\frac{\partial^2 D}{\partial x_i^2} < 0, \quad \text{where } i = K, L \tag{5}$$

In terms of input prices, r_c is the rental price of one unit of capital in the civilian sector (K_c) while w_c is the wage in that sector. Likewise, r_d is the rental price (opportunity cost) of one unit of converted capital in the defense sector (K_d) while w_d is the wage paid in the defense sector for workers producing civilian goods. Note that if after conversion expenditures the firm could not obtain the same level of output per unit of capital as civilian firms, then it would have been more efficient to not have attempted the conversion process in the first place. One way to formalize this concept is to look at the per unit costs of output in each sector in order to find the conditions under which conversion makes sense for the defense-related firm. In order to have incentives for conversion, the defense-related firm must produce civilian goods at least as efficiently as civilian firms. Therefore the per unit costs of civilian production for defense-related firms must be less than the per unit costs of production for civilian firms. Before the per unit cost comparison can be made it must be noted that defense-related firms incur a certain amount of conversion costs per unit of converted capital, as indicated in equation 6.

$$E = \frac{(x_K \cdot K_d) + (x_L \cdot L_d)}{K_d} \tag{6}$$

The rental cost, or price of converted capital becomes Ei, when using i as the market interest rate, therefore the full price of converted capital is equal to r_d + Ei. The appropriate unit cost functions were derived from the Leontief production functions given in (1) and (2) obtaining the relation in inequality 7 below. Inequality 7 states that the per unit costs of civilian production for defense-related firms must be less than or equal to the per unit costs of production for civilian firms in order for conversion to take place.

$$\frac{w_j + (r_j + E \cdot i)}{D(x_c, x_j)} \leq \frac{w + r}{C} \qquad (7)$$

For Russia, as compared to the US, it is likely that C is low due to the noted inefficiencies of Russian civilian firms while r_c tends to be high due to capacity constraints, and r_d tends to be low as weapon system export opportunities have decreased and defense orders have been slashed. If all this is true, then Russian firms would have a comparative advantage in terms of the ability to conduct firm-level conversion. (We are assuming here that $w_d = w_c$.)

V. Empirical Evidence on Conversion

So far, we have argued that Russia's MIC (Military Industrial Complex) is better positioned than the US MIC to re-deploy at least some of its resources for civilian use, because the Russian defense firms and the production factors they employ face significantly weaker competition in the civilian marketplace than do their US counterparts. The purpose of this section is to evaluate this argument in light of some relatively recent empirical evidence on conversion in Russia and the US. We used cross-sectional regional (*oblast'* and state) level data in order to estimate the influence of the presence of the MIC on the region's economy during the period of a significant drawdown of the government's defense expenditures.

Let's assume that the defense expenditure cutbacks in percentage terms have been distributed uniformly across the regions (i.e. each region experienced approximately the same percentage decline in defense-related expenditures).[16] In this case, a region where the MIC played a large role, should be affected more

[16] In fact, we only need to assume that defense expenditure cutbacks are independent from the other variables in our regression analysis.

than a region with little dependence on defense orders, because a one percent decline in defense-related expenditures would represent a loss of a greater share of the revenues in the former region. For example, if 50% of the region's economy relies on defense orders, a one percent drop in defense expenditures affects 0.5% of the region's revenues. If, however, only 10% of the region's revenues were defense-dependent before the drawdown, then a one percent cutback is equivalent to only a 0.1% loss of sales. Should the country's MIC be successful in converting to civilian production, then the level of MIC dependency prior to conversion would have little effect on the region's economy. If conversion is difficult, however, the higher levels of MIC dependency would be correlated with lower welfare in a region after the decline in defense-related spending. This argument suggests that insights in the success of conversion process can be gained by analyzing regressions of the following type:

$$Y = \beta_0 + \beta_1 X_1 + \beta X \qquad (8)$$

where Y is an indicator of the region's welfare at the end of the period, X_1 represents the region's dependency on MIC in the beginning of the period (i.e. prior to the decline in defense-related expenditures), and X is a vector of control variables.

A) Empirical Evidence On Conversion In The US

This section uses economic performance data from the fifty US states and the District of Columbia to analyze the results of the decline of the defense-related expenditures over the period between 1985 and 1993. Most of the standard economic performance indicators can be found in the Statistical Abstract of the United States.[17] The data on the share of the MIC in the state's economy, however, are not readily available. We used the employment data collected by the Logistics Management Institute as a proxy for MIC share.[18] MIC employment estimates for 1985 also used in the analysis are our estimates.

We ran various log-linear regressions using percentage changes in per-capita personal incomes, unemployment rates, and wages as dependent variables, and the share of employment in the state generated by defense orders as the principal independent variable. Share of urban population in a state served as the only control variable.[19] Personal income variables for each state

[17] US Department of Commerce, Economics and Statistics Administration, Bureau of the Census, Statistical Abstract of the United States, 1985-1994.

[18] The employment data includes estimates of both direct and indirect employment generated by defense orders. For a detailed description of the procedure see Logistics Management Institute's publication "Impacts of Defense Spending Cuts on Industry Sectors, Occupational Groups, and Localities;" Washington DC, January 1993.

[19] We also tried some other control variables such as the level of education but none of them proved statistically significant.

were deflated by the urban consumer price index (CPI-U) for appropriate metropolitan areas, as price deflators for the individual states themselves were not available.

Table 3 below provides descriptive statistics of the main variables used in the US portion of the analysis. In the table LMIMPxx denotes the share of defense-related employment in the state in year xx; PICUxx stands for undeflated average personal income per capita; UNPCxx reflects total state unemployment rate as a percentage of the civilian labor force, WGHMxx represents average hourly earnings of production workers in manufacturing industries, and URBPC90 denotes the percentage of urban population in the state in 1990.

Table 3
DESCRIPTIVE STATISTICS FOR THE US

Variable	Mean	S.D.	Maximum	Minimum
LMIMP85	0.031008	0.021125	0.08614	0.003882
LMIMP89	0.025247	0.018513	0.083619	0.004443
LMIMP93	0.022144	0.015399	0.073013	0.003299
PICU85	13339.6	2095.2	0.18405	9340
PICU89	16973.26	2837.189	24422	12077
PICU93	20157.6	3095..653	29438	14894
UNPC85	6.228	1.47098	10.8	2.6
UNPC89	7.11	1.91662	13	3.9
UNPC93	6.228	1.47098	10.8	2.6
URBPC90	0.65476	0.220484	1.00	0.204
WGHM85	9.391837	1.220624	12.64	7.22
WGHM89	10.3758	1.168892	13.51	8.26
WGHM93	11.69286	1.373016	15.36	8.89

One major difference between the US and Russian data availability is that in the US defense-related employment estimates were available for more than just one year, but the information for Russia was limited to the 1985 MIC employment figure. Therefore, in addition to the initial level of defense-related employment, the US data allowed us to use the changes in such employment over time as an independent variable. At first glance the latter procedure appears to be more reasonable, but it is not necessarily the case. Allocation of defense-related orders in the US is often affected by political considerations. While the defense industry situation prior to the mid-1980s was rather stable, the conversion process probably caused a significant intensification of the competition for the shrinking defense orders pie. The representatives of the states with relatively healthy economies did not have as strong an incentive to

fight for maintaining the old level of military orders as did the representatives of the states with poorly performing economies. Also, states where defense-related firms are relatively successful at converting would be less eager to fight for military orders. Therefore, it is likely that the largest declines in defense orders during the drawdown would take place in the states with the most vibrant civilian economies and the least difficulties with conversion, contaminating the relationship between the firms' ability to convert and the health of the state's economy.

More important, firms probably do not base their decisions to begin conversion on one year's situation in a particular state (even if this is their home state). The long-term forward-looking view of the situation is likely to be more relevant. If so, then firms would begin to downsize as soon as they believe that the country has embarked on a long-term path of reduction of defense-related expenditures. The speed and degree of this downsizing would depend on the expected speed of expenditure decline over the long run, not on its year-to-year fluctuations. The nationwide changes in defense budget (both immediate and projected) can serve as a proxy for this long run decline pattern in defense-related expenditures. Obviously, if firms in all states concentrate on the nationwide trends, it is reasonable to assume that states with a higher MIC dependency prior to the beginning of defense-expenditure drawdown would be more affected by such a drawdown than states with a relatively small share of MIC dependency in their economies.

The arguments presented in the previous two paragraphs suggest that despite the availability of the data on year-to-year changes in defense-related orders in the US, it might be advisable to use the levels of MIC shares in state economies prior to the beginning of the conversion process as a principal independent variable in regression (1). Nonetheless, both types of regressions (i.e. both those using the MIC share levels for 1985 and 1989 as base years, and changes in these levels between the base year and 1993) are presented below.[20]

There are several conventional indicators of the economic situation in the state. We concentrate on per capita income as the most general indicator. In addition, we will present the results of regressions that use industrial wages and unemployment rate as dependent variables.

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[20] We used 1985 as the base year in order to facilitate comparisons with the Russian data. 1989 was also used because it appeared to represent the beginning of a period of sharper declines of defense orders.

TABLE 4
INCOME AS THE DEPENDENT VARIABLE

Table 4a: Dependent Variable is DLRP9385

Number of observations: 51

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.0267526	0.0297998	0.8977436	0.3738
LLMIMP85	-0.0262666	0.0088194	-2.9782760	0.0045
LURBPC90	-0.0030450	0.0172276	-0.1767541	0.8604

R-squared	0.186501	Adjusted R-squared	0.152605
S.E. of regression	0.046433	Sum of squared resid	0.103490

Table 4b: Dependent Variable is DLRP9389

Number of observations: 51

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.0583127	0.0310400	-1.8786302	0.0664
LLMIMP89	-0.0208644	0.0086088	-2.4236125	0.0192
LURBPC90	-0.0034020	0.0153722	-0.2213066	0.8258

R-squared	0.143007	Adjusted R-squared	0.107299
S.E. of regression	0.040267	Sum of squared resid	0.077827

Table 4c: Dependent Variable is DLRP9385

Number of observations: 41

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.0368689	0.0254512	1.4486104	0.1556
DLLM9385	-0.0162128	0.0053934	-3.0060408	0.0047
LURBPC90	-0.0084243	0.0174856	-0.4817831	0.6327

R-squared	0.212830	Adjusted R-squared	0.171400
S.E. of regression	0.043505	Sum of squared resid	0.071923

Table 4d: Dependent Variable is DLRP9389

Number of observations: 36

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.0217478	0.0287109	-0.7574763	0.4541
DLLM9389	-0.0051509	0.0051169	-1.0066369	0.3214
LURBPC90	-0.0255275	0.0177572	-1.4375898	0.1600
R-squared	0.103131	Adjusted R-squared		0.048775
S.E. of regression	0.038657	Sum of squared		0.049315

Note: All variables are in logarithms. Variable DLLMyyxx denotes a logarithm of the difference between LMIMPyy and LMIMPxx, with observations where this difference was negative having been deleted.

The regression results shown above indicate that an original high level of defense-related employment has significant negative effects on the economic well-being of a state, for the drawdown years whether we use 1985 or 1989 as a base year. Using 1985 as the base year, the point estimates of the coefficient for MIC employment share suggest that the approximately 37% real reduction of defense-related expenditures between 1985 and 1993 (or an average annual reduction of 5.6% for eight years) resulted in a 0.026 negative elasticity of per capita income growth in a state with respect to its MIC dependency. In other words, on average, if the share of MIC in a state's economy is one percent higher than that in another state, then the first state's per capita income would have grown 0.026% slower during 1985-93. If 1989 is chosen as the base year, the real defense orders reduction would be about 15% (or 3.9% annual rate) and the respective estimate of elasticity is 0.021. The lower elasticity for the 1989-93 period is natural since both the cumulative and annual rate of reduction in defense orders during that period was lower than it was between 1985 and 1993. In line with our arguments above, the coefficients for DLLMyyxx are either small or lack statistical significance.

Table 5 continues the analysis of the US data using regressions evaluating the effects of defense-related employment on unemployment statistics. Note that unemployment data can be affected by various factors including the strength of the unions in the state. More important, employees laid off from defense contractors might be able to find much lower paying jobs elsewhere in a state. Such an outcome would not testify to successful conversion, but it would not raise the unemployment rate in a state. For this reason, we do not emphasize the results of these regressions. The coefficients of MIC employment shares have the expected positive sign even though this coefficient in the regression with 1989 as a base year is not statistically significant.

TABLE 5
UNEMPLOYMENT RATES AS THE DEPENDENT VARIABLE

Table 5a: Dependent Variable is DLUP9385

Number of observations: 51

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.3614323	0.1683713	2.1466376	0.0369
LLMIMP85	0.1211569	0.0498303	2.4313893	0.0188
LURBPC90	0.1189359	0.0973374	1.2218923	0.2277

R-squared	0.193276	Adjusted R-squared	0.159663
S.E. of regression	0.262351	Sum of squared resid	3.303752

Table 5b: Dependent Variable is DLUP9389

Number of observations: 51

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.3906515	0.1868868	2.0903109	0.0419
LLMIMP89	0.0276051	0.0518321	0.5325862	0.5968
LURBPC90	0.1856065	0.0925534	2.0053993	0.0506

R-squared	0.120590	Adjusted R-squared	0.083948
S.E. of regression	0.242438	Sum of squared resid	2.821263

Table 5c: Dependent Variable is DLUP9385

Number of observations: 41

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.2683436	0.1631085	1.6451846	0.1082
DLLM9385	0.0634804	0.0345644	1.8365816	0.0741
LURBPC90	0.1766692	0.1120595	1.5765662	0.1232

R-squared	0.161689	Adjusted R-squared	0.117567
S.E. of regression	0.278811	Sum of squared resid	2.953944

Table 5d: Dependent Variable is DLUP9389

Number of observations: 36

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.3568373	0.1707976	2.0892406	0.0445
DLLM9389	0.0041756	0.0304400	0.1371764	0.8917
LURBPC90	0.2458303	0.1056351	2.3271659	0.0262

R-squared	0.149110	Adjusted R-squared	0.097540
S.E. of regression	0.229967	Sum of squared resid	1.745203

Finally, Table 6 presents the results for change of industrial wage rates as a dependent variable. For essentially the same reasons as were presented in the case of unemployment, industrial wages are not a good summary indicator of the results of defense expenditures drawdown on the economy of the states. Again, the strength of the unions in a state plays a large role in setting wages, and a shift of labor from higher paying skilled industrial jobs often found at defense contractors to low-paying service jobs would not be fully reflected in industrial wage changes. In line with these considerations, the coefficients of MIC employment shares in these regressions are not statistically significant.

TABLE 6
INDUSTRIAL WAGE RATES AS THE DEPENDENT VARIABLE

Table 6a: Dependent Variable is DLRW9385

Number of observations: 49

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.0269703	0.0399170	-0.6756589	0.5026
LLMIMP85	0.0110450	0.0118451	0.9324545	0.3560
LURBPC90	0.0197839	0.0231465	0.8547274	0.3971

R-squared	0.057138	Adjusted R-squared	0.016144
S.E. of regression	0.060296	Sum of squared resid	0.167237

Table 6b: Dependent Variable is DLRW9389

Number of observations: 50

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.0298471	0.0346620	-0.8610903	0.3936
LLMIMP89	-0.0010382	0.0096271	-0.1078392	0.9146
LURBPC90	0.0173863	0.0174699	0.9952162	0.3247

R-squared	0.023683	Adjusted R-squared	-0.017862
S.E. of regression	0.044858	Sum of squared resid	0.094574

Table 6c: Dependent Variable is DLRW9385

Number of observations: 41

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.0455847	0.0383366	-1.1890648	0.2422
DLLM9385	0.0037312	0.0080561	0.4631477	0.6460
LURBPC90	0.0282809	0.0263511	1.0732322	0.2903

R-squared	0.042503	Adjusted R-squared	-0.010691
S.E. of regression	0.064267	Sum of squared resid	0.148688

Table 6d: Dependent Variable is DLRW9389

Number of observations: 36

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.0099336	0.0238498	-0.4165071	0.6797
DLLM9389	0.0035957	0.0042506	0.8459386	0.4037
LURBPC90	0.0028471	0.0147506	0.1930166	0.8481

R-squared	0.025104	Adjusted R-squared	-0.033981
S.E. of regression	0.032112	Sum of squared resid	0.034029

B) Empirical Evidence On Conversion In Russia

The data used in this section consist mainly of economic performance indicators for Russia's 70-odd regions which were obtained principally from the Russian State Committee on Statistics (Goskomstat).[21] In addition, the Center for Economic Analysis in Moscow has put out an economic review which was used to supplement Goskomstat data for the later years.[22] The most important series, the 1985 MIC employment as a percent of total industrial employment in a region, was derived by using a 1985 estimate of the number of defense industry employees in each region in Russia.[23] This series was apparently produced by an official Russian statistical agency but has not been published. The history of how this variable became available is described in Gaddy (1994).

The data contain information on 73 of Russia's provincial administrative units, including 49 oblasts, 6 krays, 16 autonomous republics, and the two largest cities, Moscow and St. Petersburg, which are treated statistically as being separate from their associated oblasts. As in the analysis of the US data, per capita income in the region, unemployment rates, and wages served as dependent variables. No adjustments for regional differences in inflation rate have been made due to the lack of the appropriate data. It is hoped that regional variations in (cumulative) inflation rates during 1991-94 period were small and/or uncorrelated with income changes.

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[21] Goskomstat of the Russian Federation, The Russian Federation in Figures, 1992 (Moscow: 1993, in Russian) and Goskomstat of the Russian Federation, The Russian Federation in Figures, 1993 (Moscow: 1994, in Russian).

[22] Center for Economic Analysis, Russia -1993 Economic Outlook, No. 3; September, 1993 and Center for Economic Analysis, Russia -1994 Economic Outlook, No. 3; September, 1994.

[23] The authors are indebted to Clifford Gaddy, who used cross-sectional regression analysis to evaluate the influence of Russia's MIC on the voting pattern in April 1993 referendum, for sharing his data on MIC dependency of Russia's regions (see, Gaddy, Clifford, "Economic Performance and Policies in the Defense Industrial Regions of Russia" in Privatization, Conversion, and Enterprise Reform in Russia, Selected Conference Papers, Center for International Security and Arms Control, Stanford University, May 1994.)

The principal independent variable, denoted VPKPC85, represents Russian MIC (VPK is the Russian abbreviation) employment in the region as a percentage of all manufacturing employment for 1985. This variable parallels LMIMPxx variable for the US but is not exactly the same. The Russian variable does not count employment generated by military orders indirectly via input-output effects. At the same time, it does reflect all employment at enterprises subordinate to the Soviet defense ministries, including workers involved in civilian production taking place at these enterprises.

Table 7 below provides brief descriptive statistics of the main variables used in this analysis.

Table 7
DESCRIPTIVE STATISTICS FOR THE RUSSIAN CASE

Variable	Mean	S.D.	Maximum	Minimum
INC91	5590.179	1341.098	10737	3475
INC92	44332.13	23124.28	175485	7930
INC94	281154.6	154422.4	876447	146631
UNPC493	0.075886	0.134859	0.148609	0.015482
UNPC394	1.544366	1.053811	4.46	0.14
UNPC694	1.799577	1.179377	4.9	0.15
URBPC89	0.700646	0.113862	1	0.415
VPKPC85	0.231576	0.122948	0.57	0.025
WG9291	8.27747	2.097094	14.7	5.8
WAGE92	5970.38	2857.521	17306	1059.7
WAGE394D	164413	83025.	459200	66000
WAGE94	153028	42649	358965	65409

Note: INC94 and WAGE94 refer to income and wages in December 1994.

Note that in the Russian case, the data on wages and unemployment are notoriously unreliable. For example, the wage statistics do not take into account the fact that many people hold multiple jobs, and until recently, Russian statistical agencies measured unemployment by counting only those who registered as unemployed with the appropriate state offices. Nonetheless, as long as these factors are uncorrelated with the other variables in the regressions, the resulting coefficients would be unbiased. Their statistical significance is likely to suffer, however.

Table 8 presents the results of the regressions with income changes as a dependent variable. As before, all variables are in logarithms. Variable LINCxxyy denotes the logarithm of the ratio of per capita personal income in year

xx to that in year yy. All regressions for Russia exclude observations for the Tuva region and for Ivanovo oblast' because these two regions were clear outliers, having the two lowest values of the VPKPC85 variable. At the same time, their economies were performing relatively poorly. Since values close to zero produce very large negative values of logarithms, these two observations were highly influential, far exceeding any notion of the significance of these regions for the overall economy of the Russian Federation. The elimination of these two observations significantly increased the absolute value of the coefficients of LVPKPC85 in the Table below, without, however, strongly affecting the T-statistics of the 1994-91 regression. The T-statistic of the LVPKPC85 coefficient in the 1994-92 regression declined due to elimination of Tuva and Ivanovo.

TABLE 8
INCOME AS THE DEPENDENT VARIABLE

Table 8a: Dependent Variable is LINC9491

Number of observations: 70

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	3.9940807	0.0818645	48.788898	0.0000
LVPKPC85	-0.0993015	0.0343375	-2.8919232	0.0052
LURBPC89	0.8737465	0.1445520	6.0445126	0.0000

R-squared	0.411689	Adjusted R-squared	0.394127
S.E. of regression	0.190691	Sum of squared resid	2.436337

Table 8b: Dependent Variable is LINC9492

Number of observations: 70

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	1.8395345	0.0687899	26.741347	0.0000
LVPKPC85	-0.0498960	0.0288535	-1.7292891	0.0884
LURBPC89	0.2912544	0.1214655	2.3978359	0.0193

R-squared	0.120801	Adjusted R-squared	0.094557
S.E. of regression	0.160236	Sum of squared resid	1.720264

While the regressions for Russia cover a much shorter period of time than do the US regressions, the cumulative and annual defense expenditure cuts have been much more severe and presumably quite credible (at least after 1992) in Russia. The coefficient of LVPKPC85 is predictably greater in the regression for 1991-94 period than it is for the 1992-94 regression. After all, both the

cumulative and the annual defense expenditure cuts during the former period were much larger.

The size of the cumulative and annual cuts in defense orders is crucial for interpreting the regression results and, in particular, for making comparisons between Russia and the US. Recall that coefficients of LVPKPC85 and of LMIMP85 (or 89) estimate elasticities of income changes over a given period with respect to the level of MIC dependency of the region's economy. These elasticities, however, represent a response to a given decline in defense orders. Obviously, other things being equal, a larger decline in orders would result in greater (by absolute value) elasticities. What is less clear, is precisely how these elasticities depend on the cummulative cuts of defense orders over a given period and on the annual rates of these cuts. Presumably, firms take into account both the speed at which defense orders decrease and the time period over which the drawdown takes place. The longer the period over which a given amount of decline in orders occurs, the easier and more gradual the conversion is for a firm. The greater the annual rates of decline, the more disruptive the conversion process would have to be as firms attempt to convert quickly.

The decline of defense orders in Russia between 1991 and 1994 reached about 74% in real terms, corresponding to a 35.8% average annual rate (for the period between 1992 and 1994 the respective figures were 57% and 34.6%). In the US defense orders declined by only 37% during 1985-93 period proceeding at a 5.6% average annual rate (14.8% during the entire 1989-1993 period or at a 3.9% annual rate). Therefore, if the Russian defense firms were just as (un)successful as the US firms in their conversion efforts, and if the relationship between the firms' ability to convert and the size of annual defense cuts was approximately linear, we would expect the Russian elasticities for 1991-94 to be about 6 to 8 times greater (by absolute value) than the US elasticities for 1985-93.[24] This is probably a conservative argument because the relationship between the size of defense orders cut and the firms' ability to convert is unlikely to be linear. The difficulty of conversion probably increases faster than the size of defense cuts. Our estimates suggest that income elasticities with respect to MIC-dependency were only about 4 times greater in Russia than in the US.

In addition, the broad-based conversion in Russia is hampered by the fact that the Russian economy is much more segmented than the US economy, and the factors of production in Russia are relatively immobile. These considerations

[24] These multiples are obtained by dividing the annual rates of declines in defense orders in Russia by those in the US for the two different periods under consideration. If the success of conversion depends mostly on the cumulative decline in defense orders over a chosen period, then US firms would appear in a more favorable light. Such a view, however, essentially assumes that the defense drawdown ends at the end of the period under consideration. While this might be a reasonable assumption for Russia where the decline in military expenditures cannot really continue at the 1991-94 rates for much longer, US firms would probably expect the drawdown to proceed at comparable annual rates for some time.

would tend to increase the absolute value of VPKPC85 elasticities relative to the corresponding US elasticities even if every given Russian firm was successful at converting a portion of its factors to civilian production.

In light of the above arguments, our point estimates of the respective income elasticities suggest that the defense conversion process in Russia is at least as successful as it would have been in the US, had the US firms faced defense cuts of similar magnitude. Our results do not imply that the Russian defense firms (or factors of production that are, or used to be, employed there) are doing well in any absolute sense, but that they are not doing much worse than their civilian counterparts.

Table 9 continues the analysis, presenting the regressions reflecting regional effects of defense employment on recent unemployment levels.

TABLE 9
UNEMPLOYMENT AS THE DEPENDENT VARIABLE

Table 9a: Dependent Variable is LUNPC694

Number of observations: 71

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.0712646	0.3001293	0.2374462	0.8130
LVPKPC85	-0.0055205	0.1314507	-0.0419968	0.9666
LURBPC89	-0.7084968	0.5361304	-1.3215010	0.1908

R-squared	0.025208	Adjusted R-squared	-0.003462
S.E. of regression	0.758897	Sum of squared resid	39.16292

Table 9b: Dependent Variable is LUNP9493

Number of observations: 71

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	3.3639471	0.2430992	13.837754	0.0000
LVPKPC85	0.1933903	0.1064727	1.8163374	0.0737
LURBPC89	-0.1883936	0.4342558	-0.4338311	0.6658

R-squared	0.047824	Adjusted R-squared	0.019818
S.E. of regression	0.614693	Sum of squared resid	25.69363

With respect to the Russian unemployment data, it should be said that unemployment may be a sign of both unsuccessful conversion (poor economic performance of defense enterprises) and successful conversion (a sign of

restructuring of defense enterprises). Thus, even if one had perfect data on unemployment it might not be clear how to interpret it.

Finally, Table 10 presents the regression results using industrial wage rates as the dependent variable.

TABLE 10
INDUSTRIAL WAGE RATES AS THE DEPENDENT VARIABLE

Table 10a : Dependent Variable is LWGE9492

Number of observations: 69

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	3.1881876	0.1306075	24.410445	0.0000
LVPKPC85	-0.1908905	0.0548065	-3.4829901	0.0009
LURBPC89	0.5253115	0.2306553	2.2774738	0.0260

R-squared	0.216029	Adjusted R-squared	0.192272
S.E. of regression	0.304122	Sum of squared resid	6.104368

Table 10b: Dependent Variable is LWG0394D

Number of observations: 67

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	12.062601	0.0967397	124.69136	0.0000
LVPKPC85	-0.103872	0.0377064	-2.7547615	0.0076
LURBPC89	0.8776110	0.1716533	5.1126966	0.0000

R-squared	0.365746	Adjusted R-squared	0.345926
S.E. of regression	0.207223	Sum of squared resid	2.748240

Table 10c: Dependent Variable is LRWG9291

Number of observations: 71

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-0.9125709	0.1330656	-6.8580514	0.0000
LVPKPC85	-0.1022237	0.0582801	-1.7540051	0.0839
LURBPC89	0.3778915	0.2376993	1.5897878	0.1165

R-squared	0.072704	Adjusted R-squared	0.045431
S.E. of regression	0.336466	Sum of squared resid	7.698216

While the coefficients of LVPKPC85 in the wage regressions have the expected sign and generally are statistically significant, due to the reasons noted above, their values are difficult to interpret.

VI. Conclusions.

We have argued that the prevailing view that military conversion in Russia would be more difficult than in the US is not justified, because while in the US defense firms have had tremendous difficulties competing with established civilian firms, defense firms in Russia are relatively well positioned to enter Russia's civilian markets. The relative advantage of Russian defense firms is due to the fact that Russian civilian firms are not that different from their defense counterparts and, therefore, present relatively weaker competition to the converting firms than is the case in the US.

We have also presented some empirical evidence to support our argument. While the available data are far from perfect, the results indicate that despite enormous defense expenditure cuts over a short period of time the economic performance of Russia's regions is only relatively weakly correlated with the regions' dependency on MIC. In particular, Russia's (negative) elasticities of income growth with respect to the share of MIC employment in the region were approximately 4 times greater by absolute value than the respective US elasticities, while the annual rates of defense expenditure cuts in Russia have been 6 to 8 times greater than in the US. This suggests that by itself the military conversion process in Russia may present less of a problem than in the US. At the same time, this may be the case mainly because the military conversion difficulties in Russia are insignificant relative to the problem of conversion of the entire Russian economy from socialism to markets.