

INTRODUCTION

A complete treatment of the subject of modernization and the qualitative arms race would cover a substantial portion of the scientific, engineering, and manufacturing activities of the industrialized world. In a recent publication¹ the US Department of Defense made a comparison of the levels of technology in military systems deployed by the Soviet Union and the United States in 1990. The military systems are listed in Table 1. There are thirty-one of them, grouped under the major headings of Strategic, Tactical, and C3I (i.e. Command, Control, Communications, and Intelligence). Tactical systems include sub-groups headed land forces, air forces, naval forces, and an additional system is Training Simulators.

One of the objectives of this paper is to relate modernization and the qualitative arms race to the problems of the assessment of military balances and to arms control. The most important arms control agreements that have been negotiated dealt with strategic forces or tactical land and air forces. The most generally accessible data regarding inventories of military systems concern major weapons such as strategic nuclear delivery vehicles, combat aircraft, tanks, and naval combatants.

The approach to this study of modernization will be an historical one, seeking lessons from the past experiences of modernization, extending over several "generations" of weapon systems.

1992 is a good year in which to examine the modern history of weapon modernization. For four decades, modernization was driven by the pressures of the Cold War. The rich nations devoted a substantial proportion of their gross national product and a larger proportion of their technological capabilities towards weapon modernization, by indigenous research, development, and production, and by purchase. And, when they were able to substitute new first-class modern replacements for equipment whose age and technology had degraded it to second class, the older (but still perfectly usable) second-class equipment was often passed on to a poorer ally. For the ally, substitution of their third-class equipment by second-class replacements also represented a modernization.

With the end of the Cold War, and the signing of significant agreements for arms reductions, defence expenditures and sizes of armed forces are expected to decrease. However, this does not necessarily imply less efforts to modernize weapons in the future. The United States has indicated that it intends to apply its defence budget cuts to personnel and weapon procurement, but will continue with research and development. Many of the weapons to be eliminated under the terms of the CFE treaty are likely to be transferred to other countries, for whom their acquisition will represent a modernization. There is likely to be a desire to maximize the quality of the (smaller)

1 *Soviet Military Power 1990*, United States Department of Defense, Washington, 1990, p.46.