



Capital-Intensive Modernization, Internal Expansionary Policies, Competitive Export: The Political Economy of U.S. Nuclear Assistance Programs during Bretton Woods. The Case of Italy before the End of Fixed Exchange Rates

Simone Selva

Through the research perspective of U.S. nuclear assistance programs to Italy under the fixed exchange rate international monetary regime of Bretton Woods, this paper investigates the meaning and importance of high technology transfer in the framework of the international economic policy of the United States government and the Bretton Woods institutions, particularly the World Bank Group. Through the case study of the country most dependent on foreign energy supply both during the Bretton Woods years and after the demise of currency convertibility, we follow the U.S. assistance programs to erect and to develop an Italian nuclear energy industry. We aim to shed light on the linkage between the development of capital intensive sectors and the American aim to make the reintegration of each advanced industrial economy in the postwar system of international economic relations revolve around the combining non-inflationary domestic economic growth and stable external equilibrium, including both foreign exchange stability and sound terms of trade. We make the argument that the U.S. pursued this combination both during and after the collapse of Bretton Woods international monetary arrangements by drawing upon a flow of high capital intensive technology transfer. Furthermore, while focusing only on the period prior to floating currencies in the 1970s, this article maintains that Washington

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carried out this foreign economic policy both under the Bretton Woods regime and after its demise, through foreign exchange adjustments and financial assistance programs respectively.

After reviewing how the leading literature on the history of U.S. foreign economic policy has portrayed it so far, we focus attention on the Italian case to explore the hypothesis that both under Bretton Woods and after its collapse a very close interlocking was established between exchange rate regimes and the U.S. policy of technology transfer. Through the case study of Italy, we make the argument that prior to the deterioration of fixed exchange rate arrangements Washington provided Rome with technological assistance to target the twin objective of advancing expansionary internal economic policies and pushing forward an ever-rising level of international economic integration of her partner industrial economies. We frame this reconstruction on the decades prior to currency floating before a broader interpretation about the meanings of U.S. financial assistance in the field of high capital intensive manufacturing way beyond the collapse of fixed exchange rates and the end of cheap foreign energy supply.

Introduction: Competitive Edge and Balance of Payments Equilibrium. Energy Policies and the Role of Technological Advance in the U.S. Foreign Economic Policy from Bretton Woods through the Early 1980s Monetary Shock

Through the research perspective of the American economic assistance programs to let the advanced industrial economies develop nuclear power capacity during the fixed exchange rate international monetary regime of Bretton Woods floating exchange rate system, this paper investigates the meaning and importance of high technology transfer in the framework of the international economic policy of the United States government and the Bretton Woods institutions, particularly the World Bank Group. Through the case study of the country most dependent on foreign energy supply both during the Bretton Woods years and after the demise of currency convertibility, we follow the U.S. assistance programs to erect and to develop an Italian nuclear energy industry. We aim to shed light on the linkage between the development of capital intensive sectors and the American aim to make the reintegration of each advanced industrial economy in the postwar system of international economic relations revolve around the combining non-inflationary domestic economic growth and stable external equilibrium, including both foreign exchange stability and sound terms of trade. We make the argument that the U.S. pursued this combination both during and after the collapse of Bretton Woods international monetary arrangements by drawing upon a flow of high capital intensive technology transfer. Furthermore, while focusing only on the period prior to floating currencies in the 1970s, this article maintains that Washington carried out this foreign economic policy both under the Bretton Woods regime and after its demise, through foreign exchange adjustments and financial assistance programs respectively.

After reviewing how the leading literature on the history of U.S. foreign economic policy has portrayed it so far, we focus attention on the U.S. assistance to Italy to explore the hypothesis that both under Bretton Woods and after its collapse a very close interlocking was established between exchange rate regimes and the U.S. policy of technology transfer. Through the case study of Italy, we make the argument that prior to the deterioration of fixed exchange rate arrangements Washington provided Rome with technological assistance to target the twin objective of advancing expansionary internal economic policies and pushing forward an ever-rising level of international economic integration of her partner industrial economies. We frame this

reconstruction on the decades prior to currency floating before a broader interpretation about the meanings of U.S. financial assistance in the field of high capital intensive manufacturing way beyond the collapse of fixed exchange rates and the end of cheap foreign energy supply. In fact, notwithstanding over the course of the 1970s, the Italian authorities repeatedly proved to be unsuccessful in implementing their ambitious nuclear power programs,¹ the government of Washington insisted on offering Italy continued financial support to push forward the development of energy policies alternative to oil through the financing of high technology sectors such as the nuclear industry. After the collapse of fixed exchange rates and currency convertibility, from the first oil crisis through to the turn of the 1970s, consistent U.S. support, implemented through funding from both the Export-Import Bank of the United States and, to a lesser extent, a few American commercial banks and the private capital markets, replaced the functioning of pegged but adjustable foreign exchange rates typical of Bretton Woods to support for at a time both the re-making of domestic industrial productivity and competitiveness, and internal aggregate demand, as well as the external equilibrium of Italy. As it clearly stems from the IMF articles of agreements,² prior to the end of currency convertibility in 1971-1973, a chance to adjust foreign exchange rates worth up to 10 percent out of fixed exchange rates was essential to advance the economic growth of each industrial economy most dependent on foreign energy supply. This came about in that slight adjustments let each country combine internal expansion and a rising share of foreign exchange in goods and capital. In fact, exchange rate adjustments were pivotal monetary engines to provide industrial economies dependent on foreign energy supply with relatively cheap oil and, more importantly, inexpensive import of capital intensive instrumental and capital goods, both much needed to bolster industrial productivity and to develop an import substitution energy program through nuclear power. Therefore, this exchange rate adjustment policy was to ease off import related liabilities on current accounts. In turn, as far as real exchange rate movements increased the competitive edge of the industrial economies by means of easing off import costs for raw material and capital goods, this paved the way for redressing the share of international trade without any need to implement wage-curbing policies. On the other hand, the industrial economies resorted to devalued real exchange rates to sustain their export industry in the aim to expand the assets in the balance of payments on current accounts.

Before this broad backdrop, in each of these respects Italy turns out to be a paramount case in point. During the Bretton Woods decades, industrial economies such as Italy on the one side went for slightly revaluing their real exchange rates to import capital intensive investment and instrumental goods, as well as hydrocarbons. On the other hand, as the government of Rome and the Bank of Italy showcase, they raised real exchange rates to the official exchange rates in support for the export

¹ I have recently expanded further on this topic in my own S. Selva, *Technological Advance, Transatlantic Trade, External Equilibrium. American Financial Assistance to the Italian Nuclear Power Programs from the 1960s through the first Oil Crisis*, in S. Muller (ed.), *Contesting Deregulation: Debates and Practices in the West since the 1970s*, Berghahn, New York, forthcoming in 2015.

² The Art. 1/v of the IMF article of Agreements calls on the member countries to make any possible effort to target at the same time both internal economic stability and employment, and balance of payments equilibrium (IMF Articles of Agreement). On the complex interplay between this twin objective and the 10 percent range of exchange rates adjustments since the foundation of the IMF see G.M. De Vries, *Balance of Payments adjustment 1945 to 1986*, IMF, Washington DC 1987, pp. 9 ff.

industry and to better the balance of payments on current accounts. Since the end of pegged but adjustable international monetary relations, over the course of the 1970s the financing of capital intensive nuclear power programs pushed forward that growth strategy aimed at tackling at the same time losses in industrial productivity and competitive edge, sustained domestic aggregate demand, as well as balanced terms of trade and international payments position. Furthermore, the many crises that shook up the oil producing countries of the Middle East and their oil supplying capacity in the very beginning of the 1980s made the U.S. support in that direction all the more necessary. Particularly, this was the case for countries like Italy that suffered most from that instability and the ensuing dwindling oil supply from the OPEC member states of the Middle East. Alike, the American assistance to Italy to develop nuclear power capacity way beyond the collapse of fixed exchange rates before the backdrop of overheating crude petroleum prices should be placed in the context of a structural shift in the way in which the U.S. and the OECD managed the international economy during the 1970s. In fact, during the second half of that decade, a historical turn led to move away from demand management policies carried forward thus far, particularly by the Carter Administration³. Throughout the 1970s the U.S. had repeatedly pressured their most important western allies, first and foremost the Federal Republic of Germany and Japan, but Italy and the United Kingdom as well, to make them borrow from the oil supplying countries and the IMF to finance the recasting of industrial productivity after the early 1970s' falloff. In doing so, the U.S. and the international economic institutions aimed to re-launch competitiveness and to redress the balance in the terms of trade of the industrial nations without curbing the cost of labor and domestic growth.⁴ As President Carter put it amid the storm of the second oil crisis, "the

³ The historical origins of this expansionary approach to the sluggish trend typical of both the international and the U.S. economy amid the two oil crises lay in the early Ford Administration's analyses and reaction to the inflationary strains from which the advanced industrial economies suffered following the first oil price hike. See for example an uneven speech by Arthur Burns on the impact of inflation on the rise in money supply through the expansion of banks deposits, sight and short term deposits and savings as a result of economic expectation for a downswing economic cycle following the meteoric rise in energy and consumer goods prices. See *Statement by the Honorable Arthur F. Burns Chairman, Board of Governors of the Federal Reserve System, in The Financial Conference on Inflation, held at the Request of President Gerald Ford and the Congress of the United States. Discussion Papers and Proceedings*, Washington DC, 1974, pp. 35-41. It is worth noting that on that occasion Burns came up with a concluding remark stressing the role of strict monetary policy as a very temporary measure to fight inflation. In his view, expansionary economic policies should quite soon replace tight control over the monetary aggregate. Meaningfully, he made his case for an expansion in the supply of money and credit to run counter high interest rates.

⁴ For an eye-opening sample of this U.S. foreign economic policy directive see for example, among the many primary sources available, the following reference documents: Anthony Solomon-Richard Cooper, to Economic Policy Group, Memorandum 'Strategy for the Summit. Global Economic Recovery and Stability', March 22, 1977, in National Archive and Records Administration, Archive II, College Park, Maryland (hereafter NARA), RG56 (General Records of the Department of the Treasury), Office of the Assistant Secretary for International Affairs, Deputy Director of the Office of International Monetary Affairs, Subject Files 1977-1979, b. 2, fold. London Summit 1 of 4; Economic Policy Group, 'International Financial Issues', March 1977, ivi, b. 2, fold. London Summit 4 of 4; Thomas Leddy to Anthony Solomon, Memorandum 'Notes for your Meeting of Economic Policy Group Deputies on the Summit, Tuesday March 8: Draft on Economic Recovery and Expansion', March 7, 1977, ivi, b. 2, fold. London Summit

industrial democracies particularly need to adopt and maintain coherent public policies that will improve the 'supply side' of our economies: tax, labor market and other measures that encourage higher productivity, resistance to short sighted protection of uncompetitive sectors, and careful balancing of the social objectives of regulatory functions with our productivity goal."⁵ This policy was to combine a capital intensive industrial restructuring and support for domestic aggregate demand. Furthermore, it assumed substantial borrowing from the international capital markets.⁶ This strategy assumed to draw upon the then booming oil revenues of the OPEC countries to finance a capital intensive industrial restructuring aimed to redress productivity and to reshape competitiveness on the export markets without curbing nominal wages and labor purchasing power. Since as early as the spring of 1974, as a result of the four-fold oil price hike, an unprecedented expansion in the oil revenues assets of the oil producing countries did occur. Shortly after the first petrodollar bubble, that capital intensive industrial restructuring strategy led the industrial economies to draw upon the then booming oil revenues of the OPEC countries. The government of the United States was in the forefront of this strategy. Notwithstanding a clear-sight tendency in early 1974 by the economic elites of the Middle Eastern oil producing countries to invest oil revenues on short term, highly liquid placements, since the second half of that year thereafter a substantial shift did occur toward investing money in long term bonds and other securities⁷. This accounted for the ensuing inflow of foreign finance into the advanced industrial economies that helped to replace the adjustment of pegged exchange rates both in financing the import for

3 of 4; 'Strategy for the Summit', March 22, 1977, in Declassified Documents and Reference System (hereafter DDRS).

⁵ J. Carter to Lloyd Bentsen (U.S. Senate Joint Economic Committee), June 23, 1979, in J. Carter Presidential Library, Atlanta (hereafter JCPL), White House Central File (hereafter WHCF), Subject File, Foreign Affairs, Confidential FO 6-9 1/20/77-1/20/81 through Executive FO 8 4/1/77-5/11/77, b. FO-46.

⁶ This strategy by and large stemmed from a widely-shared view about the impact of the first oil crisis on the distribution pattern of investments across the international capital markets: according to the OECD, "insofar as purchasing power was shifted to a group of countries with above average propensity to save", the main concern was about the deflationary impact of the peaking oil revenues and the shortfall in aggregate demand. In this framework the U.S. Treasury Department and the OECD agreed on pursuing expansionary policies through tackling "the demand side" (OECD, Working Party n. 2 of the Economic Policy Committee, Note by the Secretariat, 'The Macro-Economic Impact of Higher Energy Prices over the Medium Term', December 2, 1974, in NARA, RG56, Office of the Assistant Secretary for International Affairs, Office of the Deputy Assistant Secretary for International Monetary and Investment Affairs, Records Relating to OECD Monetary Committees and Working Groups 1961-1974, b. 15, fold. EPC/WP-2 Documents 1973 (Cont'd) 1 of 2.

⁷ Department of the Treasury, Office of the Assistant Secretary for International Affairs, Board Briefing 'OPEC Trade Balances in 1974 and 1975', March 31, 1975, in NARA, RG56, Office of the General Counsel, Records Relating to OPEC Financial Affairs 1974-77, b. 3, fold. O 1975-78; Remark by David Rockefeller, Chairman, The Chase Manhattan Bank, before the W. Wilson International Center for Scholars 'Monetary Aspects of the Oil Problem', February 6, 1975, in International Monetary Fund Archives, Washington DC (hereafter IMFA), Office of the Managing Director Fonds, Witteveen sous Fond, b. 3 (correspondence), fold. 3; Bill Witherell (Department of the Treasury), Briefing Paper for George Shultz, 'Oil Producing Countries External Investments of Surplus Revenue', January 15, 1975, in NARA, RG56, Office of the Assistant Secretary for International Affairs, Chronological File of the Office of Financial Resources and Energy Finance 1974-1977, b. 1, fold. Jan-March 1975.

capital intensive investment and instrumental goods, and in promoting the export industry, as well as in recovering the balance of payments from the effects of the first oil crisis through the development of energy sources alternative to oil. The case study of the OPEC member states as far as they financed the U.S. assistance to develop nuclear power capacity for civilian purposes is straightforward.⁸ As a matter of fact, the inflow of foreign financial investments both financed the import of technologies and, as far as erecting nuclear power met the skyrocketing rise in electricity demand across the industrial economies,⁹ it was an import substitution energy chance viable to stabilize the balance of payments and the terms of trade of oil-scarce economies such as Italy traditionally was. From the recession ensuing the first oil price hikes through to the Carter Administration's early move to push it forward, this strategy proved to be a short of leeway in two respects. On the one side, unlike the American will, instead of bolstering productive investments, the other advanced industrial economies repeatedly tended to borrow from the international capital markets to finance private consumption, a policy heading to an inflationary use of capital offer.¹⁰ On the other, during the Carter years the industrial economies fell into an ever rising financial path dependence on the OPEC nations, and particularly on the Middle East oil producing countries. This strategy came about as long as the U.S. and the other industrial nations called on the oil revenues rich countries for financing their demand management strategy. This was particularly the case for the U.S. banking system that since the first oil price rise had been issuing a large amount of bonds to the Arab states

⁸ As early as the winter of 1973 the U.S. Treasury Department discussed a proposed "private sector uranium enrichment facility" that was to involve financing from Iran worth up to 20 percent. See W. Witherell to Undersecretary Bennett, 'Attendance at Inward Investment Policy Review Meeting', February 18, 1975, in NARA, RG56, Office of the Assistant Secretary for International Affairs, Chronological Files of the Office of Financial Resources and Energy Finance 1974-1977, b. 1, fold. TEFRR/OFRPC Perm. Chron. January-March 1975. From the recently declassified secret negotiations on the American hostages in Iran we now know that by the time his regime collapsed, Komehini held several financial assets in the French nuclear power programs. See for this U.S. Congress, Committee on Banking, Finance and Urban Affairs, U.S. House of Representatives, 'Iran: The Financial Aspects of the Hostage Settlement Agreement', July 1981, in Federal Reserve Bank of New York Historical Archive, New York City (hereafter FRBNYA), Central Files, C 261 IRA Dec. 18, 1979-Jan. 2, 1980 Iran Blocked Accounts.

⁹ By the late 1960s the objective of expanding energy production to meet peaking electricity consumption through technological advance was not limited to nuclear power. In the U.S., then a booming energy market, a technological leap forward was the linchpin to target a significant increase in energy production from traditional energy sectors such as the coal-burning industry. In this respect it is eye-opening to get an understanding about how the western world discussed this topic at multilateral level: 'OECD Confrontation on US Energy Policy', Opening remark of Assistant Secretary Cordell Moore, January 5, 1967, in NARA, RG59 (General Records of the Department of State), Bureau of European Affairs, Office of OECD, European Community and Atlantic Political-Economic Affairs, Records Relating to Economic Matters 1953-1975, b. 13, fold. ESE OECD Energy 1967-1969.

¹⁰ Up to this point, for the U.S. stand see for example Special Report by the U.S. Treasury Department in cooperation with the State Department and the Board of Governors of the Federal Reserve System, 'Submission by the U.S. representative to the Temporary Working Party of the OECD Economic Policy Committee on Problems related to Investment of Financial Surpluses by Oil Producers', May 12, 1975, in NARA, RG56, Office of the Assistant Secretary for International Affairs, Chronological File of the Office of Financial Resources and Energy Finance 1974-77, b.1, fold. Apr.-May 1975.

to finance its liquidity.¹¹ A significant turn occurred in conjunction with the outbreak of the Iranian Revolution in 1979.

This event posed, among others, a threat to the functioning of the dollar as the reserve currency for international trade and financial transactions.¹² Making things worse, the widespread instability that characterized the Middle Eastern economies at the turn of the 1970s, hampered the scale and continuity in oil supply from the Middle Eastern oil producers to the West European importers, and cast new issues before the U.S. strategy to finance demand management economic recovery policies by drawing upon the OPEC countries financial instruments. Adding to the twin leeway which we have just made reference to, the impending instability shaking up the Middle East did contribute to make the U.S. economic policy makers go for a move to shift the industrial restructuring away from demand management policies and a demand side oriented reorganization of industrial productivity and competitiveness, to set off a supply side strategy. This turning point did take place in the framework of the watershed in the U.S. Federal Reserve Bank monetary policy to confront the economic recession stemming from the second oil price rise and to sort out of the decade-long economic stalemate. The new chairman of the Federal Reserve System moved at the same time to restrain the monetary aggregate, to raise interest rates, and to remove controls on transnational capital movements.¹³ This landmark policy, combined with the implementation of balance of payments financing facilities by the IMF to its industrial nations member countries made strictly conditional upon the adoption of structural adjustments programs including both control over the banking system to promote selected credit policies, and transfer of the tax burden from labor to industry, set off a strikingly different strategy to pursue at a time the redressing of industrial competitiveness and the stabilization of the external equilibrium. As a matter of fact, this new U.S. international economic policy assumed that the industrial countries beneficiary of foreign financial assistance implement a number of mandatory internal economic policies that run counter to the demand management policies carried forward thus far of which the development of nuclear power capacity was a key asset. In fact, the new U.S. economic and monetary policy came at variance with the aim at promoting demand side growth patterns and industrial restructuring through the combining of external equilibrium and domestic economic development that the Carter Administration still made the case for before the other industrial nations during the 1977 London Summit.¹⁴ Since the new head of the Fed, Paul Volker, set out the new

¹¹ See for example C.A. Cooper-G. Parsky, Memorandum for Undersecretary Yeo, 'Church Subcommittee request for Bank Data', April 17, 1979, in NARA, RG56, Office of the General Counsel, Assistant General Counsel, Records Related to OPEC Financial Affairs 1974-1979, b.3, fold. N Part 1 of 2, 1977-1978; R. Kessler, Banks Hold Huge Foreign Deposits. U.S. Examiners Worried about Pressure from Governments, "Washington Post", January 14, 1976, pp. A1-A2.

¹² Department of the Treasury, Office of the Assistant Secretary for International Affairs, 'Financial Implications of the Iranian Situation', September 3, 1979, in NARA, RG56, Office of the General Counsel, Assistant General Counsel, Records Relating to OPEC Financial Affairs 1974-79, b. 3, fold. N Part 2 of 2 1977-79.

¹³ In this framework, following up the directive of the Federal Reserve System, since the spring of 1980 the Federal Reserve Bank of New York passed a comprehensive set of anti-inflationary measures, including both an appreciation in the discount rate and a credit restraint program. See in FRBNYA, Board of Directors Minutes, Volume 88 (Jan. 3, 1980-Dec. 31, 1980).

¹⁴ A. Solomon-R. Cooper to Economic Policy Group, Memorandum 'Strategy for the Summit. Global Economic Recovery and Stability', March 22, 1977, in NARA, RG 56, Office of the

international monetary policy, the adoption of competitive edge tax programs such as the fiscalisation of social costs, a tight control over wage-indexation measures, and strictly monitored selection over domestic credit for productive investments, all came up as prerequisites to further implementing the IMF and the World Bank Group's external financing facilities drawing upon multilateral assistance programs. The combining of a shift in the tax burden from capital to labor, with a binding call on the industrial nations to channel external financial assistance to productive investments, and sharp cuts on public spending and other measures to restraint the cost of labor, chart the deep-rooted meaning of this turning point. Therefore, by the very end of the decade thereafter, the remaking of industrial productivity across the industrial nations was no longer based on the search for a balance between cutting production costs through advancing capital intensive added-value, and sustaining internal demand through expansionary economic policy measures and price-cutting energy policies alternative to oil. As we just stressed, both during the Bretton Woods era and after the end of currency convertibility the promotion of nuclear power programs took place in the framework of this international economic policy. Notwithstanding the new backdrop that the U.S. set out since 1979 onward, Washington insisted on pushing forward bilateral assistance to develop energy programs alternative to oil. The U.S. continued along this foreign energy policy as long as the new international monetary arrangements were to diminish further the chances to finance it through the official programs of the Bretton Woods institutions. In this context it is worth noting, as we shall do in the very last few lines of this contribution, that by the very late 1970s the financing of ENEL, the Italian state entity for energy that implemented nuclear power programs, was left with the Export Import Bank of the United States and a few U.S. commercial banks. This article takes a step back to the 1950s and 1960s to chart the deep-seated historical origins of this unfinished U.S. support to develop capital intensive energy programs. We aim to point the attention of readers to the early U.S. target to draw upon technology transfers to connect domestic economic expansion and external financial and trade stability prior to the Carter administration's initiatives to promote demand management policies through connecting the changing pattern of the international capital markets to the financing of a capital intensive industrial restructuring during the 1970s.

Matching Foreign Trade and Domestic Growth in Theory and History. The Importance of Technology Transfer during and beyond Bretton Woods

Since shortly after the foundations of post-World War II international monetary and economic settlements, scholars of international political economy and economic history have been searching for a balance between the construction of an international liberal economic order and the shaping of stable domestic economic growth and social stability within each of the modern industrial democracies that had overcome the Second World War.¹⁵ According to that leading view this combination, based both on

Assistant Secretary for International Affairs, Deputy Director of the Office of International Monetary Affairs, Subject Files 1977-1979, b. 2, fold. London Summit 1 of 4.

¹⁵ R. Gardner, *Sterling-dollar Diplomacy. Anglo-American Collaboration in the Reconstruction of International Trade*, Clarendon Press, Oxford 1956; A. Hirschman, *National Power and the Structure of Foreign Trade*, University of California Press, Berkeley-Los Angeles 1945; The economic literature investigated further this approach to shed light on the multiplier effect of international trade on demand and growth: C.S. Kindleberger, *International Monetary Stabilization*, in E.S. Harris (ed.), *Postwar Economic Problems*, New York 1943, pp. 379 ff.; id., *The Foreign Trade Multiplier. The Propensity to Import and the*

a staggering expansion in trade of goods and capital flows, and on dollar pegged currency convertibility aimed to boosting a non-inflationary domestic growth by and large based on foreign trade and export,¹⁶ worked as the fly-wheel to drive war-torn West European economies through the record-setting growth rates typical of the late 1950s and early 1960s.¹⁷ This interpretation suggested by international political economists in the second half of the 1960s revolves around statistical data tracking a staggering excess on the international markets in offer of commodities and consumer goods on domestic demand over the course of those decades.¹⁸ It made the case for a rate of international market integration higher than domestic growth.¹⁹ This tendency was confirmed by the very end of the decade, when a slipping instability on the foreign exchange markets made key industrial nations such as the United Kingdom chose to devalue their currencies. On the eve of the 1970s, British imports outstripped absorption capacity by the domestic consumer and commodity market, a tendency eventually triggering a decline in purchasing power and competitiveness by the British import industry.²⁰ The U.K. devalued sterling, among many other reasons, to provide foreign exchange earnings required to sustain domestic manufacturing, otherwise unable to earmark investment-financing financial assets due to losses in competitiveness and export lags. Before this theoretical backdrop and the historical economic dynamics that it portrayed, an abundant and successful historiography on the postwar reconstruction of Western Europe has consistently followed up this argument. Since the 1970s a revisionist school of historical inquiry, inclined to investigate either international relations or the historical trajectories of the

Balance of Payments Equilibrium, "American Economic Review", Vol. 39, n. 2 (March 1949), pp. 491-94; F. Machlup, *International Trade and the National Income Multiplier*, Blakiston, Philadelphia 1943; for a slightly different interpretation of the subject stressing a relatively less positive impact of foreign trade on internal aggregate demand see J. Polak, The Foreign Trade Multiplier, "American Economic Review", Vol. 38, n. 5 (December 1947).

¹⁶ Along this way, the driving forces of post-WWII international business and banking contributed to develop the combining of international market integration and internal economic expansion across the advanced industrial economies through pursuing their multilateral free trade market strategy. See for example *Opportunities and Pitfalls in Foreign Trade*, Bank of the Manhattan Company, New York 1947; Standard Oil Company (New Jersey), 1949 Annual Report, in Harvard Business School, Baker Library, Manuscript Division, Boston (Mass.).

¹⁷ D. Healey, 'Oil, Money, and Recession', *Foreign Affairs*, Winter 1979/80, pp. 217 ff.

¹⁸ We have made a statistical comparison between import and export trends by the five most growing industrial economies of France, Federal Republic of Germany, Italy, Japan, the United Kingdom and the USA from 1962 through to 1972, and their respective domestic growth and consumption levels based data relative on real GDP per capita and the consumption percentage share of real GDP per capita during the same time period. Although national variations occurred, in each of these five national case foreign trade skyrocketed by increasing between three and four fold. By contrast, in proportion real GDP grew much less and, more importantly, the consumptions share percentage of real GDP per capita, with rare few exceptions, either got stable or contracted substantially as was the case of Japan. For reference see respectively the Commodity Trade Statistics database (www.comtrade.un.org/data/), and the Center for International Comparisons at the University of Pennsylvania world table (https://pwt.sas.upenn.edu/php_site).

¹⁹ R. Cooper, *The Economics of Interdependence: Economic Policy in the Atlantic Community*, McGraw Hill, New York 1980, introduction and chapter 3.

²⁰ Bank of England Historical Archive, Economic Intelligence Department Records, Annual Reports, Report for the year ended 28 February 1969.

international economy, correctly demonstrated the relevance of capital intensive modernization and technological advance in binding up the reshaping of world trade to the resurrection of internal markets, and in making this combining a virtuous circuit for the postwar golden age across most of the advanced industrial democracies.²¹ The postwar transatlantic transfer in average added value technological content that stemmed from the post-World War II U.S. foreign aid programs and laid down the recasting of strategic manufacturing sectors, did this literature suggest, played out a pivotal role in both erecting brand new transatlantic economic relations, and prompting a successful resurrection of internal markets before the backdrop of rising volumes in international trade. Furthermore, it fueled ever expanding terms of trade and improving balance of payments equilibrium on either current or capital accounts. These trends, this scholarship argues, were typical of the timeframe from the late 1940s reconstruction through to the 1950s economic take off.²²

Alongside this line of interpretation, mainstream historical literature focusing on the history of U.S. foreign economic and assistance policies from the end of World War II to the end of the postwar Golden age of capitalism during the 1970s has stressed the linkage between the U.S. move to stir a capital intensive restructuring and industrial modernization across war-torn advanced industrial economies on the one side, and the reintegration of the West European economies before the backdrop of the ever expanding flows in goods and capital that shaped the international economy under the auspices of Bretton Woods's economic institutions. Likewise, this school of historical studies emphasized the linkage between technology transfer and the long postwar steady increase in foreign trade.²³ Both early studies on the U.S.-financed

²¹ The two classical reference works that account for this early debate, though from strikingly different perspectives, still are C.S. Maier, *The Politics of Productivity. Foundations of American Foreign Economic Policy after WWII*, "International Organization", Vol. 31 (1977), pp. 607-633; and A.S. Milward, *The European Rescue of the Nation State*, Routledge, London 1992, chapter 4, particularly pp. 142 ff.; Recent quantitative reconstruction have convincingly followed up this argument. For a case study on the Marshall Plan impact on the reduction of technology adoption lags across Western Europe see D. Comin-B. Hobijn, *Technology Diffusion and Postwar Growth*, "National Bureau of Economic Research Macroeconomics Annual", Vol. 25, n. 1(2010), particularly pp. 237-238.

²² D. Ellwood, *Rebuilding Europe. Western Europe, America and Postwar Reconstruction*, Pearson Longman Publishing, London 1992; A. Carew, *Labour under the Marshall Plan. The Politics of Productivity and the Marketing of Management Science*, Wayne State University Press, Detroit 1987; B. Boel, *The European Productivity Agency and Transatlantic Relations 1953-1961*, Museum Tuscolanum Press, Copenhagen 2003.

²³ B. Eichengreen, *The European Economy since 1945: Coordinated Capitalism and Beyond*, Princeton University Press, Princeton (N.J.)-Oxford, 2007; M.J. Hogan, *The Marshall Plan: America, Britain and the Reconstruction of Western Europe, 1947-52*, Cambridge University Press, Cambridge 1987; G. Behrman, *The Most Noble Adventure. The Marshall Plan and the Time when America Helped Save Europe*, Free Press, New York, 2007; R. Neebe, *Weichenstellung für die Globalisierung: Deutsche Weltmarktpolitik, Europa und Amerika in der Ara Ludwig Erhart*, Bohlau, Cologne 2004; sector-specific studies that linked the introduction of high technological content to the development of the European economic integration process and the European construction at large added new insights on the subject. See for example T.J. Misa, *Inventing Europe. Technology and the Hidden Integration of Europe*, "History and Technology", Vol. 21, n. 1, pp. 1-19; C. Bouneau-D. Burigana-A. Varsori (sous la direction de), *Le trajectoires de de l'innovation technologique et la construction européenne: de voies de structuration durables?*, Peter Lang, Bruxelles 2010; "Histoire, Economies et Société", n. 4 (2010), particularly the introduction by D. Burigana-P. Deloge; for

reorganization of the international economy after WWII, mostly focused on the impact of Marshall Plan aid, and more recent investigations on the follow up before and after the deterioration in the U.S. balance of payments equilibrium in the late 1950s, when Washington called on the Bretton Woods international economic institutions to push forward financial and economic assistance programs aimed to reorganize domestic growth as a prerequisite for letting industrial democracies reenter the international economy, made repeatedly reference to the key role of technology transfer and capital intensive modernization to account for the virtuous linkage between the politics of productivity and the shaping of a truly interdependent international economy.²⁴

a country study sample see F. Fauri, *The Marshall Plan in Italy. Industrial Renewal and Material Reconstruction*; P. Tedeschi, *Notes on the Marshall Plan in Lombardy. Technological Innovation and Vocational Training*, both in F. Fauri-P. Tedeschi (eds.), *Novel Outlooks on the Marshall Plan. American Aid and European Reindustrialization*, Peter Lang, Bruxelles 2011, respectively pp. 39-58, and 59-90.

²⁴ See respectively on the one side, among other studies C.S. Maier, *The Politics of Productivity. Foundations of American International Economic Policy after World War II, "International Organization"*, cit.; J. Zeitlin-G. Herrigel (eds.), *Americanization and its Limits: Reworking US Technology and Management in Post-War Europe and Japan*, Oxford University Press, New York 2010; B.Boel, *The European Productivity Agency and Transatlantic Relations*, cit.; on the other, for the U.S. move to get the international economic institutions born out of the Bretton Woods conference more involved in implementing American foreign economic policies see W.M. McClenahan, W.H. Becker, *Eisenhower and the Cold War Economy*, Johns Hopkins University Press, Baltimore (MD) 2011. From the deterioration of fixed exchange rate and rising prices on the international commodity markets during the second half of the 1960s through to the 1973 first oil shock, a sharp worsening in both the balance of trade and public finances of the U.S. and the major member countries of the World Bank Group and IMF made them reduce their budgetary contributions to the Bretton Woods institutions. This turn, combined with a number of other factors that contributed to the weakening of those institutions, led them to retreat substantially from financing international market integration and domestic industrial advance, making room for a rising role of private capital markets. During the first half of the 1970s some private American financial institutions took the lead in financing the reorganization of the international trade and payments system among the industrial economies and the less developed countries. By the second half of the decade the twin recession led both the Eastern European economies and the Latin American countries, formerly recipient of substantial financial assistance packages from them, to call on the Wall Street lending institutions to stop service their debt. This hit hard the financial soundness of American and other Western commercial and investment banks. At the same time this process set the course for leading the World Bank Group and the IMF to strike back to their past role of financing the international trade and payments system, by the late 1970s involving both the industrial economies, and the oil producing OPEC countries, as well as the non-oil supplying less developed countries, most of whom located in the Middle East. For the booming role of private financial markets from the 1960s down into the 1970s see the 1978 Per Jacobsson Lecture by Gabriel Hauge (Chairman of the Board, Manufacturers Hanover Trust Company), *The International Capital Market and the International Monetary System*, IMF, Washington DC, September 24, 1978, in FRBNYA, Records of the Presidents, Paul Volker papers, 1971-1979, b. 35578, fold. 740A (1977-78 Annual Meetings of IMF-IBRD), where private capital markets recycling capacity of oil exporters' surplus earnings was estimated at \$250 million for the period from the end of 1973 to 1978, compared to an official IMF financing facility totaling \$7 billion (p. 7). Regarding the debate among the most advanced industrial economies to replace Wall Street and West European banking with revamping the Bretton Woods institutions see a tidy call on the IBRD member states for a World Bank capital increase by the president of the Washington based

In this perspective, a classical and long standing wave of historical studies and reconstructions has focused attention on the economic and social stabilization objectives underpinning the process of technology transfer channeled through the European Recovery Program (ERP) initiatives from the United States to the West European economies to resurrect heavy manufacturing sectors and to set in motion the process of European trade integration. Though he cast many doubts on the thesis that the Marshall Plan was essential in resurrecting the national economies of continental Europe, British historian Alan Milward insisted on the contribution of newer technologies and the most capital intensive manufacturing sectors of the postwar era to account for the trade integration among the small European national economies specializing in supplying capital goods, and the increased demand for them by the German economy.²⁵

This line of investigation revolved around the economic impact of technological advances within each of the industrial economies. It has recently made way for a wave of fresh reconstructions and syntheses stressing the implications that capital intensive leap forwards and a significant rise in labor productivity since the late 1940s Marshall Plan financial packages through to the 1950s NATO military assistance programs, had on remaking the West European economies supply side competitive both on the domestic and on the international markets without restraining the labor purchasing power.²⁶ These fresh new reconstructions share the assumption that the combining of orthodox anti-inflationary monetary policies at domestic level, with the implementation of expansionary industrial investment programs funded through capital inflows denominated in U.S. dollars or other hard currencies to sustain both the supply side in consumer goods and aggregate demand, were pivotal in re-launching domestic growth and shaping a stable reintegration of the industrial economies in the context of Bretton Woods fixed exchange rates international trade and payments system through competitive bidding national manufacturing systems²⁷. According to this interpretative framework, these works establish a neat linkage between a substantial technology transfer in average added value instrumental goods from the U.S. dollar currency area to the consumer goods producing infant European manufacturing industry, and the impact of a capital intensive leap forward both on domestic growth in that it re-launched capital accumulation without curbing nominal

international economic institution Robert McNamara, Address to the Board of Governors, September 25, 1978, *ivi*.

²⁵ A.S. Milward, *The European Rescue of the Nation State*, *cit.*, pp. 142, 153-167.

²⁶ Two general accounts of the period following this interpretative path are D. Ellwood, *The Shock of America. Europe and the Challenge of the Century*, Oxford University Press, Oxford-New York 2012; S. Selva, *Supra National Integration and Domestic Economic Growth. The United States and Italy in the Western Bloc Rearmament Program 1945-1955*, Peter Lang, Bruxelles-Frankfurt 2012.

²⁷ In this respect it is eye-opening the concept of impact loan adopted by the Bretton Woods international economic institutions to ease off the strains on the balance of payments of the less developed industrial nations arising out of peaking import costs of commodities, raw materials and instrumental goods much needed to implement industrial investment programs and infrastructural projects. In this respect it is still a paramount study M. Alacevich, *The Political Economy of the World Bank. The Early Years*, Stanford University Press, Stanford (CA) 2009; F. Fauri, *Il Piano Marshall in Italia*, Il Mulino, Bologna 2009, see also my own *Supra-National Integration and Domestic Economic Growth*, *cit.*

and real wages, and on the steady increase in competitiveness on foreign markets.²⁸ Furthermore, this scholarship stresses the pivotal role of Bretton Woods international monetary system based on fixed exchange rates in letting the West European countries and Japan stick to all of these objectives at once. As a matter of fact, the international monetary agreements reached at Bretton Woods called on each country to abide by the fixed exchange rates but made room for one digit percentage adjustments on real foreign exchange rates.²⁹ Therefore, since the establishment of currency convertibility through to the late 1960s the industrial democracies could either revalue their own currencies against the U.S. exporters or devalue toward their export markets to respectively ease off the cost of technological upgrades or sustain their exporters on foreign markets respectively.³⁰

We frame this study on the U.S. nuclear assistance programs in the international economic relations of the 1970s before the backdrop of these scholarly trajectories by crisscrossing the history of international transfer in capital goods, and the history of international monetary relations. Although in this contribution we shall limit our reconstruction to the timeframe during which the U.S. and the World Bank Group provided their European allies with nuclear assistance programs for civilian purposes under the fixed exchange rate international monetary arrangements set off in Bretton Woods, we aim to frame this study before a longer and more comprehensive interpretation about the importance and changing dynamics of American technology transfers to friendly nations from Bretton Woods through to the 1970s energy crises. In doing so, we challenge a leading historical interpretation about the U.S. foreign economic policy during and after the decades of Bretton Woods. A backbone of works from differing research perspectives, from monetary history and the history of the international monetary relations, through to the history of economic and banking policies in each advanced industrial economy, focused on the late stage of Bretton Woods to point to the collapse of the international economic system established in 1944 as a three-fold end. These studies portrayed the demise of currency convertibility as the fading away in both fixed exchange rates and stable raw materials and energy prices, as well as the U.S. retrenchment from subsidizing the competitive edge of allied industrial democracies. In other words, they maintain that by the early 1970s Washington stopped or scaled down its commitment to funding or to propping up the technological upgrade of European and Japanese manufacturing systems on the international markets, first and foremost on the U.S. dollar area supplying markets. These studies point to the 1967 twin British pound devaluation and the ensuing oil crises that shook up the 1970s as the breaking point in the history of a post war international market integration based, since as early as the negotiations between the United States and its West European allies about the Marshall Plan aid,³¹ on the search

²⁸ For a sketchy, though vivid, historiographic survey, see G. Toniolo, *Europe's Golden Age. Speculations from a Long-Run Perspective*, "Economic History Review", new Series, vol. 51, n. 2 (May 1998), pp. 258-260.

²⁹ H. James, *International Monetary Cooperation since Bretton Woods*, Oxford University Press, Oxford 1996.

³⁰ For a rather different appraisal about the role of transatlantic monetary and technological relations during the 1960s pointing to these two issues as a matter of conflict between the U.S. and Europeans see H. Zimmermann, *Western Europe and the American Challenge: Conflict and Cooperation in Technology and Monetary Policy 1965-1973*, "Journal of European Integration History", Vol. 6, n. 2 (2000), pp. 85-110.

³¹ T. Healey, Will Clayton, Negotiating the Marshall Plan, and European Economic Integration, "Diplomatic History", Vol. 35, n. 2 (April 2011), pp. 229-256.

for a balance between recasting domestic consumer markets and sustaining competitive edge and foreign trade through binding up cheap energy sources and other commodities, and relatively inexpensive technological modernization.³² As such, according to this view, the turning point of the 1970s marked the collapse of an international growth model that had successfully made its way from the late 1940s through to the late 1960s.³³ Before the backdrop of this interpretative path it is widely accepted to view the 1970s as the historical roots laying at the origins of both a path-breaking falloff in high added value manufacturing industry, and a reappearance across the advanced industrial nations of labor intensive and low capital intensive production chains that during the following two decades plunged the Fordist mode of production into prolonged and sluggish meltdown, eventually setting off industrial demerger and hiving off. From works in monetary history stressing the end by the mid-1960s of tight monetary policies by the U.S. Federal Reserve System aimed at coordinating international economic cooperation and trade integration that by the second half of the 1960s arguably made way for domestic oriented and unemployment-targeting monetary and credit policies,³⁴ to general accounts making the case for the demise of Fordist-Keynesian compromise as the root eventually leading to the end of average capital intensive serialized and standardized mass production,³⁵ through to studies in historical sociology pointing to the decade as the second industrial divide,³⁶ a mainstream literature was successful in portraying the 1970s as the historical watershed leading to a shortfall in high technological content.

Tough authoritative historical accounts have pointed to the role that the appearance of flexible modes of productions had in adjusting production to fluctuating demand on international markets since the early 1970s without resorting to a low capital intensive reorganization on the supply side,³⁷ only quite recently a bulk of studies in international political economy reverted that mainstream accounts, indeed still widely accepted among historians of American foreign relations and U.S. domestic economic history.³⁸ This new wave of historical and economic inquiry points to a

³² T. Mitchell, *Carbon Democracy*, Verso, London 2011; C. Maier, *The World Economy and the Cold War in the Middle of the Twentieth Century*, in M. Leffler-A.O. Westad (eds.), *The Cambridge History of the Cold War*, Cambridge University Press, New York 2009, pp. 44 ff.;

³³ *The Economics of Ostpolitik. West Germany, the United States, and the Gas Pipeline deal*, in T. Schulz-T. Schwartz (eds.), *Strained Alliance. U.S.-European Relations from Nixon to Carter*, Cambridge University Press, Cambridge 2010, pp. 65-83.

³⁴ This scholarship points to the stepping down of Alfred Hayes from his appointment to the presidency of New York Fed as the watershed that marked the end of a monetary policy aimed to binding up selective capital investments and tight monetary policy as the linchpin to sustain anti-inflationary growth and the competitive position of U.S. manufacturing on foreign markets. See M. Bordo-B. Eichengreen, *Bretton Woods and the Great Inflation*, in M. Bordo-A. Orphanides (eds.), *The Great Inflation. The Rebirth of Modern Central Banking*, The University of Chicago Press, London-Chicago 2013, pp. 460 ff.

³⁵ D. Harvey, *The Condition of Postmodernity. An Inquiry into the Origins of our Times*, Basil Blackwell, London 1990.

³⁶ C. Sabel-J. Zeitlin, *The Second Industrial Divide. Possibilities for Prosperity*, Basic Books, New York 1984;

³⁷ For a convincing account along this interpretative path see E. Hobsbawm, *Age of Extremes. The Short Twentieth Century 1914-1991*, Abacus, London 1994, pp. 403-405.

³⁸ M. Nolan, *The Transatlantic Century. Europe and America 1890-2010*, Cambridge University Press, New York 2012, chapter 9; J. Stein, *Pivotal Decade. How the United States Traded Factories for Finance in the Seventies*, Yale University Press, New Haven-London 2010.

different periodization. It makes the argument that during the 1970s the industrial democracies still based their domestic growth strategies on steady market competitiveness resting on the linchpins of high added value manufacturing sectors and foreign trade.³⁹ Besides, it argues that both the United States and most of the West European industrial democracies sustained growth through either demand management macroeconomic policies or corporatist arrangements between capital and labor typical of coordinated market economies. This fresh new wave of cross-disciplinary studies share the idea that during the 1970s significant politics of stabilization across differing industrial democracies coalesced.⁴⁰ Our approach to the history of the U.S. foreign economic policy after the collapse of Bretton Woods as aimed to stabilize the international economy through mixing up the financing of capital intensive industrial restructuring and the promotion of demand management-oriented internal economic policies is intended to add fresh new historical reconstruction to this theoretical framework.

Before this theoretical interpretative framework on the historical turning point of the 1970s and the varying ways in which the advanced industrial economies faced up to the economic drawbacks of the decade, so far historical research dragged the feet in investigating this subject, leaving with the economic and social sciences to provide the scholarly community and the broader public audience with the mainstream interpretation we have just mentioned. As a matter of fact, a rather limited bunch of historical syntheses on the 1970s' process of industrial restructuring correctly pointed to the linkage between an overall shift in productive investments away from average capital intensive and mature manufacturing sectors, and the successful development of new high added value and labor saving sectors that ensued over the following two decades. Mainly from a business history perspective, this literature focused mostly, though not exclusively, on former large state-owned concerns and enterprises to argue that many of the success story international cooperation agreements among national entities to develop European-level industrial consortia among industrial democracies occurred since the 1970s thereafter in newly established technologically advanced sectors like aerospace industry, geological survey, telecommunications.⁴¹ Therefore through an overall attention to the ways by which the United States shaped its foreign economic policy to confront the sluggish international economy of the 1970s, and the international energy policy that Washington carried forward during the time frame from the second half of the 1960s through to the very beginning of the 1980s in the field of nuclear power, we follow this recently offered interpretative trajectory.⁴² In doing so, through the case study of U.S. and the World Bank Group nuclear assistance programs to Italy to develop energy producing capacity alternative to hydrocarbons prior to the collapse of fixed exchange rates arrangements that helped technological assistance, we frame this piece of work into a broader and more comprehensive inquiry into the changing role of technology from the dollar-pegged international monetary

³⁹ R. Rosecrance, *Débat sur l'Etat virtuel*, Presses de Sciences Po, Paris 2002.

⁴⁰ D. Wass, *Decline to Fall. The Making of British Macro-Economic Policy and the 1976 IMF Crisis*, Oxford University Press, Oxford 2008; P. Hall, *The Political Origins of Our Economic Discontent*, in M. Kahler-D. Lake (eds.), *Politics in the New Hard Times. The Great Recession in Comparative Perspective*, Cornell University Press, Ithaca(NY)-London 2013, pp. 129-149; G. Duménil-D. Lévy, *The Crisis of Neoliberalism*, Harvard University Press, Cambridge (Mass.)-London 2011, chapter 1.

⁴¹ For a path-breaking case in point see for example V. Zamagni, *Finmeccanica. Competenze che vengono da lontano*, Il Mulino, Bologna 2009.

⁴² This long term time frame is the subject of a research paper currently under preparation.

system of Bretton Woods to the heydays of floating currencies in reorganizing productivity and easing off the strain of the oil crises on the external equilibrium of those energy scarce industrial economies that opted for setting off an industrial restructuring based on the highest added value manufacturing sectors. The unfinished search for a stable external equilibrium by a resource-scarce modernizing economy like the post-War World II Italian society makes the peninsula an exemplary case in point in that all along the decades following the reconstruction years, Italian economic policymaking pursued the country's reintegration in the international economy in the aim to target the objectives of capital intensive industrial productivity and relatively cheap foreign oil supply to respectively strengthen the assets and ease off the liabilities in the balance of payments on currents account.

Before the Quest for External Equilibrium and the Search for Technological Drift: The Changing Italian Energy Regime from Prior to the Second World War to the Early 1950s

In the framework of a European-wide search for import substitution energy sources alternative to oil, the case study of Italy's nuclear power programs is a worthwhile sample to investigate the interconnectedness between attempts to restore foreign exchange equilibrium in the West European countries as far as the 1970s oil price hike hurt it, and the search for a capital intensive industrial restructuring to regain sways on world trade market and to restore the country's terms of trade and domestic growth following the harmful impact that early that decade a skyrocketing inflation had on the Italian manufacturers' export and internal demand. The early U.S. nuclear assistance programs from the late 1950s through to the 1960s help trace to what extent way before the 1970s the U.S. government and the World Bank Group elites viewed of utmost importance the linkage between oil and energy supply, the development of average or high technological content industrial manufacturing, and the stability of an oil-scarce economy as Italy in both domestic economic development and international payments. Therefore, in this paragraph and the following one we bring into focus this theme through exploring bilateral negotiations between the United States and Italy to negotiate the level of American financial assistance to Rome in connection with the beginning and implementation of the Italian programs to build up a number of nuclear power plants. We further demonstrate, as we already argued in the introduction, that during this period the two counterparts, and particularly Italy, resorted to real exchange rate adjustments to smoothly support the process of technology transfer occurring in the framework of the Italian betting on nuclear power for civilian purposes. Following a short snapshot providing historical grounding on the subject, we focus on the development of post-World War II debates and plans to convert electrical power stations from oil-fired to nuclear-powered generators since they began in the 1950s.

During the decades following the unification of Italy, fossil fuels accounted for only a very modest percentage, less than 10 percent of the country's total energy supply. The contribution of coal and other fossil fuels to the total energy balance of Italy definitely crept up during the time frame from World War I to the late 1930s, when it rose from about 40 percent to almost 50 percent.⁴³ During the interwar years two dynamics triggered further this upswing demand for fossil fuels for physical output. On the one side the war industry demand for oil and fossil fuels empowered energy

⁴³ P. Malanima, *Energy Consumption in Italy in the 19th and 20th Centuries*, CNR, Napoli 2006.

supply; on the other, a fundamental turnaround from agriculture to manufacturing marked the history of the Italian economy during those decades. This watershed prompted a structural shift from waterpower-based economic activities typical of post-unification Italy such as agriculture and labor intensive cotton industry and handcraft manufacturing,⁴⁴ to the development of mechanization in agriculture and the expansion of the mechanical, metalworking and chemical industry. This turn in the history of the Italian economy contributed to increase the industrial demand for electricity. Therefore, during the 1930s and early 1940s the onset of colonial wars and the ensuing participation of the country in the Second World War drove up the internal demand for fossil-fuels powered energy production. Besides, the process of industrial modernization, coupled with the fascist regime's policy of economic self-sufficiency and autarchy, made it clear that the peninsula's traditional scarcity in raw material and energy primary sources represented an Achilles' heel to the country's industrial take off and its positioning in the international system of political and economic relations.

As such, the need to meet the rise in electricity demand led to devise policies of energy diversification by means of pinpointing energy sources alternative to coal and its by-products. Furthermore, this search for energy sources to replace coal was to target Italy's long-standing energy dependence on foreign supply. Since the very end of World War II the United States viewed the Italian effort to develop domestic energy supply an important strategic asset to the country's postwar industrial resurrection.⁴⁵ In this context, since shortly after the end of the Second World War the Italian economy came through an historical drift from coal powered energy supply to oil and its hydrocarbon compounds. This shift took place under the aegis of a U.S. and NATO international energy policy that after the war made a clear bet on oil. Soon after the end of the war the U.S. raised both the level of oil production for domestic uses and to export to friendly nations of Western Europe at an unprecedented pace.⁴⁶ On the other hand, Washington reshaped the U.S. foreign policy in the aim both to establish most favored nation oil drilling and trade agreements with Venezuela, at the time the main Latin American oil producer,⁴⁷ and to make any effort to bring under the U.S. sphere of influence the oil-rich producing economies of the Middle East.⁴⁸

In the making of this U.S.-led international energy system, the reshuffling of the Italian energy policies around what the historical literature has termed the "hydrocarbon paradigm" did not ease the country's dependence on foreign supply of energy sources. By contrast, as long as over the two decades following World War II

⁴⁴ P.A. Toninelli, Energy and the puzzle of Italy's economic growth, "Journal of Modern Italian Studies", n. 1 (2010), pp. 107-127.

⁴⁵ In the framework it is exemplary the U.S. position within the Allied Commission: see for example Harland Cleveland, 'Some Conclusions and Recommendations on United States Policy and Organization in Italy', May 28, 1945, in NARA, RG 169 (Records of the Foreign Economic Administration), Bureau of Areas European Branch, Records Relating to the Economic Relief Program for Italy 1943-1945, b. 2(Documentation-Procedure to Foreign Mission Financial Letters, fold. Financial Directives).

⁴⁶ Up to the importance of U.S. foreign reserve production and supply since World War II see F. Venn, *Oil Diplomacy in the Twentieth Century*, St. Martin's, New York 1986.

⁴⁷ D.S. Painter, *Oil, Resources, and the Cold War 1945-1962*, in M.P. Leffler-O.A. Westad (eds.), *The Cambridge History of the Cold War, Vol. I, Origins*, Cambridge University Press, New York 2010, pp. 491 ff.

⁴⁸ T. Mitchell, *Carbon Democracy*, cit.; D.S. Painter, Oil and the American Century, "Journal of American History", Vol. 99, n. 1 (2012), p. 30.

the country experienced an uneven economic growth and domestic market expansion, the Italian economy faced a peak demand for energy by and large in excess of supply. The unevenly industrializing peninsular economy eventually dragged structurally dependent on foreign supply of oil. During the decade following the end of the conflict on the one side Italy's consumption of hydroelectric power declined constantly; on the other, a substantial rise in oil consumption changed the pattern of the country's domestic energy market altogether. On the eve of Italy's economic take-off, oil accounted for roughly one-third of total energy consumption⁴⁹. Throughout the 1950s, the country strove to curb its energy dependence on foreign markets through both an energy diversification policy mainly based on the search for indigenous energy sources, and a firm foreign oil policy to enter price-sharing negotiations with a wide range of oil supplier countries to import crude petroleum. According to this two-fold energy policy, since the reconstruction years before the establishment of the state-owned entity for hydrocarbon compounds (ENI), the former fascist government's oil monopoly AGIP engaged in domestic oil and gas explorations. On the other hand, the search for cheap foreign oil supply led the Italian elites and the newly established ENI to engage in a wide set of negotiations, including both the Atlantic bloc's oil supplying economies and the oil producing countries aspiring to drill, produce and distribute hydrocarbons free from binding relations with either the United States or the Soviet bloc. ENI was a front runner throughout the 1950s both in the pursuit of inward energy policies and in pushing forward a path dependence energy policy. In this framework by the mid-1960s ENI on the one side negotiated the import of Soviet crude oil for a total amount equal to circa 14 percent of the country's total crude import.⁵⁰ On the other, under the leadership of Enrico Mattei the state hydrocarbon entity struggled to bring under its control a number of oil fields across energy-rich African countries through the establishment of subsidiaries and the construction of refineries in Iran, Somalia, Morocco, Congo, Kenya, Sudan, and Nigeria.⁵¹ Thus far an abundant scholarship in business history has comprehensively explored both the commitment of ENI after the reconstruction years to lead the Italian search for indigenous natural gas and methane as import substitutes, and the Italian far-ranging challenge to the American oil multinational operating across the international oil markets under the guidance of Mattei in search for profit sharing agreements.⁵² Before this backdrop, in order to grip the paramount importance of oil to the Italian foreign energy policy during the 1950s, it is worth mentioning the high level refining capacity that the Italian petroleum industry gained since the end of World War II. On the one side it led the

⁴⁹ For this breakdown see IMD Little and Rosenstain Rodan, 'Summary and Conclusions of Peaceful Use of Atomic Energy in Italy', in World Bank Group Archive, Washington DC (hereafter WBGA), Italy- Nuclear Power Project - Negotiations 01, b. 182615B.

⁵⁰ Department of State, 'Guidelines for Policy and Operations-Italy', May 1962, p. 10, in J.F. Kennedy Presidential Library (hereafter JFKPL), Presidential Papers of John F. Kennedy, National Security Files, Country File, Italy, Reel 7, b. 120, fold. 0016.

⁵¹ CIA, Special Report 'Recent Activities of Italy's State Petroleum Corporation', April 17, 1964; Department of State, Bureau of Intelligence and Research, to the Secretary of State, Research Memorandum INR-91, November 2, 1962, 'Effects of Mattei's Death on Italian Oil Policies', all three documents are in DDRS; The American Embassy in Rome to the Department of State, November 28, 1962, in NARA, RG59, Bureau of European Affairs, Country Director for Italy, Austria and Switzerland, Records Relating to Italy 1943-1968, Lot File 67D319 fold. Petroleum.

⁵² For archival insights into the topic see the abundant sources in economic diplomacy easily retrievable in JFKPL, National Security Files, Country File, Italy, Reel 7, b. 120.

Italian business community to press the government of Rome to engage in bilateral trade partnership with certain nonwestern aligned oil-rich economies such as Persia to expand the volumes of oil import by Italy.⁵³ On the other, the specialization of ENI in refining was attractive to the United States in many respect. In first instance the government of Washington began monitoring the security of the Italian petroleum industrial facilities to patron and maximize her refining activities. This U.S. policy was implemented according to the guidelines to implement NSC-29, "Security of Strategically Important Industrial Operations in Foreign Countries", a U.S. National Security Council policy paper approved in September 1948.⁵⁴ Secondly, at the turn of the 1950s the U.S. oil companies and the State Department considered the issue of refining as part of a trade off with Mattei to face his profit-sharing energy strategy. In particular, Secretary of State Dean Rusk fully endorsed a draft agreement by the Standard Oil of New Jersey aimed to prevent Mattei from expanding ENI's commercial bonds with the Soviet bloc by trying "to accommodate ENI's need for assured supply cheap crude oil and possibly natural gas and use of Jersey refining capacity in certain countries as key elements in broader understanding with Mattei."⁵⁵ All these Italian and American energy policy stakes, paired by the exceptionally cheap and stable prices of crude petroleum on the international markets throughout the 1950s and early 1960s,⁵⁶ otherwise delayed the Italian search for alternative energy sources but natural gas, thus postponing a firm search for import substitutes from the top of the country's foreign economic policy agenda.

A High Degree of Bilateral Cooperation: Currency Convertibility, Foreign Exchange Adjustments, and the Early Steps of Nuclear Power Programs between the U.S. and Italy

Therefore, since the liberation of Italy through to the 1950s economic take-off, the Italian business community bet on the oil-powered and gas-fuelling industry to meet the country's demand for electricity and energy. However, way before the 1960s the United States engaged in supporting Rome to undertake the nuclear energy option to feed up the domestic industrial and private demand for electricity. As the historical research on the subject correctly pointed out, as early as the late 1950s Italy reached international agreements to build up three nuclear power producing plants, two of which would be based on American technology and one based on British technology.⁵⁷ What is noteworthy from the viewpoint of this article is that they all took place exactly at a time, from the late 1950s through to the mid-1960s, when Italy's stability on the foreign exchange markets and the pattern of domestic growth experienced an uneven and sudden change, moving from high employment rates and steady increase in GDP

⁵³ Memorandum by the Secretary of State for Foreign Affairs, 'Italy and Persian Oil', March 31, 1953, in National Archives UK, Cabinet Papers, CAB/129/60.

⁵⁴ Undersecretary of State, 'National Security Council Progress Report on the implementation of Security of Strategically Important Industrial Operations in Foreign Countries (NSC29)', June 8, 1953, in DD. Eisenhower Library, Abilene (Kansas), White House Office, Office of the Special Assistant for National Security Affairs Records, 1952-1961.

⁵⁵ Dean Rusk to American Embassy Rome, April 23, 1962, in DDRS;

⁵⁶ 'Petroleum Average Crude Prices 1950-2011', in IMF, *International Financial Statistics online*; see also 'Free market commodity prices, annual, 1960-2010', in UNCTAD, UNCTADstat.

⁵⁷ Ministero degli Affari Esteri. Possibili temi di collaborazione tra Stati Uniti e Italia nel settore nucleare, undated (likely 1973), in National Archives Italy, Rome (hereafter ACS), Aldo Moro papers (AMp), b.160, fold. 242.

by the very end of the 1950s to a downswing economic cycle in 1963-1964 conducive to a worsening in the balance of payments and to shrinking growth rates. On both issues the U.S. government and the Italian monetary authorities agreed to cooperate to let the peninsula sort it out.⁵⁸ Although devoid of any coordinated nuclear power program, the construction of these nuclear electric power facilities shed insights on both the early interest of the Italian governments in investing in R&D, and in committing the state-owned shareholdings to invest on nuclear power, as well as on the attitude on the part of the United States and the International Bank for Reconstruction and Development (IBRD) to link the expected technological advance stemming from nuclear technology transfer to the stabilization of Italy's balance of payments on current accounts. Moreover, they are useful in getting a better sense of understanding about the importance that the Americans placed on the added-value spill over on the Italian mechanical and chemical industry working on procurement for the nuclear industry. The development of these negotiations into the mid-1960s proved further these stakes, showing that the Italian policymakers shared the American view about the interconnectedness between the nuclear power programs and the stability in the country's external equilibrium. In the light of these considerations, though the historiography had already devoted time and careful research to them, we touch upon these early programs to construct the centerpiece of this article. We focus on the so-called SENN program as it is exemplary to investigate economic and financial relations between the U.S. and Italy in the nuclear field as far as it involved the IBRD to finance the Italian acquisition of technology from the U.S. dollar currency area.

The establishment since as early as 1951 and 1952 of two leading research institutions, the National Committee for Nuclear Energy (CNEN), and the National Institute for Nuclear Physics (INFN), were paired with an early wave of average capital intensive investments by the state shareholding National Institute for the Industrial Reconstruction (IRI) aimed at fostering a reorganization of its mechanical firms based on average technological content eventually leading to specialize in the production of components, instrumental goods and machinery to build up or to assemble a number of nuclear power stations. On the part of the Italian private manufacturers, the establishment of *Centro Informazioni Studi e Esperienze*, set up in 1946 under the auspices of nation-level private companies including among others Edison and Fiat to actively support nuclear research, led in the early 1950s to propose collaboration with Belgium in launching a nuclear power program.⁵⁹ This early Italian move to bet on nuclear power, tough promising, proved rather uncoordinated. More importantly, as the U.S. Central Intelligence Agency put it, “the financial position of the country and the lack of source of uranium ore at present precludes the establishment of even a modest program.”⁶⁰ In a matter of very few years, the financing side and the technological issue involved in establishing a coordinated nuclear industry in Italy became the cockpit of American nuclear assistance that underpinned the U.S. diplomacy and the IBRD in providing Rome with continued support lasting through the very late 1970s.

⁵⁸ Summary of Memorandum of Conversation Robert Roosa-Guido Carli 'Italian-American Discussions of March 10-12', March 12, 1964, in DDRS.

⁵⁹ C. Lombardi, *La questione dell'energia nucleare*, in *Storia dell'industria elettrica in Italia*, vol. V, *Gli sviluppi dell'Enel 1963-1990*, edited by G. Zanetti, Laterza, Rome-Bari 1994, p. 600.

⁶⁰ 'Brief Resumes Prepared by the CIA of the Atomic Energy Programs in France, Sweden, Norway, Switzerland, Italy', in Harry S. Truman Library, Papers of Harry S. Truman, Records of the National Security Council.

This American stand indeed turned up since the first important Italian initiative to produce a nuclear power program. Following the decision by Finelettra, the financial holding that grouped all of the utilities of IRI specializing in energy and electricity production, to leave Simea, a consortium involving both IRI and a number of private enterprises, in 1956 within IRI it was set up Società Elettronucleare Nazionale (SENN).⁶¹ The history of bilateral negotiations on the American economic assistance to build up the nuclear power plant of SENN began when under the Eisenhower administration both parties engaged in studies to develop nuclear power capacity for civilian purposes in Italy. The Italian scholarship correctly pointed out that the planning and financing of SENN nuclear power plant, built up 35 miles north of Naples on the Garigliano river under licenses from the International General Electric (IGE), had deep-seated roots in the international panel on the ENSI project as well as that the bulk of American funding came from an IBRD loan to the Italian state agency for the industrial development of Southern Italy, widely known as Cassa per il Mezzogiorno, charged with lending that loan to SENN.⁶²

Since the beginning of negotiations on the loan to Cassa, both the U.S. economists involved and the IBRD technical Mission to Rome, as well as the Italian government and the Central Bank of Italy representatives, focused on the opportunities and risks that the implementation of SENN's project posed on the Italian balance of payments. Since the early meetings between the IBRD Mission to Italy, the SENN, the Cassa, and the Italian government, the bulk of discussions on the loan, eventually fixed at \$40 million for the purchase of uranium fuel and technological components, revolved around this topic. As any IBRD loan to each member country of the World Bank, the government of Italy was requested to warrant against the loan to Cassa. In this framework, the Italian Treasury requested that the loan to Cassa be denominated in U.S. dollars "to guarantee the Cassa against exchange devaluation."⁶³ On its part, the IBRD Mission focused attention on the many ways to prevent real exchange rates fluctuations from impacting on the borrowing and purchases by SENN abroad and, as a consequence, on the liabilities in the balance of payments on current accounts. During negotiations, the representatives of the IBRD based in Rome proved open-minded and cooperative toward the issue the Italians had with the likely impact of SENN import requirements on the international payments position of the country. They shared the Italian concern about the implication of purchasing nuclear

⁶¹ M. Comei, *L'Iri, la nazionalizzazione dell'industria elettrica e le scelte di investimento degli indennizzati*, in *Storia dell'IRI*, vol. II, *Il "miracolo" economico e il ruolo dell'IRI*, edited by F. Amatori, Laterza, Rome-Bari, p. 408; see also, among other studies, Sabrina Pastorelli, *Lo stato imprenditore e la qualificazione tecnologica dello sviluppo economico italiano: l'esperienza dell'IRI nei primi decenni del secondo dopoguerra*, "Banca d'Italia. Quaderni dell'Ufficio Ricerche Storiche", n. 12, (2006), p. 54.

⁶² On the forefront of this scholarship see A. Rigano, *La Banca d'Italia e il progetto ENSI*, "Banca d'Italia. Quaderni dell'Ufficio Ricerche Storiche", n. 4 (2002); B. Curli, *Energia Nucleare per il Mezzogiorno. L'Italia e la Banca Mondiale 1955-59*, "Studi Storici", n. 37 (1996), pp. 317-351; id., *Il progetto nucleare italiano 1952-64. Conversazioni con Felice Ippolito*, Rubbettino, Soveria Mannelli 2000; by contrast, some recent studies downplay these early steps, suggesting that the nationalisation of the energy sector in 1962 somehow delayed the development of nuclear power projects. See for example S. Labbate, *Italy and the Development of European Energy Policy. From the Dawn of the Integration Process to the 1973 Oil Crisis*, "European Review of History", Vol. 20, n. 1 (2013), pp. 67-93.

⁶³ W. Diamond to M. Lejeune, 'First Report of the Mission to Italy', September 29, 1958, in WBGA, Italy Country File;

equipment and fuel on the stability of the Italian lira on the foreign exchange markets. Within the IBRD Mission to Italy they engaged in lengthy discussions on this matter. In first instance they considered forestalling or reducing to the least possible rate the cost of loan to purchase nuclear fuel on the American oil markets by means of getting involved the European and US nuclear authorities. In particular, in their view a first option was that “the US Atomic Energy Commission might provide the fuel to SENN and charge only interest on the value of the fuel provided.”⁶⁴ In second instance, after a lengthy bilateral debate on whether the uranium fuel for the initial core should be leased or purchased,⁶⁵ they made the hypothesis that the cost of fuel purchase could be eliminated from the import bill of the Italian nuclear power program through a commitment by Euratom to transfer it to SENN cost free. The relevance of devising ways to reduce or contain the strains of import requirements on the current accounts by both the Italian Treasury and the American representatives in Rome should be linked on the one side to the U.S. dollar currency area from which the bulk of equipment was imported; on the other, to the dynamics of the exchange rates between the dollar and the lira over the period.⁶⁶ As a matter of fact, from the viewpoint of the IBRD, the impact of real exchange rate variations on both loan repayments and the market prices for the import of investment and instrumental goods could hamper a fundamental objective underpinning the U.S. and IBRD financial commitment to support the erection of nuclear power facilities across the country. Since the beginning the IBRD considered the project a viable chance to upgrade the competitive edge of the Italian industry by scaling up its technological content, reducing energy intensive industry production costs, and establishing a high added value producing inward industry vital to reduce the strain of technological upgrade on import requirements. All these factors were to flatly curb per unit production costs. According to an early study by Rosenstein Rodan, “low cost of nuclear Kwh will enable Italy to eliminate cost disadvantages in energy intensive industries, and expand production in those sectors whose rate of growth has to be restricted in the decade 1954-1964. Foreign exchange savings through such import savings may be considerable.” Therefore, although in his view it was doubtful that nuclear power machinery could be produced in Italy in a matter of very few years, “the indirect balance of payments effects of nuclear power may be thus greater than the direct ones.”⁶⁷ In the framework of these objectives, the Mission to Rome viewed uneven real exchange rate variations or adverse currency denominations of import related international payments as a harmful threat.

Along with this aim to make technological transfer a fly-wheel to better the external position of Italy, notwithstanding Rosenstein Rodan's skepticism about the possibility in the short term to lay down the foundation of a domestic capital intensive industry, all in all the IBRD consistently pursued a technological drift target. The approval by IRI-Finelettrica and the Italian government of SENN nuclear power project led to launch an international competitive bidding for the supply of nuclear equipment that

⁶⁴ A.D. Spottswood (IBRD Public Utilities Division Chief), 'SENN Project-Italy', September 26, 1958, *ivi*.

⁶⁵ N. Bass to Spottswood (Chief, IBRD Public Utilities Division), 'ENSI. Progetto Energia Nucleare Sud Italia', September 29, 1958, in WBGA, Italy Nuclear Power Project, b. 185424B.

⁶⁶ I shall expand upon this relevant topic herein. For aggregate data for the years spanning the negotiations and implementation of SENN and the other two nuclear power projects see Center for International Comparisons at the University of Pennsylvania World Table (<https://pwt.sas.upenn.edu>).

⁶⁷ I.M.D. Little-P.N. Rosenstein Rodan, 'Peaceful Uses of Atomic Energy in Italy', in WBGA, Italy-Nuclear Power Project-Negotiations 01, b. 182615B.

was finally awarded to International General Electric, a subsidiary of U.S. General Electric. In making some internal remarks on it, the representatives of IBRD in Rome emphasized that the decision of the Italian government to contract the Italian steel-making, electrical and mechanical industries for the procurement of up to 70 percent of the component parts of the plant should be considered an important step forward to increase per unit technological content of the Italian industry and to let it work on procurement for the national government “to build complete nuclear power plant for Italy and possibly the foreign market.” According to the IBRD Mission this technological spill over would stem from the exchange of patents, licenses, and know-how with the U.S. firms necessary to build up the plant on the Garigliano River, for which the selection of IGE by the Italians meant going for a water-boiling nuclear reactor based on American technology.⁶⁸ The U.S. interest in easing off the cost of nuclear fuel and equipment transfer to Italy through flattening down the cost of loans to purchase equipment or through commitment by Euratom to transfer it cost free took place in the framework of this U.S. aim to also prevent that exchange rate movements reverse the competitive advantage that the Italian nuclear, mechanical and metalworking firms were to gain from technological transfer. On the Italian side, the Rome government showed his sharing with the IBRD of this competitive edge target offered by these early nuclear power programs on several occasions. We have already made reference to the Italian Treasury focus on the currency denominations of the loans to prevent uneven real exchange rate movements from pricing up the cost of technological imports, thus offsetting its competitive leap forward. Alongside this interpretative approach, it is worth analyzing the dynamics of foreign exchange rates between the Italian lira and the U.S. dollar from the beginning of negotiations to the years when this and the other nuclear power plants went into full production. It is eye-opening to bring into focus the years from 1959 to 1962, during which on the one side the SENN and the other two nuclear power programs of SIMEA, located next to the city of Latina, and the SELNI plant in North Eastern Piedmont region, were fully implemented;⁶⁹ on the other, trade exchange between the Italian industry and the U.S. supplying market were set on. During this first time frame the U.S. dollar annual average against the lira declined, thus charting a significant improvement in the exchange rate of the Italian currency that bettered the purchasing power of the Italian industry on the American market.⁷⁰ In the framework of these foreign exchange rate adjustments, during those years the rise in the value of export that the Italian economy performed matched with both a drop off in labor intensive durables and farm products, and a rampant rise in the export of chemical and capital-intensive goods like engineering. Significantly, only during 1961 the import of capital goods from the U.S. market increased by 50 percent.⁷¹ This Italian exchange rate policy that helped to transfer capital goods and high technological content equipment from the U.S. to the Italian market, namely from IGE to Finelettrica, must be set in the very early 1960s high degree of cooperation between Italy and the U.S. in both multilateral

⁶⁸ IBRD Mission to Rome to IBRD Washington DC, cable, September 24, 1958, Ivi.

⁶⁹ CIA, Office of Research and Reports, Economic Intelligence Memorandum 'Present Cost of Nuclear Programs in Selected Countries and Potential Cost of Converting Present Programs to Production of Nuclear Weapons, October 1963, in DDRS; see also M. Comei, *L'Iri, la nazionalizzazione dell'industria elettrica e le scelte di investimento degli indennizzi*, cit.

⁷⁰ IMF, *International Financial Statistics*, August 1963.

⁷¹ The IMF Acting Secretary to Members of the Executive Board, 'Italy. Article VIII Consultations, 1961', October 5, 1961, in IMFA, Executive Board Documents, Staff Memoranda, 1961 Staff Memoranda, Italy-1961 Article VIII Consultations SM/61/70, Sup. 1.

development assistance⁷² and, more importantly, bilateral financial and monetary arrangements. In particular, the appreciation of the Italian lira against the U.S. dollar, conducive to trade exchange in nuclear and other high capital intensive equipment between the two countries, was consistent with the assistance that in many ways the government of Rome offered to help redress the disequilibria in the U.S. balance of payments during four consecutive years of balance of payments surplus for Italy.⁷³ Among other measures, in 1962 Italy made debt pre-payments of \$178 million. Washington considered them “a most helpful means of partly offsetting their current surplus against our present deficit on current accounts.”⁷⁴ Alongside this line of action, between 1962 and 1963 the two countries reached agreement to offset the U.S. military expenses in Italy. A first bilateral arrangement led Italy to purchase \$124 million of military equipment from the U.S.; in 1963 the U.S. and the Bank of Italy conducted further discussions for pre-financing of Italian military purchases from the U.S.⁷⁵

Nuclear Cooperation and Monetary Arrangements in the 1960s from Crisis to Renewal

By all these arrangements, including the lira revaluation against the dollar through 1962, Italy helped Washington to redress the international payments position of the dollar. By contrast to these bilateral monetary arrangements in support for the U.S. currency, a roughly equal exchange rate devaluation of the lira against the dollar occurred by 1963, right before the SENN and other nuclear power plants either began operating or their construction was completed.⁷⁶ This depreciation of the Italian lira in correspondence with the end of construction programs and imports required to complete the nuclear power programs can be better grasped by considering the broader macroeconomic and monetary conjuncture that Italy experience after 1962. Following a decline in the rate of investments in industrial infrastructures and equipment,⁷⁷ by 1963 a stubbornly rise in nominal wages and labor costs led to wage increases outstripping productivity increases. As a result of this trend, income redistribution laid in a shift from savings and investments to consumption that reversed the competitive advantage that manufacturing had gained during the heydays

⁷² In this respect it is exemplary that both the Bank of Italy and the Government showed resilient to the American pressure to cooperate in financing development assistance policies set up within the Development Assistance Committee of the OECD by implementing export promotion policies toward the less developed countries through foreign trade measures such as export credit (The U.S. Embassy in Rome to the Secretary of State, April 30, 1962, in JFKPL, Presidential Papers of John F. Kennedy (hereafter PPJFK), National Security Files, Country File, Italy, reel 7, b. 120, fold. 0001.

⁷³ State-Defense Treasury message (G. Ball) to American Embassy Rome, May 11, 1962, in JFKPL, PPJFK, National Security Files, Country File, Italy, reel 7, Italy General, b. 120.

⁷⁴ Department of State, Position paper 'Prime Minister Fanfani's visit to Washington January 16-17, 1963, Position paper US-Italian monetary cooperation', January 14, 1963, in DDRS.

⁷⁵ 'President's European Trip', June 14, 1963, in DDRS.

⁷⁶ For these data see the official exchange rate statistics by the Bank of Italy in www.bancaditalia.it; I myself have reworked these statistics for a long term data set on the Italian macroeconomic development since unification in J.Castaneda (ed.), *Statistical Gold Analysis Worldwide, Short Notes on the Main Economic Developments and Monetary History since mid Nineteenth Century: Canada, France, Germany, Italy, The Netherlands, Spain, UK, and USA*, GoldMoney Foundation, 2012.

⁷⁷ The Secretary to Members of the Executive Board, 'Italy-1963 Article VIII Consultations' February 20, 1964, in IMFA, Executive Board Documents, Staff Memoranda, 1964 Staff Memoranda, Italy-1963 Article VIII Consultations (SM/64/21).

of Italian economic boom. Faced with this situation the Italian monetary authority increased liquidity to meet planned investment, thus plunging the country into credit expansion and price-push inflation.⁷⁸ Faced with the ensuing inflation and strains on the current account position of the lira that this downswing economic cycle triggered, the Bank of Italy promptly acted to run counter this curse through a number of internal and foreign economic policy moves. Expectations for a balance of payments deficit for some \$750 million in 1964, led the Governor of the Bank of Italy Carli to go for both a stricter credit policy including a deceleration in the rate of expansion of bank credit and tighter commercial credit, and a full support to the export industry by substituting export for internal demand. In the framework of this fight to restore the international payments position of the lira, in first instance Italy adopted exchange devaluation against the U.S. dollar to resurrect the competitive position of the Italian exporters. Secondly, the Bank of Italy on the one side arranged a number of monetary swaps with the Federal Reserve Bank of New York, the British and the West German monetary authorities.⁷⁹ On the other, more importantly, the Italian Central Bank made a call on the U.S. for getting further external financial assistance aimed to the two-fold target of drying up the current accounts deficit and setting off investments to reshape the competitive edge of the Italian industry by means of productivity-enhancing capital intensive investments.⁸⁰ In making this claim before the U.S., Carli showed his consistency with the Italian and American approach to the interconnectedness between the search for a stable balance of payments and the shaping of a competitive national manufacturing system that a few years earlier had been the framework to conduct negotiations on the first nuclear power programs and on the earlier IBRD loans to the Cassa per il Mezzogiorno. The U.S. authorities and the American high ranking officials interested in the Italian economic affairs and outlook promptly grabbed this point. From the view point of the U.S. government overall outlook on the Italian economy, Walter Rostow suggested that resurrecting the Italian economy from the current downturn required both restoring the balance of payments equilibrium and a big investment boom to link wage increases to productivity changes. In his view “past wage increases and end of mass labor reserve in South Italy require radical increase in industrial investment for Italian industry to remain internationally competitive.”⁸¹ On their part, in discussing the scale and scope of further IBRD lending to Italy in 1964, the economists of the World Bank stressed that “Carli does not make any distinction between the restoration of balance of payment equilibrium – for which he requires capital imports – and the need for capital imports for investment

⁷⁸ Memorandum of Conversation G. Carli-Undersecretary Ball 'Governor Carli's Discussion with Under Secretary Ball', March 11, 1964, in *Foreign Relations of the United States* (hereafter *FRUS*) 1964-1968, Volume XII, *Western Europe*, Government Printing Office, Washington DC 2001, pp. 180-183.

⁷⁹ Memorandum from Secretary of the Treasury Dillon to President Johnson, 'Financial Assistance for Italy', March 13, 1964, in *FRUS 1964-68, Volume XII, Western Europe*, cit., pp. 183-184.

⁸⁰ Summary Memorandum of Conversation Carli-Roosa, 'Italian-American discussions of March 10-12, March 12, 1964, in DDRS.

⁸¹ Telegram from the Consulate in Frankfurt to the Department of State, June 25, 1964, in *FRUS, 1964-68, vol. XII, Western Europe*, cit., p. 193; in this respect see also 'paper left by Mr. Rostow in Rome', in NARA, RG59, Bureau of European Affairs, Country Director for Italy, Austria and Switzerland, Records Relating to Italy 1943-1968, b. 10, fold. Economic Affairs (General), Italy General Reports July-December 1964.

purposes.”⁸² Therefore, before this rather different and shrinking Italian international payments position, the country continued in its effort to make the competitive edge of the Italian industry revolve around the pillar of technological advance and capital goods import. This position underpinned Italy's call for financial assistance on both the U.S.-backed banking corporations, then arranged in 1964 with the Commodity Credit Corporations and the Export Import Bank of the United States to finance the import of U.S. agricultural commodities and American produced goods and services respectively,⁸³ and the IBRD. Due to the current account deficit the Italian economic policymakers lacked any chance to draw upon upward movements in the foreign exchange rate to alleviate the cost of technological import requirements, thus making foreign credit and capital inflows all the more necessary to hold up the competitive edge of the Italian industry. The negotiations to obtain further lending from the IBRD after the last \$40 million to the SENN power project took place before this new backdrop, clearly illustrating the Italian stand and the U.S. response. In the framework of his visit to Washington of March 1964 to conclude negotiations for short term credit from the U.S. government and an automatic drawing from the IMF,⁸⁴ Governor Carli visited the IBRD to request a loan of \$300 million, stressing the urgent need to restore equilibrium in the current account position while sustaining large investments “to maintain the country's competitive position at the new wage level.”⁸⁵ Although the Mission sent to Italy in May and June 1964 by the IBRD shed several doubts on the need for such a large loan from the World Bank due to the continuing lack of adequate justification by the Italians through developing useful projects,⁸⁶ the Italian request found president George Woods mostly sympathetic to Carli's argument about a pressing need to pair import requirements for investment purposes with deficit financing in support of the balance of payments while keeping wage restraints to the least possible level and sustaining the growth level achieved from the late 1950s through 1961.⁸⁷ The Bureau for West European Affairs of the State Department shared this view, stressing “that there was danger that the credit squeeze would result in unemployment and some recession.”⁸⁸ On its part, the International Monetary Fund

⁸² IBRD Mission to Rome, 'Some Preliminary thoughts', June 16, 1964, in WBGA, Italy country File, Italy-Cassa General 1964.

⁸³ The total amount of credit from the two federal banks was roughly equal to \$450 million. See The Department of State during the Administration of President Lyndon B. Johnson, November 1963-January 1969, Vol. I, Administrative History, Chapter 3, Part D, Bilateral Relations with Western Europe, Italy, in Lyndon B. Johnson Presidential Library (hereafter LBJL).

⁸⁴ IMF European Department, 'Use of the Fund's Resources-Italy', March 23, 1964, in IMFA, Executive Board Documents, Executive Board Specials, 1964 Executive Board Specials, Italy-Use of the Fund's Resources (EBS/64/55).

⁸⁵ Staff Loan Committee, Memorandum from Department of Operations Europe 'Italy-Further Bank Lending', April 21, 1964, in WBGA, Italy-Cassa General 1964.

⁸⁶ D. McKillon to Tyler 'Prospective IBRD Loan to Italy', October 9, 1964; The Assistant Secretary of State for West European Affairs (W. Tyler) to the Undersecretary of State Mr. Ball, 'Your Dinner Tonight with George Woods-Italy', October 6, 1964, both in NARA, RG59, Bureau of European Affairs. Country Director for Italy, Austria, and Switzerland, Records Relating to Italy 1943-1968, Lot File 67D319, b. 1, fold. Italy-Export-Import Bank Credits- FN 11-2. May to 1964.

⁸⁷ IBRD Staff Loan Committee, Memorandum from Department of Operations Europe, 'Italy-Further Bank Lending', April 21, 1964, in WBGA, b. 182601B.

⁸⁸ Memorandum of Conversation L. Rist (Chairman IBRD Mission to Italy)-H. Spielman (Bureau of West European Affairs, State Department), 'Report of IBRD Mission to Italy',

outlook on the international payments position of Rome for 1965 firmly suggested not to run it unchecked.⁸⁹ In the framework of this consistent focus on the linkage between external equilibrium, a reorganization of the competitive position of the Italian economy on foreign markets through productive investments based on technological advance and, in turn, a sustained level of domestic aggregate demand, the new flow of public funding on which Carli, the Cassa, the U.S. government and the Bretton Woods institutions reached an agreement should be set. Indeed, this call for credit by the Bank of Italy came at a critical time for the country's international economic position not only because – unlike the recent past – losses in its foreign exchange reserves deprived Rome of an important negotiating monetary instrument against the dollar, thus hurting bilateral monetary cooperation between the two countries; but also because bilateral cooperation in restoring the competitive advantage of the Italian economy by means of technological transfer came to a stalemate. The failure of the SENN plant on the Garigliano river, finally shut down in 1964 after going critical on several occasions,⁹⁰ and the effects of nationalization of the Italian national energy sector of 1962 on the IBRD credit programs to carry forward the nuclear power programs, threatened the continuation of full monetary and financial cooperation between the two countries set out earlier that decade. As the 1962 delay of the Export Import Bank loan to the Selni nuclear power project proved further,⁹¹ the Italian government expropriation of the energy sector, which included the third nuclear power plant under construction in northwest Italy by SIMEA⁹² undermined a fundamental stake underpinning the U.S. firm stand in support for funding the construction of the three first nuclear power plants by Italy. As then IBRD president Eugene Black briefed the Italian Ambassador to the U.S. Manlio Brosio right before the creation of the joint Bank-Italian government nuclear study group ENSI, Italy's best prospect to obtain funding from the IBRD would lay in establishing its credit in foreign capital markets, particularly New York, adding “that the proposed nuclear power project (of SENN) might well prove a good basis for an approach to the market.”⁹³ Repeatedly averted by Carli and Rostow about the threat to the purchasing power of the Italian industry in

August 31, 1964, in NARA, RG59, Bureau of European Affairs. Country Director for Italy, Austria, and Switzerland, Records Relating to Italy 1943-1968, Lot File 67D319, b. 1 fold. Finance.

⁸⁹ D. Templeman (Assistant Treasury Attaché, Office of the Secretary of the Treasury) to John Ghiardi (U.S. Treasury Attaché, American Embassy Rome), October 20, 1964, in NARA, RG59, Bureau of European Affairs. Country Director for Italy, Austria, and Switzerland, Records Relating to Italy 1943-1968, Lot File 68D436, b. 10, fold. Economic Affairs General-Italy Gen. Rpts. July Dec. 1964.

⁹⁰ The boiling water reactor was particularly critical: See "Applied atomics", n. 402, June 12, 1963. For further details see A. Rigano, *La Banca d'Italia e il progetto ENSI*, cit.

⁹¹ Memorandum for the Record 'Selni Reactor Financing', March 15, 1962, in NARA, RG59, Bureau of European Affairs, Country Director for Italy, Austria and Switzerland, Records Relating to Italy 1943-1968, Lot File 68D436, b. 7, fold. Italy-Nuclear (Atomic) Senn 1961 to Selni.

⁹² A. Coumo (American Embassy Rome) to E. Frank (Department of State, Bureau of European Affairs), November 28, 1962, in NARA, RG59, Bureau of European Affairs, Country Director for Italy, Austria and Switzerland, Records Relating to Italy 1943-1968, Lot File 67D319, b. 1, fold. Petroleum.

⁹³ Black remarked his argument suggesting that “as a first step the Italian government should consider appointing New York bankers who could begin actively to work on Italy's behalf” (Memorandum 'Proposed Italian Nuclear Power Project', undated (but 1956), in WBG, Italy-Nuclear Power Project -Negotiations 01).

the foreign capital markets which acute speculative drains on the lira caused by lack of capital infusion and devaluation might led to, during 1964 the U.S. banking system involved in Italian economic matters widely shared this concern.⁹⁴ This issue is crucial to explain why notwithstanding that critical juncture in the U.S.-Italian bilateral monetary relations, the two counterparts respectively undertook two foreign monetary initiatives conducive to push forward cooperation among the two countries in both the technological and the monetary fields. In fact, on the one side the Bank of Italy's option to intervene on the foreign exchange markets to support the current account through devaluation was abandoned, thus paving the way to keep the lira exchange rate against the dollar stable from 1963 through to 1968 at the 1958 par value.⁹⁵ On the other, that widespread concern induced the Federal Reserve Bank of New York, the U.S. government and the two Bretton Woods' sister international economic institutions to approve vast credit lines and loans programs. This new framework restored the foreign exchange conditions that the Italian currency and importers had taken advantage of a few years earlier under a full operative currency convertibility system, thus making room to set out new investment programs based on high technological and average capital intensive leap forward.

Before this backdrop the U.S. business community and the Export Import Bank of the United States became involved in financing further the implementation of Italy's nuclear power programs since the second half of the 1960s. It is noteworthy to stress that the American involvement in the Italian nuclear power programs accelerated exactly when the devaluation of British Sterling marked the end of a stable international exchange rate system. In 1967, in the framework of the late 1960s downward trend in the cost of nuclear plants, the IBRD undertook a detailed objective review of the prospects for nuclear power in developing countries. In the context of this exercise, the Engineering Department of the World Bank made an inquiry with professor Angelini, then General Manager of ENEL and during the 1970s president of the Italian state-owned energy entity, regarding the possibility of having a Bank Mission sent to Italy to get useful information drawn upon the Italian experience in the development of nuclear reactor types and nuclear facilities.⁹⁶ Coincidentally, U.S. General Electric became once more involved in the Italian nuclear power projects. Before the backdrop of the Italian state shareholding system IRI commitment to develop high capital intensive manufacturing sectors, in 1967 the state controlled Ansaldo Meccanico Nucleare set up a joint venture with General Electric to establish a nuclear fuel and instrument goods producing facility working under American licenses and technology.⁹⁷ This brand new Italian-American business ventures took

⁹⁴ Melvin Sonne to Consul General Crain, Memorandum of Conversation M. Sonne-P. Austin (First National City Bank) 'Foreign Exchange Operations of the First National City Bank', April 21, 1964, in NARA, RG59, Bureau of European Affairs, Country Director for Italy, Austria and Switzerland, Records Relating to Italy 1943-1968, Lot File 67D319, b. 2, fold. Finance.

⁹⁵ For statistical reference see www.bancaditalia.it, and my own statistical reworking in J.Castaneda (ed.), *Statistical Gold Analysis Worldwide, Short Notes on the Main Economic Developments and Monetary History since mid Nineteenth Century: Canada, France, Germany, Italy, The Netherlands, Spain, UK, and USA*, cit.

⁹⁶ The Assistant Director of the Engineering Project Department to ENEL President Angelini, February 23, 1967, in WBGA, Italy-General-Nuclear Power Mission-Correspondence 01, b. 182601B.

⁹⁷ Attuazione dei Deliberati Cipe: costituzione della Fabbricazioni Nucleari S.p.A., September 18, 1967, pp. 28 ff., in Historical Archive of the Italian Institute for Industrial Reconstruction, Rome (hereafter ASIRI), Numerazione Nera, Verbali del Consiglio di Amministrazione.

place in connection with the approval by ENEL and the Italian government of construction of a new nuclear power plant in Northern Italy.⁹⁸ In this context IRI and General Electric revamped bilateral trade exchange in capital intensive instrumental and investment goods at a time when international monetary negotiations to reach agreements on real exchange rate adjustments was pursued at both bilateral level and in the framework of multilateral settings such as the Bank for International Settlements to cope with the impact of deteriorating nominal exchange rates on the stability of international trade that from 1968 through to 1971 anticipated the collapse of Bretton Woods monetary arrangements.⁹⁹ This U.S. involvement anticipated the unfinished commitment during the 1970s by both General Electric and Westinghouse, and the Export Import Bank of the United States,¹⁰⁰ as well as some American commercial banks such as Chemical Bank, to support the Italian energy diversification programs by combining technological drift and foreign exchange savings.¹⁰¹ This policy, fully backed by the State Department during the 1970s, prolonged into the new decade the U.S. strategy to both restore the competitive edge and the international payments position of a foreign oil supply dependent partner industrial nation.

⁹⁸ "Ansaldo Meccanico Nucleare, 'Note Sul bilancio 1968 e sulle previsioni 1969', *ivi*, April 1969; IRI, Consiglio di Amministrazione, 'Assegnazione all'Ansaldo Meccanico Nucleare della IV Centrale Elettro-nucleare ENEL', *ivi*, December 18, 1969.

⁹⁹ With respect to the case of Italy, still after the Nixon administration's watershed decision to terminate the gold-dollar parity, the Italian Ministry for the Treasury made a betting on exchange rate alignments to improve the competitive position of the Italian currency and to re-launch Italian economy. See the U.S. Embassy in Rome to the Department of State, the Department of the Treasury and the Fed New York, 'Italian Treasury Minister Ferrari Aggradi on International Monetary Matters and Devaluation of Lira', telegram, January 1972, in NARA, RG56, Office of the Assistant Secretary for International Affairs, Subject Files of the Office of International Monetary Affairs 1968-1978, b. 5 (International Monetary System General), fold. International Monetary System General (8).

¹⁰⁰ S. Selva, *Technological Advance, Transatlantic Trade, External Equilibrium. American Financial Assistance to the Italian Nuclear Power Programs from the 1960s through the first Oil Crisis*, *cit.*

¹⁰¹ Up to the U.S. Commercial Banks' involvement in financing ENEL's nuclear power projects by the late 1970s see FRBNYA, Central Files, Records Relating to Meetings with New York City Bankers.