

the likely path of short- and medium-term developments. These developments will either constrain, or provide the opportunities for, proposals to control conventional proliferation.

The first characteristic is that the system is driven by the *development of new (or revolutionary) military technologies* that create "gaps" in the capabilities of weapons possessed by states. These differentials can translate into battlefield superiority, even in cases of numerical inferiority, as was demonstrated during the 1990-91 Persian Gulf war. Examples of these innovations range from the dramatic (the development of rifled steel cannon, "Dreadnought" battleships, military jet aircraft, or nuclear weapons) to the mundane (improvements in avionics or weapons guidance, more efficient explosives). Attempts to close or eliminate these gaps, and to stay at or near the forefront of "modern" weapons technology, have been a major goal of national defence and security policies for centuries. This is the primary impetus behind both arms production and the arms trade.

*Dominant centres of military innovation* have always emerged in a small number of states (between one and four). These states, whether Britain, France and Germany during the Industrial Revolution, or the United States and the Soviet Union after 1945, are in any given period the largest producers of weapons, they possess the largest and most advanced research and development (R&D) establishments, and they have sizable domestic markets for the weapons they produce.<sup>4</sup> This R&D capability and size of the domestic market ensure that these leading edge (*first-tier*) producers are able to push forward the frontiers of military technology, and are *not* as dependent upon exports to maintain a healthy defence industry as other producers. They are also, not surprisingly, usually global great powers or superpowers, and are the most concerned with maintaining their edge by protecting their lead in military technologies.

Behind the leading-edge states are ranged a *second tier* of arms producers, who have a strong enough industrial and technological-economic base to keep pace with advances in military technology, but not to lead it forward. In certain limited sectors, they can become innovators or specialists, but in general these states possess a much smaller domestic market and make limited investments in R&D. Their goal is to be able to build and adapt new weapons to their needs, and to maintain a relatively equal military and political status with the first tier states. Their economic and industrial infrastructure is usually comparable to that of the most advanced states, although the small size of their domestic arms markets make them more dependent upon exports. Because their competitive edge in exports is also

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<sup>4</sup> Of course, at different times military R&D has been primarily private, primarily public, or some combination of the two. See Maurice Pearton, *Diplomacy, War and Technology since 1830* (Lawrence: University Press of Kansas, 1984).