Eureka and Esprit: Implications for Theories of European Political Integration*

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INTRODUCTION

Eureka and Esprit are international research and development programs with the common goal of promoting the development of a European information technology (IT) industry that is competitive with the United States, Japan and the most advanced newly-industrialized countries. While Eureka and Esprit have similar ostensible objectives, the structure and administration of each program is vastly different. A comparison of Eureka, an intergovernmentally administrated program, and Esprit, a program administered by the European Community (EC), offers insight into the nature of policy integration within the EC. The comparison of Eureka and Esprit serves as evidence that European political integration within the EC contains elements of both neo-functionalism and neo-realism. Scholars have recognized the inadequacy of either neo-functionalist or neo-realist models to predict the course of political integration, yet have found it difficult to develop something more robust. Eureka serves as an example of neo-realist policy integration to compare against Esprit. Esprit serves as empirical evidence for the notion that new theories must combine elements of neo-functionalism and neo-realism.

The methodological approach of this paper treats the process of policy integration embodied in Eureka and Esprit as variables dependent on the dynamics of relationships at three levels. The first level of analysis is the dynamic of

relationships between each program's administrating body and the national governments of the countries party to Eureka and Esprit. The second level of analysis studies the relationship between the respective administrating bodies and the IT producers. Finally, the third level of analysis focuses on how collaboration between firms has shaped Eureka and ESPRIT. A comparison of Eureka and ESPRIT at each of these levels demonstrates that policy integration within ESPRIT is characterized by both neo-functional and neo-realist qualities. While the multilevel analysis does not include the influence of every agent responsible for the shape of ESPRIT an Eureka, it demonstrates our fundamental claim with a minimum of variables.

BACKGROUND

Historically, despite the efforts of the European Commission to develop a coordinated EC level policy, industrial policy in western Europe has been the domain of national governments. A comprehensive picture of Eureka and ESPRIT requires a rudimentary understanding of how national industrial policies developed alongside the EC. The perception held by several EC member countries in the late 1970's that Western Europe was becoming less competitive globally in IT is another important factor in the evolution of Eureka and Esprit. Finally, a brief review of the theoretical interpretations of policy integration within the EC will complete the background,

National industrial policies in the European Community (EC) member countries have been independent and often contrary to the principles of the Treaty of Rome. The European Commission's effort to create an EC level research and development program in the Information Technology (IT) field is representative of a general effort to replace national industrial policies with a coordinated EC effort. The 1992 Single Market initiative has aided the Commission's effort by eliminating many of the protectionist industrial policy tools used by member countries. However, a complete understanding of Esprit's contribution to the EC's political integration requires looking beyond the 1992 initiative.

The composition of industrial policies in the European Community varies by country. The variation reflects

different national philosophies and often the structure of the government. Despite national differences in application, several policy tools are common to European industrial policies. Subsidies, directed procurement strategies designed to support a particular industry, and national technical standards tailored for domestic producers help national governments preserve particular production patterns. Governments also use incentives such as tax breaks, low-cost financing, and research grants to promote the development of industries they feel will be competitive in the future. Individual Community members have applied these tools differently to create unique national industrial policies. Since its inception, the Common Market has struggled with national industrial policies that discourage intra-Community competition and trade.

The 1957 Treaty of Rome recognized a need for better coordinated markets at a European level. Rather than organize activity in a single sector, the Rome Treaty sought to create a common European market for industrial goods by eliminating intra-Community tariffs. The architects and proponents of the Rome Treaty represented a range of economic and political goals but all agreed that trade was critical to the economic development of Europe. The Rome Treaty explicitly required the development of common policies for agriculture, trade and transport, fiscal harmonization, and competition, but did not mention

industrial policy. National differences in industrial policies were too difficult to reconcile at the time.

Despite intense economic growth in the Community member countries during the decade that followed the Rome Treaty, a true internal market did not develop. Many industries underwent concentration at a national level through mergers, but the non-tariff barriers implicit in national industrial policies often prevented competition at a European level. National firms benefited from subtle forms of support including tax breaks, procurement, low-cost financing and technical standards that favored domestic producers, but the creation of intra-Community business entities was limited by the absence of a common European corporate law.[1] Intra-Community trade grew but European industry did not reorganize to reap economies of scale at a Community level or benefit from intra-Community competition. Many large firms became dependent on nearly captive national markets and did not feel competitive pressure to innovate. Against a background of general economic growth, these phenomena did not become apparent until several years later.

The European Commission attempted to define a comprehensive industrial policy with the 1970 Colonna Report. The Colonna Report recognized that significant barriers to trade existed beyond those eliminated by the

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[1]Elizabeth de Ghellnick, "European Industrial Policy Against the Background of the Single European Act," Main Economic Policy Areas of the EEC: Toward 1992 (Norwell MA: Kluwer Academic Publishers, 1990), p.120.

Rome Treaty. A European industrial policy administered by the Commission could establish a European corporate law, rationalize industries to make them more competitive, and define a role for the Community in innovation and the development of new technology.

At the time the Colonna Report was released, member countries were not receptive to a comprehensive policy that would impinge on their ability to use national industrial policy tools. During the mid 1970's, the inward looking reactions of the European Community members' national governments to price shocks in oil and commodity markets and subsequent high inflation and unemployment highlight the difficulty the Community had in establishing any policy, let alone industrial policy.

Coupled with high inflation and unemployment, was the perception that the countries of Western Europe faced a growing "technology gap" in fields of IT and microelectronics. Later empirical studies revealed that Western European firms lost considerable global market share in IT through the 1970's and 1980's. In 1975 the EC had a positive trade balance of 1.7 billion ECU in these technologies. By 1988 the EC reached a deficit of 22 billion ECU in the same technologies.[2] Similarly, in 1973 Western European countries provided 18% of the world's semiconductors, an amount equal to Japan's market share. By

[2]"Esprit: Key to the Technological Awaking of Europe," Commission of the European Communities, Nov. 1989, p.4.

1981 the European companies' global share fell to 7.5% while Japan's had grown. [3] The perception that a "technology gap" was growing between Western Europe and the United States and Japan helped prompt both the European Commission and several large EC members to develop IT research and development programs.

During the 1970's, the EC's largest sponsors of national IT research programs, France, Germany and the United Kingdom, had undertaken competitive national strategies. All three encouraged mergers among domestic IT producers in hopes that national champions large enough to compete with United States and Japanese would emerge. Strategic government procurement programs and the development of national technical standards geared toward national producers provided national champions with a market. The national strategies of the three largest IT producing countries in the EC were not conducive to an EC level IT research policy.

Not only were national strategies incompatible with the Commission's vision of a European IT industry, but the strategies themselves did not foster firms that could effectively compete outside their national markets with United States and Japanese companies. European IT firms gradually became more reliant on overseas companies for access to new technologies that they were not developing themselves. Eureka and Esprit are international programs

[3] "A New Technology Gap for Europe?" SAIS Review, May 1985, p.229.

that seek to improve the competiveness of the European IT industry where national programs appeared insufficient.

This paper argues that Eureka, a non-EC IT research and development program, is a clear example of an intergovernmental arrangement that coincides with neo-realist theories of political integration while Esprit combines elements of neo-functionalism and neo-realism. Considered broadly, scholarly analysis has approached political integration within the EC from either a neo-functional or neo-realist perspective. Yet many observers recognize that neither approach holds empirically.

Neo-functionalist theories of European political descend from the work of Ernst B. Haas. Neo-functionalism views political integration as a continuous process characterized by "supranationalism." [4] Years of simplification have changed Haas' s concept of surpanationality. Supranationality is perhaps best articulated by Keohane and Hoffman who use the term to describe a decision making process that centralizes the policymaking power of its members in an institution that embodies a gradual shift in loyalties from national states to a supranational institution.[5]

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[4]David R. Cameron, "The 1992 Initiative: Causes and Consequences," in Alberta M. Sbargia ed., Euro Politics: Institutions and Policymaking in the "New" European Community (Washington D.C.: Brookings, 1992) P.25.
[5]Robert O. Keohane and Stanley Hoffmann, "Institutional Change in Europe in the 1980s," The New European Community: Decisionmaking and Change (Boulder CO: Westview Press, 1991) p.16.

Neo-functionalism describes regional integration as a process by which states assign "inherently expansive" tasks to a supranational institution.[6] As the supranational institution implements its tasks, their expansive nature leads to pressure from interest groups, including political interests within national governments, to push for expansion of the institution's authority. "Spillover" occurs when change caused by integration one area leads to pressure for changes in related areas. In the case of Esprit, IT research and development is assigned to the Commission, integration begins with pre-competitive research but is inherently expansive. Research in IT, for example, establishes the foundation for common technical standards.

Neo-functionalist theory, in its present state, cannot completely explain the integration of research and development policy in IT within the EC. John Peterson has developed a complex scheme to separate and examine the development of policy communities within EC research and development policy.[7] Peterson's work shows that neo-functionalism explains aspects of the ESPRIT program, especially at the project level, but falters as a macro theory at higher levels.

Neo-realist views of European integration contrast the neo-functionalist view of integration as an continuous

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[6]Cameron, p.25.
[7]John Peterson, "Technology Policy in Europe: Explaining the Framework Programme and Eureka in Theory and in Practice," The Journal of Common Market Studies, vol. XXIX no.3 (March 1991).

process that leads inevitably toward closer economic and political integration.[8] Neo-realism assumes that the nation-state is the principal actor in international politics and that self-interest motivates states to cooperate. Neo-realism views the EC as an international or intergovernmental institution rather than a supranational institution. The EC has power to the extent its member states allow, member governments exercise ultimate authority. Neo-realist theory sees member states selectively "pooling" their sovereignty in the EC rather than ceding or assigning it to an expanding supranational authority.

A crude application of neo-realist theory would explain the extension of EC authority in research and development in the IT industry as a bargain between EC member governments to pool their resources to obtain benefits that were unavailable individually. Actual analysis of ESPRIT from a neo-realist perspective, reveals a complex process that a neo-realism as a macro theory cannot adequately explain.

Scholars such as Keohane and Hoffman and Cameron represent a growing number who feel that models based strictly on neo-functionalism or neo-realism are insufficient predictors of European political integration. Keohane and Hoffman combine neo-functionalism and neo-realism when they contend that the EC represents a supranational process that occurs in the context of

[8] Cameron, p.28.

agreements between governments. Similarly Cameron argues that both neo-functionalism and neo-realism are helpful if not imperative to explain the integration process.[9] A comparison of Eureka and ESPRIT provides empirical evidence that policy integration is a process that combines neo-functionalism and neo-realism.

The Development of Eureka

The Eureka program began as a political initiative by the French government to counter President Ronald Reagan's Strategic Defense Initiative (SDI, or "Star Wars"). In early 1983, Ronald Reagan announced his intention to develop a strategic ballistic missile defense system. The proposed $26 billion project would, require the most advanced developments in the IT industry. To help meet this need, U. S. Secretary of Defense Caspar Weinberger attempted to enlist the aid of other NATO allies.

SDI received minimal support from America's NATO partners. The French government sponsored a counter program to encourage European NATO members to collaborate in high-technology military research and development. Euphemistically invoking "European unity", the French started the project with the interest of protecting the French armament industry, improving the Mitterand government's relations with business, preventing a "brain drain" of French technologists and researchers to the United States, and out of a general concern

[9] Cameron, p.30.

for the future of the French economy.[10] The program, however, lacked funding and strategic vision. The beginning stages of Eureka lacked organization at the European level, and was viewed with skepticism by other EC governments. The private sector's involvement in the Eureka program was unclear, and some EC governments resented the thought of potential French dominance in the proposed joint-ventures.

A trip to NATO capitals in the spring of 1985 by SDI program director Lt. Gen. James Abrahamson led to a revival of industry and government interest in Eureka. Although attempting to sell the SDI program directly to NATO high-tech companies, Abrahamson raised the specter of U. S. export control laws that might limit the transfer of sensitive technology to European corporate participants. EC industries and governments drew a parallel from this suggestion to the Siberian gas pipeline dispute that occurred two years earlier. The French response was direct: President Mitterand turned down French participation in the SDI project and declared that French industry would not play the role of sub-contractor to the United States. Several EC governments, feared that involvement with SDI, would increase the EC's dependence on American technology. Meanwhile, representatives from four large European IT corporations - Phillips (Netherlands), Siemens (Germany), ICL (Britain), and Thomson (France) - met privately and proposed five priority areas for a successful Eureka collaborative research and development program. The

[10] SAIS Review, p. 230.

areas proposed by the companies were: 1. Information Technology; 2. Communications Technology; 3. Robotics; 4. Life Sciences; 5. New Materials: ceramic turbines.[11] The eventual Eureka partners reacted to the IT coporations proposal with a propsal that expanded on the French Eureka initiative.

Despite the renewed interest in Eureka, the launch of the program was beset by member state disputes regarding the areas of funding, project administration, and project focus.[12] Holding to is initial vision of Eureka, France wanted the member states to make large contributions for the collaborative research and development program. Britain vigorously opposed this, and favored private sector funding for the initiative. Italy and the small states were in favor of a powerful central agency to govern Eureka, whereas Germany, France, and Britain, wanted a small bureaucracy with limited powers.[13] In addition, France and Britain saw Eureka purely as a market-driven research and development program, whereas Germany hoped that Eureka would help solve public problems common to all of the members states - such as pollution and traffic control.[14] Because of these policy

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[11] Ibid, p. 231.

[12] The participating states were Austria, Belgium, Denmark, Finland, France, West Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. The Commission was also represented as a separate entity in the body. Since the first meeting in July 1985, Turkey, Iceland, and Hungary have joined the Eureka program - with a host of other East European states expressing great interest as well.

[13] Peter Gumbel, and Richard L. Hudson, "Europe's High-Technology Eureka Project is Beset by Squabbles, Inadequate Funding", Wall Street Journal, November 5, 1985: p. 34.

[14] Curien, p. 61.

disputes among the member states, it took Eureka members nearly five months to draw up Eureka's "Declaration of Principles".

Significant progress was achieved by the member states at the second Eureka conference in Hanover on Nov. 5-6, 1985. The ministers adopted a "Declaration of Principles that represented a compromise between Britain, France, and Germany. The declaration stated that the Eureka program would enhance cooperation between enterprises and research institutes in the hopes of improving the competitiveness and productivity European industry. Eureka would exploit high technology products, services, and processes to achieve this goal, as well as serving public sector interests.[15] The role of Eureka's secretariat, and means of funding, were not resolved until the June 30, 1986 London meeting. At this meeting, the member states decided to establish a small bureaucracy in Brussels.[16] The first 72 collaborative projects were also accepted at the London meeting

An additional 37 projects were approved at the Dec 17, 1986 meeting in Stockholm. The Stockholm meeting addressed the delicate issue of state financing with some member states pledging to make token contributions of public funds. West Germany and France were the major contributors, pledging $100 million and $115 million, respectively. By 1989, West Germany

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[15] Ibid, p. 61.

[16] For an interesting discussion on the debates (indicative of neo-realism) surrounding the site of the Eureka headquarters, see Curien, p. 62.

allocated 380 million ECU, France 220 million ECU, Britain 23 million ECU, and the Netherlands 11 million ECU.[17] Currently, state funding accounts for 35% of the total project costs in France, and 20% in Germany. Private and state funding supports over 500 Eureka projects involving 3,000 participants, working on projects worth over 8 billion ECU.[18]

If Eureka is examined in the context of the three different levels, administrating body-state, administrating body firm and interfirm, the evidence suggests that the Eureka development is neo-realist arrangement. Such a policy promotes limited cooperation and maximizes the sovereignty and control of the program by the participant states.

Eureka as a neo-realist bargain

The politics behind the formation of Eureka offers striking evidence supporting the argument that Eureka is the result of a neo-realist policy integration process. Eureka was initially a tool of French self-interest. The other EC and EFTA members only took the Eureka program seriously after the U. S. hinted that it might use export restraint laws to control the flow of vital information. The Mitterrand government shrewdly relaunched the foundering Eureka project, after Gen. Abrahamson's announcement. Only after this turn of events did industry formulate a plan for Eureka to assist the European high-technology industry. Eureka started as a state-led industrial strategy that was shaped by national champions.

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[17] Because of the varying length of these projects, it is very difficult to estimate annual spending levels see Gaster p. 250.
[18] Allan Piper, p. 73.

The Eureka secretariat, the program's administrating body, is subservient to the member states. Eureka's secretariat is small compared to the total value of the projects bearing its name. The headquarters in Brussels has only seven officials, with a small additional number of bureaucrats in each member state.

A second neo-realist element in the Eureka secretariat-member state relationship is that Eureka does not possess a central fund from which to finance high-tech research and development projects. The primary source of project funding comes from the participating firms. The member states are allowed to contribute up to 50% of the total project costs incurred in that country, but no government money crosses state borders.[19]

Although Eureka officials are fond of citing that projects under their banner account for over 8 Billion ECU, the private sector provides the lion's share of the funding for Eureka projects. Member state funding for Eureka projects is purely voluntary. Because of the voluntary nature of public sector funding, member state financial commitments vary widely, for example, France contributed nearly 10 times the funding for Eureka projects within its projects than Britain in 1989. The provision of funding on a voluntary basis serves state interest and avoids the chronic interstate funding disputes that take place in the Esprit program. In addition

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[19] Robin Gaster,"Research and Technology Policy," in Leon Hurwitz and Christian Lequesne ed. The State of the European Community, (Boulder CO; Lynne Rienner, 1991) p. 250.

this system protects individual state interests, due to the stipulation that no government money crosses national borders. One commentator describes the Eureka program as a tool for national governments to channel subsidies to selected projects - '...with a fashionable European twist'.[20]

At the administrating body-firm level of analysis, the secretariat's role is limited and simple: it plays a match-maker role by maintaining a free access database on Eureka activities, and promotes the program by circulating project proposals to companies which could offer collaborative assistance.[21] The industrial firms of member states were solely responsible for proposing Eureka projects. National governments provide public funding for individual projects. If a firm seeks funding it must look to its national government not the Eureka secretariat.

At the third level of analysis, the interfirm relationships of Eureka also are indicative of a neo-realist policy. Industrialists and researchers themselves determine the nature of the collaboration, and establish the form of project management.[22] The negotiated projects are confidential and participants to police the agreements. Eureka projects participants frown on technology transfer or the process of disseminating innovations to all members. Because Eureka partners negotiate the terms of the agreements

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20 Ibid, p. 255.
21 Ibid, p. 250.
22 Lutz G. Stavenhagen, "The Concept and Aims of EUREKA", Intereconomics, Jan/Feb 1986: p. 4.

among themselves, there are no Eureka directives governing the sharing of technology. The limited sharing of technology between partners that results limits the Eureka's ability to promote collaboration on a truly European scale. Second, Eureka's participating firms employ large numbers of workers and are typically viewed by their governments as vital to the domestic economy. Big industry made up the majority of early Eureka program participants. Half of all projects in 1986 were headed by large companies, or large national champions such as ICI, Peugeot, Aerospatiale, and Volvo.[23] Small and medium sized enterprises, however, substantially increased their involvement by participating in two-thirds of all Eureka projects by 1988. The role for big industry is still crucial for Eureka's largest (3.8 billion ECU) and most well-known project - JESSI (the Joint European Submicron Silicon Initiative). The project represents the EC and EFTA states' attempt to challenge Japanese and American dominance in the growing semiconductor market. The interfirm relationships that resulted from Eureka tend to reflect the interest of national champions. Therefore, all three levels of analysis indicate that Eureka is a neo-realist arrangement.

The Development of Esprit

Before examining Esprit's usefulness in explaining political integration within the European Community (EC), a brief description will clarify the program's scope. The

[23] Peterson, p. 279.

Commission of the European Community administers the EC's research and development activities through the Framework Programs for research and development. The Framework Programs cover a number of research and development programs in fields other than information technology (IT). Esprit became the centerpiece of the First Framework Program in 1985. Subsequently, the Second Framework Program ran from 1987 to 1991 and the Third Framework Program is scheduled to run from 1990 through 1994.

Esprit or European Strategic Program in Information Technology promotes research on pre-competitive technologies. Generally defined, pre-competitive technologies are not marketable for 5 to 10 years. Typically, research sponsored by Esprit is "generic" or not intended to produce products that will be marketable independently. Generic technologies become components of more complex products. Esprit serves as a bridge between basic research and the applied research and development of marketable technologies.

Esprit's central feature is collaborative research between firms from different member countries. Joint funding by the EC and firms finances Esprit's activities. Firms match up to 50% of the total project cost. EC funding. The Commission and industrial participants share decisionmaking power at the project level that is nearly autonomous from member country governments.

The appointment of Entienne Davignon as the Community Commissioner of Industry in 1979 set the stage for a unique interplay of interests between the Community and the major technological firms in the EC. One of Davignon's early actions was to meet with senior executives from the 10 largest electronics manufacturers in the EC for the purpose of determining proposals that would promote collaboration and end the EC decline in the critical information technology sectors.[24] The cooperation between the Commission and industry was further strengthened in late 1981, when Davignon convened a roundtable discussion with the directors of the 12 largest information technology firms to prepare for the future of IT in the Community.[25] After being told that Community funds would be allocated to a major program fostering cooperation in IT, Davignon gave the Big 12 the responsibility of proposing a program and a steering committee that would benefit Community IT efforts. This committee (also known as the Roundtable) worked with the Commission and, in the Spring of 1982, reached an agreement on five broad areas in which Community funding should be targeted. These areas were pre-competitive R&D in advanced micro electronics, advanced computing, software technologies, office automation, and integrated computer

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[24] Wayne Sandholtz, "ESPRIT and the Politics of International Collective Action", Journal of Common Market Studies: March 1992, p. 14.

[25] These firms, which will be referred hereafter as the "Big 12" were: Bull, Thomson & CGE from France; Siemans, Nixdorf, & AEG from Germany; GEC, ICL , & Plessey from the U. K. ; Olivetti and STET from Italy; and Phillips from the Netherlands.

systems for manufacturing.[26] Three overall objectives were adopted by the committee: 1. to promote intra-European industrial cooperation; 2. to furnish EC industry with the basic technologies it would need to bolster its effectiveness over the next five to 10 years; 3. to develop EC norms and standards.[27] In May, 1982 the Commission proposed the ESPRIT program (European Strategic Program for Research and Development in Information Technologies) to the Council of Ministers .[28]

The Commission received formal approval for an Esprit pilot phase in December 1982. The pilot phase began with a formal invitation for proposals in the five areas that the Roundtable had identified in the Spring of 1982. Esprit's rules during this stage stipulated that each project must involve at least two firms located in two different EC countries, and that their research focus on the pre-competitive level. The Big 12 companies had already proposed 15 projects, while the Commission added one more.[29] The Community provided 11.5 Million ECU, which was matched by the participating companies. The pilot phase was supposed to encourage small and medium size enterprises but

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[26] Sandholtz, p. 14.

[27] Lynn Krieger Mytelka and Michel Delapierre, "The Alliance Strategies of European Firms in the Information Technology Industry and the role of ESPRIT" Journal of Common Market Studies: Dec 1987, p.243.

[28] It should be noted that Esprit is included in a bigger R & D package known as the "Framework". This also includes a telecommunications program (RACE), BRITE (Basic Research in Industrial technologies for Europe), and a biotechnology program. Esprit receives the lion's share of the Framework funding, but the other programs will be referred to at the end of this section.

[29] Sandholtz, p. 15.

72% of the participants in this phase were large firms with over 1,000 employees.

The Commission, especially through the efforts of Davignon, cultivated a close relationship with IT producers that ultimately led to the creation of Esprit. The Commission circumvented uncooperative member governments and secured industrial support for the initiative. The Esprit pilot was the result of a supranational institution's ability to organize industry in a manner that would have been inconceivable in an intergovernmental arrangement. The Commission, primarily through the efforts of an individual, Davignon, convinced industry that the EC could be an effective administrator of an research and development program.

The Commission administers Esprit projects through three committees. During the first few years of Esprit the Steering Committee consisted of representatives from the "Big 12." The Esprit Advisory Board consists of industrial, academic and other contributors and users of IT research. The Advisory Board advises on general development. The Esprit Management Committee includes representatives from national governments and the Commission. The Management Committee selects projects that will receive funding based on proposals from industry and research centers. Thus a complex policy group that reflects national, industry and EC interests administers Esprit. Esprit's administrative

structure provides evidence of a neo-functional policy integration process in which the Commission orchestrates the policy making process.

Esprit addressed a trend in interfirm relationships that its supporters felt threatened the competitiveness of European IT producers. In the early 1980's European high technology firms seemed increasingly reliant on agreements with U.S. and Japanese firms for access to new technologies. This reflected EC IT companies' weakness as well as the relative attractiveness of overseas competitors.[20] Because EC IT producers had diverse standards and segregated markets as a result of protective national policies, their technologies were not complementary. Intra-firm agreements among EC producers did not have much appeal. Agreements with Japanese and American IT producers usually allowed producers access to new complementary technologies without sacrificing privileged national markets. Member governments and the Commission felt that this pattern was dangerous. Member governments tried to combat it with support for research to develop new technologies domestically while the Commission argued for a coordinated EC effort. The ESPRIT pilot phase helped encourage firms to look within Europe for the resources to research and develop new technologies and recognize common interests.

ESPRIT Phase 1

Although Phase I was eventually approved by the Council, the target date of January 1984 was delayed because the program became entangled in a dispute over the general Community finances and budgets. Britain and Germany threatened that they would not approve the Esprit budget unless the other members agreed to general provisions for EC budgetary discipline. Again, Davignon traveled to negotiate an agreement with the recalcitrant members in early 1984. An agreement was reached in which Esprit would be funded at its proposed level out of existing appropriations for the first two years.[30]

Esprit's first phase shows a rise in international collaborative research among EC firms. Esprit projects involving 327 firms greatly expanded communication among European IT firms. In some cases, participants indicated that their new relationships caused them to rethink company strategies.[24] Esprit changed the way some EC firms approached research and made them aware of the benefits of collaboration at a pre-competitive stage. The EC IT industry looked to Esprit as a compliment to the existing national industrial strategies.

The wrangling over Esprit's budget during the First Framework Program shows that a successful program did not guarantee expansion. Despite Commission and industry's relative autonomy at the project level, Esprit was subject

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[30] Ibid, p. 16-17.

to budget debates within the Council of Ministers. Esprit relies on an intergovernmental negotiation for its resources yet relies on a supranational arrangement for its administration.

The Commission originally proposed a budget of 2,050 million ECU for ESPRIT under the Second Framework Program. The Council of Ministers awarded 1,600 million ECU.[26] Member governments, especially Britain and Germany, were reluctant to expand funding not only for Esprit but for technology policy in general. Large members did not feel the Commission was accountable for its budget. The Commission argued that their proposals for Esprit funding were defined by their technical objectives and achieved with full consultation from industry. The Commission attempted to trade on its relationship with industry for more funding from member states as it had successfully done during Esprit's pilot phase and under the First Framework program. The Council of Ministers responded with a ruling that the management of Esprit should be assisted by a committee with two representatives appointed by each member country. The member governments gave themselves a consultative role in Esprit's management, but recognized that part of Esprit's success was the Commission's ability to coordinate firms from different member countries by giving them a voice in the administration of the program and therefore did not attempt to control Esprit management.

Phase 2 also saw a decline of Big 12 particpation in projects. Despite the increasing interest of small and medium enterprises' (SME's) in the ESPRIT program, it was clear that many of these firms played only a sub-contracting role in the larger projects. In an effort to diffuse criticisms on the role of small firms, the Commission launched a high-profile campaign to attract SME participation in all all areas of the Framework Programs. As a result, there were substantial increases in the number of projects and funding involving biotechnology and other "young sciences." A significant neo-realist factor contributing to this redirection of emphasis and funding can be found in the politics of the Council. Because of the capture of large chunks of funding by the Big 12 in the early stages, the less advanced states were successful in their insistence that more be funds be set aside for the young sciences. Larger states were concerned that this strategy would dilute the high-technology program by targeting funds to promote the development of less advanced firms and regions.[31] The substantial commitment made by the EC in partially funding JESSI and other high-profile projects reinforces an important trend that the Big 12 are privately assured of their "piece of the pie" and avoids some complications emanating from EC competition law, by switching their high-technology efforts to the Eureka

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[31] Peterson, p. 281.

program.[32] The Commission, however, asserted that, "...in order to promote improved competitiveness in Community industry as a whole, it is necessary that other industrial companies in the Community which did not participate in a specific project, but which have the ability to use its results and wish to do so, should have the opportunity to acquire the rights".[33]

The Commission attempted to follow-up Phase 1 by implementing several structural changes to the Esprit program in Phase 2 and 3. The Commission also proposed large increases in funding to promote technological developments in poorer EC regions (Stride Program).[34] The Commission acquired the right from the Council to redirect up to 15% of the funding from the broad categories toward emerging priorities while closing off less promising areas - without the consent of the Council.[35] The current EC Commissioner for Research, Filippo Pandolfi, also has proposed rule changes for approving Framework's budgets. He proposed that future budgets should be approved by unanimity, while allowing specific sub-program budgets for Esprit to then be approved by majority vote.[36] A decision on rule changes for budgeting, which was denounced by Germany and Britain as a virtual `blank check' for research, was to

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[32] Ibid: p. 284.
[33] Ibid, p. 39.
[34] Peterson, p. 281.
[35] Robin Gaster, "Research and Technology Policy", in Leon Hurwitz & Christian Lequesne (editors) *The State of the European Community.* Boulder, Colorado, Lynne Rienner Publishers (1991): p. 249.
[36] Peterson, p. 283.

be put off until 1993, pending a new inter-institutional agreement between the Commission, the Council, and Parliament.[37] The interplay of national interests and the Commission's effort to promote EC level colloboration during Phases 2 and 3 demonstrates that neither neo-realist or neo-functionalist relationships dominate Esprit.

Esprit as a Combination of Neo-realist and Neo-functionalist Integration Processes

The preceding description of the development of Esprit showed that the program's evolution contains evidence of both neo-realist and neo-functional integration processes. This section will review the development of Esprit from the three levels of analysis to better illustrate this contention.

The European Commission's role in establishing Esprit is a product of its relationship with member country governments. The Commission's frustration with member country resistance to an EC level IT research and development policy and industrial policies led it to court industry rather than member governments. While the Commission successfully established Esprit, its budget was and still is dwarfed by the IT research and development spending by the largest member countries. Furthermore, the budget battles in the Council of Ministers indicate that the Commission's administration of Esprit is not independent of

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[37] Ibid, p. 283.

state will. Finally, Esprit's emphasis on increased small and medium sized enterprise participation during its second phase resulted from pressure by smaller member countries who were underrepresented by the Big 12. The administrating body-state level of analysis suggests that, at a macro level, Esprit is shaped by a neo-realist bargaining process that results during the approval of the program's overall budget in the Council of Ministers.

The dynamic of the Commission-firm relationship, the second level of analysis, within Esprit reveals a more complicated neo-functional policymaking process. Davignon cultivated a relationship with IT producers from diverse member countries. The Commission used this relationship to justify funds for an EC program in IT research and development by offering a level of interfirm cooperation that no intergovernmental program could match. Esprit's management committees and project selection process represent a neo-functional decision making process that takes place under the guidance of a supranational institution. Intergovernmental wrangling may determine the level funds Esprit receives, but Esprit's managing committees have considerable autonomy in individual project selection and funding. Eureka's participants, in contrast, appeal directly to their national governments for funds.

Finally, at the third level of analysis, the dynamic of interfirm relationships within Esprit also suggests a neo-functional integration process as firms begin to look to the

EC for direction and funding. The evidence is weakest at this level, but Esprit has been successful at creating inter-member interfirm cooperation within the EC where previously there was little. Esprit also requires the sharing of technology developed in the hope that it will lead to cooperation and economies of scale at an EC level in the development and production of marketable technologies. Eureka does not promote technology sharing because many of the governments that formed Esprit wanted to protect the interest of their national champions.

The multilevel analysis of key relationships in the development of Esprit reveal both neo-realist and neo-functional qualities in the program. Neither theory can explain independently the integration of IT research and development policy embodied by Esprit.

Conclusion

Most theories of European political integration descend from a neo-realist or neo-functional tradition. Many students of the EC have recognized that neither tradition accurately describes the actual process. A comparison of Eureka and Esprit supports the claim that the EC's political integration process contains elements of both theories.

Eureka is an example of an intergovernmental bargain that fits well with neo-realist integration theory. Eureka originated as an initiative to further French national interest. Eureka's eventual structure was a compromise between the diverse visions of its member states. A

comparison of Esprit to Eureka reveals that Esprit cannot be independently explained by neo-realist theory or neo-functionalist theory.

Esprit, as an example of political integration in European IT research and development policy, provides an empirical example of David Cameron's contention that political integration within the EC is simultaneously a neo-realist and neo-functional process. The Commission is subject to bargaining between member states, particularly on Esprit's overall budget and program priorities. At the management and project level, firms and the Commission operate nearly autonomously and are representative of a neo-functionalist policy integration process. Policy integration within Esprit indicates that models of political integration within the EC must reconcile neo-realism and neo-functionalism to have predictive value.