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brief 17

Russia's Defense Industry at the Turn of the Century

november 2000

Contents

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State Research and Production Company "Splaw". Production of rockets for new Russian multiple rocket launchers
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Summary

The defense industry still in a state of flux

After more than ten years of reorganization and tentative conversion of the Russian defense industry, no end is in sight. Efforts to restructure have been muddled and a permanent, stable configuration has not been achieved. The defense industry has been marginalized politically and has failed to either take on the role of an engine of economic recovery and growth or raise the technological level of the civilian industry, as many post-Soviet governments had expected. It now represents only a small fraction of the Russian economy with an annual output in military and civilian markets of roughly US $8 billion. Nevertheless, however dramatic the economic and social downturn in the defense industry was, it did not produce the social explosion of national dimensions predicted in the early 1990s: after the revolutionary transition of 1992, further decline was gradual; large-scale plant closures were avoided and people in most cases received voluntary redundancies. The significant and active part of society appeared to accept the decline of the defense industry as a by-product of the waning of the all-powerful state with which they identified themselves less and less.

In the late 1990s, however, interest in Russian defense economics was renewed as a result of the financial crisis of 1998, the relative recovery and changes in defense policy in reaction to NATO action in Southeast Europe, the start of the second Chechen war, and the inauguration of a new administration. What effect did the general macroeconomic environment and defense policy concepts have on the defense industry? How viable was the defense complex itself as an institution, in terms of its boundaries, configuration and mission? What kind of a defense industry did the Russian political elite want? Did a shift 'from guns to butter' materialize? Which sectors became especially vulnerable to defense cuts and the shocks of macroeconomic transition? What economic impact did the active part of the defense industry have? Will crises reverse conversion trends of the 1990s? How did companies which resisted decline achieve output growth? Were regions able to develop competency in carrying out conversion policies? It is these questions which the present study attempts to answer.

Isolation versus civil-military integration

In general it appears that the Russian government has abandoned the idea of a comprehensive defense industry, comparable in capacity to its US American counterpart. Radical downsizing, increased efficiency and securing better value for the scarce money spent on both military hardware and conversion projects are the dominant concerns. It is not maintenance of the defense industrial base and direct conversion which are on the agenda, but rather industrial modernization in both the military and civilian sectors.

In the late 1990s it became obvious that the state would not be in a position to spend significantly more on defense in the following 10–15 years. Thus debates on military affairs shifted from the question of priority between defense and non-defense spending within the federal budget to the issues of improving efficiency and defining priorities within the defense budget itself. A more realistic assessment of what forces Russia can maintain would probably benefit the defense industry.

Up to now, however, the contraction of the defense industry has predominantly been a reaction to changes in civilian demand, the situation on the international arms market, prohibitive interest rates, the increased level of monetarization of the economy, international oil prices and other economic variables rather than a reaction to the allocative priorities of the military. The military has prioritized strategic forces and minimal upgrading of hardware with a practical 'stop' to the manufacture of series of conventional weapons.

The defense industry is no longer a single, homogeneous institution. Since the early 1990s it has become increasingly segmented, driven by new market situations, changed ownership relationships, rearrangement due to company splits and mergers, and also unequal access to international markets. More than ever before it now presents a complex combination of large and medium-sized firms of prime contractor and subcontractor type, either publicly or privately owned (more often, mixed) with various different degrees of specialization and defense-dependency and, more importantly, various scales of activity or idleness on the market. Only one-third of defense enterprises carry out defense orders, while the Ministry of Defense gives many contracts to commercial firms outside the defense complex and even outside Russia. Only one-fifth of the entities within the defense industry show signs of stability and long-term viability, and this has created a new hierarchy of the defense sectors and companies.

Structural adjustment within the defense industry remains the most sensitive issue. Two of the main conclusions of this present study are that there is no sound rationale for the existence of a 'defense complex' and

that the government must choose between two alternative options: further isolation of the industry or civil-military integration. The mixed approaches of the 1990s have contributed greatly to the current crisis. Closing down, merger or conversion of the virtually 'hollow' part of the defense complex, elimination of duplicated sourcing, and radical reduction in the number of prime contractors are measures expected to rationalize the defense industry.

The new government has not been very successful in pushing through such measures. Opposition from industry and host regions is strong and the government has not found the resources to finance plant closure, lay-offs and the transfer of assets, but rather has returned to 'softer' measures and delayed decisions. Little is known about further plans, though there is evidence to suggest that increased state intrusion and the promotion of exports to compensate for low domestic military demand will be given high priority among possible policy measures. Moreover, the government appears to be discouraging further privatization of the defense industry and has erected additional barriers against new private entrants to the market.

The industry reacted to the funding constraints, the collapse of demand and other shocks with a dramatic contraction in output. The latter recovered only slightly in 1999 and early 2000. Military output in the defense complex in 1999 accounted for only one-third of the 1991 level, being particularly low in the electronics and communications sectors. The nuclear and space sectors found themselves in a better position. Though civilian output did not compensate for the downturn in military output and was in an equally depressed situation, its contribution to the adjustment of the defense industry cannot be overlooked: the share of civilian domestic output in the defense complex is comparable to that of Russian international arms sales. Conversion successes are, however, rare and may be found mainly at the sub-sectoral or micro-establishment level but it is unclear whether these can be sustained.

Several factors have limited conversion. Lack of access to information frequently resulted in the misallocation of resources, while product diversification often failed due to the continued use of existing technologies and core skills rather than the adoption of demand-driven alternatives. Incorrect evaluation of competitiveness and civilian market trends contributed to preventing a successful departure from military manufacturing. Further, the general lack of certainty had a major effect, as well as the difficulty in learning how to cope with the economic shocks.

The study shows that recovery in the defense sector after the crisis of 1998 was mainly the result of import substitution by middle-sized, privatized entities which sold significant parts of their production in barter transactions and which neglected their social responsibilities. However, while these last two factors can be efficient short-term solutions to crisis, they are hardly healthy in the long term. More sustainable growth was experienced by companies which had a good position on the international arms market and those with stable contacts to well-established, cash-rich domestic clients.

At the turn of the century

The Russian defense industry is once more at a crossroads. Numerous experiments with mergers, consolidation and conversion policy have not solved its basic problems of overcapacities, resource constraints and uncertainty with respect to the security and macroeconomic framework for reform. The current government acknowledges these challenges, although whether it will choose the painful path of mass reductions and consolidation of defense industry property or a slow transition and the prolongation of the problems into the new decade remains unclear.

Zusammen-fassung

German summary

Selbst nach mehr als zehn Jahren der Umgestaltung und der zögerlichen Konversion der russischen Rüstungsindustrie ist kein Ende in Sicht. Die Umstrukturierungsversuche waren widersprüchlich und eine dauerhafte, stabile Konfiguration ist nicht erreicht worden. Die Rüstungsindustrie wurde politisch an den Rand gedrängt: Sie hat weder die Rolle eines Motors der ökonomischen Wiederbelebung und des Wachstums angenommen, noch hat sie das technologische Niveau der zivilen Industrie angehoben, wie viele post-sovietische Regierungen es erwartet hatten. Mit einem jährlichen Umsatz in militärischen und zivilen Märkten in Höhe von ungefähr 8 Milliarden US Dollar repräsentiert sie nunmehr lediglich einen kleinen Anteil der russischen Wirtschaft. Wie dramatisch der ökonomische und soziale Abwärtstrend auch war, er führte trotzdem nicht zu einer sozialen Explosion von nationaler Reichweite, wie es in den frühen Neunzigern vorausgesagt wurde: Nach dem revolutionären Übergang im Jahre 1992 war der weitere Rückgang graduell. Großflächige Werksschließungen wurden vermieden, während in den meisten Fällen die Menschen freiwillig ausschieden. Der bedeutende und aktive Teil der Gesellschaft schien den Niedergang als Nebenprodukt der Schwächung des allmächtigen Staates zu akzeptieren, mit dem sie sich immer weniger identifizierten.

In den Spätneunzigern aber wurde das Interesse an der russischen Rüstungswirtschaft als Folge der Finanzkrise von 1998, der relativen wirtschaftlichen Erholung und den Änderungen in der Militärpolitik als Reaktion auf den NATO-Einsatz in Südosteuropa, des Beginns des zweiten Tschetschenienkriegs und der Amtsübernahme der neuen Regierung wiederbelebt. Welchen Einfluß hatten der allgemeine makroökonomische Kontext und Konzepte der Militärpolitik auf die Rüstungsindustrie? War der Militärisch-Industrielle Komplex als Institution mit seinen Grenzen, seiner Konfiguration und Mission überlebensfähig? Welche Art Rüstungsindustrie wollte die politische Elite Russlands? Kam ein Richtungswechsel von 'Kanonen zu Butter' zustande? Welche Sektoren wurden für Kürzungen im Verteidigungshaushalt und makroökonomische Schocks besonders anfällig? Welche ökonomische Wirkung hatte der aktive Teil der Rüstungsindustrie? Werden Konversionstrends der Neunziger-Jahre durch Krisen umgekehrt? Wie haben Firmen, die dem Niedergang widerstanden, Produktionswachstum erreicht? Es sind diese Fragen, die diese Studie versucht zu beantworten.

Isolation versus zivil-militärische Integration

Es sieht im Allgemeinen so aus, als habe die russische Regierung die Idee einer allumfassenden Rüstungsindustrie mit einer Kapazität vergleichbar ihrem US-amerikanischem Gegenüber aufgegeben. Drastische Verkleinerung, erhöhte Effizienz und damit ein höherer Ertrag bei knappen Mitteln, die sowohl für militärische Hardware als auch für Konversionsprojekte ausgegeben werden, sind die vorherrschenden Ziele. Auf der Agenda stehen nicht die Aufrechterhaltung der militärisch-industriellen Basis und direkte Konversionsprojekte, sondern industrielle Modernisierung sowohl im militärischen als auch im zivilen Sektor.

In den späten Neunzigern wurde offensichtlich, dass der Staat in den darauffolgenden 10-15 Jahren nicht in der Lage sein würde, mehr Mittel für Verteidigung bereitzustellen. Daher verschoben sich Debatten über Militärisches von der Frage der Priorität zwischen militärischen und nichtmilitärischen Ausgaben innerhalb des Budgets der Föderation auf die Frage der Verbesserung der Effizienz beziehungsweise der Definition von Prioritäten innerhalb des Verteidigungsbudgets. Eine realistischere Einschätzung dessen, welche Streitkräfte sich Russland leisten kann, wäre für die Rüstungsindustrie wahrscheinlich von Nutzen.

Bis jetzt aber war die Verkleinerung der Rüstungsindustrie weitaus eher eine Reaktion auf Änderungen in der zivilen Nachfrage, die Lage auf dem internationalen Rüstungsmarkt, äußerst ungünstige Zinssätze, erhöhte Monetarisierung der Wirtschaft, internationale Ölpreise und andere ökonomische Variablen als eine Reaktion auf die Prioritäten des Militärs. Das Militär gab den strategischen Streitkräften und einer minimalen Verbesserung der Hardware die Priorität, während die Herstellung von Serien konventioneller Waffen praktisch 'auf Eis gelegt' wurde.

Die Rüstungsindustrie ist keine einzelne homogene Institution mehr. Seit den frühen Neunzigern wurde sie zunehmend segmentiert. Grund dafür waren neue Bedingungen auf dem Markt, veränderte Besitzverhältnisse, Umstrukturierung nach Trennungen und Zusammenschlüssen und auch der ungleiche Zugang zu internationalen Märkten. Mehr als je zuvor besteht sie aus einer komplexen Zusammenstellung großer und mittelgroßer Firmen von Haupt- oder Unterlieferanten, welche entweder in öffentlichem oder privatem - meistens: gemischtem - Besitz sind und verschiedene Stufen der Spezialisierung und Rüstungs-

abhängigkeit und, noch wichtiger, verschiedene Skalen der Aktivität beziehungsweise des Leerlaufs auf dem Markt aufweisen. Lediglich ein Drittel der Rüstungsfirmen führt Rüstungsaufträge aus, während das Verteidigungsministerium viele Verträge an kommerzielle Firmen außerhalb der Rüstungsindustrie und sogar außerhalb Russlands vergibt. Nur ein Fünftel der Einheiten innerhalb der Rüstungsindustrie zeigen Zeichen der Stabilität und der langfristigen Überlebensfähigkeit, was eine neue Hierarchie der Verteigungssektoren und -firmen geschaffen hat.

Die Umstrukturierung der Rüstungsindustrie bleibt ein Thema. Zwei der wichtigsten Folgerungen dieser Studie sind, dass es keinen rationalen Grund für die Existenz eines 'Rüstungskomplexes' gibt und dass die Regierung zwischen zwei alternativen Optionen wählen muss: weitere Isolation der Rüstungsindustrie oder zivil-militärische Integration. Die gemischten Ansätze der Neunziger-Jahre haben zu der gegenwärtigen Krise wesentlich beigetragen. Firmenschließungen, Zusammenschlüsse oder Konversion des faktisch 'hohlen' Teils des Rüstungskomplexes, die Eliminierung von Doppel-Kapazitäten sowie weitgreifende Verminderung der Zahl der Hauptlieferanten sind Maßnahmen, von denen erwartet wird, dass sie die Rüstungsindustrie rationalisieren.

Die neue Regierung ist bei der Durchsetzung solcher Maßnahmen bisher nicht sehr erfolgreich. Die Opposition von Seiten der Industrie und der betroffenen Regionen ist stark, während die Regierung keine Ressourcen gefunden hat, mit denen sie Werksschließungen, Personalabbau und die Übertragung von Sachwerten finanzieren kann. Im Gegenteil: Sie griff wieder auf 'weichere' Maßnahmen zurück und verschob Entscheidungen. Über die weiteren Pläne ist wenig bekannt, obwohl es Hinweise gibt, dass die erhöhte Einmischung des Staates sowie die Förderung von Exportgeschäften, um die niedrige Binnennachfrage nach Rüstungsgütern zu kompensieren, unter den möglichen Politikmaßnahmen hohe Priorität haben werden. Außerdem sieht es so aus, als würde die Regierung der weiteren Privatisierung der Industrie entgegenwirken und neuen privaten Marktteilnehmern Hindernisse in den Weg stellen.

Die Rüstungsindustrie hat auf Finanzierungsbeschränkungen, den Zusammenbruch der Nachfrage und andere Schocks mit einer dramatischen Reduzierung des Ausstoßes reagiert. In den Jahren 1999 und 2000 gab es nur eine leichte Erholung. Die militärische Produktion durch den militärisch-industriellen Komplex entsprach im Jahre 1999 nur einem Drittel dessen von 1991 und war in den elektronischen und Kommunikationssektoren besonders niedrig. Die Nuklear- und Weltraumsektoren waren in einer besseren Lage. Obwohl der zivile Ausstoß den Rückgang der militärischen Produktion nicht kompensieren konnte und in einer vergleichbar schlechten Situation war, darf sein Beitrag zur Anpassung des Rüstungskomplexes nicht übersehen werden: Der Anteil des zivilen Binnenausstoßes des Rüstungskomplexes gleicht dem der russischen Rüstungsverkäufe ins Ausland. Beispiele erfolgreicher Konversionsprojekte sind jedoch selten. Meistens sind sie auf der untersektoralen oder Firmenebene zu finden, und es ist oft unklar, ob sie durchgehalten werden können.

Verschiedene Faktoren haben Konversion erschwert. Fehlender Zugang zu Informationen führte häufig zur falschen Allokation von Ressourcen. Die Produktdiversifikation ist oft deshalb nicht gelungen, weil bestehende Technologien und Grundfertigkeiten weiter eingesetzt wurden, statt nachfragegerechte Neuerungen einzuführen. Die falsche Einschätzung von Konkurrenzfähigkeit sowie Trends auf den zivilen Märkten haben eine erfolgreiche Abwendung von der militärischen Produktion verhindert. Ferner übte die allgemeine Unsicherheit einen großen Einfluss aus, sowie die Schwierigkeit den Umgang mit wirtschaftlichen Schocks zu lernen.

Die Studie zeigt, dass die Erholung des Rüstungssektors nach der Krise von 1998 hauptsächlich eine Folge der Importsubstitution durch mittelgroße, privatisierte Firmen war, die Teile ihrer Produkte über Tauschhandel verkauften und ihre sozialen Verpflichtungen ignorierten. Während aber diese letzten Faktoren wirksame kurzfristige Lösungen einer Krise sein können, sind sie längerfristig gesehen keine gesunden Maßnahmen. Dauerhafteres Wachstum wurde von Firmen erzielt, die auf dem internationalen Rüstungsmarkt gut positioniert waren sowie stabile Kontakte zu zahlungsfähigen inländischen Kunden hatten.

An der Jahrhundertwende

Die russische Rüstungsindustrie steht wieder einmal am Scheideweg. Unzählige Experimente mit Firmenzusammenschlüssen, Konsolidierung und Konversion haben die grundsätzlichen Schwierigkeiten der Überkapazitäten, der beschränkten Ressourcen und der Unsicherheit in Bezug auf die sicherheitspolitischen und makroökonomischen Rahmenbedingungen für Reformen nicht gelöst. Die jetzige Regierung erkennt diese Herausforderungen, obwohl unklar bleibt, ob sie den schmerzhaften Weg von Massenreduzierungen und der Konsolidierung der Besitzverhältnisse der Rüstungsindustrie oder ein Fortschleppen der Probleme in das neue Jahrzehnt wählen wird.

Russian Summary

Оборонная промышленность по-прежнему в состоянии перемен

Прошло десять лет с тех пор, как были начаты попытки реорганизовать и конвертировать военную промышленность России, однако процесс далек от завершения. Попытки реструктуризации оказались хаотичными, и устойчивая конфигурация комплекса так и не сложилась. Оборонная промышленность маргинальна в политическом отношении. И она не смогла стать локомотивом экономического роста и технологического возрождения, как предсказывали многие пост-советские правительства. Сегодня это всего лишь небольшая часть Российской экономики (годовой оборот на военном и гражданском рынках, включая международный, по приблизительным оценкам составляет не более 8 миллиардов долларов). Более того, несмотря на весь драматизм экономического и социального падения, оборонная промышленность не стала источником социального взрыва национального масштаба, как это виделось в начале 90х: после революционных изменений 1992 года дальнейшее падение было более или менее постепенным, удалось избежать масштабных закрытий предприятий, незанятые работники в большинстве случаев уходили сами. Да и значительная и активная часть общества все-таки воспринимает упадок военной промышленности как побочный результат разрушения атрибутов прежнего государства, с которым она себя все меньше ассоциирует.

В конце 90х годов, однако, интерес к Российской военной экономике возродился из-за финансового кризиса 1998 года с последующим относительным ростом, изменений в сфере военной политики в результате действия НАТО в юго-восточной Европе, начала второй Чеченской войны и прихода новой администрации. Как макроэкономическая среда и военно-политические концепции повлияли на военную промышленность? Насколько жизнеспособен сам институт военно-промышленного комплекса, его границы, конфигурация и цели? Какую оборонную промышленность хотела бы видеть в идеале российская политическая элита? Состоялся ли переход от пушек к маслу? Какие отрасли оказались наиболее уязвимыми в отношении сокращений и макроэкономических шоков? Как активная часть оборонной промышленности влияет на экономику? Состоится ли ревизия конверсионных тенденций 90х годов в результате кризиса? Каковы источники роста в устойчивых компаниях? Могут ли регионы построить разумную конверсионную политику? В настоящей работе предпринята попытка найти ответы на эти вопросы.

Изоляция или военно-гражданская интеграция

Похоже, Российское правительство отказалось от идеи универсальной военной промышленности, сопоставимой по параметрам с американской моделью. Идеи радикального сокращения промышленности, поиска наиболее эффективных путей использования ограниченных ресурсов как в оборонных, так и в конверсионных проектах, доминируют в концепциях. Не поддержание военно-промышленной базы и прямая конверсия, а модернизация промышленности в ее военной и гражданской частях стала основной задачей.

В конце 90х годов стало понятно, что страна вряд ли может позволить себе тратить на оборону больше, чем сейчас еще по крайней мере в течение 10-15 лет. Поэтому фокус военно-политических дискуссий сместился с проблем приоритетов расходования средств между оборонными и остальными расходами федерального бюджета к вопросам эффективности и приоритетов расходования средств внутри военного бюджета. Можно ожидать, что более реалистичная оценка численности вооруженных сил, которые Россия может себе позволить, вероятнее всего окажется выгодной для военной промышленности.

Однако, до настоящего времени, динамика производства в оборонной промышленности определялась не столько приоритетами военных, сколько динамикой гражданского спроса, международного рынка вооружений, мировых цен на нефть, запретительными процентными ставками, возросшим уровнем монетаризации экономики и другими экономическими показателями. Военные оставили приоритетным оснащение стратегические сил при минимальной модернизации остальных систем и практической «остановке» серийного производства обычных вооружений.

Оборонная промышленность больше не является единым институтом. С начала 90х годов ее сегментация значительно усилилась под влиянием различий в рыночной ситуации, изменений отношений собственности, изменения границ фирм в результате раздела компаний или их слияний, разного доступа к международным рынкам. Более чем когда-либо, она представляет собой сложное сочетание крупных и средних фирм, генеральных подрядчиков и субконтракторов, государственных или приватизированных компаний (чаще всего - смешанных) с различной степенью военной специализации и зависимости, и что более важно - активных или умерших участников рынка. Только третья часть всех предприятий оборонного комплекса заняты выполнением оборонного заказа, в то время как Минобороны размещает контракты на коммерческих фирмах или даже за пределами России. Только пятая часть предприятий показывают признаки стабильности и жизнеспособности. Такие процессы создали новую иерархию оборонных отраслей и предприятий.

Структурные реформы оборонной промышленности остаются наиболее больной проблемой. В работе сделано два вывода. Дальнейшее существование военно-промышленной базы в форме оборонного комплекса не имеет рациональных оснований, и правительству придется выбирать один из двух вариантов: настаивать на дальнейшей изоляции небольшой по размерам промышленности или проводить политику военно-гражданской интеграции. Смешанные подходы, которые практиковались в 90х

годах, внесли свой вклад в настоящий кризис. Закрытие предприятий из неработающей «виртуальной» части оборонного комплекса, их слияния или конверсия, устранение дублирования и радикальное сокращение числа генеральных подрядчиков - эти меры, как ожидается, могут привести к рационализации оборонной промышленности.

Новое правительство, однако, не слишком успешно проталкивает эти инициативы. Значительна оппозиция в среде промышленников и региональных лидеров, да и правительство не смогло найти ресурсы для финансирования закрытия предприятий, увольнений и перемещения производственных мощностей. Оно вернулось к мягким мерам и отложенным решениям. Хотя дальнейшие планы мало известны, есть основания ожидать что приоритет будет отдан усилению государственного вмешательства в управление промышленностью и стимулированию оружейного экспорта. Кроме того, очевидны намерения приостановить приватизацию и создать дополнительные барьеры для прихода новых частных компаний на военный рынок.

Промышленности отреагировала на финансовый голод, разрушение спроса и другие шоки драматическим падением производства, которое лишь в небольшой степени выросло в 1999-2000 гг. Производство оборонной продукции в 1999 году составило только треть от уровня 1991 года, особенно сильно упало в электронике и промышленности средств связи. Атомная и ракетная отрасли оказались чуть в лучшем положении. Несмотря на то, что гражданское производство в оборонном комплексе не смогло компенсировать падение военного спроса и испытало серьезный спад, тем ни менее не стоит недооценивать его роль в трансформации оборонного комплекса: доля внутреннего гражданского рынка в продажах предприятий оборонного комплекса сопоставима с российским экспортом оружия. Успешные истории конверсии, однако, довольно редки, их можно увидеть или на уровне подотраслей, или предприятий, да и остается открытым вопрос об устойчивости и долгосрочности достижений.

Говоря о понятных трудностях конверсии, следует упомянуть несколько факторов. Недостаточная информация нередко приводила к ошибкам в направлении инвестиций, выбор продукта с ориентацией на технологию, а не на спрос также приводил в неудачам. Неверные оценки конкурентоспособности и тенденций развития рынка серьезно препятствовали успешному расставанию с военно-промышленным прошлым. Общая неопределенность, и медленное накопление опыта реагирования на экономические шоки также сыграли свою роль.

Исследование показало, что рост выпуска продукции после кризиса испытали в основном приватизированные предприятия среднего размера, которые использовали импортозамещение и бартерные сделки, и

кроме того пренебрегали своими социальными обязательствами. Однако эти меры могут быть лишь краткосрочным инструментом преодоления кризиса. Более устойчивое положение заняли предприятия, хорошо позиционированные на рынке торговли оружием или интегрировавшиеся с устойчивыми и богатыми клиентами на гражданском рынке.

На рубеже веков

Российская оборонная промышленность опять оказалась на перепутье. Многочисленные эксперименты с политикой слияний, консолидации и конверсии не решили основных проблем оборонки - избыточности производственных мощностей, недостатка ресурсов и неопределенности в отношении политики безопасности и макроэкономических рамок реформ. Нынешнее правительство признает существование этих проблем, однако остается неясным, пойдет ли оно по пути болезненных массовых сокращений и консолидации собственности или замедлит реформы и растянет решение проблем еще на десятилетие.

The Security and Macroeconomic Context: Implications for the Development of the Defense Industry

Profound changes in the general political and economic environment—especially changes in the security situation and systemic reform of the economy—have initiated the fundamental transformations now underway in the Russian defense industry. Having lost its superpower status, Russia altered its defense options as the reduced threat of a war of global dimensions had removed the rationale for maintaining oversized defense establishments, typical of the Cold War era. However, the cuts in military spending and the contraction of the defense industry were much more drastic than might have been expected, given the security context. There is evidence that military planning has played a less important role in defense industry reform than the economic situation in general and the broader political struggle over the mission of the armed forces and the defense industry. Another driving force is the balance of interests among the most powerful political factions: as the military's position declined, so too did its ability to influence key strategic political decisions.

Moreover in the late 1980s—even before systemic reforms had been launched—the Soviet defense industry had already experienced a certain pressure to restructure. The impulse came from the military themselves who questioned the sense of maintaining a large number of technically obsolete enterprises in the defense industry and obsolete weaponry in the forces, looking for radical modernization and a switch to advanced warfare. The military—in return for their loyalty during the severe struggle for power on the eve of the Soviet Union's collapse—succeeded in pumping significant resources out of the federal budget: in 1990 defense expenditures were higher than they had ever been when the country was at peace (Ekspertnyy Institut, 1996).

The launching of reforms, however, required a dramatic cut in public expenditures, and the military budget—along with economic subsidies, investment and social funding—fell victim to these cuts. Despite this, sufficient funds were not available to finance the reorganization of the defense industry along the lines specified by the military in order to achieve modernization. Reductions in defense expenditures were only partly linked to security considerations, however there is reason to believe that the post-Cold War security situation created a social climate where acceptance of the build-down trends was more likely.

The sections below investigate how the nature and extent of the changes in the defense industry were influenced by two major factors: security planning and macroeconomic shocks.

Security planning

In the long run, the security environment appears to have had a strong influence on the pace and direction of change in the defense industry. Yet when one gets down to the level of specific events in the 1990s, it becomes clear that it is misleading to directly link security concepts on paper to the actual dynamics of the defense industry: real life changes have been too fast, not always straightforward and driven by a complex mixture of factors.

The Soviet inheritance

In addition, several fundamental features of Russian defense and security policy should be noted: the strong historical legacy from the Soviet past, the emphasis on nuclear power in line with the concept of deterrence, and the fact that the boundaries of security policy have been extended beyond the Russian Federation. The engagement of Russian troops in military action in Chechnya as well as several peacekeeping operations, both of which changed the mission of the armed forces in principle, should also be taken into consideration.

The legacy of Soviet security concepts seriously hampered reform of the defense industry in the transition period, not to mention the difficulty of relinquishing the strong identification with defense cultivated by decision-makers for many years. Former war scenario-concepts and the striving for

military parity to balance *qualitative* Western superiority in certain technologies and weapons systems with *quantitative* superiority resulted in huge outputs and accumulated weapon inventories, excessive mobilization capacities, regional dispersion, and the duplication of production facilities. Overcapacities and unrealistic mobilization plans—the latter were not reduced till 1994—explain many failures to adjust, while the location practice in the defense industry led to severe social problems and the lack of decisiveness on the part of the government to launch restructuring reforms. On the other hand, it is conceivable that the large quantities of weapons accumulated at arsenals made the military more tolerant to reductions in output and thus, in principle, to plans to reorganize, concentrate and modernize the defense industry.

The most salient feature of the impact of post-Soviet security thinking on the defense industry is uncertainty. In the new Russia, no clear security concept has yet been outlined, though several documents entitled "Military doctrine" have been drafted and made public. In fact, military planning has lagged well behind the actual processes taking place in society, the armed forces and industry, and it is safe to say that the tailoring of an operational military doctrine to the armaments program, defense industry restructuring, conversion, and arms export policy is still to emerge.

Military programs in the second half of the 1990s

The military program adopted in 1996—and canceled in 2000—defined the mission of the defense system squarely as to deter war, ward off aggression, prevent and react to internal conflicts, and ensure societal and personal safety (Sitnov, Gaponov and Tuzhikov, 1997). To meet these targets, the Defense Ministry detailed the following requirements for the defense-industrial base:

- Maintenance of production capacities for weapon systems which could not be purchased abroad, with a focus on high-tech systems
- Competitive bidding and contract consolidation to a limited number of enterprises; standardization as the most important measure in reducing supply costs; reductions in the variety of weapons produced; elimination of duplication
- Permanent readiness to increase defense outputs in the case of the war
- Integration of the military-technical and the civil infrastructure, along with better interaction between state and private enterprises.

None of the above mentioned requirements was entirely achieved, and practically all of them were reiterated in the 2000 version of the military doctrine. Thus, when the most dramatic reforms were taking place in the defense industry in the 1990s, realistic guidelines for the defense-industrial base did not exist. During the meeting of defense industrialists in March 2000, at the height of the presidential campaign, it was admitted that the military program adopted in 1996 had completely failed. The Defense Ministry subsequently drafted the concept of a new 10-year military program—however its parameters were not made public (*Prime-Tass*, 21 March 2000). The immediate result of the new administration's security plans will be the delay of restructuring reforms in the defense complex until the military program had been fully developed (TS-VPK Information Agency, *Survey*, February 2000).

Decision-making in the second half of the 1990s was dominated by the challenge of drafting the most effective security policy within a tight economic environment. Several steps 'to economize' were taken:

- Rearmament and modernization of the forces was delayed. In principle, the military agreed to wait until 2005. In the period up to that date, the industry is to be reorganized, downsized and reorientated to suit a qualitatively different type of warfare. It was reportedly the Defense Ministry which insisted on cutting the number of defense contractors down from about 2,000 to 600 and which lobbied for the most radical plan to close obsolete plants (Anatoliy Sitnov, Chief of Armaments, Defense Ministry, interview, *Eksport Vooruzheniy,* November/December 1999, pp. 20–22, also available at www.cast.ru). Moreover, the Defense Ministry had *de facto* restructured the industry by granting significant procurement contracts to a relatively small number of the elite and most competitive enterprises, which, they believed, had the potential to survive the crisis and become the basis for a modernization program after 2003–2005.
- While strategic forces and the upgrading of hardware were given priority, there was a provisional 'stop' to the serial manufacturing of conventional weapons in order to maintain only a minimal conventional operational force. In 1999, this trend was reinforced by a special law guaranteeing funding of the part of military expenditures allocated to the nuclear sector and abandoning the commitment to no-first use of nuclear weapons in favor of a "flexible response". The effects of the Chechen war may change this perception however, and lead to conventional weapons being given more priority again. As Vice-Prime Minister Ilya Klebanov noted, the industry will not only manufacture missiles in future, but also weapons "for solving internal problems" (TS-VPK Information Agency, *Survey,* October 1999).

Another economizing step initiated by the defense authorities failed, but may nevertheless still affect military planning: in late 1998, the General Staff drafted the Law on the Armed Forces of the Russian Federation (*Nezavisimoye Voyennoye Obozreniye*, 17–24 December 1998) which foresees grouping all uniformed forces in Russia—including the armed forces, border troops, and the troops of the Ministry of the Interior—under the Defense Ministry's coordination, including a centralized procurement policy and a common budget. The goal of the proposed action was to radically cut defense expenditures and distribute them more 'justly' across competing forces, as well as to avoid duplication and inefficiency in procurement policy. At the time of writing, however, the law had not yet been adopted, though the initiative itself deserves attention and may seriously affect procurement policy in the future.

The gap between wording of the doctrine and the actual state of the forces, infrastructure and supply industries has mattered greatly in the current crisis: wishful thinking and the lack of political will to make decisions

Figure 1: Overview of the Russian military doctrine of 2000

Source: *Russian Federation, 2000*

Security threats	*Security principles*	*Prioritized weapons systems*	*Requirements of the defense-industrial base*
Territorial claims Conflicts on the Russian periphery Discrimination abroad against Russian security interests and citizens Extension of military blocks and the build-up of military forces Internal threats: religious and ethnic extremism, terrorism, illegal forces, illicit arms and drugs trade	Nuclear deterrence; possibility of the use of nuclear force in the case of aggression Defense policy coordinated with Belarus; collective security within CIS (Commonwealth of Independent States) Priority of political, diplomatic and other non-military means of conflict prevention Coordinated policy and supply of armed forces and other forces Priority of strategic forces; maintenance of forces' mobilization capacities; development of conventional forces for the prevention of local conflicts	Advanced communication, command, control and intelligence systems (C^3I) Long-range precision-guided conventional munitions Electronic warfare assets Mobile non-nuclear systems	Maintaining a balance between the strength of the forces and the availability of resources Concentration of resources in priority areas Integration of military and civilian economic sectors, based on security interests Development of a general infrastructure, based on security interests The protection of intellectual property rights with respect to military hardware and the corresponding technologies State support to enterprises, which provide technological stability, to entities in defense-dependent cities and to closed scientific sites Independence in R&D (research and development) and the manufacturing of key weapons systems

which might not please the military leadership have slowed down the effective adjustment of the defense industry and have discouraged managers from taking corporate policy decisions in line with the real—rather than the theoretical—situation. Kuzik shows that, in the second half of the 1990s, the ideal pattern of defense planning—drafting of the military doctrine, long-term planning of supply and procurement, and finally contracting—was replaced by an adjustment to minimal funding, lobbying, and the implicit prioritizing of the nuclear forces (Kuzik, 1999). Moreover, he observed that the relations between the military and industry were built on the basis of traditions, personal links and mutual pressure and were subject to a constant trade-off between security and pragmatic interests. Thus, in 2000, the new administration again faces the formidable task of providing practical guidelines for defense requirements along with a framework in which to organize the defense-industrial branches.

The military doctrine of 2000

A reading of the document published on the new military doctrine adopted by the Putin administration in 2000 (see Figure 1 for a summary of the document) does not reveal any revolutionary changes in military thinking. The government has once more returned to stocktaking in the forces and industry, as a starting point for planning. This proves that the adjustment of force levels was for the most part chaotic in the 1990s and that output dynamics depended on the resources available, resulting in the emergence of a large portion of 'hollow' forces in the army and 'empty' enterprises in the industry. As the Chairman of the *Duma* Defense Committee, Army General Andrey Nikolayev, admitted: "It is hard to expect efficiency from any organization when its goals and objectives have yet to be determined. We are witnessing attempts to hide the true state of affairs and a lack of definition of terms like 'prevention' or 'deterrent'. The chaotic moves made nowadays have nothing to do with facilitation of military security" (*Nezavisimaya Gazeta*, 10 February 2000, p. 2).

Military planners see immediate security threats originating from local conflicts on the periphery of Russia, especially influenced by the spread of religious fundamentalism, ethnic and national tensions, as well as disintegration risks, the proliferation of nuclear weapons, regional arms races and trafficking in illicit arms and drugs. Another concern is the increased terrorist activity caused by the weakening of state structures in several regions and by economic distress. Currently, the armed forces are authorized to engage in new missions such as coping with conflicts on Russian territory and participating in peacekeeping operations.

In this respect, the senior military officials stress the priority of long-range, precision-guided conventional munitions, electronic warfare assets, and advanced communication, command, control and intelligence (C^3I) systems. Asymmetric warfare to 'leapfrog' potential enemies by catching up and surpassing them in certain weapon areas is also argued for. However, there is no data available to the public to show that these priorities have already materialized in procurement contracts and that resources have been shifted from strategic nuclear warfare, traditionally prioritized. Indirect indicators, such as the rapid growth of military output in the communications and radio branch of the defense-industrial complex between 1995 and 2000, may however be evidence of change.

In order that they may fulfill their newly defined mission, the military expect the defense-industrial base to concentrate resources and efforts in priority fields, to integrate civil and military sectors and to use the general economic infrastructure to further security interests. State protection of critically important and vulnerable enterprises, as well as better social protection for defense industrial employees, are also mentioned as important aims.

Unsolved problems

However many problems relating to the defense industry's role in ensuring post-Cold War security remain unanswered. For example, no agreement has been reached as to the extent to which excess production lines should be kept running or insolvent enterprises helped to avoid bankruptcy in order to maintain the defense-industrial base, critical technologies and the country's independence in weapon supply. Until recently, the boundaries of the defense industry had been kept significantly beyond demand in the interest of maintaining the defense-industrial base. Critics point to the high costs and counterproductivity of the above approach, given the initial exaggerated size of the industry and the quick depreciation of idle capacities which will hardly suit future defense requirements. Moreover, doubts have often been raised as to whether defense procurement policy is a suitable instrument to pursue economic and social goals—such as the protection of the national industrial base and the command of critical technologies—rather than being simply an efficient way of purchasing military hardware for defense.

No clear decision has been taken on the organization of defense procurement or the leading role of the military or industry in decision-making. The government doctrine states that the Defense Ministry is to take

responsibility for allocating defense procurement contracts although—in early 2000—it appeared that the industry had started to take over from the military in arms procurement policy and contracting procedures after the Defense Ministry had dominated this field for several years. The lack of administrative skills in the Defense Ministry to manage contracts and payments, as well as the misappropriation of funds, had caused severe criticism from defense industrialists, who had sought a return to the traditional contracting practice via the State Commission on Military-industrial Affairs which was reestablished in 1999. Though its functions are now limited to general planning, coordination of technical policy, and initiation of the restructuring of industry, there is reason to believe that it may become the main distributor of defense contracts and the holder of funds allocated for defense procurement in the federal budget. For instance, President Vladimir Putin, reporting at the All-Russian Meeting on Defense-industrial Strategy in March 2000, spoke of procurement reform and the concentration of defense orders in the hands of a single state contractor.

Another uncertainty in defense procurement policy is the role of imported hardware in the supply of the army. It is important to note that Russia depends greatly on supply from the former Soviet republics. According to Sitnov, Gaponov and Tuzhikov (1997), Russia is only able to produce 17 types of weapon system entirely domestically; all other hardware requires the supply of components from the other ten CIS (Commonwealth of Independent States) countries. The number of non-Russian defense component suppliers amounts to 1,500 which matches the number of enterprises constituting the Russian defense complex. Maintaining industrial links with enterprises which only became 'foreign' several years ago is therefore one of the main concerns of the Russian military.

As far as imports of hardware from the West are concerned, politicians and national producers oppose such options, although in fields such as electronic components, machinery, aircraft engines and avionics relatively large market niches are already *de facto* occupied by foreign producers. However many of the systems manufactured using imported components are designated for export rather than for domestic purchase.

No decision has yet been made as to which enterprises are to be withdrawn from the defense complex and subjected to conversion. There is a clear clash of interests between security and economic priorities on this issue. Economics is currently the main driving force in this selection process which suggests that predominantly the least successful, problem-ridden and financially weakest enterprises will enter the civilian economy, conversion being treated as a method of 'soft' bankruptcy. Economically viable enterprises will thus be given priority as defense contractors. Furthermore, as the export of arms was one of the most critical factors for success of defense enterprises in the 1990s, defense procurement agencies are likely to give domestic contracts primarily to arms-exporting enterprises.

Uncertainty is increased by the constraints of the unsettled alliance framework within the CIS countries along with ever-changing perceptions of NATO expansion, currently viewed as hostile—though *rapprochement,* as the presidential election campaign has shown, has not been excluded. Belarus has been named as the main military ally, while other CIS countries are involved in the coordinated security policy.

Possible US deployment of a national missile defense system and the future of the ABM (Anti-ballistic missile) Treaty have also contributed to the rise in tension in the area of security. The recent meeting of Russian and American military officials and researchers showed that the concerns of the Russian side are not linked so much to the missile defense system itself but to the accompanying technological advances which could be used to counter the effectiveness of Russian forces in the future (Koybayeva, 1999). The new government has taken a tough approach to the problem: addressing the UN Security Council in April 2000, President Putin said that Russia would bring all international responsibilities into line with its national security concept including the potential to turn to an offensive position (*Kommersant*, 11 April 2000). It is difficult to predict how events will unfold, but a new arms race cannot be entirely excluded.

Future prospects

A further question is how military action in Chechnya along with the earlier tough reaction of the Russian military to NATO action in Southeast Europe may influence security planning and thus affect the defense industry. In general there is a great deal of evidence that these events have encouraged the Russian military to claim a bigger stake in the federal

budget and reverse the tendency to downsize the army and the defense industry: monthly expenditures to finance the war accounted for 4–8 percent of all federal expenditures (*Kommersant*, 22 April 2000). An expansion of the political role of the army, along with its lobbying capacity, may also be expected, as well as a rise in the national demand for defense. Moreover, the two Chechen wars demonstrated that post-Cold War security thinking does not differ much from Cold War approaches: the Russian society has failed to address the new security threats with non-military instruments and instead has decided in favor of advanced weapons systems and an improved military force to meet its security challenges.

In 1999 President Putin, acting at that time as Prime Minister, declared arms manufacturing for domestic requirements a priority, thus replacing the previous focus on conversion and arms exports (*Nezavisimoye Voyennoye Obozreniye*, 24–30 September 1999). Moreover, Vice-Prime Minister Klebanov, responsible in the government for the defense complex, reported that the new situation required the transfer of several converted defense enterprises *back* from civilian to military manufacturing (*Novye Izvestiya*, 22 September 1999). Even earlier than that, former Prime Minister Primakov had talked about "resource mobilization" as a possible response to NATO actions. The growth of the procurement budget by 80 percent in 2000 has therefore definitely been caused by the changes in security perceptions. Defense spending growth started from a very low level, however, and will hardly lead to big numbers of procured weapons.

In addition, there is evidence that the industry has used the Chechen war to test new models of weapons, especially those intended for export. The media reported that Rosvooruzheniye, the state arms-exporting company, financed combat testing of the Ka-50 helicopter, that the Sukhoy concern insisted that the military test the modernized fighter Su-25 equipped with high-precision weaponry, and that the Uralvagonzavod company funded manufacture, delivery and testing of its armored anti-mine vehicle on the battlefield (*Izvestiya*, 3 December 1999).

On the other hand, the current evidence is not sufficient to conclude that the second Chechen war and the strong words used against NATO and the ABM Treaty indicate a definite rethinking of security policy and a corresponding increase in the defense industry, especially given resource scarcity and existence of other powerful claimants for federal budget funds. It is, however, possible that the consolidation of power and resources which is accompanying the inauguration of the new administration will make it more probable to reach the political consensus necessary to carry out defense industry restructuring—and this would mean that state policy would be more intrusive than before.

To sum up, it can be argued that losing the Cold War, and the further changes in the societal system in Russia, were not accompanied by adequate revisions in the security doctrine and realistic military planning which might have cushioned the restructuring of the defense industry: risk, instability and uncertainty plagued the changes in the defense-industrial base.

The macroeconomic environment

Despite the fact that the macroeconomic situation in Russia was in general highly unfavorable to conducting large-scale resource reallocation and restructuring, new chances did exist for most entrepreneurial managers in some particularly competitive sectors and sub-sectors. It could be argued that, after 1992—when defense expenditures were radically cut—defense enterprises, like most other Russian enterprises, struggled to adjust to the various macroeconomic shocks the Russian economy was subjected to. Output contraction in the defense sector was a reaction to the dynamics of civilian demand, prohibitive interest rates, the increased level of monetarization of the economy, international oil prices, and other economic variables rather than to the allocative priorities of the military. Adjustment following the shocks was slow to lead to more stability and thus the current situation is by no means final.

Early reforms and problems

Reforms launched in 1992 included the end of centralized planning, price and market liberalization, and institutional reforms. Reduction of direct subsidies and inefficient investments, and cuts in defense expenditures were seen as playing a crucial role in sustaining economic growth and facilitating the move towards a modern market economy. However the ability of the market to efficiently reallocate the released capital was hampered by a host of obstacles.

The data presented in Figure 2 illustrates some of the macroeconomic problems, which have plagued the Russian economy and have created a particularly unfavorable climate for industrial restructuring and conversion.

Figure 2: Main economic indicators

Sources: Ekonomicheskoye Razvitiye Rossii, *1999, June/July, Vol. 6, pp. 4–5; State Committee for Statistics, 2000; OECD, 1997*

n.a. Not applicable
- Not available

Annual percentage changes	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*
Real GDP	-5	-14	-9	-13	-4	-4	1	-5	3
Industrial production	-8	-18	-14	-21	-3	-4	2	-5	8
Investment	-15	-4	-12	-24	-10	-18	-5	-7	1
Exports	-28	-18	4	8	25	9	-1	-16	-3
Imports	-45	-18	-11	9	12	-1	14	-18	-34
Real disposable income	-	-47	9	13	-13	-1	6	-18	-15
Consumer prices index	750	2,510	840	220	130	22	11	84	37
Producer prices index	238	2,049	987	235	180	26	8	23	67
Nominal annualized interest rates, in percent	20	50	119	176	355	100	49	61	55
Debt service expenditure as a percentage of federal budget expenditures	-	-	-	8	17	31	26	25	29
Unemployment, as a percentage of the economically active population	n.a.	4.7	5.5	6	8	9	11	12	12
Average age of plant and equipment in industry, in years	11	12	13	13	14	15	16	17	18

Industry was challenged by the scarce and expensive access to credit. The tight monetary policy of the Central Bank, phasing out direct credits, was associated with high interest rates and a prohibitive price for commercial credits to enterprises. In addition, proliferation of various money surrogates and payment arrears complicated the financial position of the industry.

The extent of output depression in Russian industry in general is one of the most dramatic indicators of the systemic crisis. However, decline in investment has surpassed the fall in output and, by 1999, the volume of capital investment stood at only 10 percent of the 1990 level. The central budget and centralized credits—the traditional source of investment—fell dramatically from 90 percent in 1990 to about 10 percent of a much smaller absolute amount of GDP (gross domestic product) as of 1999. This reduction has not been compensated for by the capital markets or retained earnings because of falling profits and levels of liquidity, as well as problems with corporate governance and incentives. Moreover, government bonds, which were used to cover the deficit until the 1998 crisis, provided a more attractive investment opportunity for commercial banks, which resisted risky long-term industrial investment. The government returned to this method of financing the deficit in early 2000, and this measure is seen by many as a serious barrier to further industrial growth.

Further barriers to improvement

Aging capital stock in industry is another result of the drop in investment: it is simply not worthwhile to reuse military production capacities for civilian purposes—as conventional approaches to conversion foresee—because reforms take too long and production capacities become obsolete in the meantime. While premises and personnel may be 'convertible', technical modernization—that is, investing in new equipment—continues to be necessary.

The build-up of public debt as a result of large fiscal deficits of 7–8 percent of GDP in the mid-1990s is another barrier to industrial growth. The budgetary crisis culminated in default as of August 1998, when authorities announced a restructuring of the ruble-denominated government debt and allowed the ruble to float, suspending servicing of the external debt from Soviet times. As of early 2000, Russian foreign debt had reached US $150 billion—approximately eight times the annual budget—of which roughly 65 percent had been inherited from the Soviet period (*Kommersant*, 6 April 2000). Debt servicing absorbs up to 40–45 of the federal budget revenue, thus drying up funds badly needed to finance other governmental programs. Though banks have been affected by these measures more than industry, the crisis in the banking sector is preventing many positive developments in the industrial sector. In addition, it has reduced the chances Russia had of borrowing on the international capital market. Negotiations on the rescheduling and rearranging of the Russian external debt are underway but, at the time of writing, no agreement had yet been reached. It is of note, however, that the former director of the IMF (International Monetary Fund) warned that it may stop granting further credits to Russia if defense expenditures seriously affect the federal budget (TS-VPK Information Agency, *Survey*, October 1999).

Inflation should also not be neglected as a detrimental factor. After severe depreciation of the ruble in 1992, industrial enterprises lost their working capital, and were challenged by high cost inflation and limited access to commercial credits. Generally speaking, the country underwent several waves of national currency depreciation and appreciation in the 1990s, thus making adjustment and the long-term planning of enterprises very difficult.

On the demand side, consumption declined consistently with developments in real disposable income and the decline in other welfare measures for the population. Real wages fell sharply in 1992, 1995 and 1998, while restrictive macroeconomic policies prevented wages from catching up with inflation. Depressed demand—according to many surveys—is one of the most serious factors preventing recovery and growth. It is surprising that, despite the recovery of 1999, demand has continued to contract.

The opening up of the Russian market has created strong competition from imports, especially given the appreciation of real exchange rates in the mid-1990s. It has shown how backward many sectors are, including the manufacturing of consumer durables in the defense industry, where the defense enterprises traditionally had a strong position.

Institutional reforms—including mass privatization—were expected to help owners/investors emerge and compensate for certain shocks by making better allocative decisions. However privatization in industry has had little effect on corporate culture and has not gone much further than the nominal transfer of ownership rights, leaving a high degree of insider ownership and control. Moreover, the struggle over the property of several cash-rich exporting defense enterprises has seriously complicated the long-needed reorganization of the defense complex and blocked many rational decisions concerning the restructuring of defense firms.

A change in 1999?

There was, however, a turnaround in 1999: industrial output grew by 8.1 percent, primarily led by import substitution following the depreciation of the national currency. Reflecting the recovery in output and energy prices, government revenue performance improved and the federal cash deficit diminished. In addition, a tripling of energy prices and a reduction of imports (by 33.8 percent compared to the level of 1998) resulted in a turnaround from the external current account deficit (US $2.7 billion as of early 1998) to a substantial surplus in early 2000. These positive developments may result in growth in the medium term, if structural reforms are made and demand stimulated.

The contribution of the defense industry

In short, during the entire 1990s, macroeconomic aggregates were not conducive to the efficient realization of a 'peace dividend'. As for the role of the defense industry: Did it, in turn, contribute to macroeconomic instability? Did it tend to increase, or decrease, the opportunities for economic recovery?

In Russian writings on the subject, the defense industry is often described as having positive externalities especially on account of its level of technology along with its infrastructure- and human capital-enhancing activities. For instance, government economic programs name the defense complex as a locomotive of economic growth. Current evidence, however, is mixed: there *are* indeed clusters of growth among selected, defense-related sub-sectors, and certain production factors—above all qualified personnel—*have* played a significant part in successful international cooperation at a company level and in private business development in the leading regions; on the other hand, however, one cannot neglect serious negative factors, which are generated by inefficient management, competition for scarce public funds and investment, and strong pressure for government subsidies from defense firms with low levels of productivity. The latter often insisted on writing off debts, and in general slowed down macroeconomic restructuring by supporting the system of hidden subsidies, barter trade, and lack of transparency in economic transactions. It should be noted, however, that this is not a defense-specific phenomenon, but it is relevant to the defense complex because of its size and the over-proportional number of loss-making enterprises which are allowed to survive on the market for security and social reasons.

A recent McKinsey Report on Russia (McKinsey and Company, 1999) showed that, across the ten sectors studied, average labor productivity stands at about 20 percent of the US level and that the reason for this is similar across sectors: a complex system of hidden subsidies, administrative measures and distorted prices which allow ex-state or state firms with low productivity to survive and make it very difficult for new, more productive firms to enter the market. Though the defense complex is not an object of study in this report, the conclusions reached are particularly valid for the defense industry, which may be viewed as one of the extreme cases of government grant-seeking, subsidized pricing, and discrimination against new, more efficient private firms. Thus it may be argued that delays in introducing restructuring reforms in the defense industry have slowed down general reforms and, in the short-run, have had a negative effect on the macroeconomic situation. If one is to capitalize on positive factors—especially skills and infrastructure—a lot depends on the time factor: the risk of wasting resources is growing, the longer the crisis lasts.

The Defense Complex: Reasons for its Existence, Size, Boundaries and Configuration

When measured by expenditure, output and economic and political weight, it is obvious that the Russian defense complex has gone through a significant metamorphosis since the height of its importance in Cold War times. However, if one looks at its formal size (number of enterprises) and configuration, the changes have been less dramatic.

Since the mid-1990s, all Russian governments have felt that the country needed to restructure its defense industry. Its size, boundaries, the proportion between public and private companies, and the balance between state intrusion versus regulation through the market were seen as driving forces for change. All viewed reorganization as a way to eliminate excess arms-production capacities and to protect vital design bureaus and manufacturing enterprises, avoiding options, however, which were highly painful politically such as large-scale plant closure.

Numerous restructuring programs have been designed, though not a single program has been implemented on the full scale, while some were even canceled before launching. The ideology behind the restructuring programs has been challenged by budget constraints and has conflicted with the interests of the many actors involved, as well as necessitating high social costs. Moreover, by mid-2000, Russia had its fifth government in two years.

Unfortunately for defense restructuring reform, the reaction to administrative changes has always been to slow down, delay matters and reshape the interest groups which had reached consensus under the previous government. While the crisis of 1998 created the impression that redundant capacities and wastage of resources, linked to the structural overcapacities of the defense complex, could not be tolerated any more, subsequent growth in energy prices, the change in elite groups, and the recovery of the defense budget provided another window of opportunity for delay.

The following sections will show that major decisions must be made concerning the size and configuration of the defense complex, if the government wishes to aim at a certain degree of efficiency. At present the worst-case scenario has materialized: Russia's defense-industrial base is autarchic, technologically stagnant, socially depressed and is still organized in the outdated form of a defense complex.

Size, boundaries and rationale of the defense complex

Speaking to the recent national meeting of defense industry representatives in March 2000, President Putin admitted that the Russian defense complex was burdened with serious problems: "Firstly, hugely excessive capacities specific to the defense industry. Secondly, state arrears. Thirdly, insufficient financing of mobilization capacities. Fourthly, lack of adequate state support for conversion. The state certainly does not have money for all these undertakings" (TS-VPK Information Agency, Survey, March 2000). It can be argued, however, that scarcity of funding was less of an impediment to the defense-industrial base than the government's failure to address the problem of structural overcapacities and to bring the size of the industry into line with security risks and the financial resources available for defense. Moreover, the rationale for the existence of the 'defense complex' itself as an institution needs to be questioned.

The defense complex—usually understood in the West as a interest group rather than a structured institution—is viewed differently in Russia: the Russian defense industry is administered by the state as the 'military-industrial' or 'defense' complex—a set of manufacturing enterprises and research entities whose status and activities are controlled by the special regulations and legal acts applying to the work of defense contractors. These regulations are applied to the entities themselves, rather than to their activities, thus the limits of the defense complex are not defined by whether an entity is performing military or civilian work but rather by institutional criteria, namely in which of the industrial sectors—traditionally termed 'defense-related'—they are grouped by state authorities. As a result, the defense complex is comprised of many entities, several of which are either redundant or do not produce for the defense market. Criticizing the concept of the defense complex, Kuzik suggested that type of final customer—rather than sectoral affiliation—should be used to define the limits of the defense industry: if an enterprise has both civilian and military customers, it can only be seen in part as belonging to the defense complex (Kuzik, 1999).

There are grounds to believe that the continued existence of the defense-industrial base in the form of the defense complex has no sound rationale. Its benefits—secrecy, resource concentration, centralized decision-making—are either no longer valid in the new systemic environment or are outweighed by negative factors and externalities. More than half of the enterprises within the so-called defense complex do not work for defense any more, and are only grouped there either because of the requirement to maintain mobilization capacities or due to the character of their core skills and manufacturing capacities, unique to defense. On the other hand, according to the Defense Ministry's Chief of Armaments, Anatoliy Sitnov, the military places half of its defense procurement contracts with enterprises outside the defense complex on the basis of regular commercial transactions (Sitnov, interview, *Eksport Vooruzheniy*, November/December 1999, pp. 20–22, also available at www.cast.ru).

Options for restructuring

In principle, in the 1990s, two options were open to the government. The first was to cut the number of defense contractors radically, increase the isolation of the defense industry, and build a system of state-owned entities (analog to public arsenals) strongly regulated by the government. A navy with only one type of ship and an air force with only one type of aircraft have been argued for, which would result in a small defense industry, dominated by large state-owned prime contractors who would tend to internalize the whole value chain of production. This might increase efficiency, help avoid resource wastage and duplication, and make procurement a purely defense—not job-creation—program. In addition, the relatively small size of the industry would guarantee that the inefficiency of the public sector would not proliferate into the civilian high-tech industries, currently dominated by the defense complex. However the disadvantage of this policy would be the likely monopolistic behavior of the selected "national champions", lack of competition, as well as strong pressure from industry and host regions to maximize the number of their contractors. The low level of the Russian procurement budget is, however, the strongest argument in favor of a small, isolated, arsenal-type industry.

The other option was to use civilian-military integration as an instrument of industrial rationalization—first of all for sectors and enterprises which were not entirely defense-oriented—to eliminate the dividing line between defense and commercial production and to open up the defense market to newly emerged private competitors. Sitnov, Gaponov and Tuzhikov argue that the high level of monopolization on the part of the defense industry may be explained by the existence of artificial barriers between the civilian and military economic sectors which prevent optimal deployment of contracts and pricing of products (Sitnov, Gapanov and Tuzhikov, 1997). Technological spillovers to and from defense companies and the support of defense industry development as a part of general industrial modernization rather than as the retention of specific strategic industrial capabilities could well be the result. Gradual transformation of the defense contractors into strong, diversified companies working for the domestic and international, defense and civilian markets could be envisaged. It is worthy of note that the new 2000 version of the military doctrine follows this line of thinking and clearly defines civil-military integration as one of its major security goals (see Figure 1).

In reality, however, neither of the two options was chosen. A hybrid approach, combining elements of autarchy and openness—and one which was still applied to too many entities grouped in the defense complex—has proven fairly controversial.[1]

In addition, the current approaches do not make a distinction between the various types of defense producers, such as between serial-manufacturing final assembly plants of the prime-contractor type and component suppliers, or between companies working close to the frontiers of high technology and those producing low-technology goods, although their status, business models, influence and the skills required for liaising with the government are different.

The question of the defense complex' mission is less often discussed than that of its size and configuration. There seems to have been only one serious attempt to question the current understanding of the mission of the defense complex and to offer an alternative ideology for the defense-industrial base. The minister responsible for emergency situations and political leader of the movement *Yedinstvo* [Unity], Sergey Shoygu, wrote that the main problem of the Russian defense complex was adherence to militarism and the ideology of the 'besieged fortress', which he found hopelessly outdated. Civilian rather than military security would be the best

[1] Disputes about the boundaries of the defense complex and the unclear division of regulatory functions between defense and civilian authorities as regards defense enterprises have already caused many conflicts. For example, the civilian agency which oversees nuclear safety issues (the State Atomic Inspection agency) prohibited the sale of containers intended for the management of waste removed from nuclear submarines although the containers had been designed and produced by the defense enterprise Izhorskiye Zavody under a joint project of the Ministry of Atomic Energy and the US government. The project thus fell victim to a clash of interests between the two agencies, which failed to maintain a balance between civilian safety and military secrecy (*Kommersant*, 11 April 2000).

option, in his opinion: the Russian defense-industrial base has the chance to change its mission and refocus itself on products and services which support 'human' security in fields such as reacting to emergencies, protection of nature and recreational sites, and the development of medical technologies and equipment. International agreements opening up the way for joint efforts in these areas could be concluded and this would be a chance for Russian science and industry to enter international markets if its products were marketed within fixed 'service packages': hospitals which the Ministry of Emergencies could establish in disaster areas worldwide, might be one of example of this kind of integration (Shoygu, 1999).

Current reforms: mergers, consolidation and industry exit

There is clearly no easy way of addressing the structural problems of the Russian defense industry. The data on the defense-industrial capacity inherited by Russia differ in detail, but in general indicate a huge overhang in capacity. The Ekspertnyy Institut showed that, by the end of the 1980s, the defense complex of the Soviet Union comprised about 3,000 direct defense contractors and 10,000 subcontractors. Three-quarters of these capacities were located within Russia (Ekspertnyy Institut, 1996). As of early 1999, 1,489 enterprises were officially counted as belonging to the defense complex, including 724 industrial enterprises and 545 research organizations (see Figure 3). Therefore it may be roughly estimated that the total number of direct defense contractors was reduced by one-third in the 1990s, while at the same time military output decreased by almost 80 percent and civilian by 60 percent (see Figures 13 and 14).

Figure 3: Main structural indicators of the Russian defense complex as of early 1999

Source: *TS-VPK Information Agency, 2000*

Note: *Figures have been rounded off.*

Grouped according to ownership status:	*Number of enterprises*
State-owned	612
Stockholdings with state stock	490
Stockholdings without state stock	387
Total	***1,489***

Grouped according to activity:	*Number of enterprises*
Industrial manufacturing	724
Research	545
R&D and manufacturing	115
Others	105
Total	***1,489***

Markets	*Share in output 1999, in percent*
Military production for the domestic market	17
Military production for the international market	37
Civilian production for the domestic market	35
Civilian production for the international market	11

Sectors	*Share in employment, in percent*
Aerospace	29
Armaments	19
Ammunition and special chemicals	13
Radio	11
Shipbuilding	12
Electronics	9
Communications	6

Duplication of weapons systems and double-sourcing contributed heavily to overcapacities. According to Sitnov, the industry still has the capacity to produce 3,500 tanks and 4,500 pieces of movable artillery per year. About 40,000 people are also currently employed in duplicating R&D within the strategic missile program. Unification of the system, as planned by the military, will result in a reduction to 8,000–10,000 employees in this program (Anatoliy Sitnov, Chief of Armaments, Defense Ministry, interview, *Eksport Vooruzheniy*, November/December 1999, pp. 20–22, also available at www.cast.ru). Additional reasoning for the cuts is the coexistence of modern and technically-outdated enterprises, producing several generations of weaponry simultaneously. The military authorities want to rid themselves of the responsibility of keeping obsolete entities going and insist on them closing down, rather than their restructuring or merger.

A history of failed restructuring

In general, restructuring programs for the defense industry have been targeted at the reduction of the industrial base, reorganization, institutional reforms, and a change in the relationship between the state and industry in the defense procurement field. The government has tested several approaches. As described in BICC's 1998 yearbook (BICC, 1998, pp. 108–116), it was planned in the first years of reform (1992/93) to keep the defense complex structurally untouched, while arms exports were viewed as a substitution for the reduced domestic demand for weapons. To solve the cash-deficit problem, the government allowed commercial initiatives to develop along with the spinning-off of small firms which capitalized mostly on free access to premises and equipment and to low or no-taxation regimes, promoting economies of scope by diversification of activities. Institutional reforms were limited to a number of experimental cases.

By late 1994, still challenged by the long-lasting defense build-down and other shocks, the defense authorities drafted a restructuring program which tried to introduce a selective approach to defense contractors, prioritizing the most promising. The plan was to divide defense enterprises into three main groups with different rights in respect to access to procurement contracts, federal subsidies and commercial activities:

- Privileged state-owned entities, fully subsidized from the budget (*kazenniye*), so-called 'unitary' enterprises
- Defense contractors with mixed (public *and* private) ownership and relatively large commercial freedom
- Entities fully released from defense complex regulation and open to market-driven activities.

Thus the proposed reform planned to decrease the number of enterprises subordinated to the defense authorities by more than one-third, following a fivefold decrease in military production, at the same time however not allowing a significant number of entities to distance themselves from the state. In 1994/5 as well, the first steps to launch defense industry consolidation were made. Several structural forms of industry consolidation were introduced, including financial-industrial groups (FIGs) and unitary state holdings.

By the mid-1990s, however, it had become clear that these restructuring plans had failed. Though the reform did not include any tough (market exit) measures, such as closures or bankruptcies, and differentiated between enterprises with respect to the state funding sources and the right to carry out military contracts, it was resisted by entities not included in the list of privileged enterprises. Moreover, the draft of the defense restructuring reform was based on an unrealistic estimate of the dynamics of military procurement expenditures and conflicted strongly with the basic principles of economic reform. The few firms with a strong market position—mainly arms-exporting entities—which underwent consolidation were dragged into conflicts for power, property and managerial decision-making rights, thus blocking many active restructuring initiatives. Political pressure from all sides to keep restructuring measures bearable and to stop the sell-off of state stock added to the constraints on the restructuring policies. Moreover the government failed to appoint new managers and to remove idle enterprises from the defense market.

In 1997, control of the defense industry was moved to the Ministry of the Economy and many experts expected that this was a drive towards the opening up of the defense complex and civil-military integration. Further changes in the administration of the defense industry, however, show that the struggle between isolation and dualization has not yet come to an end.

The compromise of 1998

Another restructuring program was developed and approved for implementation in July 1998, just before the financial crisis hit the country. What is remarkable is that this program was drafted in cooperation between central and regional authorities. Regions hosting large defense enterprises were invited to participate in the working group on restructuring. As a result of a long bargaining procedure, the number of enterprises to remain in the defense complex doubled from the 300 initially planned to 600, and the regions received the right to influence which enterprises were to be chosen as defense contractors, along with the list of defense enterprises which were either not allowed to be privatized or were to be subjected to liquidation/ bankruptcy. Moreover, the administrations of thirteen regions also received the right to conclude separate agreements with the federal government on how defense enterprises were to function (Khokhlov, Timofeyev and Stepanov, 1998, p. 63). Agreement with the industry's elite was achieved in return for writing off debts between the government and the defense sector.

Several elements of the 1998 restructuring program are worth noting (Kuzik, 1999):

- Reduction in the number of defense contractors to 600; reduction of military production capacities by 30–40 percent; establishment of a defense complex 'nucleus'. The state will support this nucleus of the defense-industrial base by guaranteeing the level of procurement contracts and profitability and by promoting arms exports by core companies.
- Industrial consolidation should be achieved through mergers and the redeployment of production capacities and personnel.
- Enterprises not included in the nucleus are to be privatized.
- Economic assistance to enterprises which are withdrawn from the defense complex is to be provided in the form of financial and economic auditing, marketing studies and optimization of production capacity utilization.

The bone of contention in the program was, and still is, the way the government has created the so-called 'nucleus' of the defense complex—those enterprises with privileged access to state contracts and other government rents and advantages. As the Defense Ministry sees it (Sitnov, Gaponov and Tuzhikov, 1997), the core is to be comprised of large plants with serial production, which work either for the domestic or the international arms market, as well as state research centers and leading R&D organizations from the industry. With respect to property status, the Ministry insists on tough state control of the nucleus, either in the form of the state unitary enterprises (those fully funded from the federal budget) or stockholdings with either all or control stock belonging to the federal government. The latter should guarantee stable contracts from the state, ensuring that at least half the production capacities are utilized.

Initial data on the way the program has been implemented shows that, as far as consolidation of procurement orders and the reduction of capacities are concerned, some progress has been made. With respect to sections of the program requiring significant compensatory funding (such as social support to employees made redundant, job placement measures, transfer of social assets from the enterprises to the state, funding of company closure or relocation) not much has been done due to the almost complete absence of financing. The total expenses for restructuring the defense industry were planned to account for 2.1 billion rubles (US $339 million) of the 1998 federal budget (*Nezavisimaya Gazeta-Politekonomiya* , May 1998, No. 9, p. 7) but only a very tiny portion of these resources was actually paid out.

In spite of political uncertainties and budget constraints, some reorganizational measures were indeed carried out in 1998, though the extent of the reorganization, its speed, and the number of entities affected appears to have been much lower than initially planned:

- The number of defense companies receiving contracts directly from the Defense Ministry decreased to a total of 600 enterprises and design bureaus. In other words, the government consolidated defense contracts but failed to consolidate the defense industry itself: as of January 1999, more than 900 enterprises, grouped in the defense complex, were not receiving any more military procurement contracts.
- Concentration of the defense industry and the creation of large, vertically integrated holdings were slowed down by the political uncertainties, crisis and the conflict of interests between the entities which were supposed to merge. Nevertheless, the total number of integrated holdings in the defense industry reached 39. Seven holdings were established in 1998, among them the Tekhnokompleks science and industry center and the concerns Aviatsionnoye Vooruzheniye, Skala and others.
- As far as defense research organizations and design bureaus were concerned, the program presses for the reorganization of the most valuable entities into so-called 'federal science and industry centers'. In 1998, six entities were awarded this status and the total number of centers reached 16.

- About one hundred defense companies which had been completely privatized and which had no defense orders or mobilization capacities at the time were withdrawn from the defense complex. In practice this meant that these entities were no longer subjected to specific defense-industrial policy and to the restrictions linked to the status of defense companies.

- Defense enterprises which were not included in the list of Defense Ministry contractors and which had not been invited into the nucleus of the defense complex were subjected to various different reorganization options: privatization; transfer to the jurisdiction of regional and municipal authorities or federal bodies dealing with civilian industry; bankruptcy; merger; or a transformation into subsidiaries of companies already well-positioned in civilian markets.

(Pustyakova, 1999).

Reform reversal?

The crisis and political changes which followed the elections of 1999 and 2000, reverted control of the defense industry back to the traditional pattern of insulated development: in the fall of 1999, the State Commission on Military-industrial Affairs was established as the main coordinating body and five branch-specific agencies were organized. The liberal members of the government see this policy shift as a negative step: the former Minister of the Economy, Jakov Urinson, warned that such administrative reform would increase the defense industry's isolation and inefficiency (TS-VPK Information Agency, 1999). The industry, in turn, is pushing for the further centralization of government control and a return to ministerial status for the bodies which control the defense industry.

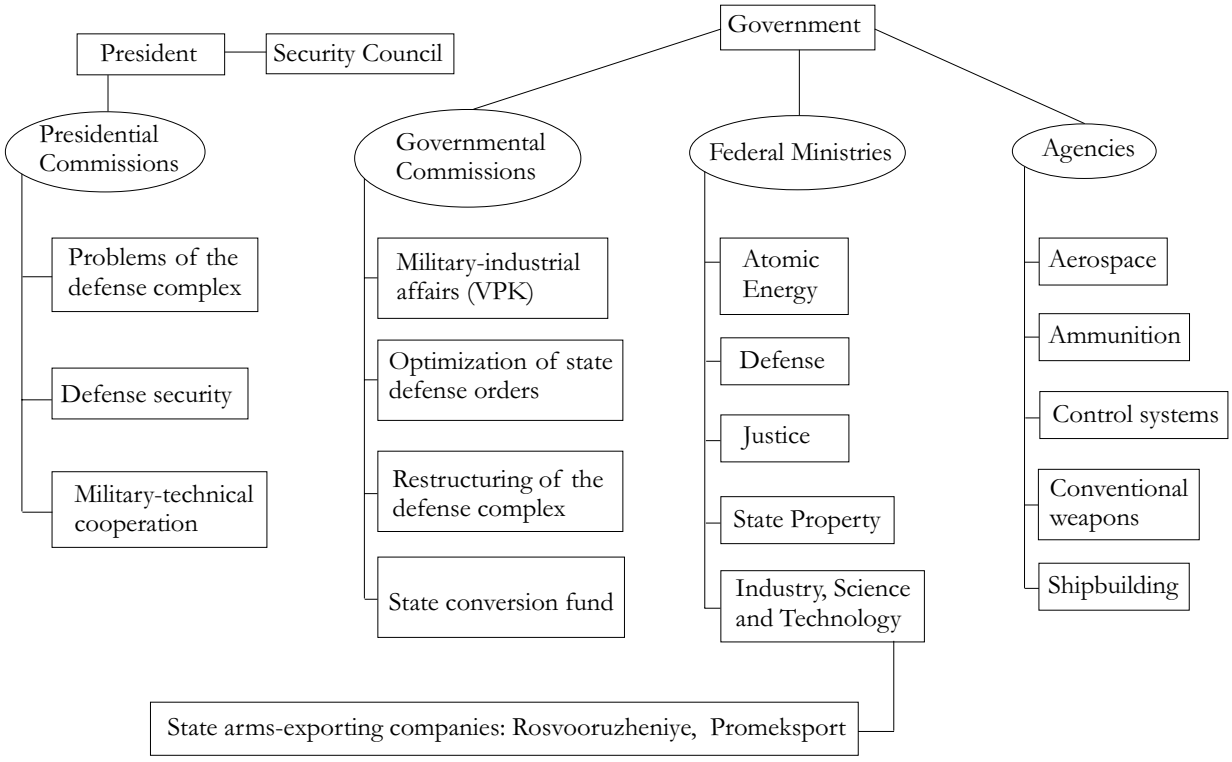
As indicated in BICC's 2000 yearbook, it is difficult to expect that the new bodies will be capable of reinstating Soviet-type sectoral regulation, given the status of the agencies and the strength and qualifications of their personnel (BICC, 2000). According to Russian laws, they will be responsible for supply of information, oversight and general regulation, but not for direct control, contracting and commercial policy. Moreover, the bureaucratic and administrative skills needed for such a turnaround have more or less disappeared and would be difficult to recover.

On the other hand, the way state officials currently interpret the administrative reform raises the suspicion that they have high expectations as regards intrusive power, exceeding the legitimate level. For example, Vice-Prime Minister Ilya Klebanov said that the new agencies should carry out the restructuring of 1,600 enterprises, plant closures and company mergers, as well as performing functions of the general state contractor in arms procurement (*Vek*, 16–22 July 1999). The Director General of the Federal Agency for Control Systems, Vladimir Simonov, went even further and reported that the agency under his supervision would create powerful corporations in the fields of air defense systems, telecommunications and electronics, as well as granting enterprises arms export licenses, and coordinating all federal programs in electronics, communications, navigation and information (*Krasnaya Zvezda*, 23 September 1999).

Initial data on the activities of these agencies, however, shows that neither sectoral control by command was reestablished, nor was there much enthusiasm to initiate plant closures and industrial consolidation. For example, instead of dealing with restructuring of the industry, the new agencies rushed into promotion of the arms trade (Aleksandr Kotelkin, chief adviser to the director general of Rosvooruzheniye, interview, *Eksport Vooruzheniy*, November/December 1999, pp. 10–11).

In mid-2000, state control over the defense industry underwent further changes: the defense industry came under the joint control of the newly established Ministry of Industry, Science and Technology and the agencies which had been established earlier and were coordinated by the State Commission on Military-industrial Affairs. This new ministry had been set up to plan scientific and industrial policy, employ managers of public enterprises, coordinate state programs, administer financial-industrial groups with state share stock and state unitary enterprises as well as to "participate in military contracting" (TS-VPK Information Agency, Survey, July 2000). Moreover, all arm-exporting agencies were brought under the control of the new ministry. There is clear evidence that the functions of the new body clearly overlap with those of the branch-level agencies, which—according to Vladimir Salo, Deputy Economics Minister—serve as state contractors in restructuring and conversion projects and define the groupings of enterprises in the defense complex (*Promyshlennost' Rossii*, May 2000, p. 9). Various governmental commissions and other ministries (above all those of Defense, Atomic Energy, and State Property) add to the administrative confusion of state control over the defense industry, arms exports, and conversion (see Figure 4).

Figure 4: State control over the defense industry as of July 2000



As far as practical steps in 1999 were concerned, another 100 companies exited the defense complex. There is, however, no data on their status (prime or subcontractors) though evidence suggests that mostly subcontracting firms were affected. Mergers also took place: by the end of 1999 the number of integrated companies in the defense complex reached 51, including 35 with predominantly military production (Stringel, 2000).

Although the new government of 2000 has not canceled the restructuring program, it has slowed it down. The official explanation for the delay is the need to bring reconfiguration of the industry into line with the long-term armaments and procurement program which, at the time of writing, had not yet been approved. Along with this, delay is also caused by the economic and technological auditing of the defense-industrial base to investigate the capabilities of the enterprises for recovery. According to Vice-Prime Minister Klebanov, this work was to be completed by late 1999/early 2000 and, after that, further mergers and consolidation policy were to be designed and implemented (Klebanov, interview 20 October 1999, *Eksport Vooruzheniy*, No. 5, October 1999, available at www.cast.ru). The target is to leave no more than 10 technologically integrated entities within each of the five defense-industrial agencies.

Several legal acts drafted to facilitate the restructuring process were waiting for final approval by the State *Duma* in early 2000: acts on specific proceedings of bankruptcy in the defense industry; laws on holdings, and on state and municipal unitary enterprises; changes in the law on stockholdings; and, finally, the act on 'State Regulation of Structural Reform of the Defense-industrial Complex'. These laws will build the legal basis for the implementation of the new federal program for reform of the defense complex from 2001 to 2005, targeted at finalizing the organizational restructuring of the defense industry by 2005.

Effects on company integration

These frequent reversals in the approaches to the defense industry's restructuring have naturally had an effect on the newly integrated companies within the defense complex. Several integrated companies which were merged in the 1990s experienced severe difficulties: some disintegrated, some had to rearrange participating entities. Though the exact reason for failure of the merger was different in each individual case, there were nevertheless several general grounds for the problems.

For Vice-Prime Minister Klebanov, for example, the reason for failure of the mergers lies in clashes of interests and in wrong motivation for integration: he claims that integration in the mid-1990s was driven by the personal interests of people striving to gain control of the cash flows of exporting enterprises rather than by motives such as efficiency and better economy of scale. In addition, institutional problems—in particular the merging of companies with differing ownership structures—had a negative effect, as well as complications caused by the new federal set-up and the concerns of regional administrations with regard to tax revenues (Ilya Klebanov, interview 20 October 1999, *Eksport Vooruzheniy*, No. 5, October, 1999, available at www.cast.ru).

In turn the chief of armaments in the Defense Ministry, Anatoliy Sitnov, noted that—with the exception of the Antey corporation—all integrated entities had been established with a view to carrying out one particular project and that, once the project had been completed, the organization had no further purpose (Sitnov, interview, *Eksport Vooruzheniy*, November/ December 1999, pp. 20–22, also available at www.cast.ru).

Independent experts offer additional explanations: Makiyenko, for instance, saw the failure of mergers mainly as a result of the struggle between competing bureaucratic and economic groups along with institutional and even technological conflicts. Analyzing the conflict around the disintegration of the MiG-MAPO concern (see also Box 5), which previously included designers and manufacturers of MiG fighters and several models of helicopters, he was left with the following reasons:

- The personal competition of managers in the aircraft industry, and the struggle of the financial and political groups associated with them, resulted in profound instability and blocked rational strategic economic decisions within the defense industry.
- There was competition for the market in modernization of fighters of the MiG series.
- Conflicts regarding technical modernization strategies existed.
- The general crisis of the aircraft industry resulted in the chaotic restructuring of this sector.

(Makiyenko, 1999).

Summing up, it may be argued that the Russian defense authorities failed to develop a clear vision of the defense-industrial base. External circumstances—economic and political instability—were not conducive to drafting and implementing a coherent restructuring policy. The new government of 2000 practically began to re-design the configuration of the defense industry from scratch, launched the economic auditing of companies, and has delayed decisions until the new armaments program is ready. Little is known about further plans, though there is some evidence to suggest that increased state intrusion, isolation of the defense complex, and export promotion to compensate for low domestic demand will be given high priority among possible policy measures.

Institutional restructuring

In the early 1990s, a large-scale denationalization program was launched, removing the state monopoly over defense enterprise property. New institutional design was part of the general drive towards privatization, rather than of a policy shift designed specifically for the military. However it was in general understood that the core elements of defense business would not become fully private enterprises, and that the government and the defense-industrial base would remain in close contact. The government therefore designed special regulations for defense industry privatization and bankruptcy, as well as directives for the entry of new private firms into the defense market. The main instruments of these regulations were, firstly, the list of entities which were not allowed to be privatized (first developed in 1993), secondly, management of state share stock and, thirdly, direct control through state representatives within enterprises.

Historical perspective

Privatization of the defense industry started with single, exceptional cases in 1990/92, went through the stage of mass privatization in 1993/95 and since 1996 has returned to a case-by-case pattern. Figure 5 shows that the share of public enterprises in the defense complex fell dramatically from 100 percent in 1991 to 30 percent in 1995. After that, privitization slowed down and the proportion of public entities in the defense complex actually increased again, mainly due to changes in the structure of the defense industry and the removal of fully privatized enterprises from the defense complex. It is striking that the relative share of public (state-owned) entities and stockholdings in which the state holds shares of stock increased between 1996 and 1999, while the portion of fully private entities (stockholdings in which the state does not hold shares) diminished (Figure 6). From 1998 to 1999, only 18 defense enterprises were privatized and transformed into stockholdings, while the number of entities, for which privatization was banned, was reduced from 427 to 387 (Stringel, 2000). It seems that the government had the clear intention of discouraging further privatization of the defense industry and of erecting additional barriers for the new entrants to the market.

Figure 5: Dynamics of privatization: share of state-owned enterprises in the defense complex

In percent

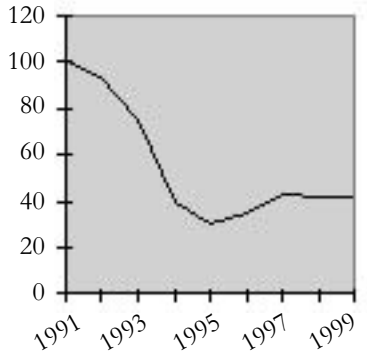


Figure 6: Ownership structures in the defense complex

Percentage of the total number of enterprises

Sources: *Baumgarten, 1996; TS-VPK Information Agency, 2000*

	1996	*1997*	*1998*	*1999*
State-owned enterprises	34.6	42.8	42.2	41.8
Stockholdings in which the state holds stock	28.6	29.5	29.1	33.1
Stockholdings in which the state does not hold stock	36.8	27.6	28.7	25.2
Total number of enterprises	-	**1,731**	**1,749**	**1,528**

Sectoral structures of privitization

Among defense-industrial branches, the ammunition and space industry sectors remain the least privatized (the share of public entities accounts for 78 and 61 percent respectively), while the aircraft industry and electronics are highly privatized (the share of public entities is only 25 and 32 percent respectively) (see Figure 7). The ammunition, armaments and shipbuilding sectors have the lowest proportion of fully privatized enterprises. There are also indicators showing that industry is much more privatized than the R&D sector: the government appears to lay greater emphasis on state control of research and prototypes than of production.

There is little data on the composition of the new private owners in the defense industry however it seems that significant consolidation of stock has been taking place. This process has diminished insider control and moved it to fewer, more powerful owners—mainly banks and investment funds. However the 1998 crisis seriously weakened the position of the banks: the two most ambitious investors from the banking sector, Oneksimbank and Inkombank, are facing bankruptcy procedures and are hardly capable of executing effective control. Among other private owners, the Oppenheimer Investment Fund, and the Belukha and Kaskol groups of companies are mentioned as holders of relatively large diversified stakes of both civilian and military R&D and manufacturing enterprises (*Eksport Vooruzheniy*, November/December 1999).

Privatization evaluated

Several questions may be raised with respect to the institutional reforms in the defense complex: Was privatization in principle the best option for restructuring the industry? How did it help to sort out the size and structure of the defense complex? And, finally: How did privatization affect enterprise performance?

According to Baumgarten, high expectations were linked to the privatization of the defense industry, among them cost savings, regulation of industry exit, harmonization of federal and regional interests, retention of a core labor force, and lowering of social tensions through insider ownership (Baumgarten, 1996). In practice, however, these aims have not been achieved in full and privatization has predominantly led to a formal large-scale redistribution of ownership rights. The trouble with the policy is that it ignores plant-level restructuring and the improvement of corporate management. Moreover, many experts question the logic behind privatization of the defense industry in times of low demand and dramatic societal change.

Figure 7: Ownership structures in the defense complex across branches, as of 1999

Source: *TS-VPK Information Agency, February 2000*

	State-owned entities, total		State-owned entities not allowed to be privatized		Stockholdings in which the state holds stock		Stockholdings in which the state does not hold stock	
	Number	*Share of total in percent*	*Number*	*Share of total in percent*	*Number*	*Share of total in percent*	*Number*	*Share of total in percent*
Aircraft	80	24.9	41	12.8	125	38.9	116	36.1
Ammunition and special chemicals	105	78.9	92	69.8	20	15.0	8	6.0
Armaments	60	43.4	50	36.2	54	39.1	24	17.4
Communications	66	43.7	51	33.8	48	34.8	37	24.5
Radio	121	48.7	69	27.8	63	25.4	64	25.8
Space	22	61.1	4	11.1	4	11.1	10	27.8
Shipbuilding	77	45.0	50	29.2	64	37.4	30	17.5
Electronics	98	32.1	29	9.5	130	42.6	77	25.2

Pages argued that, even in the United States, small serial industry may require mechanisms which date back to the era of public military arsenals. Tough regulation and guaranteed subsidies may be the only devices available to ensure a cost-effective and technologically-wise ("savvy") defense sector in a world of larger defense companies, fewer new contracts, and reduced opportunities for international cooperation (Pages, 1999). To this Sapolsky and Golz add that, when the United States relied on arsenals to preserve weapons skills in times of low demand, workers were paid no matter what the production rate was. Private enterprises, however, uphold production contracts by lobbying—a very expensive way of maintaining technologies and skills (Sapolsky and Golz, 1999).

In the Russian case, corporate culture does not differ much between privatized and public enterprises in the defense industry: the learning period has been too short to produce a new generation of effective managers, while lobbying pressure exercised by the traditional, old-style directors may be equally as strong as that of directors of private companies. In the current economic and security situation, however, it may be suggested that public ownership of a limited number of defense contractors which comprise the nucleus of the defense complex might be more appropriate than their privatization, and could help to avoid mismanagement of resources and the fierce conflicts accompanying the redistribution of property of cash-rich enterprises.

Even if privatization did not contribute significantly to the efficiency of the defense-industrial base, it may have worked better as an instrument of reorganization of the defense industry, especially in dealing with excess capacities, industrial consolidation, and changing the configuration of the industry. The record is mixed: there is some evidence that privatization created serious barriers to mergers and industrial consolidation, especially when companies with different ownership status were subjected to joint reorganization. Moreover, during the period of mass privatization from 1993 to 1995, the research and manufacturing wings of companies were often separated, thus making further cooperation difficult. Many observers therefore consider the decision to carry out privatization of

defense contractors, before the concept of defense industry restructuring had been drafted, a serious mistake.

On the other hand, there is reason to believe that privatization also contributed to the exit from the defense industry of companies which underwent relatively successful conversion. Furthermore, the performance indicators of privatized companies tended to improve in comparison to those of public enterprises. This is illustrated by the *Duma* hearings of 1997 which showed that 157 defense enterprises—about ten percent of the total number—achieved recovery and growth. Of these, 80 percent were non-public (*Vek*, 21–27 March 1997; *Rabochaya Tribuna*, 25 March 1997). A survey of the performance of defense entities after the 1998 financial crisis also showed that not a single company of the fully privatized defense enterprises underwent decline (Kosals, 2000).

The future of institutional reform

Current policy regarding privatization remains fairly uncertain. The new privatization program of 1998, which foresaw further large-scale denationalization of the defense industry, was rejected by the State *Duma*. Analysis of further political plans (for example, the 'Concept of State Property Control and Privatization' approved in late 1999, and several governmental decisions concerning state control of federal 'unitary' enterprises (that is, enterprises fully funded from the budget)) makes it possible to suggest the following developments:

- The state may discourage privatization of defense contractors, especially the sale of stakes to foreign investors. Sanctions—already applied to private companies—include removal from the list of defense contractors, losing arms export licenses, and red tape in international cooperation.[2] The law on military-technical cooperation prohibits companies from independently exporting arms if the control stake of the company does not belong to the state or if any stake belongs to foreign investors.

- Private investment and denationalization in the defense industry will be used mainly as an instrument of diversification and industry exit.

- The law on bankruptcies will be modified to prevent 'unwanted' new owners getting control of defense enterprises. This decision was influenced by the strong pressure against bankruptcies exercised by the *Duma* and by directors and regional authorities: the All-Russian meeting of leaders of defense industry enterprises demanded that the government cancel bankruptcy procedures against "strategically important defense enterprises" (*Finansovye Izvestiya*, No. 54, 28 July 1998, p. 11). At the time of writing, the government had only planned the bankruptcies of a few selected loss-making entities which were to be excluded from the defense complex. This should be compared with the period up to 1998 when the Ministry of the Economy had initiated 395 cases of defense company bankruptcy.

- The number of 'unitary' enterprises—those fully funded by the budget—will be reduced. The survey conducted by the Ministry of State Property showed that enterprises of this type—among them many defense-related—are particularly subject to corruption and mismanagement. Illegal transfer of money to spun-off commercial firms, contracts concluded in the interest of directors, and the illegal renting of federal property have frequently been reported (*Ekspert*, 26 April 1999, p. 11). Moreover, the government does not have enough qualified personnel to audit such a large number of federally funded entities.

- Enterprises released from the 'unitary' status become subject to two policy options depending on their potential profitability: the ownership of those enterprises which are—or may potentially become—profitable will be transferred to the regions or municipalities in exchange for federal debt to the regions or will be privatized and sold at auctions. Entities making constant losses will be either liquidated or transferred to the regions and municipalities free-of-charge, if the latter guarantee their recovery.

- To improve control over the state's stock of shares, the Ministry plans to replace current state representatives. The latter have been justly criticized for their poor managerial skills and their conflict of interests, taking decisions against the interest of the state. It is planned that professional managers and firms will be invited to administer state stock.

- The government also plans to modify the way it handles state stock. Until recently the government has only sold its stock at auctions and competitive sales. Now it plans to increase the state stock in certain cases by adding land to the fixed assets, by issuing new shares and by using state stock as a security pledge for implementation of targeted projects. Furthermore, state stock may be used to initiate or support the vertical integration of companies and the establishment of holdings.

Nationalization of some defense

[2] In 1999, for example, the list of companies which had the right to conduct independent sales on the international arms market was shortened in order to exclude companies in which the state did not have the controlling stake. Later, the Tula ammunition plant was removed from the list of defense contractors by the director of the Agency of Conventional Weapons (*Nezavisimoye Voyennoe Obozreniye*, 14–20 January 2000).

companies which had earlier been privatized is very rarely openly discussed as a legitimate policy measure. Nevertheless there is reason to believe that some of the companies expected to comprise the nucleus of the defense-industrial base may be re-nationalized.

One of the peculiarities of privatization in the defense complex is that the principal legal acts (the laws on defense contracts, mobilization capacities, and the status of the defense enterprises) were adopted long after the mass privatization campaign had been launched. Another point is that, during the mass privatization of 1993–1995, many deals took place which violated the rules to a smaller or greater extent because of scarcity of time and the lack of professional legal support. Therefore, in principle, the government has legal grounds to dispute the privatization of some companies or to insist that its stake in the respective company be increased.[3]

It cannot be ignored that the concentration of military production and exit of private companies from the defense market necessitate immediate costs, which the government is not prepared to fund. Thus, Klebanov noted that the government was tempted to get rid of privatized companies in the radio and electronic industry, in which the public stake was small (of 778 enterprises, half have already been privatized) (Ilya Klebanov, Vice-Prime Minister, interview 20 October 1999, *Eksport Vooruzheniy*, No. 5, October 1999, available at www.cast.ru) but the economic and social costs of this step were too high. Another example is the aircraft weapon sub-sector where several dozen enterprises produce weapons for fighter aircraft. In principle, the government would have liked only one company in this market segment but saw financing the transfer of assets as too expensive for the budget. A gradual approach was therefore selected: an integrated concern 'Airborne Weapons' will merge enterprises with public, mixed and private property. At the next stage, the government expects that redistribution of financial flows among the participants of the new concern will lead to transfer and concentration of capacities and resources.

Procurement cuts and numerous experiments within pro-merger and consolidation policy regarding privatization and bankruptcy have not yet solved the basic dilemma of how to shape the country's defense-industrial capabilities when demand has decreased below the scale of economy for the majority of enterprises and research institutes. The shift from the Yeltsin to the Putin administration brought a policy shift in favor of a more pro-active role of the government in industrial oversight and, to a certain extent, reconciled the conflicting parties in the government, parliament and regions. The question of how this new combination of elites and interests will affect the restructuring of the defense industry remains open.

As far as privatization is concerned, its current effects remain mixed: on the one hand it proved to be a questionable instrument with which to increase the efficiency of the defense industry, improve corporate management and sort out the configuration of the industry; on the other, it definitely helped successfully converted companies to exit the defense market and promoted diversification. However the confusing results of institutional reforms forced the government to slow reform down, discourage further privatization of companies of prime contractor-type, and manipulate institutional changes and state stock in a pragmatic, rather than in an ideological, way. It is likely that privatization will be further used as a tool to lessen the effects of plant closure and to share the risks of active restructuring with the regions, new owners and the leading survivors in the defense industry. As, in addition, the government is interested in regaining some of the revenue of the privatized arms-exporting companies, re-nationalization or increases in the amount of stock held by the state cannot be excluded.

[3] For example, the amount of state stock at the shipbuilding company Krasnoye Sormovo may be increased because the government disputes its privatization, which failed to take into account public intellectual property in the form of technologies, R&D products and prototypes (*Tribuna*, 17 February 2000).

Box 1: Sectoral restructuring from above: aircraft industry

The aviation industry is comprised of 335 enterprises and employs about 650 thousand people (a reduction from more than a million employees in 1992). However these employment figures should be taken with caution, as they reflect headcounts rather than numbers of people really employed on the payroll: the actual figure may be significantly lower. 131 entities are involved in serial manufacturing, 133 in R&D and testing. They are capable of manufacturing about 350 fixed-wing aircraft and 300 helicopters per year. The actual output in 1998, however, only reached 100 pieces. Forecasts of demand dynamics in the 'best case' scenario predict that up to 2007 the Russian domestic market will absorb annually no more than 50–70 civilian aircraft, 15–25 military airplanes and 20–40 civil and military helicopters. Even if export sales (up to 25 machines annually) are added to these figures, this demand will at best absorb no more than one-fourth of the industry's capacity.

The crisis has affected all production factors of the aviation industry. Nevertheless some new types of aircraft have been developed and have entered either prototype or manufacturing stage. Among them are the Il-96/T, Tu-204, Tu-234 and Tu-344; the amphibian Be-200 plus several new civilian helicopters. These projects remain in a problematical situation, however, in view of scarcity of resources and the delay in the introduction of leasing. In the meantime, the enterprises are replacing actual manufacturing by modernization, repair and servicing contracts and are expanding in non-core markets. They are for example becoming involved in the manufacture of equipment for the fuel and energy sectors, where defense companies (aviation, space and shipbuilding) already hold about one-third of the market. Another non-core civilian market is medical equipment.

Being confronted with huge overcapacities, internal competition for reduced contracts, and social tension at the enterprises, the aviation industry has been subjected to a variety of administrative and restructuring reforms. After liquidation of the Ministry of the Aviation Industry, the state experimented with various different patterns of regulation. Parallel with output and employment decline, this weakened state control of the industry. Thus the control function moved from the Ministry of Industry in 1992 to the Committee of the Defense Industries, the Ministry of the Defense Industries, the Department of Aviation in the Ministry of the Economy and finally, in 2000, to the Aerospace Agency.

The concept for the structure and configuration of this branch of industry also changed several times. One extreme idea was to leave only one 'superconcern' (comparable with the natural gas monopoly Gazprom). Another was to merger the existing 335 companies into two large holdings in order to integrate the whole value chain from R&D and manufacturing to sales and aftersales service in two principle fields: civilian and military aviation. As of 1998, the concept of three holdings took precedence: fighter planes, passenger and transportation jets, and helicopters. And finally, in mid-1999, the then current supervisor of the defense industries, Ilya Klebanov, appeared to intend to leave ten holdings within the branch, uniting the most competitive entities. Partial nationalization of the merged companies was planned to ensure that the state had the majority stock in all ten concerns, while redundant plants were to undergo full privatization. In addition to the industry exit, this measure was expected to raise funds for the support of the stronger part of the aviation industry.

However the integration scheme covers no more than one-third of the existing companies. At the time of writing, they were to include groups of companies formed around the Ilyushin, Tupolev, MiG, Sukhoy, Mil, and perhaps Kamov, aircraft design bureaus and additional survivors dealing in engines, avionics and airborne armaments who have not yet emerged. The rest may be expected to exit the aerospace market.

It is therefore not surprising that these restructuring plans met with strong resistance from the companies and regions affected. Scarcity of resources made it impossible to finance plant closure and other forms of market exit. Relatively strong companies, which mainly sell on the international market, resisted mergers initiated by the government to avoid redistribution of property and financial flows and to retain their independence and control. Moreover, some market leaders considered it more feasible to survive the crisis by staying relatively small and resisting equity transfer although they found it useful to coordinate marketing and sales policy at a company level in order to avoid competition between Russian manufacturers especially on the international markets.

Nevertheless, several mergers have been carried out, even if most are unstable and conflict-ridden.

Integrated groups of companies in aircraft industry

Sukhoy military-industrial complex (VPK Sukhoy)	Sukhoy and Beriyev design bureaus; Irkutsk aviation unit; Novosobirsk aviation unit; Komsomolsk-na-Amure aviation unit
MiG (RAC MiG) Russian aviation company	MiG engineering center; Moscow Voronin plant; Lukhivitsy machine-building plant, testing facility, tooling plant
Ilyushin international aviation corporation (MAK Ilyushin)	Ilyushin aviation complex; VASO (Voronezh); Tashkent aviation unit
Tupolev stockholding	Tupolev aviation science and production complex; Ulyanovsk aviation plant
Shturmovoki Sukhogo	Joint venture of 49 aviation enterprises from Russia, Ukraine, Belarus, Georgia and Armenia, involved in modernization, repair and servicing of Su-25 aircraft
Mil helicopter holding	Moscow helicopter plant; Rosvertol (Rostov-na-Donu); Kazan helicopter plant; Ulan-Ude aviation plant

Sources: *Center for Economic Analysis,* Rossiya*, 1996, No. 1/2, p. 95;* Rossiyskaya Gazeta*, 7 September 1997;* Ekspert*, 21 September 1998, p. 42; TS-VPK Information Agency, Survey of the aviation industry, December 1999;* Jane's Defence Weekly*, 9 September 1998, pp. 46–48;* Pustyakova*, 1999*

Box 2: Restructuring of the atomic industry

The atomic industry remains one of the least known of the defense-industrial sectors, though its restructuring and conversion deserve particular attention in view of its major political and economic role, as well as the specific characteristics of its adjustment mechanisms. The atomic industry has now been separated from the defense complex and is grouped under the Ministry of Atomic Energy, which is believed to have significant powers and lobbying capacities. The administrative reform of 2000 left the ministry untouched; moreover, it reports to the Vice-minister of Finance rather than to one of the defense industrial bodies, and is the only body in the defense-related sector which has retained the status of a ministry. All the rest—the agencies—have much lower decision-making and regulative powers.

The relative wealth of this sector is based on four factors: sales of electricity generated by nine nuclear power stations; domestic military contracts; tax advantages granted to the closed nuclear sites (they are allowed to keep practically all taxes collected within their territory); and numerous international programs, among which sales of uranium may be safely named the industry's 'cash cow'. The military program of the atomic industry represents the core and most prioritized part of the Russian defense procurement program. As far as sales were concerned, however, the share of military output declined from 50 percent in 1989 to 2–3 percent in the late 1990s. The atomic industry's employment estimates correspond to approximately 550,000 persons (including, most probably, subcontracting entities).

Unfortunately the government stopped publishing data on output and employment dynamics after 1997. Available statistics suggests that, as of 1997, the military output of the atomic industry accounted for only one-third of the 1991 level, while civilian output exceeded the pre-reform level. These relatively positive output dynamics, however, do not exclude problems: the sector is struggling with low and delayed wages, excess employment, aging and de-qualification of personnel along with the environmental threats associated with nuclear waste management and warhead storage and dismantling. Most plants are more than 40 years old, thus the target is probably not conversion, but rather the closing down of obsolete facilities, cleaning them up, and the reemployment of nuclear workers on clean-up or research programs, at least until they are ready for retirement. The failure of the government to provide the promised funds on a full scale has resulted in social tension, strikes, and other forms of protest.

Entities in the atomic industry are predominantly grouped into three types: R&D institutes, fissile material facilities, and warhead-production facilities. In principle all three have non-defense alternatives—though the workload would be much lower than the capacities available and would not be likely to provide as many jobs as earlier. Estimates show that investment totaling almost US $1 billion might be necessary to create jobs to employ excess nuclear workers. In the closed nuclear cities alone as many as 50,000 of the 130,000 weapons specialists will have to find work in the next few years.

Fissile material production facilities no longer need to produce new materials for bombs. The alternative is to provide secure storage for, and disposal of, excess weapons material. Moreover, fissile material production entities generate income from blending down highly enriched uranium for the US-Russian uranium purchase agreement (about US $350 million in 1999) as well as from foreign contracts for commercial nuclear services. Krasnoyarsk-26, however, continues to produce plutonium from its production reactor, which is still needed to provide heat and power to the city. The warhead production facilities are now mostly devoted to dismantling nuclear warheads, but their workload will soon decline. Three major facilities, including two of the four plants used for the assembly and disassembly of nuclear weapons, will be completely out of military work by the end of the year 2000.

R&D institutes are trying to maintain the safety of arsenals and to reorient themselves towards civilian research. R&D conversion focuses on ecological and safety studies, as well as medical and software engineering.

To meet the challenges of the new security and economic situations, the Ministry of Atomic Energy designed a restructuring program which, in contrast to other branches, did not remain purely on paper but was actually launched in 1998. The program has two levels of initiatives: branch-level re-organization, and plant-level restructuring and conversion. The latter have been developed to suit each of the seventeen largest atomic entities and include analysis of the economic, financial and technological status of each enterprise; reduction/concentration of capacities; the splitting of defense and civilian production; and future development plans. Enterprises fully released from military contracts are to undergo complete conversion.

In addition to restructuring from above, enterprises and nuclear cities have also developed their own conversion initiatives. Success or failure of conversion projects depend a lot on location of the site and the state of the surrounding economy. For example, the sites around Moscow are positioned better in view of the availability of numerous shock-absorbing opportunities. Remote cities find themselves in a more problematic situation and those who live there do not have the financial resources to move and buy a house in one of the more wealthy, 'opened' regions. In general very few conversion projects initiated by the nuclear cities themselves have brought commercial success. In most cases, success came as a result of international investment or funding by a cash-rich Russian investor. For instance, a new plant was built in Krasnoyarsk-45 producing audio and video tapes for BASF (interestingly, part of the investment has been financed by revenues from the sale of uranium); diamond-cutting capabilities were established in Arzamas-16. Recent agreements between the Ministry of Atomic Energy and Gazprom about re-equipping the natural gas industry, calculation of gas reserves, and automation of oil and gas transportation have provided thousands of alternative jobs for the nuclear workers. Another domestic civilian client is the automotive industry: development and manufacturing of automobile electronics and automatic machinery have provided 5,000–8,000 jobs for those previously involved in the atomic industry.

Another priority of atomic industry is to expand on the electric power market and the market for nuclear waste management. Both are surprising in view of the ecological burden—in particular the plans to build a new chain of nuclear power stations. Unfortunately the current political scene in Russia is such that opposition to the atomic industry is weak. There are unlikely to be any inputs of independent ecological expertise into the Ministry's plans. It is significant that the members of the Russian parliament approved the plans at the recent hearings—even the part about the imported nuclear waste management. The Minister for Atomic Energy termed it 'export of nuclear waste management services' although Russian law forbids the import of spent fuel from abroad merely to store it rather than to reprocess and return it.

In the 1990s, the atomic industry was targeted by various international assistance, conversion and commercial programs. Programs are focused either on scientists, fissile material production facilities, or nuclear cities. Warheads production entities are hard to get access to in view of secrecy limitations. The general target of practically all projects is to redirect excess nuclear scientists and other workers to the tasks of nonproliferation, arms control, management and the disposition of surplus fissile material, and environmental clean-up, as well as to open new commercial opportunities up to defense industrial enterprises.

Sources: *Ryabev, 1999; Bunn, Bukharin, Cetina, Luongo and von Hippel, 1998*; Economist*, 26 February 2000, pp. 25–30*

The Defense Industry's Performance

The 1990s were a critical time for the sectors of the defense industry and for regions hosting large defense enterprises. By 2000, the output from military manufacturing in the defense-industrial complex had dropped by three-quarters and civilian manufacturing by two-thirds. Job losses reached the millions—with even larger cuts now on the horizon, if the restructuring program reaches the stage of large-scale plant closure. Furthermore, the loss of their great economic and political power of Soviet times, and the shift to a rather marginal position significantly behind industries within the fuel and energy complex or transportation services, accounted for a drop in the social status of the defense sectors and ricocheted through the sub-suppliers and regions concerned.

The following section examines the specific situation of Russian defense economics during this crisis and its effect on sectoral and micro-establishment performance.

Specific characteristics of Russian defense economics in the 1990s

In the first section, it was shown that the macroeconomic environment was highly unfavorable to defense industry reform in the 1990s and that, along with other industrial sectors, the defense industry shared the impact of numerous economic shocks, on both the supply and demand side. But the defense market had its own additional troubles—together with some advantages—which gave it a very special position within the Russian market.

Uncertainty and distortions

The shift from large-scale production to small-volume, prototype-manufacturing of single samples of military hardware or modernization and repair has significantly changed the economics of the defense industry. When arms procurement is as low as it was in Russia of the late 1990s, actual defense production factors—capital, labor, cost, location—matter less than inside information, access to information, state-industry relations, and finally prospects in commercial market niches. This trend most probably widened the gap between defense and commercial markets, especially in terms of corporate governance skills, and caused managers to conclude that defense was an insecure market, well-disposed only to privileged 'national champions'.

The defense-industrial activity in Russia in the 1990s was dominated by uncertainty much above the 'normal' level. Lack of concrete information on technical requirements, costs and performance is often viewed as a specific feature of the defense industry (Sandler and Hartley, 1995). As far as Russia was concerned, rapid transition and political instability reinforced the scarcity of information and the ensuing uncertainty. For example, the government often canceled programs without prior warning, cut expenditures, designed unrealistic policies and programs and did not pay for ordered equipment on time or delayed payment, often using money surrogates. Access to restricted information and concealed rents gave a significant competitive advantage to privileged enterprises.

Industry, in turn, sent the wrong signals to the government, thus distorting the information environment for policy-making. In order to escape taxation and receive rents, it hid profits and attempted to maximize apparent losses. Enterprise managers organized their operations within the shadow economy and the gray areas of export, illegally shifting overheads to defense production and pursuing survival rather than strategic targets as the ultimate goal. Although the pressure of regulation and intrusion was often excessive, the government nevertheless failed to support regulation by monitoring, checking and control, and thus did not reach the aims intended by this intrusive policy. It was not surprising, therefore, that the new government of 2000 launched an economic and technological audit of the defense enterprises to learn about the real state of affairs in the industry in order to create a basis for the restructuring and conversion program.

Cost and competition

Another phenomenon of transition are too high direct and transaction costs, to which several factors have contributed. The inflation of energy and transportation costs appeared to be higher than prices for industrial products in general and defense in particular. Low numbers of serial and prototype production rendered the prices of single samples of defense hardware fairly expensive. Likewise non-core civilian products were manufactured on expensive unique equipment. Combined with the cost of maintaining mobilization capacities, this made civilian products uncompetitive and expensive. High transaction costs were a result of the low degree of integration of the defense industry in other markets and the underdeveloped status of banks, communications and infrastructure, as well as dominance of barter trade and payment arrears.

Competition for reduced procurement contracts intensified, and there is evidence that the enterprises in the Russian defense complex lost out to

low-cost manufacturers in the other CIS countries as well as in the domestic civilian sector, especially at the subcontracting level, though this process conflicted with the official policy of defense internalization and independence ("Buy Russian"). Competition among Russian manufacturers on the international market is frequent, especially in the fields of aerospace, where companies tend to outbid each other in terms of price, technology transfer and payment forms.

However the advantages available to defense-related businesses—government subsidies, protection of markets, ability to shift costs between defense and commercial business, access to hidden and official subsidies—did not outweigh the negative aspects for the majority of depressed enterprises. Moreover, in contrast to the negative aspects of the market, its advantages tended to be concentrated on a limited number of prime contractors, which could, as a rule, keep a balance between domestic and international markets and defense and commercial sales.

However diversification was limited by the depressed state of the commercial market niches in which defense enterprises had been active. The share of the defense industry in national consumer goods manufacturing had dropped from 25 to 7 percent between 1992 and 1998 (Astakhov, 1999) thus commercial sales only served as a shock absorber for a relatively small number of entities. Military and civilian output growth usually go in parallel: an increase in military-related liquidity stimulates civilian output (BICC, 1998).

Labor issues

Another production factor which significantly affects the economics of defense in Russia is labor. The defense industry lost large numbers of workers as a consequence of low payments and unclear perspectives: average annual loss of personnel between 1992 and 1999 was 15–20 percent, depending of the branch. This separation took place in a rather chaotic manner, left industry still over-employed, and in addition transformed the educational and skill structure to the worse imaginable: the most highly qualified, young and active employees tended to leave the industry. As a result, in addition to over-staffing, the defense industry is now burdened with the problem of low qualification of workers and their advanced age.

The problem is especially acute in Moscow and St. Petersburg where relatively good reemployment opportunities for highly skilled workers stimulated rapid personnel outflow from the defense industries. In the provinces, employment levels are more stable in view of the more problematic state of the civilian labor market, though even there a scarcity of qualified engineering personnel in defense enterprises has been noted. For example, the Voronezh mechanical plant advertised 200 vacancies in 1999 but only 30 were filled, though only a year earlier 560 people had been made redundant (*Izvestiya*, 16 November 1999). The deficit of skilled labor emerged as the plant decreased outsourcing (85 percent of turnover is internal production, even including tools and capital equipment) and increased the output of import substituting products for the natural gas industry and automobile engine components.

Several approaches were tested to solve the general problem of lack of qualified engineering personnel. For instance, there were both proposals to introduce alternative military service at defense factories for graduates specialized in critical technologies as well as the 'import' of specialists from the now-independent, former Soviet republics (Yuri Ivanov, director of the Mashinostroyeniye design bureau, interview, *Vek*, 5–11 November 1999).

However, despite such strategies, significant output growth in 1999 was accompanied by a further decrease in employment, especially in the radio and communications industries. These sectors had accumulated huge latent unemployment which has been becoming more visible since 1998. Only a few enterprise managers changed over to an active restructuring policy, firing redundant workers on a large scale and motivating qualified personnel to stay with their company. Unfortunately for those employees dismissed, state programs to compensate unemployment do not work. Thus the social tension associated with active labor policy and lay-offs remains one the critical factors preventing restructuring.

Sources of income and finance for the defense industry

In the 1990s, resource scarcity dominated the agenda of discussions on the defense industry, especially the collapse of demand for defense and the inability of commercial sales to absorb the shocks and compensate for military losses. Estimates show that, in the late 1980s, about 80 percent of the military output of the defense complex had been consumed by the Soviet army, 15 percent by Warsaw Treaty member countries, and 5 percent by military aid to the Third World (*Ekspertnyy Institut*, 1996). All three markets underwent a severe reduction in the total size and structure of

demand. As of the late 1990s, two-thirds of the military output was exported and only one-third was purchased by the Russian military, while on commercial markets less than one-fourth of the output of the defense industry was exported (see Figure 8). The situation is changing, however: since the fall of 1999, defense demand has partly recovered. It is however unclear how large this build-up will become and what the industrial implications will be.

The following section looks in detail at the dynamics of several main sources of funds for the defense industry: procurement spending, arms export revenue, federal subsidies and credits, enterprise profits, and international sources.

Arms procurement funding

That there was a dramatic decline in the financing of Russian arms procurement in 1992—when transition reforms were launched and defense spending was radically cut—is a well-known fact. Less well-know was the second wave of cuts which occurred in 1995 along with a tightening of federal fiscal policy and a focus on macro-economic stabilization. Calculations show that arms procurement funding (allocated in the federal budget) was at least halved in real prices in 1995 in contrast to 1994, if calculated using the GDP deflator (see Figure 9). Although it is difficult to arrive at a definite figure for procurement financing, it is nevertheless obvious that the actual number of weapon systems and military techniques which the armed forces could afford to buy seriously decreased again in the mid-1990s, driven by an erosion of revenues and the preoccupation of the government with debt servicing.

Figure 8: Export dependency of defense-related industries

Source: *Center for Economic Analysis,* Rossiya, *1998, Issue 2, p. 114, 1999, Issue 2, p. 136*

Note: *Only enterprises of the defense complex which produce for both the military and civilian markets are included.*

	Share of arms exports in military sales, in percent			*Share of exports in civilian sales, in percent*		
	1996	*1997*	*1998*	*1996*	*1997*	*1998*
Aerospace	66.1	60.7	84.0	27.6	24.0	32.1
Armaments	40.4	41.8	46.5	7.8	7.0	14.0
Shipbuilding	16.9	1.0	59.1	37.5	58.7	54.3
Radio	21.4	15.2	68.4	6.3	5.8	2.4
Communications	3.6	18.4	19.4	12.9	6.0	3.5
Electronics	5.0	4.6	6.8	22.7	22.7	27.5

Figure 9: Arms procurement funding, 1994–2000

Sources: *Estimates are based on official statistics published in the* Garant database *and* Krasnaya Zvezda*, 6 February 1998; Gonchar and Shukhgalter, 2000; TS-VPK Information Agency, November 1999*

[a] *The estimation of the 2000 procurement budget in real prices is based on the expectation that the annual GDP deflator will reach 25 percent in 2000. It should be noted, however, that—in addition to the annual procurement budget—the government plans to pay back debts in 2000 on former procurement contracts, estimated at 25 billion rubles, thus nearly doubling the procurement budget. Estimates in brackets refer to both the procurement plan and debt recovery.*

	1994	1995	1996	1997	1998	1999	2000[a]
Arms procurement budget plan (billion rubles, current prices)	8,442	10,287	13,213	10,964	15,148	16.0	27.3 (52.3)
Share of arms procurement in the defense budget plan, in percent	20.6	21.2	16.5	19.9	16.3	14.9	19.5
Arms procurement budget plan in real 1996 prices, calculated with GDP deflator (billion rubles)	27,057	13,352	13,213	9,714	12,618	12.32	20.5 (39.2)
Index of arms procurement budget plan in 1996 prices (1994=100)	100	49	49	36	47	46	76 (145)

Another important point with respect to arms procurement funding is that the expenditures actually paid out from year to year appear to have been much lower than planned. As of 1996, the accumulated state debt to the defense enterprises for unpaid defense contracts exceeded the annual arms procurement budget. Arms procurement was funded at lower rates than other sub-categories of military expenditures, ranging at between 5 and 10 percent of planned allocations (Center for Economic Analysis, *Rossiya,* 1998, Issue 3, p. 114). Moreover, instead of having their debts paid in money, the enterprises received restructured tax exemptions and various state bonds. Given the current poor state of the banking system and low value of state bonds, it is hardly possible to cash in tax exemptions and bonds for more than 60 percent of their value.

The situation changed in late 1999 however, when two factors—recovery of energy prices and demand stimulated by the Chechen War—led to a growth in the procurement budget. There is evidence that the financial position of the defense industry has improved as a result.

Nevertheless, it is impossible to say with any certainty exactly how large this buildup is and how it is structured across branches of the armed forces and industrial sectors. Two aspects are of relevance here: first, the government has stopped publishing procurement data while occasional statements from officials do not provide reliable figures. Second, procurement expenses have been financed in a rather confusing manner since 1999: in addition to the federal expenditures budgeted—which were paid without major delays from 1999 to 2000—additional revenues for procurement are collected through targeted taxing of arms exports by the regions and customs agencies, as well as from the export of enriched uranium. Moreover, the government has now paid its earlier debts to the enterprises: in 2000 the debt payments are expected to be nearly as large as procurement funding. Our estimates (see Figure 9) therefore give only a very general impression: if only the procurement budget is taken into account, then expenses in 2000 will reach only 75.8 percent of the 1994 level (which was the top figure for the 1990s); if, however, additional payments are taken into account, then the 1994 level will be exceeded by 45 percent.

Indirect data gleaned from the enterprise-level is proof of the improvement of the defense industry's financial position. In a survey conducted by the Center for Economic

Analysis, the share of respondents who showed financial recovery grew from 14 percent in 1998 to 42 percent in 1999 and was especially high among entities in the ordnance, aircraft and electronic industries, while the share of enterprises reporting net losses, decreased from 31 to 13 percent (Center for Economic Analysis, *Rossiya,* 2000, Issue 1, p. 62).

The question is also: What could the Defense Ministry have purchased in any case with on average US $2 billion annually to distribute among a still too large number of defense contractors? There is evidence that, between 1996 and 1999, the serial manufacturing of weapon systems was practically stopped and that the industry only had contracts to produce single samples for domestic use in addition to repair and renovation contracts. Figure 10 provides some data on the actual number of procured weapons systems, though cross-checking of these figures is not possible and they should therefore be taken with a certain caution. In 2000, production of small series was launched again, though procurement still focuses on new production in the nuclear field and on modernization and repair in other branches.

Vice-Prime Minister Klebanov indicated that the government had several priorities in procurement funding, which were affected by lessons drawn from the two Chechen wars. In addition to procurement of the nuclear strategic forces—which remains the highest priority—the government planned:

- Modernization of aircraft (particularly the SU-24 and SU-25) enabling them to be used in all weathers and day and night and equipping them with the high-precision weapons
- Standardization of the communication systems used by the different forces, first of all those of the army and troops of the Ministry of the Interior
- Modernization of space-based intelligence systems and radio and electronic hardware
- Improved protection for the individual soldier

(Klebanov, interview 20 October 1999, *Eksport Vooruzheniy,* No. 5, October 1999, available at www.cast.ru).

Thus it seems likely that several branches and sub-sectors will benefit from the 2000 build-up—the nuclear, space, avionics and radio industries for sure. However the term 'build-up' should be used with caution as the systems to be procured are counted in single samples. Thus, in 1999, only ten intercontinental ballistic Topol-M missiles, ten space satellites, and one TU-160 strategic bomber were purchased (TS-VPK Information Agency, July 1999).

As indicated in its forecasts on future weapon requirements (see Section 1), the General Staff of the armed forces expects that the defense budget will not allow the purchase of new weapons systems before 2005 (General Staff of the Armed Forces of the Russian Federation, 1999). The Defense Ministry will most probably allocate modernization contracts and maintain a minimal procurement level sufficient to keep the core of the defense industry on track. From 2005 onwards, however, the General Staff is planning to introduce a new weapons program dependent upon economic growth and the availability of the relevant new military technology. Thus the arms procurement budget for 1999–2004 is likely to be kept at a level of 35–40 billion rubles, and, as of 2005, will probably be increased to 70–75 billion rubles (in 1999 prices).

To sum up, the way the arms procurement budget is funded and distributed makes the current defense market highly uncertain, risky, depressed and segmented. At the industrial level, this has resulted in low utilization of capacities, low economies of scale, high production costs and prices and, in general, the poor economic and financial standing of the majority defense enterprises. Were there funding sources to compensate for this?

Figure 10: Estimate of numbers of weapon systems manufactured for domestic and international sales, 1992–1999

Source: Argumenty i fakty, *April 2000, No. 14 on the basis of data from the Russian arms exporting agencies*

	Domestic procurement	*Export sales*
Ships	2	11
Tanks	31	435
Submarines	2	10
Aircraft	7	278
Helicopters	8	98
Air defense systems	1	22
Armored vehicles	17	217

Arms exports as a 'cash cow' of the defense industry

In order to understand the influence of arms exports on the economics of the defense enterprises, it is necessary to ask several questions. First, how large are the exports and their share in total sales? Second, how are they structured across branches? Third, what is the return to industry, especially in respect to the form of payments?

As of mid-2000, two state agencies—Rosvooruzheniye and the recently merged agencies Promeksport and Rossiyskiye Tekhnologii—and 12 enterprises in Russia had licenses allowing them to engage in the international arms trade. Rosvooruzheniye is authorized to sell new arms directly from industrial production and Promeksport from army depots; Rossiyskiye Tekhnologii is expected to sell technology. In reality, however, all entities compete for the same market niches (*Krasnaya Zvezda*, 29 January 2000).

Total export sales accounted for approximately US $2.5–2.8 billion in 1998, grew to about US $3.3 billion in 1999, and could reach 4 billion in 2000 (Figure 11). Data on individual companies is scarce, though there is evidence that the leading role in the late 1990s belongs to Antey (producing air defense systems; sales worth US $200 million in 1999), the Tula design bureau specializing in machine tools (with contracts worth US $300 million in 2000) and the Sukhoy and MiG conglomerate (*Eksport Vooruzheniy*, November/December 1999, Annex). As of 1998, 90 percent of sales were shared by three sectors: aerospace 55.6 percent, electronic optics 21.1 percent and the radio industries 13.2 percent (Astakhov, 1999). Dependency on arms export sales is highest in aerospace (more than two-thirds of military sales) (Figure 8). In total, arms exports represent almost 70 percent of all military sales (see Figure 3) while, in commercial markets, the defense companies are exporting far less successfully: civilian exports are less than one-third of military exports (see Figures 3 and 8).

Figure 11: Estimates of arms export revenue (deliveries) across agencies

In million US dollars

Sources: *Grigoriy Rapota, former Director General of Rosvooruzheniye, interview 1 March 1999 on Moscow NTV,* FBIS Daily Report *FBIS-SOV-1999-0301;* Eksport Vooruzheniy, *November/December 1999, p. 1 (of Annex);* Nezavisimoye Voyennoye Obozreniye, *4–10 February 2000.*

[a] *Includes Rossiyskiye Tekhnologii and companies with direct exports*

Agency	*1998*	*1999*	*2000 (forecast)*
Rosvooruzheniye	2,300	2,800	3,100
Promeksport	200–500[a]	150	340–400
Rossiyskiye Technologii		20	merged with Promeksport
Companies with direct exports		300	400–500
Total	**2,500–2,800**	**3,300**	**3,840–4,000**

Interpretation of the figures presented above would be misleading, however, without knowledge of payment procedures and forms. The following fact serves as a reminder against the misinterpretation of the economic role of Soviet arms sales: on average no more than 10 percent of Soviet sales have actually been paid or were of some commercial value—the rest were granted as military aid or on soft loans. Moreover, even in the case of commercial sales, the enterprises received only a small share of the revenue gained which was centralized and redistributed to the defense industry through the budget.

Currently the financial returns from Russian arms export sales remain a contested issue and estimates range from the very optimistic to the rather skeptical. Although the current evidence is very fragmented, there is nevertheless reason to suggest that transactions in hard currency cover no more than one-third of sales. The rest is barter trade and state credit loans, provided to industry under the process of Russian state debt restructuring to countries which have agreed to receive debt payment in the form of weapons. For instance, Urinson states that the fall in export sales of 1997 was due to a substantial decrease in debt-to-weapon swaps to one-eighth of their 1996 level, a fact which reduced exports by US $800 million (Jakov Urinson, former Minister of the Economy, interview 5 August 1998, *Eksport Vooruzheniy,* No. 4, August 1998, available at www.cast.ru). It may therefore be estimated that debt-to-weapon swaps in 1996 provided for about one-third of sales, namely US $900 million. The following year, credit loans were reduced to US $100 million, and later recovered again.

In short, it can be assumed that Russian arms exports are paid from two major sources: cash transactions and the Russian federal budget (budget line pertaining to state debt servicing). When transaction costs, trading agency commissions and losses linked to cashing in barter goods are excluded from the total sum, it can be roughly

estimated that the returns to industry from arms exports in the late-1990s were at a level similar to domestic procurement funding. However, for several reasons, arms export sales seem to have had a greater effect on performance and the restructuring of the industry than domestic contracts.

First, even if they are paid out within the framework of compensatory contracts, revenues from international contracts represent much 'better' funds in terms of reliability, transaction costs, time of payments and liquidity than domestic income. Thus these revenues ensure real profit and the better economic performance of the enterprises involved. The annual survey of defense enterprises confirms that arms exports were driving the growth of military production: two-thirds of the entities which reported an increase in military outputs in 1997 were predominantly working for the international arms markets (Center for Economic Analysis, *Rossiya,* 1998, Issue 1, p. 130). Secondly, arms exports are being increasingly concentrated: the number of companies involved in arms exports is rapidly declining. Moreover, the restructuring process in the defense industry is also believed to depend on the international links of defense companies (Center for Economic Analysis, *Rossiya,* 1998, Issue 2, p. 112).

Export shares in sales became one of the few traceable indicators of a company's competitiveness and viability, and in general helped distinguish between an operational and an idle enterprise. Enterprises which manufacture exportable products constitute the core elite of the Russian defense industry and are believed to have significant lobbying power and influence over the government. This gap between the core and the rest of the industry is a recent phenomenon which promotes its further segmentation and prevents the defense complex from organizing itself as a more significant political power.

In the late 1990s, the government changed the direction of its arms trade policy several times. First, it initiated pro-export campaigning by the highest officials ("We will lobby for every machine-gun") (Ilya Klebanov, Vice-Prime Minister, interview 20 October 1999, *Eksport Vooruzheniy,* No. 5, October 1999, available at www.cast.ru) and reduced red tape (the number of agencies in control of arms exports was reduced from thirty to two or four respectively: the Defense and Foreign Ministries in the case of enterprises and products included in the list of exports, and four agencies for the others). In addition, the most advanced weapons were released for sale.

The explanation for an increased focus on export is that the government sees it more than ever before as a 'cash cow' and is seeking to re-channel arms export revenues in the interests of national procurement rather than individual enterprises. For example, according to Klebanov, as of 2000 about 1,000 fighter aircraft will undergo modernization (including MiG-21 and 23 and Su-22 and 24) and will later be offered to foreign clients. The expected revenue may be allocated to the purchase of more advanced vehicles for the Russian army (TS-VPK Information Agency, August 1999).

State subsidies and investments

This new state policy proved to be a problem for the defense industry rather than a solution because it not only failed to achieve its specific goals, but also significantly cut subsidies to industry, while remaining intrusive and relatively powerful in respect to restructuring adjustment and the selection of "national champions". The total economic subsidies paid out of the federal budget were reduced from 13.6 percent of GDP in 1992 to 1.6 percent in 1996 (Dmitriyev, 1997), while in these years GDP itself was nearly halved. Ironically, the most liberal post-reform government of Yegor Gayder was the most generous as regards subsidizing the defense industry in the early 1990s. There is much evidence, however, that these subsidies did not compensate for the loss of working capital at enterprises as a result of the ruble devaluation, and were mostly spent on wages and the support of social assets rather than on investment and conversion projects.

The state is often—and with good reason—criticized for being a poor surrogate entrepreneur promoting dependence upon subsidies and preventing enterprises from learning how to operate under market conditions. The problem is, however, that private capital is still too weak and is not yet able to take—or interested in taking—risks with investment in industries associated to a long value chain. Having access to a certain amount of capital in a capital-scarce environment, the state could have become central to the process of channeling money into high-risk investments and enhancing the capacity of strong firms to confront the international markets.

The state has experimented with direct measures (federal subsidies, easy-to-pay credits funded from the state budget) and indirect intervention (such as exemption from tax and duties). Even though these measures in general provided the defense enterprises with extra and scarce funds, these were too small for the number of entities to be supported and payment was often delayed. In addition, misappropriation of resources has frequently been documented.

Falling investment activity—harmful especially to conversion projects—reflects the downsizing trend in federal support to industry. A breakdown of investment by financial source reveals the relatively modest role of the state in that particular field: a reduction from 16.6 percent of total investment in 1992 to 9.2 percent in 1996, (OECD, 1997, p. 126). The federal share of investment in the defense industry is higher, though a precise figure is not available.

If the distribution of investment to the defense complex among enterprises with different kinds of ownership status is analyzed, state-owned enterprises are in the lead: they received more than half of the total investment (65 percent in shipbuilding but only 42 percent in electronics) followed by the enterprises with mixed property (State Committee for Statistics, 1996). Strikingly, the share of state enterprises in the total output is significantly lower than their share in investment: 36 percent as opposed to 51.6 percent, thus the efficiency of investing in state-owned enterprises may be questioned.

Conversion funding corresponded to no more than 10–15 percent of the budgeted resources put at the disposal of defense enterprises, including subsidies and credits. Figure 12 shows that enterprise profits and banking credits have taken over from the state as a source of funding. Moreover, research conducted at the Center for Economic Analysis has shown that federal subsidies, planned for investment in conversion projects, were funded only in part as small allocations targeted at the retraining of personnel and maintenance of the enterprises' social assets. Between 1995 and 1996, only 10 percent of the credits planned in the federal budget were actually financed, and in 1997 only 1 percent (Center for Economic Analysis, *Rossiya,* 1998, Issue 2, p. 111).

Figure 12: Sources of conversion funding in Russia, 1995–1998

Share of total funding in percent

Sources: *Center for Economic Analysis,* Rossiya*, 1998, Issue 2, p. 14, 1999, Issue 2, p. 136*

	1995	*1996*	*1997*	*1998*
Federal subsidies	33.0	30.1	38.2	30.2
Federal credits	5.2	4.3	0.4	0.6
Regional budgets	1.5	3.4	2.3	1.4
Extra-budgetary sources including:	60.3	62.2	58.8	67.8
Enterprise profit	36.8	46.3	41.5	56.8
Conversion funds	7.1	5.3	7.9	1.9
Bank credits	15.9	8.3	6.2	4.6
Outside investors	0.2	-	-	-
including foreign investors	0.04	-	-	-
Total funding in billion (old) rubles, in current prices	**2,196**	**2,508**	**2,449**	**2,240**

Thus, federal subsidies and credits have become an uncertain and declining source of finance in both the military and civilian parts of the defense industry.

Private investment

Private investment has been depressed for most of the 1990s although there is evidence that private enterprises outperformed the state as a funding source in conversion projects. Nevertheless the total volume of private investment remained sluggish and hardly affected the economy of the defense enterprises. Gazprom, the natural gas monopolist, and several cash-rich companies from the fuel and energy complex should be mentioned among the non-state, outside-funding sources.

A few privatized defense enterprises made tentative approaches to the still underdeveloped and relatively small and volatile capital market. Some top banks, which launched ambitious projects in the direction of defense companies obtaining stock from some of them during the privatization process or due to credit-for-shares deals, found themselves in a very difficult situation as a result of the financial crisis of 1998; they are not likely to recover and as a result are unlikely to launch further investment projects in the short term.

In addition, there are profound defects in the current economic position of defense enterprises which prevent undercapitalized private businesses from entering the defense sector. Loss-making and the large accumulation of debts, the problematic state of many production capacities, high investment risks—especially with respect to state interventions and property nationalization—and unclear legal status create objective barriers to investment. Another is inadequate corporate governance. As a result, only a few arms-exporting companies and enterprises involved in large international cooperation projects are attractive to private capital.

Foreign investment in the defense complex has remained the exception and is hardly evident in the statistics on conversion funding (see Figure 12). However, on the demand side, the role of international funding sources is fairly significant, especially in the case of innovative firms in the space and nuclear industries, software engineering and aircraft manufacture. Foreign contracts to Russian defense research establishments and enterprises bring in international funds within the framework of both intergovernmental programs and commercial ventures and help to compensate for the low domestic demand for innovate, high-tech products and services.

Cross-sectoral performance

The downs (1991–1997) and ups (1999–2000) experienced by the defense industries in the 1990s were structured very differently across sectors depending on the following factors:

- Sectoral concentration of procurement contracts and arms export sales
- Different limitations with respect to international competition and cooperation

Figure 13: Military output dynamics across defense industrial branches

Sources: *BICC, 1998, p. 218; Center for Economic Analysis,* Rossiya, *1998, Issue 1, p. 133, 1999, Issue 1, p. 143, 2000, Issue 1, p. 61–64; Center for Economic Analysis, 2000*

Notes: *The Russian government has revised the 1998 military output figures in publications as of 2000 in contrast to earlier estimates and as a result these appear about ten percent lower. Shipbuilding is, however, an extreme case: its official military output estimates have been reduced from 242 percent growth (Center for Economic Analysis,* Rossiya, *1999, Issue 1, pp. 141-143) to only 110 percent growth (Center for Economic Analysis, 2000)*

	1995 as a percentage of 1994	*1996 as a percentage of 1995*	*1997 as a percentage of 1996*	*1998 as a percentage of 1997*	*1999 as a percentage of 1998*	*1999 as a percentage of 1994*	*1999 as a percentage of 1991*
Aircraft	93	85	64	134	129	87	16
Shipbuilding	107	75	61	110	175	94	50
Radio	68	96	143		84	102	34
Communications	58	80	75	81	135	38	9
Electronics	90	79	95	83	145	81	7
Armaments	79	-	-	86	136	-	-
Ammunition and special chemicals	82	72	67	88	241	83.9	17
Space	87	80	106	88	152	98.7	41
Nuclear	73	93	100	-	-	-	34
Defense complex total	**80**	**80**	**77**	**105**	**137**	**71**	**19**

- Specific technologies, especially as regards prospects for commercialization
- Different institutional structures and regulations
- The behavior of individual firms and regions along with managerial competence and the ability to adapt.

As a result, military-industrial diversity has increased significantly in recent years. Figure 13 shows that military output in the defense complex in 1999 was only one-fifth of what it had been in 1991. Two waves of output downsizing, following two waves of cuts in defense spending, were the most striking—one in 1991/92 and one in 1996/97. Output growth observed in 1998 and 1999 did not compensate for the losses in the previous years: it brought military output to only 71 percent of its 1994 level. Sectoral outsiders emerged: the electronics and communication industries declined by more than 90 percent compared to the level of 1991, whereas shipbuilding managed to retain half of its pre-reform output. The space, radio and nuclear industries may be seen as survivors because they retained approximately one-third of their 1991 military output. The demand created by the Chechen war is reflected in the significant growth in output in the sector of ammunition and special chemicals production which grew in 1999 alone by 241 percent.

The cut-back in military output was not compensated for by an increase in commercial sales as these also underwent a severe depression. A great deal of evidence suggests that, after 1992, output dynamics in both the military and civilian parts of the defense industry were driven by macroeconomic shocks rather than by defense procurement or conversion policies. Figure 14 shows that the civilian output of the defense sector in 1999 was only 39 percent of the 1991 level and that the most problematic years were probably 1995/1996. Prohibitive interest rates, tough monetary policies, and budget constraints as well as the low competitiveness of the civilian goods manufactured by defense enterprises in comparison to imported hardware influenced this decline most of all. Moreover, in those sectors and sub-sectors most affected by international competition, commercial products were manufactured at a loss.

Because of inter-sectoral differences, the chances a branch had of losing or gaining from market liberalization, transition shocks, and fluctuations in the procurement and arms export dynamics were varied. One puzzling observation was that leaders in the military market kept their leading positions in commercial sales too. The electronics, communications and ammunition sectors underwent the most dramatic declines in civilian

Figure 14: Civilian output dynamics across branches

Sources: *Center for Economic Analysis,* Rossiya, *1998, Issue 1, p. 133, 1999, Issue 1, p. 143, 2000, Issue 1, p. 61–64*

	1995as a percentage of 1994	*1996 as a percentage of 1995*	*1997 as a percentage of 1996*	*1998 as a percentage of 1997*	*1999 as a percentage of 1998*	*1999 as a percentage of 1994*	*1999 as a percentage of 1991*
Aircraft	83	64	96	88	138	62	32
Shipbuilding	99	80	96	92	95	66	39
Radio	69	65	92	89	147	54	33
Communications	72	67	90	84	142	52	14
Electronics	78	74	95	105	131	75	21
Ammunition and special chemicals	78	72	95	92	120	59	16
Space	94	68	111	111	136	107	75
Nuclear	103	105	100	-	-	108	104
Defense complex total	**87**	**83**	**98**	**92**	**129**	**84**	**39**

output—by 80–84 percent compared to the 1991 level—compared to 90–95 percent of losses on the military market. The nuclear sector is the only obvious leader in commercial sales: in 1998 its output was even larger than in 1991.

These differences can clearly be traced back to the nature of civilian markets in which the defense sectors operate, as well as to the availability of shock-absorbing mechanisms and alternatives. The complexity of supplier networks, industrial linkages, access to international markets, and competitiveness in general matter a great deal. Thus the nuclear industry was better placed than other defense branches to gain from market liberalization due to its control of easily marketable products for both the domestic and international markets: electricity produced at nuclear power stations and enriched uranium. Producers of electricity benefited from the new price structures in the domestic economy causing energy prices to increase much faster than the prices of products with higher value added. International sales of enriched uranium, which had been stockpiled in significant quantities and did not require much input, also brought high profit margins. Other industries, such as space, benefited from international linkages and the rapid expansion of the telecommunications industry along with growing demand for space launches and boosters.

While civilian manufacturing was focused primarily on consumer durables before reform took place, in early 2000 this market was primarily occupied by imports. However there is reason to believe that defense enterprises which have been successful have moved into civilian niche markets. The defense enterprises gained 85 percent of the domestic market for oil-drilling equipment and other equipment for the fuel and energy industries and 90 percent of the market for sophisticated medical equipment (Stringel, 2000).

However the available statistics fail to identify the turbulences of success and failure occurring below the surface level of the aggregated sector. There is evidence that, in some product markets, significant growth was achieved by defense firms even in the most depressed electronic and communications industries, especially through import substitution.

All branches experienced losses in employment, the largest in the aircraft industry in absolute terms, and in electronics in relative terms. Technological change did not play a major role in these losses in either the depressed or relatively well-positioned sectors, as investment and R&D expenses were small during the crisis years. The only way that technological developments significantly affected the defense industry was through the increased use of computers to administer employees and for office and documentary work.

Industrial performance after the crisis of 1998

Given the complexity of state-industry relations, the nature of transactions between banks and industry, and the way existing contracts were fulfilled, it is not possible to classify the effects of the financial crisis of 1998 as either entirely positive or negative.

Certainly, the federal budget crisis worsened the position of those entities which remained heavily dependent on state funding and which were not selected as 'national champions'. State-owned enterprises and especially research institutes and federal science centers may be seen as the losers: their funding was terminated or was subjected for sequestration and cuts. Devaluation of the ruble and the related inflation dramatically increased production costs and lowered the purchasing power of salaries, thus heavily depressing demand. Banking crises destroyed trust in banks and lowered savings and other sources of investment. At the micro-level, the scrabble for state rents—the strategy which had previously ensured the survival of many enterprises—became more and more problematic.

In 1998, all performance indicators in the defense industry worsened in contrast to 1997, when signs of recovery of civil manufacturing had been observed within the defense complex. The share of civilian output in total output of the defense industries declined from 59.4 percent in 1997 to 56.3 percent in 1998 (Pustyakova, 1999). The fact that the civilian part of the industry had been affected more by the financial crisis than the military part may be explained by the extensive use of imported components in certain products, especially in consumer durables produced at the defense companies. Ruble devaluation increased input costs and immediately resulted in a serious decline in output. Later, price increases on the supply of local material and energy, as well as the devaluation of working capital, added to the shocks of inflation and caused many enterprises to become idle.

On the other hand, some sectors and enterprises attained a better position on the market as a result of domestic currency devaluation, namely companies concentrating on export sales or those pursuing a strategy of import substitution, not dependent upon the foreign input of components. Arms sales and their role in sectoral and company performance have already been discussed. The civilian sales of defense companies, however, also became a significant shock absorber. In total, 333 enterprises in

the defense complex had exported civilian products in 1998 at a total value of US $810 million (Pustyakova, 1999). Being able to pay sub-suppliers in cheaper rubles, the exporters achieved better cost structures and gained additional competitive advantages.

In 1999, defense branches outperformed civilian industry in post-crisis growth in both the military and civilian sectors: the total output of the defense complex grew by 32.6 percent, the engineering industry by 13 percent, and the total industry on average by 7.5 percent (Stringel, 2000; Center for Economic Analysis, *Rossiya,* 2000, Issue 1, p. 61). According to the estimates of the Ministry of the Economy, this growth was due to the increasing demand for investment goods in the domestic economy, increased price competitiveness of domestic products in comparison to imported goods, higher effectiveness of export marketing, and better funding of arms procurement and targeted federal programs.

In a survey of the defense industry at the micro-establishment level, conducted jointly by the League of Defense Enterprises and the Academy of Sciences, 28 percent of respondents reported that the crisis had ultimately had a positive influence, such as the increase in domestic demand through import substitution and cost advantages on international markets because of the devaluation of the ruble. It also became easier to reduce the number of workers, cut down capacities, and write off debts. In general, the respondents judged that the crisis fostered a more realistic assessment of the economic and financial situation. Those enterprise managers who stressed the negative effects cited financial losses, canceled investment projects, and the loss of the most highly skilled workers (Rivkina, Kosals and Simagin, 1999).

Among product markets, in which defense enterprises have been active, growth in late 1998 to mid-1999 has been reported in food-processing equipment, medical devices and several consumer durables such as washing machines and vacuum cleaners. The space industry benefited from the stable growth of the international market in commercial launching services. On the other hand, markets with long investment cycles (civilian shipbuilding) or a large share of imported components (consumer electronics) have been significantly depressed as a result of the crisis (Center for Economic Analysis, *Rossiya,* 1999, Issue 2, pp. 133–134).

One question remains: How did the banking crisis affect industry in general and the defense industry in particular? There is reason to believe that problems in the banking sector had a much greater effect on market leaders than on outsiders. The former tended to keep a large part of their assets in state bonds, had diversified relations with the banks, and combined production operations with various forms of financing. Outsiders, on the contrary, had little contact to banks except to facilitate transactions: bartering, bills of exchange, offsets, and other interim instruments of financing dominated their business.

To sum up: in the 1990s the Russian government experimented with various different funding sources for the defense industry, though all remained very limited and were only sufficient to maintain small production series and modernization and repair. This resulted in low liquidity in the majority of defense enterprises, which used delayed payments (arrears) as an instrument to increase their liquidity. In principle, this strategy was successful, as the debts were written off several times. Other measures towards improved corporate governance, such as increased transparency, controlling, and careful accounting of profits and losses across product lines were more difficult to achieve, and required time for relearning and changes in management, sometimes even a new generation of managers. Shock-absorbing measures, such as arms sales and industrial commercialization, only had a positive effect in certain markets.

Microeconomic Adjustment

Although defense companies often adopt many common approaches to defense downsizing and conversion, there is much evidence that two companies may often react in a different way to the same situation and the same combination of crisis shocks or market opportunities. The main reason for this lies in the nature of the product, differences in labor and facilities, product mix, relationships with the customer, regional location and the state of the surrounding economy. Chance and circumstance also matter, although it can be argued that state-industry relations, access to information, as well as the speed at which managers learn entrepreneurial skills have probably played the most crucial role in the success or failure of microeconomic adjustment.
Speaking to a meeting of defense industry managers shortly after presidential elections, Vladimir Putin admitted that, even if the government funded the restructuring, conversion and maintenance of mobilization capacities of the defense industry on a full scale, there was much reason to believe that resources would nevertheless be wasted. The reason for this was that enterprises had not yet adapted their economic policies to market conditions, along with poor financial and marketing management (Putin, 2000). Nevertheless, the government continues to subsidize inefficient enterprises in a concealed way, mainly in the form of reduced fuel and energy tariffs and tolerance to payment arrears at all levels of budgets. Moreover, it is reluctant to apply the conventional instruments of industry exit, such as bankruptcy. The modern defense complex in Russia is therefore comprised of entities at both poles of economic performance: strong market leaders and ones which stay idle for several years.

This section discusses a number of topics concerned with the operation of Russian defense enterprises at the micro level, along with incentives at regional level to facilitate microeconomic adjustment.

Factors for failure or success at company level

If the standard measure of industrial performance—profitability—is applied to Russian defense companies, the picture is depressing. More than a third of the enterprises in the defense complex enterprises (35 percent) operated at a loss even in 1999 when there was output recovery in almost all sectors associated with defense (Center for Economic Analysis, 2000). Furthermore, losses have been registered in both military and civilian sales, though in the military market they were less. This may be explained by the high share of exports in the military market, which balanced uncertainties in domestic arms procurement policy. In addition there is reason to believe that—however high the risk of doing business with the state in current economic circumstances is—commercial activities are still more vulnerable to macroeconomic shocks, especially to high interest rates, depressed demand, and price distortions.

Explanations of the poor performance of defense companies are usually focused on the extreme inertia of operational and financial managers installed by the previous system and the objective difficulties of doing business in a depressed economy under hardships of transition. According to the Center for Economic Analysis, the poor financial status of defense companies is due to several factors: delay of restructuring reforms, unreliable financing of defense contracts, high taxes, unbalanced cost structure, low competitiveness of civilian products under the pressure of competitive imports, and excess production capacities (Center for Economic Analysis, 1998).

General lack of certainty had a major effect, as well as the difficulty of learning how to cope with the economic shocks. Scarcity of information often resulted in misallocation of resources, which added to the failures in product diversification driven by technological limitations rather than demand. Wrong estimations of competitiveness and civilian market trends also prevented a successful departure from military manufacturing. Some studies attribute failures to the high degree of insider control and the weakness of mechanisms for the replacement of inefficient management, though this feature is hardly defense-specific.

It remains to be seen when the critical breaking point will come, pushing the idle and loss-making sections of the industry out of the market. There is some evidence that market exit is unlikely to occur all at once in view of the political sensitivity of the issue and the hard social consequences which the government will not be able to compensate for. Most probably exit will go through several stages, beginning with the removal of idle entities from the list of defense contractors, forcing them out of the defense complex and from control by state bodies; state share stock will be removed, or transferred to municipal authorities. At this stage either local administrations or creditors are likely to initiate plant closure.

Another approach, already tested by the government, is to pass the burden of decision concerning plant closure and defense market exit on to the industry itself through reorganization in holdings. Redistribution of financial flows and contracts within holdings and other integrated entities is expected to push idle enterprises out of the market with less political pain than bankruptcy procedures initiated by the government. An example is the Radar company of St. Petersburg, which designs dual-use radio and electronic equipment. It applied for re-nationalization in order to separate from the Leninetz holding and associated loss-making entities, intending to internalize all R&D and manufacturing facilities within a relatively large export contract (*Delovoy Peterburg*, 15 March 2000; *Izvestiya,* 2 June 2000). A year earlier the Oboronitel'nye Systemy holding, which designs and manufactures S-300 air defense systems, was dismantled at the initiative of the key producer, Almaz. The decision had been taken in order to retain revenues from the export of arms without having to distribute them among the insolvent enterprises of the holding (*Ekspert*, 30 August 1999, p. 34). In practice, however, conflicts between 'leaders' and 'outsiders' within holdings leave little hope of smooth exit procedures. The pursuit of insolvent and ill-performing enterprises by the holding rather than by a federal insolvency agency will seldom materialize.

Successes

However common the negative external and internal factors in adjustment at company level are, they have nevertheless not prevented some enterprises from surviving, consolidating themselves and even expanding in the market. Urinson estimates that 20 percent of all defense entities were successful (Jakov Urinson, former Minister of the Economy, interview 5 August 1998, *Eksport Vooruzheniy*, No. 4, August 1998, available at www.cast.ru). Why was it, therefore, that a fifth of the enterprises performed better, especially given the controversial reaction of defense enterprises to the financial crisis of 1998, domestic currency devaluation, and relative defense buildup?

A government survey (Center for Economic Analysis, 2000) shows that the enterprises which performed best as of 1999 were those, which had concentrated defense orders and had been involved predominantly in military production. In addition, earlier surveys showed that company performance became more dependent on the size of enterprises than before: large enterprises employing more than 5,000 people performed better and were more successful in retaining their core specialization and qualified labor (Center for Economic Analysis, *Rossiya*, 1998, Issue 4, p. 127). A possible explanation might be that large and powerful entities with good liquidity were less vulnerable to difficulties with money surrogates and payment delays than small companies. Another new trend which may have contributed is declining diversification and the growing specialization of defense companies either in the military or civilian market.

In the study by Gonchar and Wulf, several factors contributing to a certain degree of success were discussed: civilian and arms export; dualizing defense technologies and product diversification into niche markets; government rent-seeking; close links with large solvent customers; active enterprise restructuring; international cooperation; entry into the financial market (Gonchar and Wulf, 1998). In principle, these factors remain valid in 2000, though the importance of exports of all kinds outweigh all other factors. Crisis in the financial market and the collapse of state bonds pushed many industrial enterprises out of this market. A less significant factor is government rent-seeking in view of resource scarcity and government favors focussing on a limited number of elite entities though there is also evidence that companies apply to the regional and local authorities for support, tax relief and other advantages, as well as demanding financial help from local budgets.

A recent study of a sample of defense enterprises (Kosals, 2000) reveals that output growth following the national currency devaluation of 1998 was sometimes due to unexpected reasons and rarely resulted from conventional market-friendly incentives. Two groups of production factors, which influence output dynamics, were tested: firstly, specific characteristics of the enterprise (size, ownership type, and so on) and, secondly, links between the enterprise and external partners, sub-contractors, clients, creditors, debtors and local authorities. Several surprising results were revealed:

- The most positive dynamics were shown by entities fully released from governmental ownership—not a single one among them declined in performance. The worst performance characteristics were shown by public, state-owned enterprises. Stock holdings in which the state had a stake were somewhere in-between.

- Indicators such as the share of civilian production in output and payment arrears per employee tended to have practically no influence—a finding which conflicts with the conventional view of the economics of Russian enterprises.

- In contrast to government surveys, this study showed that middle-sized entities (500– 2,000 employees) are in a better position than large and small entities. The explanation might be that large entities have not been flexible enough to collect devaluation tax, while small enterprises were too weak and vulnerable to the payment crisis.

- Barter deals still dominate transactions. Although the average share of barter sales within total defense enterprise sales accounted for 27 percent (below the industry average), output growth was higher at enterprises which were involved in a large amount of barter deals. Enterprises whose barter share accounted for more than two-thirds of sales had output growth twice as high as enterprises which did not use bartering at all. This infers that industry has little trust in banks and the state as partners.

- A clear distinction between the corporate strategies of growing and declining enterprises was found. For example the directors of expanding enterprises actively plan restructuring (separation of military shops and divisions; change of juridical status; clarification of property rights; struggle against violation of the shareholders' rights). Directors of declining enterprises on the other hand do not plan such measures at all. Declining enterprises tend to rely more on export, searching for foreign investors and outside consultancies. Although directors of declining enterprises are more concerned about social aspects—payments, social assets, employment—than output recovery, workers often do not gain from output growth as salaries remain the same. For expanding enterprises, payment arrears are often higher; moreover such enterprises are often in conflict with the regional authorities.

It may be concluded that recovery in the defense sector after the crisis was mainly experienced by middle-sized, privatized entities which sell significant parts of their production in barter transactions and which neglect social responsibilities. However, while the last two factors can be efficient short-term solutions to crisis, they can hardly be seen as healthy growth factors.

Box 3: Khrunichev State Science and Technology Center

The case of the Khrunichev Center represents one of the rare success stories in the Russian defense industry. Several factors played an important role: the favorable market situation in the space launching business, the dual nature of the core product and technologies, and active restructuring policy.

The Center is a leading manufacturer of the heavy boosters of the Proton model, as well as the new Rokot and Angara models (all represent re-engineered strategic missiles). The company employs 20,000 people working in several integrated entities: the Salyut design bureau, the Khrunichev space manufacturing plant, a consumer goods factory and the Baykonur launch site. Sales have been divided between international commercial clients (60 percent as of 1998), the Russian space agency (18 percent), the Ministry of Defense (7 percent) and Glavkosmos, another state body, operating on the space market (4 percent).

The company experienced 'ups' and 'downs' in the 1990s and experimented with the several strategies. In order to integrate its value chain, for instance, it expanded the R&D department of the manufacturing plant. However this step did not bring the expected results, and merger with the Salyut design bureau was initiated instead. Conversion into non-core businesses (medical equipment, bicycles, snow-equipment) brought losses, though the management is continuing to subsidize these projects in view of the probable recovery of demand and better liquidity at later stages in product life-cycles.

The dualization of the core product and technology—space launches with heavy boosters, marketed internationally, and the manufacture of international space stations—has become the 'cash cow' of the company. Technological limitations (eight boosters require to be manufactured simultaneously) make the company very sensitive to minimal scale economy and competition from the other space-launching firms.

The restructuring activities at the Khrunichev Center included the following:

- Establishment of a marketing service to control the entire subcontracting and client networks
- Mergers at the sub-division level and delegation of profit center functions and rights to the sub-divisions
- Formalization of relations between designers and manufacturers in the form of rigorous contracts
- Contracts linked to projects have replaced life-time job patterns for employees; labor productivity has grown (for example, a twofold growth in output only led to a 20 percent growth in employment)
- Technical modernization of R&D and of arms manufacturing in order to achieve technical and technological interoperability with international partners.

***Source**: Kiselev, 1998*

Enterprise restructuring strategies

The literature on Russian defense conversion often points to two potentially efficient strategies of enterprise restructuring: firstly, integration of a bank, or other cash-rich partner, into the organization and, secondly, spinning off commercial businesses into separate small firms. How efficient have these measures been in the 1990s?

Involving banks and other credit institutes in the management of defense enterprises or enterprise groups was often viewed as a panacea which played a crucial role in the revival of investment and the improvement of corporate governance. The idea was to raise non-public funds for the fixed capital investments, to overcome barriers of insider control, to replace incompetent managers and, in general, to substitute equity markets which functioned poorly. Mergers, credit-for-equity swaps, debt contracts, and informal networks were most often exploited. Though it is too early to make definite conclusions about the efficiency of bank-industry relations in the defense sector, nevertheless several initial—if contradictory—observations can be made.

First, not many bank-industry mergers in the 1990s were driven by the officially proclaimed long-term strategic aims. As a rule, the real targets were pragmatic and short-term, thus relations remained unstable. For example, in the early 1990s, the enterprises established so-called 'pocket banks' with the only aim of reducing interest rates for insiders. Later, the establishment of financial-industrial groups was mostly driven by the incentive of economizing on VAT (value added tax) in the transactions among the group's participants. Banks, in turn, have been interested in resale rather than in investment or restructuring, and in getting control over the cash flows of exporting corporations. Figure 15 illustrates the instability of bank-industry equity mergers. Urinson noted that, in groupings with banks, false targets and hidden agendas are found in the defense industry more often than in other industrial branches (Jakov Urinson, former Minister of the Economy, interview 5 August 1998, Eksport Vooruzheniy, No. 4, August 1998, available at www.cast.ru).

The second observation is that banks have been reluctant to become actively involved in corporate governance until they have acquired control stock, which is difficult to obtain in the defense industry. Thus the formation of financial-industrial groups has not been accompanied by investment recovery. Furthermore, due to the specificity of bankruptcy procedures for defense enterprises, banks have difficulty collecting collateral in the event of default, and therefore require high liquidity collateral (as state bonds before the 1998 crisis) which the ailing defense firms can rarely offer.

Figure 15: Selected non-state portfolio investors in the Russian defense industry

Sources: Vedomosti, *5 May 2000; VPK Information Agency, Survey, November 1999*

Banking or investor group	*Defense enterprises under control of the banking or investor group, 1998*	*Development after 1998*
Interros (ONEKSIMBANK)	Severnye Verfi andBaltiyskiy Zavod shipyards 14 percent of Sukhoy (aircraft) LOMO (optics) Dygterev plant (small arms) Kovrov mechanical plant Moskva radio plant	ONEKSIMBANK restructured itsinvestments: its stockin Baltiyskiy Zavod was sold; other shares were either sold or transferred to the Novye Programmy i Kontseptsii holding where Interros holds 50 percent of shares
Inkombank	10 percent of Sukhoy Morskaya Tekhnika (diesel submarines) financial-industrial group Ulan-Ude aviation plant	Bank underwent bankruptcy; some defense company shares were most probably placed in off-shore financial centers. Stock in the Morskaya Tekhnika financial-industrial group taken over by the National Reserve bank
Rosprom (Menatep Bank)	Kurgan machine-building plant (armored vehicles)	-
Group of Kaskol companies	20 percent of Sokol (aircraft) 15 percent of Rosvertol (helicopters) 60 percent Hydromash (aircraft)	Increased its participation in the defense industry
Kakha Bendukidze	Ural machine-building plant Almaz shipyard 38 percent of Krasnoye Sormovo (shipbuilding)	Concentration of stock, struggle over corporate control against company insiders
Oppenheimer fund	Shares in Hydromash Urkutsk aircraft plant Progress (helicopters) Ulan-Ude aviation plant	-
Novye Programmy i Kontseptsii	Kovrov mechanical plant and other entities	
Aviabank	Integrated into MiG-MAPO concern	Aviabank separated the divisions of the concern after its reorganization in 1999

Box 4: Izhmash

Izhmash is located in the defense industrial heartland of Russia, the Udmurt Republic, and is a heavily defense-dependent enterprise which underwent severe decline in the 1990s, launched conversion and restructuring initiatives to compensate for its military losses, and experienced partial recovery as a result of war contracts in 1999/2000 and export sales. A relatively large-scale conversion project is also underway.

Izhmash is the chief manufacturer of automatic small arms in Russia, though today's military sales to the Russian Department of Defense are focused on precision artillery shells and missiles. Export sales consist predominantly of small arms, hunting weapons and motorcycles. In 1999, exports accounted for US $ 39.1 million.

The enterprise has serious technological barriers to conversion: automatic production lines are hardly convertible, while the market for alternative and comparable civilian products—hunting rifles—is too small to compensate for the decline in defense orders. Another complication is the state's requirement of retaining mobilization capacities. Thus managers are not able to either sell or dismantle idle production capacities. The Department of Defense had owed Izhmash payment arrears for more than five years, some of which were paid in 2000 though without compensation for inflation.

The enterprise, in turn, is heavily in debt to state bodies at all levels. To solve this problem, the managers offered the city government shares in exchange for debt recovery and the transfer of social assets to the municipal authorities. It is remarkable that Izhmash is still subsidizing one fourth of the city's housing, road maintenance, hospitals, its concert hall, power stations, dam and sluices.

As for civilian activities, Izhmash traditionally manufactured motorcycles, components for the automobile industry, small fire extinguishers, bicycles and diesel engines. However the market for these products is fairly depressed in Russia. Recently, a new conversion project was launched: in 1999, an intergovernmental agreement was signed concerning the project of assembling Volkswagen automobiles at the Izhmash production facilities released from the defense industry.

Restructuring initiatives at Izhmash followed the fashion which dominated the defense industries of the 1990s: thirty subsidiaries have been established as profit centers, though financial and material flows between them have been integrated vertically. Export sales and marketing of small companies were centralized and controlled by the parent company. Another restructuring measure—transfer of social assets—has not been completed in view of scarcity of resources in the municipal budget.

Source: Vek, *18–25 March 1999; Jakov Urinson, former Minister of the Economy, interview 5 August 1998,* Eksport Vooruzheniy, *No. 4, August 1998, available at www.cast.ru*

Small businesses

As for small business development in the defense industry, there was substantial growth in the early years of transition but this slowed down later. However, many controversies surrounded the process of spinning off the small firms. For example, there is a great deal of evidence that small firms have made a major contribution to technology commercialization and conversion and have proved to be significant shock-absorbers. Furthermore, they stimulated entrepreneurship and helped to breed a new generation of managers, providing additional secondary income to low-paid engineers from the parent company. It is however difficult to ignore the fact that the development of small and medium-sized enterprises (SMEs) has been used extensively to pump state resources from larger firms and for tax evasions and shadow performance. The managers of the parent firms often establish SMEs to avoid tax payments: confronted with low liquidity, they transfer payments from their clients—which would otherwise be confiscated by the tax authorities—to the small firms' accounts. Concerned about poor tax collection, the government therefore tends to discourage the spin-off of small firms (Putin, 2000).

Recently another dimension of SME business in the defense industry has been seen: given the low levels of military procurement and the predominance of modernization contracts rather than the manufacture of new systems, existing outputs can be maintained by producting on smaller scale plants which have greater flexibility and lower overheads than the parent companies. Establishment of new small firms, targeted specifically at weapon modernization, has been reported in the late 1990s. They compete successfully for Ministry of Defense modernization and R&D contracts, offering more competitive prices and quality, and capitalizing on the developments of the mother company. These 'new small defense companies' are already active in avionics, navigation, software engineering, radio techniques, protection of the individual soldier, and so on. Examples are: Russkaya Avionica, established by the former MiG designers who quit the large concern and which competes with the parent company for MiG-29 and MiG-31 modernization contracts; Kronshtadt, a new company established by the state arms exporting agency Rosvooruzheniye; Transas from St. Petersburg, a monopolist in sea navigation systems; and the Central

Bank's subsidiary Eurofinance which develops navigation systems for combat aircraft (*Vedomosti*, 5 May 2000).

Cash-rich partners

Plugging into cash-rich civilian partners also proved to be a mechanism that provided sustained recovery for some defense enterprises. The case of the natural gas monopoly, Gazprom, offers the best example of non-state procurement, investment and even subsidization. The product line ranges from gas-pumping engines, re-engineered from aircraft motors (at Rybinskiye Motory in Yaroslavl') to various drilling tools (made at the Voronezh mechanical plant) and sea platforms (the Rosshelf Project). Automobile companies are also considered an alternative to defense markets: in 1999, for instance, 38 defense enterprises in the Nizhniy Novgorod region already manufactured components for the GAZ automobile factory, which alone has been producing more than one-third of the region's industrial output (*Krasnaya Zvezda*, 7 August 1999).

It appears, however, that, as of early 2000, the enterprises in the defense complex which performed best were, above all, the leaders among the arms-exporting companies along with enterprises which benefited from the build-up of expenditures due to the war (Center for Economic Analysis, 2000). This may be seen as an indication of hard times for conversion initiatives. On the other hand, evidence suggests that these growth factors will hardly last long and will not be sufficient to maintain the industry's recovery. It is remarkable that even such companies as MiG and the producers of the Su fighter series have turned to the civilian aircraft markets (see Box 5) in an attempt, through a fundamental change of strategy, to carry over their success on the arms markets into the future.

Regional shock-absorbing instruments

There are defense industries in 72 of the 89 administrative Russian territories, particularly heavily concentrated in the Ural and Moscow regions and Moscow itself, St. Petersburg and East Siberia. Defense-dependent regions and especially towns dependent upon one particular company, so-called 'company towns', suffered badly from the defense build-down and are still in the process of learning how to cope with depression, job cuts, and large-scale resource reallocation. Regions lack traditions of structural adjustment: the centralized nature of the previous system made all decisions subject to Moscow's authority; regional policy instruments, bureaucratic skills and infrastructure have to be developed from scratch. Until the 1990s, regional administrations were in charge of only a very limited number of public policy areas, related to communal and infrastructural issues, food and labor shortages, but the deep structural crisis as of the 1990s left regional authorities with no alternative but to devise a broader range of policies, including conversion.

Box 5: MiG-Sukhoy: failed merger

The story of mergers and scandals associated with the leading Russian manufacturers of the MiG and Su fighter series mirrors the complicated nature of factors influencing the restructuring of the aircraft industry. Both companies went through the establishment of vertically integrated concerns, experienced 'ups' and 'downs' in export sales, faced resistance from the government, regions and partners, and entered into tough competition for domestic and international contracts.

Events culminated in 1999, when the government fired top managers and introduced a plan to merge both entities, MiG and Sukhoy. The Defense Ministry and the Ministry of the Economy jointly lobbied for nationalization of MiG-MAPO in the form of a 100 percent state-stock company and for its disintegration and further unification with the Sukhoy group of companies. By 2000, the merger had still not materialized, though the chief designer of the Su-35 and 37 fighters and a member of the Sukhoy's board of directors Nikolay Nikitin was appointed Director General of the MiG company (the fifth director in four years). Unexpectedly, he changed strategies and launched cooperation projects of MiG with civilian counterparts in the aircraft industry, namely the Tupolev and Ilyushin holdings.

MiG Russian Aircraft Company

On the eve of these dramatic changes, the MiG Russian Aircraft Company (as MiG-MAPO is now called) was comprised of 12 enterprises from different sub-sectors of the aviation industry, mainly involved in the manufacture of military aircraft and helicopters. This concern was viewed as one of the best example cases of industrial integration, active restructuring, literate market behavior and aggressive expansion. However, several events in the late 1990s made the situation deteriorate. Domestic and international contracts dried up decreasing liquidity. Internal conflicts—as well as the testing of a 'fifth generation fighter' which turned out to be a bluff—made the public question the leading role of MiG in the Russian defense market. This was completed by the embezzlement of state credit, which had been intended for the support of MiG's deal with India.

In the meantime, key designers quit the company and established the private firm Russkaya Avionika under the former director general, Mikhail Korzhuyev. The new firm aggressively claimed a niche in the fighter modernization market. It developed a standardized cockpit, which could be used for different fighter models, including MiG and Su, and received a contract from the Department of Defense, competing directly with the parent company. Under pressure from the defense-industrial lobby however, the government withdrew the license for this defense contract in February 2000 in favor of the parent company, MiG.

As of mid-2000, the MiG Russian Aircraft Company has been comprised of six entities, including an engineering center (former design bureau), three manufacturing plants and one tooling and one testing facility. Entities which designed and manufactured helicopters, the Aviation Bank and some other entities left the concern. A total of 13,000 people are now employed and control is executed through the central company, which consolidates the state stock of all participants.

In 1999, the new director general announced the launching of a large-scale conversion program at MiG in order to have 80 percent of sales deriving from the civilian aircraft Tu-334 by 2002. It is worthy of note that the main Russian competitor in this market, Aviastar from Ulyanovsk which used to manufacture civilian aircraft of the Tu family, may lose out to the competition as it is too financially distressed to invest in certification and the modernization of capacities. MiG on the other hand hopes to raise the necessary funds from international contracts dealing with the modernization of MiGs and from other military export contracts. Thus MiG's new strategy is to carry out extensive conversion in the field of core specialization and to use military sales to support this new strategy.

Moreover, the military market is shared with Western partners: DASA is involved in the MiG fighter modernization and a group of French firms in the joint development and marketing of the MiG trainer jet. It is also possible that priority will be given to the development and manufacturing of the multi-purpose dual-use aircraft, MiG-110.

Sukhoy

The Sukhoy military-industrial concern (VPK Sukhoy) is another example of difficulties in integration and restructuring. It was supposed to be the leader in a possible MiG-Sukhoy merger, having at the time a better position and perspectives both on the domestic and international military aviation markets, though integration within the Sukhoy concern has not yet been completed. In contrast to MiG, the leading role in integration within Sukhoy has been played by the design bureau rather than by the manufacturing companies. Participants of the concern, however, remain in conflict, which is further complicated by the conflicting interests of the central and regional governments, host manufacturing enterprises, the confusing ownership status of participants, and ambitions of individual managers.

As of 2000 the VPK Sukhoy has been comprised of the Sukhoy and Beriyev design bureaus and three serial manufacturing plants. All have different property status: the design bureaus and the Irkutsk plant have been privatized (the state retains the control stock in the design bureaus but only 15 percent of shares in the Irkutsk plant); the assembly plants in Komsomolsk-na-Amure (KNAAPO) and Novosibirsk (NAPO) are state unitary enterprises. Assembly plants manufacture different models of Su, Beriyev and An aircraft, linked to various different international and domestic contracts. Moreover, plants use technologies in their manufacturing lines which are different in principle, even if one type of aircraft is produced, and therefore the low level of standardization adds to the difficulties of merger (Kuzik, 1999).

The idea was to corporatize the assembly plants as a 100 percent state-stock holding and to concentrate the state stock of all five entities into the central company. Reduction of production capacities was planned, as well as getting rid of non-core businesses and social assets, and an expansion into the civilian markets with airplanes for rent.

Assembly plants have been fighting against these plans for four years since 1996 however, when the government decision concerning this merger and corporatization was taken. The main 'troublemaker' is KNAAPO, which is involved in Su-27 sales to China and other projects such as Beriyev's Be-103 and S-80 aircraft. KNAAPO is resisting privatization and merger, being concerned about losing control over its finances and profits in favor of the central company. The regional government of Khabarovsk *kray* is supporting the company in view of a possible transfer of tax payments and export revenue from the region to Moscow. Moreover, the closing down of non-core businesses associated with KNAAPO (including factories producing furniture, bricks, bicycles, boats and agricultural products along with polyclinics, sport and other social facilities) is expected to cause great distress to the local economy which is highly dependent on the aviation plant. At the time of writing in early 2000, resistance had been successful: the central government had delayed privatization under pressure from the regional lobby, which had even organized itself into a Committee for the Protection of KNAAPO and collected 60,000 signatures against privatization.

Another line of conflict between the state and the concern is the fact that the state claims intellectual property rights over developments funded from the federal budget. The latest news from Sukhoy is separation of the civilian subdivision as a stockholding

called Civilian Sukhoy Aircraft, registered in Moscow in late May 2000, and the development of conversion plans, both in R&D and manufacturing fields. All 100 percent of shares of the new company will belong to the Sukhoy design bureau rather than to the concern. In principle, Sukhoy has experience in civilian design of the SU-26 sport aircraft and S-21 passenger jet. Some R&D work has been conducted on the supersonic business jet S-21 though there is reason to believe that the new company will focus on R&D subcontracts from Western clients, using the manpower skills of the parent design bureau.

Sources: Nezavisimaya Gazeta, *6 February 1999;* Parlamentskaya Gazeta, *2 September 1999;* Rossiyskaya Gazeta, *5 November 1999;* Segodnya, *24 December 1999;* Vek, *5-11 February 1999;* Nezavisimoye Voyennoye Obozreniye, *17–23 March 2000;* Kommersant, *1 June 2000*

In a study by Gonchar and Opitz, (Gonchar and Opitz, 2000) it is shown that, however problematic the economic situation in the regions was, decentralization has nevertheless provided them with the decision-making power and resources to influence conversion in a positive way: regions now raise and reallocate more money than the federal budget does and play a larger role in subsidizing industry and social expenditures than the central government. Moreover, 31 regions which host significant defense industries, have signed agreements with the central government concerning policy coordination with regard to defense procurement contracts, conversion, and structural and investment policy (Pimenov, 1999). It is likely that regional administrations will take over from central government in holding the stock of defense enterprises, released from military contracts. Furthermore, the state arms exporting agency, Rosvooruzheniye, has opened up its offices in ten regions in order to support coordination between defense enterprises and regional administrations with respect to placing export-oriented subcontracts and control over their fulfillment (Jakov Urinson, former Minister of the Economy, interview 5 August 1998, *Eksport Vooruzheniy*, No. 4, August 1998, available at www.cast.ru). Another reason is, however, to prevent inexperienced regional authorities from marketing Russian arms abroad, which, according to the agency, has already resulted in losses (*Eksport Vooruzheniy*, 1999, November/December, p.10).

The role of defense-dependence

There are striking regional discrepancies in the way local economies overcome defense dependency and are adjusting to transition shocks. Defense-dependent cities in depressed economic regions are especially vulnerable to the negative social consequences of defense-related depression. Recently published data shows that there are 70 defense enterprises located in completely defense-dependent cities in thirty of Russia's eighty-nine regions (Ministry of the Economy, 1998, p. 30).

On the other hand, at a more aggregated regional level, it seems that initial defense dependency matters less than economic history and sectoral specialization, access to exportable resources, and the availability of built-in 'stabilizers' and 'shock absorbers'. For instance, the economies of the city of Moscow, Ural and St. Petersburg, which used to produce better guns and better butter, are in general also in a better position than those of the regions which are far less defense-dependent but which lack marketable resources and a cohesive public policy.

The October 1998 survey of regional aspects of defense industry adjustment, based on questioning of defense enterprise directors, showed that not a single economic region is anywhere near recovery or stability in defense-industrial matters: all are depressed, struggling with low utilization of capacities, job losses and payment arrears. Some have even collapsed: defense directors from the Central Black Earth economic regions unanimously reported capacity utilization of below 25 percent, significant job losses, very low salaries, and salary payment delays of over three months. The Central Region, Ural, Eastern Siberia and the Far East are in a far better position. As regards the 1999 recovery, it was concentrated mostly in Ural Transvolga and the North-West region, which reported the highest output growth and improvement in enterprises performance (Center for Economic Analysis, 2000).

Adjustment assistance is required in all regions concerned, even if they are in general slow to recognize their new role and the importance of well-

designed policies. Regional conversion programs have remained on paper instead of being funded, while financial flows from the regional budget to assist conversion have been exceptional and scarce. Regions have been more successful in the establishment of infrastructure for small businesses, employment centers and assistance for technology transfer. These instruments are not defense industry-specific, but are of great practical help in the adjustment process.

Regional contributions

On the other hand there is some evidence that regional administrations have taken the initiative in designing defense industry restructuring programs. The regional contribution to defense conversion and restructuring policy includes the following:

- Introduction of low energy tariffs for enterprises which carry out public orders along with exemption from land and property taxes and lowering of tax on profits (Moscow City administration).
- Establishment of interregional cooperation (Moskva-Yaroslavl' regions, Siberian agreement, Greater Ural), and coordinated lobbying of the central government.
- Separation of land lying idle and idle production shops from the defense enterprises and establishment of innovative technology parks and low-rent small firms on the land released (St. Petersburg).
- Regional and municipal procurement in transportation, infrastructure and other fields (Moscow, Nizhniy Novgorod).
- Initiation of industrial concentration and conversion. For example, the administration of the Far Eastern Primorskiy *kray* expressed its readiness to retain only five defense enterprises in the region. Moreover, it decided to subsidize these five entities in order to increase their chances of staying in the Russian defense market. It also designed a civilian procurement program to support demand for products from the other companies.
- Direct control and management of public property. Thus the government of the Tatar Republic took seven defense enterprises under its jurisdiction, which did not have military orders. The decision was made to freeze military production capacities, restructure enterprises and separate civilian production shops.
- Creation of industrial zones where there is an especially favorable business climate for rapid conversion of defense enterprises. The electronic city Zelenograd in Moscow and seven zones in Nizhniy Novgorod have already been established.

However, the above mentioned support is not provided without costs for the central government: powerful regions have been demanding the transfer of the valuable federal stock of the defense enterprises to regional jurisdiction. How far this process will go, remains unclear, especially in view of the serious shift in the regional policies of the government in 2000: after years of liberalization and deconcentration, the Putin government has launched the policy of return to more centralized methods of control.

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