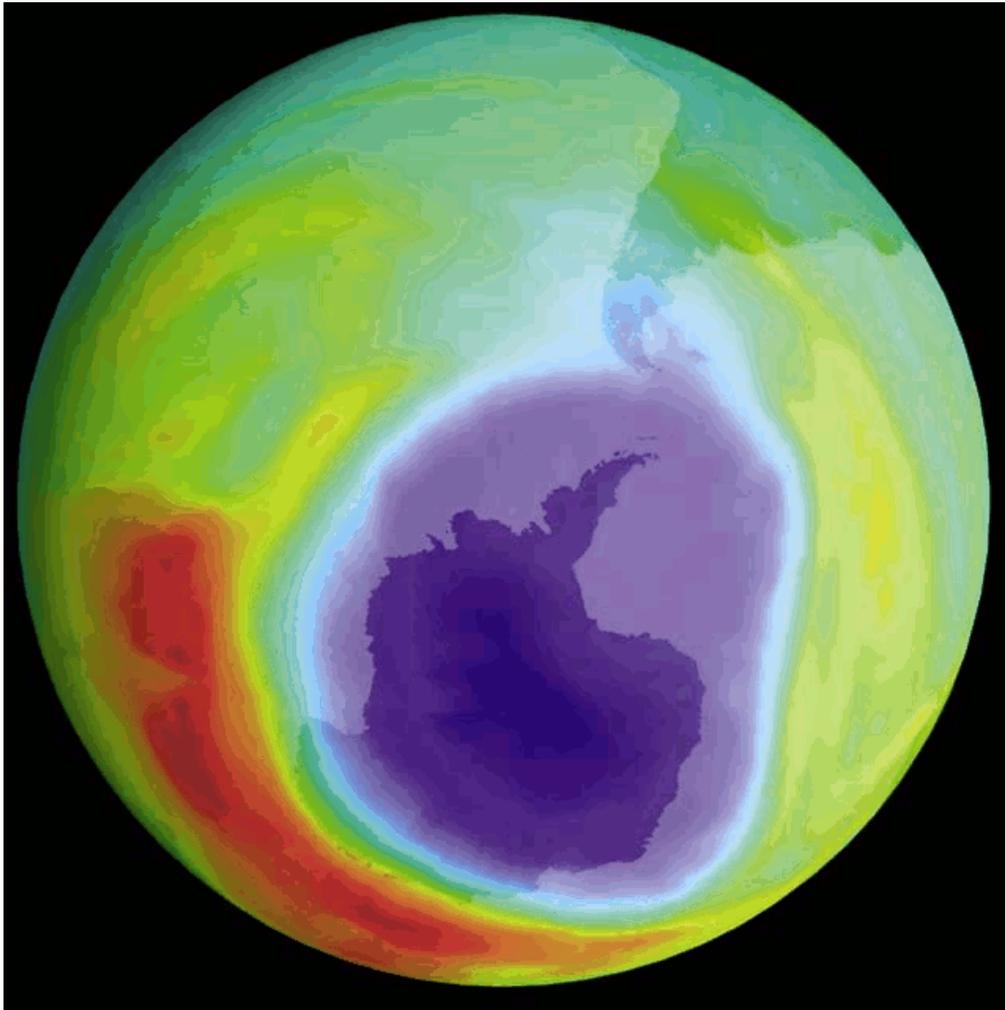


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THE CENTRALITY OF FINANCE

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ABSTRACT

In the contemporary conjuncture financialization is driving a fundamental reorganization of American capitalism and increasingly that of other economies significantly impacting the trajectory of the world-system. This paper interrogates the nature and extent of financialization, the ways it is adding to systemic risk with attention to the future of the dollar, and implications for the relationship between US-based finance and new emerging centers of the world-system.

INTRODUCTION

This paper discusses the manner in which financialization is coming to dominate the US economy and the ways in which international financial institutions are influencing the trajectory of capitalist development. Ironically, for the dual nature of the new reality has not been widely grasped, it is the expansion of financialization which sets the terms on which US hegemony is being challenged and at the same time an important process through which it is being re-asserted. That is to say the territorial space of the United States productive economy is contracting relatively to global production while at the same time following the path of previous hegemonic powers which expanded the scope of their financial control to extract rentier income from rising centers of accumulation. From the perspective of geopolitical strategists the hope is to combine financial dominance with technological and military superiority. Such a claim is consistent with observations by world-systems theorists that previous great powers – Genoa, Holland, Great Britain – when no longer globally paramount in product markets moved decisively to financialization as their loss of leadership is accompanied by the geographic relocation of the centers of capital accumulation (Arrighi and Silver 1999). The speed with which this process is taking place and its multifaceted nature tend to be discussed in terms of the possible damage rapid financialization poses for system stability, a question which will be discussed here but in the context of the ways in which transformation is transforming contemporary American capitalism and its place in the world-system taking a longer look forward.

The first section of this paper defines and discusses the concept of financialization and details its rapid growth. A second part considers the ways in which it is changing the character of American capitalism and the American role in the international political economy. A third discusses the fragility resulting from aspects of financialization which are adding considerable risk and the extent to which speculative excesses are creating potential problems. The widely debated significance of the US current account imbalance and the future of the dollar are the topics of part four. In the concluding section the time frame of the discussion is extended and implications of these developments for the relationship of US-based finance to new emerging centers of the world-system are addressed.

DIMENSIONS OF FINANCIALIZATION

Financialization refers to “the increasing importance of financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international levels.” (Epstein 2002:3) Finance capital, footloose and flexible, interposes itself whenever arbitrage opportunities present themselves. It represents the increased power of abstract capital as opposed to productive capital. On another level, financialization is a policy choice of governments in alliance with internationally oriented financial institutions. It is a tool of accumulation pushed powerfully by the American state and other money center governments.

Robin Blackburn has characterized financialization, this growing and systemic power of finance and financial engineering, as “grey capitalism” because relations of ownership and responsibility have become weakened or “blurred.” He writes “In the end the largest and most famous of corporations have only a precarious and provisional autonomy within the new world of business – ultimately they are playthings of the capital markets” (Blackburn 2006:42). While perhaps somewhat exaggerated in the sense that financial markets respond to and anticipate changes in the real values of assets including the credit worthiness of corporations, and CEOs have discretion over strategic decisions in meeting market demands, these financial pressures exercise a powerful influence over how success is to be measured at any point of time. Blackburn (2006:43) is right as well when he suggests that investors consider the corporation itself as simply “an accidental bundle of liabilities and assets that is there to be reorganized to maximize shareholder value.” Today’s investors are far from the patient capital of the earlier period. Given the pressure on institutional investors to maximize short term returns there is a constant churning of assets and so pressure on companies to maximize quarterly earnings. The incentive structure makes this rational behavior but can produce irrational results in terms of the longer run health of companies and the system.

The US financial market is the largest in the world with 37 percent of global financial stock, 45 percent of global equities, and 51 percent of private debt security stock (McKinsey and Company 2006). In 2005 foreigners held more than half of US Treasury securities (up from 20 percent in 1975), 14 percent of US equities (from 4 percent thirty years earlier), and 27 percent of US corporate bonds (compared to only 1 percent three decades previous). Surplus funds have been attracted to the US market for a variety of reasons ranging from the desire of governments to hold greater dollar reserves against the threat of financial crisis and to hold down the value of their own currency to promote exports to the desire of the investor class around the world for higher risk adjusted returns. Because of the dominant position of the dollar close to two-thirds of foreign exchange official reserves are held in the US currency and 89 percent of all foreign exchange trades are against the dollar. The United States has been the innovator in financial instruments, for example asset backed securities, primarily real estate but extending to a large variety of future earning streams from auto loans and leases, credit card receivables, small business loans and other categories now valued in the trillions of dollars.

Financialization has proceeded very fast in the opening years of the new millennium. Between 2001 and 2004 daily foreign exchange turnover increased by 57 percent and daily trading in derivatives was up by 74 percent. In 2006 private equity firms controlled \$800 billion in capital, 300 percent more than five years earlier and hedge funds managed a trillion dollars compared to half of that in 2001. Importantly debt creation, private and government debt securities, accounted for more than half of the overall growth in financial assets from 2000 to 2004. Taken as a whole the corporate profits of the financial sector of the US economy in 2004 were 300.6 billion dollars compared to 534.2 billion for all nonfinancial domestic industries, or about 40 percent of all domestic corporate profits. They had been less than two percent of total domestic corporate profits forty years earlier, a remarkable indication of the growth of financialization in the American economy (Council of Economic Advisors 2006).

FINANCIALIZATION AS A SOCIAL STRUCTURE OF ACCUMULATION

A crucial difference between the era of national Keynesianism and that of global neoliberalism is in the priority given to growth by the managerial capitalism of the earlier regulatory regime under which top executives benefited from the growth in the size of the firms they managed. The triumph of stockholder capitalism in the era of global neoliberalism has meant firms are pressed to extract every bit of surplus they can from stakeholders. This produces a pattern of slower growth and upward redistribution. To align corporate leaders with the single-minded pursuit of stockholder value stock options became the dominant source of executive compensation in the new institutional setting (on managerial capitalism see Chandler 1977; on the new financial capitalists see Baker and Smith 1998; and on the new ideology of shareholder value see Lazonick and O'Sullivan 2000). In practice encouraging executives incentives to maximize short term profit invites manipulating earnings to coincide with cashing options and to a shift in the firm's objective function to a new chosen growth-profit combination which exhibits higher profit and lower growth. Firms under the new incentive structure could grow faster but choose not to because that would reduce profitability (Stockhammer 2000). This often involved the greater use of financial gimmicks, many illegal as was increasingly revealed (Mills 2003). Gatekeeper conflict of interest proved substantial as accountants, bankers, lawyers, stock analysts, and corporate boards cooperated with questionable and illegal practices (Coffee 2006).

Financialization is a central part of the social structure of accumulation we call global neoliberalism. Innovations in computer power and information processing has been the basis for an increased ability to parse and price risk in new, highly complex ways so that the future can be bought and sold by turning expected future income streams into negotiable securities and through a host of derivatives, financial instruments which allow taking positions on future outcomes to either minimize risk of unexpected events or to speculate on their occurrence. The possibility of gaining control of assets with borrowed money and using the underlying capital as collateral for extensive borrowing puts a steady pressure on corporate leaders to use any surplus cash for share buybacks, and to take on debt for this purpose so as to make their companies less likely to be takeover targets. This is changing the fundamental nature of the business enterprise. Indeed, it is our assertion here that financialization represents a new dominant regime of accumulation.

The moments of structure and agency which determine the trajectory of financialization are complex and multifaceted. The slowing of growth and decline in conventional investment opportunities relative to accumulation of surplus in the 1970s and 1980s led to a seeking of more speculative outlets in finance. At the same time the push to maximize stockholder value and the greater use of options as a form of executive compensation encouraged shorter time horizons by corporate leaders. Floating exchange rates following the demise of the Bretton Woods system invited hedging strategies to minimize exposure to currency risk (and invited counterparty speculation). Innovation in, and lower cost of, information technology and explosion in computer power allowed for advances in innovation of risk pricing and packaging at low cost which allowed for explosive growth in structured finance as future income streams were transformed into negotiable collateralized debt instruments.

As the sheer number of people making their livelihood from finance and linked sectors grew and the investor class expanded thanks in part to tax expenditures such as 401(k) and other programs attracting money to mutual funds, a larger constituency allied with the extremely wealthy to become part of what can be understood in Gramscian terms as a hegemonic bloc materially rooted in gains from financialization. As Wall Street as opposed to manufacturing came to more powerfully dominate US capitalism the political influence of financialization advocacy grew, its goals and strategies endorsed with greater urgency by major political parties. While always a central component of any hegemonic coalition, the increased political power of finance accompanies and enhances its economic centrality. This recursive process is evident in recent elections, their financing, and the policy priorities of officials once elected. It can be argued for example Bill Clinton owed his presidency to Robert Rubin and other Wall Street boosters. Through the Clinton Administration Congressional members of finance committees

were showered with contributions to facilitate deregulation and especially to repeal New Deal era banking legislation which had segmented the industry and imposed safeguards against excessive risk taking. The coalition which brought George W. Bush to power was Sunbelt-oil-military-contractor-based. However by the 2004 Bush campaign was the recipient of a huge infusion of cash from Wall Street which in 2003 was his biggest donor base. The leading figures were prominent executives from Merrill Lynch and Lehman Brothers. This influence was cemented toward the middle of his second term when Henry Paulson head of Goldman Sachs became Mr. Bush's third Secretary of the Treasury. Its power is further demonstrated in recent "reform" bankruptcy legislation.

Internationally, financial liberalization has both preceded, and allowed the rapid inflow of short term borrowing. It has set the stage for crisis when the cycle turns and then is the pretext for greater liberalization to solve the crisis. In the countries effected by serious debt and banking problems financial adjustment is typically accompanied by poor performance across various social indicators including health outcomes and education. There have been general impacts on economies globally even if not of crisis proportions. Tightening by a major central bank limits liquidity globally and impacts financial markets. For example a rise in interest rates by the Bank of Japan means hedge funds which had borrowed cheaply in yen and invested in high yield assets elsewhere leveraging their money. The popularity of such carry trade meant knock-on impacts to high yielding currencies from New Zealand to Iceland. Financial liberalization and the need to protect against severe dislocation has also produced an underconsumptionist bias to the global economy in the 1980s and 1990s as countries restrain domestic demand out of fear of inflation which might discourage investors and produce capital flight.

FINANCIALIZATION AND FRAGILITY

Fear of serious asset valuation loss has led to a spectacular growth in credit derivatives which allow investors to buy protection against defaults and other downside risks. These are sold mostly by the giant banks. JP Morgan Chase is said to have held some 2.2 trillion of credit derivative exposure as of mid 2006. If another wave of Enrons and WorldComs were to occur in the presence of such exposure the global financial system could be seriously affected. The very existence of such contracts produces moral hazard, greater risk is undertaken because the investor is insured. Lenders do not worry because they believe themselves protected. As a result they may not as a result monitor closely, or at all. Neither may those who sell the derivatives which can be quite complex. For the issuers these instruments may prove highly risky especially when speculative activity is in remote markets and arcane products like credit default swaps and catastrophe bonds. These are highly illiquid and cannot easily be sold off as many of the earlier innovations in securitization allowed. While losses to individual investors and local issuers may not be a major policy concern for international regulators the scale of speculation has increased dramatically.

The fastest growing segment of the industry (until recently overtaken by the explosion in private equity finance) is hedge funds which follow high leveraged strategies and are another US contribution to the growth of financialization. The typical "2 and 20" compensation scheme (two percent fees go to managers plus twenty percent of the profits) encourage and generously reward risk taking with other people's money. The reward structure promotes excessive risk taking. Investment banks put larger amounts of capital at risk, leveraging their own funds by borrowing vast sums. The size and increasing numbers of such funds, which according to the SEC controlled \$2.4 trillion in assets, pursue essentially similar strategies and so have pushed down returns encouraging still riskier behavior as more money piles into these vehicles creating the potential (signaled by the near bankruptcy of Long Term Capital Management in 1998) for serious systemic risk. Hedge funds bet using lots of leverage and often unhedged credit derivatives. Because of the existence of deep financial markets there is a general belief that these positions can be sold if need be. But while speculators are believed by financial theorists to be exploiting market inefficiencies and anticipating market movements (Paredes 2006) the potential for herd

error is often ignored until a major widely shared misjudgment occurs. As successful hedge funds attract entry by less skilled, opportunistic players and their less sophisticated customers the potentially successful opportunities for high returns may not match the amounts being thrown onto the market. Sooner or later hedge financing turns into Ponzi financing (Minsky 1992) It is not only highly leveraged players who then face the prospect of serious losses.

Hedge fund borrowers have become an important source of bank revenues and, as Morris Goldstein (2005:8) writes, “In an environment where flows into hedge funds are strong, where banks face strong competition from other suppliers of services to hedge funds, and where hedge funds are very important clients to banks, how heavily we can count on a regulatory model where banks are the agents primarily responsible for exercising oversight over the risk-management practices of hedge funds?” Since these hedge funds follow similar investment strategies, position mistakes, say in emerging markets, can trigger a rush to the exit. With the growing amount of capital seeking investment opportunities market pricing reflect little provision for risk as the IMF has pointed out. It warns of the possibility of illiquid market conditions for some of the new and complex financial instruments which could act to amplify a market downturn (International Monetary Fund 2006)

The wreckage of the collapse of such leverage would be considerable and could be triggered not only by a change in market sentiment but by a failure to settle trades with knock-on effects in highly leveraged interdependent market (as the collapse of Long Term Capital Management threatened to do in 1998). The rapid rise of debt and high leverage raises serious questions for systemic stability despite the presumed more sophisticated risk management tools employed by major banks – as a reading of the increasingly agitated *Global Stability Report; A Report by the International Capital Markets Department on Market Developments and Issues* released twice a year by the International Monetary Fund – suggests. There appears as well to be a concentration of risk. The US Comptroller of the Currency (Office of the Comptroller of the Currency 2004) reveals that five commercial banks account for 96 percent of the total notional amount of derivatives and for four of these five exposure equaled 230 percent or more of their risk-based capital. For banks and hedge funds higher leverage has become the general rule and are worrying (Geithner 2006). Whatever the systemic risk, there is just too much money to be made to turn cautious too soon. Even in the face of widespread loss after a period of caution the game is likely to resume. The question which remains to be answered by history is whether financialization is now so much the economy’s driving force means the amounts involved in a meltdown will bring the era of global neoliberalism itself to an end.

Amidst the thrust and counter thrust of those worried about such a prospect and those resolutely unconcerned, what needs to be added to the discussion is proper appreciation of the success US-based financial institutions have had and are likely to continue to generate from global financialization. There is need to analyze the prospects for such firms separately from the territorially-based productive economy of the United States. While I would not want to bet against a hubristic overreaching by unilateralist, militarist nationalism and the capacities of those fractions of the US ruling class which have led to adventurist and costly undertakings to adversely effect the future of the dollar, it is my judgment that the financial sector will continue to be strengthened by the likely trajectory of globalization. The issues of the US foreign debt and balance of payments receives attention, but from a longer term perspective of how economic power will be exercised and which interests will appropriate the lion’s share of future growth, it is the expansion of financialization and the role of US-based and US-controlled financial institutions which is important. In the next section of the paper the two dominant positions on US foreign debt are discussed. The position I take is at something of an angle to these more narrowly economic perspectives; it is that the future of the dollar depends on three things. The first two are surely familiar terrain. They are dependence on the political-military strength of the United States and its effectiveness in deploying its power and on willingness and capacity to reign in borrowing and keep debt creation within margins of safety. The third is the comparative advantage of US-based finance vis-à-vis other firms with which they compete. If US-based investment banks, private equity, hedge funds and the rest are able to keep innovating, earning economic rents from bold moves successfully executed and retain

their leadership as they operate around the world, they can perpetuate and expand capacity to restructure global financial markets and earn continued impressive economic rents along the lines pioneered by earlier money center hegemony.

THE DOLLAR

The financial liberalization the United States has pursued has favored both the US as a debtor nation living well beyond its means and financial institutions irregardless of the price of a build up of serious global imbalances. From 1996 to 2004 the US current account deficit grew to \$666 billion from \$120 billion, requiring external financing of \$546 billion. These funds allowed the country's economy to grow rapidly without inflation but raised the issue of how much longer this could go on. In 2006 the US current account deficit was close to seven percent of GDP leading to fears that adjustment would come through a dramatic drop in the value of the dollar (Roubini and Setser 2004; Blanchard, Giavazzi and Sa 2005). Estimates of an unwinding of the dollar's current account deficit, financed by three-quarters of the combined current account surpluses of all of the world's surplus countries, suggest a potential collapse of the dollar by as much as thirty percent or more (Obstfeld and Rogoff 2005). Many economists and financiers, as George Soros (1998:26) has said, see "an acute financial and political crisis" which "if left unchecked will lead to the disintegration of the global capitalist system" and it is true that if one extrapolates trends the United States in a not distant future would absorb all the world's savings and then some having to make interest payments exceeding its own GDP, but like all simple minded trend projections this will not happen. Such a linear extrapolation does however suggest the seriousness of the growing imbalance.

Adjustment however wrenching does not, contra Cassandra-like predictions from George Soros and others, necessarily mean the disintegration of the global capitalist system despite the pain of the expected adjustment process which would bring a decline in US living standards. An increasingly financialized system will write down assets, reassign ownership claims, and reterritorialize accumulation away from the traditional industrial core. This all becomes clearer when one disentangles the significance of trade and capital movements. The official position, that of the Treasury and the Fed, is that the United States because of the strength of its economy attracts surplus savings from countries where savings exceed domestic investment opportunities. The alternative story has a number of elements. The first is that in a world of floating exchange rates, uneven growth, and the impact of interest rate policies (above all of the United States), lead to rapid movement of funds into and out of smaller economies often to devastating effect. To protect their economies countries have substantially built up reserves, holding U.S. Treasury securities and other dollar assets. Wealthy individuals fearing currency weakness have done likewise. Such developments produce large capital inflows for the United States since the dollar remains the dominant international reserve currency and the US the market of preference for global south exporters. The foreign savings in this telling are not really voluntary but driven by export competitiveness imperatives and the need to build dollar foreign exchange reserves. There is of course pressure everywhere to hold down the value of currencies and so enhance their international competitiveness, to squeeze unit labor costs, and stimulate growth; but export expansion at the expense of wage increases and currency appreciation leads to low domestic demand.

The official story can further be questioned by pointing out that the seeming high savings of the Japanese, Germans, and Chinese are not quite what they seem. It may be that Japan as an aging society needs to save more (as is argued by among others Bernanke 2005), but this does not explain the capital account surplus. Japan's current savings surpluses come from the business sector and are not explained by an autonomous expansion of national savings. Japanese firms with surplus capital, insurance companies and banks, find it difficult to lend internationally in yen and so are big buyers of dollars. The driver is the continued position of the dollar as the key currency. Ironically this means that appreciation of the yen could bankrupt some of these same firms if the yen value of their dollar holdings dropped

significantly. In Germany, another current account surplus country there has been wage disinflation in recent years producing greater export competitiveness (for the numbers see UNCTAD 2006). Even China where money wages in manufacturing are growing substantially (12-16 percent annually in recent years in industrial centers) is experiencing declining unit labor costs in manufacturing as labor productivity is rising at close to twenty percent a year (UNDP 2006); and of course the renminbi is being held down by government fiat. Chinese net saving is not particularly high compared to its forty percent annual investment rate.

The Treasury and Fed claim that there is 'a worldwide savings glut' (Miller 2005) can therefore be contrasted with a competitiveness interpretation. While high tech sectors in the US are doing well, industrial production is growing slowly (overall by five percent between 2000 and 2005), while consumption of durable goods increased by more than thirty percent in this period. It has been the hegemonic position of the United States that has permitted and encouraged this capacity to transfer purchasing power to the United States. I would further argue that the United States has been put in a considerably better position since the end of the Bretton Woods fixed exchange rate system. Not only does the world need more dollars for reasons already discussed, but the United States is freed of any obligation to make good dollar claims in gold, a requirement under Bretton Woods which limited the creation of dollars at the whim of Washington policy makers. It is for this reason that the rest of the world would benefit from a new global financial architecture. It is also the reason the United States resists a more balanced and so potentially more stable system.

These are two separate but conjuncturally connected aspects of the US financial position. The first is the debate over what is widely viewed as the irresponsible behavior of the US government manifest in the impacts of large and continuing budget deficits. There is reason, noted above, to think that the fiscal policies of the United States are not sustainable and that financial markets may come to heavily discount federal debt instruments and there is the retort that the successful achievement of US-based financial institutions and transnational corporations in venues outside the nation's borders which draw capital from investors globally can grow without creating major difficulties. As to the more optimistic position, while US-based capital has been exceedingly successful, the country has become dangerously indebted.

The usual either/or, it is a problem or it is not, policy discussion proceeds innocent of any awareness of the importance of the stakes to finance sector participants and indeed to the gains from such policies to the country at large. Use of the dollar as the international medium of exchange favors US banks and financial interests more broadly and makes the US antagonistic to multilateral arrangements such as increasing global liquidity through expansion of Special Drawing Rights. The United States opposes European proposals for currency management including those for a target zone regime. In Asia, Washington has opposed a regional lender of last resort facility. For Washington policy makers the cost of addressing global imbalances is paid in a loss of US hegemony and the economic gains continued imbalances bring. It would take a major crisis to force the US to give up what in Charles De Gaulle's phrase is its "exorbitant privilege" and to accept something like Keynes' proposed bancor world currency and other symmetrical adjustment mechanisms. The appeal of continued growth of financialization, of more debt and leverage, speculation and hedging in the face of potential volatility to American capital is thus powerful. Whether the world-system comes to be centered in Asia only time will tell but the signs are there. In such a transition the allure of maintaining the position of US capital by relying on finance is evident.

A decline in the value of the dollar increases rest of the world exports to the United States. This creates American jobs and helps domestic producers increase their exports. It also makes US assets cheaper for foreign investors in their own currencies and encourages tourism and shopping sprees in the United States all of which helps the US reduce its balance of payments deficit. Likewise there is increased pressure on exports to the US. Since American liabilities are denominated in dollars and its foreign assets are not as heavily in its own currency, devaluation improves its position. The United States also benefits from its special privilege in terms of seigniorage rents. Well over half of all US coins and

currency circulates outside the United States. World trade is invoiced in dollars as are almost all commodity markets. The rest of the world exchanges real goods and services for this token money. American financial markets draw in capital from the rest of the world, the dollars generated by the world's need for dollar reserves and export oriented economies governments desire to hold down the value of their domestic currencies. If the dollar holds steady or declines in a controlled manner the US benefits. If there is fear of, or the actuality of, a serious drop and a flight from the dollar this would be a very different matter. Already the dollar price rise of oil has not brought a commensurate increase in income to producers who spend their money outside the dollar zone. OPEC now calculates the modified Geneva+1 basket. Were it to insist on payment in such a currency basket (which is weighted by its collective merchandise imports) this would lead to a further significant decline in the value of the dollar.

Financialization and the World-System

That there is potential for systemic crisis present in a world in which leverage and risk may be expanding beyond tolerable bounds is widely recognized. Whether such crisis will occur from any other flash points discussed in this paper is unknowable. Regulators are active consolidating protective measures for a borderless world even as market players move the frontiers of financial market innovation (Geithner, McCarthy and Nazareth 2006). The growth of financialization continues basically unimpeded apace. Given existing constraints and incentives, foreigners are investing globally through the agency of US-based financial institutions and transnational corporations and earning good returns for doing so. The amount of capital coming into the country is two times the current account deficit of the United States. The rest is going out again. The continuation of such flows rests on U.S. structural power in the international political economy, confidence in the value of the US dollar, and the capacity of the debt-driven US economy to continue to be a motor of a global economy. Along such lines some economists embrace what has come to be known as the Bretton Woods II perspective which asserts that both debtors and creditors have a vested interest in preventing the dollar from losing value. American demand for goods and services paid for with borrowed funds coincides with the interests of exporters and investors. The US thus absorbs savings generated elsewhere, provides markets for other countries, and channels global investments through the mediating role of American financial institutions and transnational corporations. In such a view imbalances are likely to persist for some time and will be resolved with a smooth adjustment in interest and exchange rates (Dooley, Folkerts-Landau and Garber 2006).

While one would hope for such a benign outcome most analysts see a dangerous high stakes game being played. Assuming it can be sustained, the US will continue to benefit from the overvalued dollar and its stunning capital account surplus. The costs of addressing this imbalance would be great for other countries. It is this which gives those who hold to the Bretton Woods II perspective the sense that the current situation can be prolonged into the middle term. But the strains are showing and systemic breakdown is feared by others. Failure to develop a coordinated strategy to deal with the problem as Charles Dallara, managing director of the influential Institute for International Economics suggests, is to "roll the dice and to leave it to the markets to reduce global imbalances" (Guha 2006:4). The manner in which markets might do this could prove harsh. While such dangers are widely recognized, and surely appreciated in Washington and on Wall Street, the huge returns to US financial power, and continued political power, from the growth of a dollar-based globalized financialization are of unquestionable benefit despite any and all stability risk and goes unquestioned despite the stagnation of real wages and the growing insecurity it imposes on the majority of Americans. If the dollar loses its safe haven function and its status as a reserve currency to any significant degree, both unthinkable even a short while ago the dollar would decline precipitously and this cannot be ruled out. The only response the U.S. could make would be to raise interest rates. This would help the dollar but hurt domestic growth. It is the choice once Great Britain made to help its financial sector at the expense of its industrial competitiveness.

From this examination of financialization in the contemporary period that the United States it does appear to be on the historical trajectory of previous great powers. As described by Arrighi

(2004:536):

“...one kind or another of financialization has always been the predominant response to the overaccumulation problem of the established organizing centers of the system of accumulation. Thanks to their continuing centrality in networks of high finance, these centers have been best positioned to turn the intensifying competition for mobile capital to their advantage and thereby reflate their profits and power at the expense of the rest of the system. Over time, however, financial expansions have promoted the geographic relocation of the centers of capital accumulation by rerouting surplus capital to states and regions capable of ensuring a more secure and profitable spatial-temporal fix to the overaccumulation crisis. Previously dominant centers have thus been faced with the Sisyphean task of containing forces that keep rolling forth with ever renewed strength.”

A study by PriceWaterhouseCoopers (2006) forecasts that in the year 2050 the Chinese economy will be almost as large as that of the United States in dollar terms with India which has been the fastest growing in economy in recent years the third largest. They predict Brazil's economy in 2050 to be as large as Japan's, the Indonesian and Mexican economies to be larger than those of the UK and Germany, and expect the 'E7' (Brazil, China, India, Indonesia, Mexico, Russia and Turkey) to be around 25 percent larger than the current G7 – and to be driving the growth of the global economy. Whatever one may think of the details of such projections there is little doubt that momentous changes in relative nation state economic standing are in the offing. The questions of ownership claims and financial assets at mid century are another question. Looking at today's outsized rentier claims of Dutch and British capital (Epstein and Jayadev 2005) one suspects that the position of large asset holders domiciled in the United States in mid century may be impressive. The relative decline of the territorial United States economy is likely to be accompanied by the continued prosperity of the top ten percent of the US income distribution, and within that the top one-tenth of one percent of the population which has in recent years already increased its lead over the rest of the country to record levels (Piketty and Saez 2006).

Disappointing social progress during the decades of rapid globalization strongly support the view that the two decades 1960-1980 during which national Keynesianism reigned was a far more successful time overall for global development than the quarter century and counting of global neoliberalism during which economic growth and social progress for the vast majority countries has been significantly slower (Weisbrot, Baker, and Rosnick 2005). Real global growth averaged 4.9 percent a year during the Golden Age of national Keynesianism (1950-1973). It was 3.4 percent between 1974 and 1979; 3.3 percent in the 1980s; and only 2.3 percent in the 1990s, the decade with the slowest growth since World War II (Maddison 2001). The slowing of the real economy led investors to seek higher returns in financial speculation and the inventiveness of the financial sector in developing new products to meet the needs of those wishing to protect against the risks inherent in a globalized economy in which foreign exchange and interest rate risk had increased, permitted and encouraged by the greater capacity and lower information costs computerization and new technologies provided, allowed for an unbundling of risk and the ability to find willing buyers for different sorts of risk instruments of the sort discussed earlier. The increased liquidity and lower costs of borrowing encouraged in turn further expansion of finance. The coincident trends of growing inequality and insecurity on the one hand and the spreading power of rapid financialization do not suggest a smooth continued expansion path for a society based on increased debt and growing leverage.

Dissatisfaction with low dollar returns on their foreign reserves has lead an increasing number of countries from Brunei, Qatar and Kuwait to Russia, China and Korea to Norway, Australia and Canada to set up sovereign wealth funds to invest government reserves in higher risk-high return investments instead of simply holding their money in US Treasuries and other lower yield securities. Together these funds are larger than the largest pension funds and private equity funds. They are buying into among other investments the more successful US-based financial players. Wisely they are giving up voting

rights when they do so as Abu Dhabi did when it bought 7.5 percent ownership in Carlyle and China did when it purchased 9.9 percent of the Blackstone Group. These funds are growing rapidly in size and will increase their influence as they learn to manage their money. They may increase their stakes in US-based financial institutions as the US did in taking over the older houses in London, strike out on their own, or both. The 2007 Industrial and Commercial Bank of China's \$5.5 billion purchase of twenty percent of Standard Bank of South Africa, the largest overseas investment by the Chinese and the largest foreign direct investment in Africa may be indicative.

Such considerations do suggest that it is useful to examine the changes in the mode of regulation of capitalism in the contemporary period in the context of an appreciation of the relevance of historical precedents in the world-system of a seemingly natural trajectory in which great powers, that at one time dominate the world economy, come to lose their position of leadership and as a result turn to a dependence on financial skills and institutions build during the earlier period of hegemony. It also suggests stepping back from grand theorizing to consider working class responses to the contradiction of the distribution of the costs and benefits of further financialization.

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OIL FOR FOOD: THE GLOBAL STORY OF EDIBLE LIPIDS

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ABSTRACT

This paper addresses the issue of the globalization of food production and consumption in the last half-century through the medium of fats and oils, or lipids. The dual traits of being essential for human life and signifying a diverse range of regional styles of consumption make lipids an ideal bulk commodity to study international differences in food. FAOSTAT food balance sheet data on fats and oils from 1961 and 2003 are interrogated using correspondence analysis, which provides a means of displaying the principal trends in large tables of data. The analyses reveal evidence for a global convergence in lipid availability from 1961 to 2003 (from animal fats to vegetable oils), in addition to a trends towards an increased disparity which at the extremes is between the wealthiest, as importers of diversity, and least affluent regions, as the most resistant areas to homogenizing trends.

INTRODUCTION

In recent years it has been suggested that the world is undergoing a nutrition transition, characterised by a convergence on the so-called Western diet, high in saturated fats, sugar, and processed foods (Popkin 2003; Lieberman 2003). This trend has been associated with the response of food systems to the most recent phase of globalization, in which increased integration within the world economy has resulted in a supposed global homogenization of institutional, legal, economic, social and cultural practices (Kennedy, Nantel and Shetty 2004). Indeed, Lang (1999: 169) argued that “the food system is one key area in which a tension between globalization and internationalism is being fought out.” Consequently, it is the aim of this paper to investigate globalization and the extent of any nutrition transition through an analysis of the changing patterns of global food consumption over the last half-century. The present study focuses on the consumption of one category of food – lipids, or oils and fats. Lipids represent an ideal commodity for the study of globalization processes, as they are a vital dietary component (through the provision of essential fatty acids) with a multitude of regional varieties. Also, unlike cereals, lipids can be interchanged without very obviously altering well known staples. They are also relatively light, per dollar, to transport – and so the trade and use of lipids reacts more rapidly and flexibly to changes in demand, and changes in the uneven distribution of resources.

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The Globalization of Food: Existing Approaches and Critique

In the last decade or so the term globalization has become somewhat nebulous in both meaning and understanding. In an economic sense, globalization describes a process of integration into the world economy (Nayyar 2006). From this perspective, O'Rourke and Williamson (2002: 26) state that "the only irrefutable evidence that globalisation is taking place is a decline in the international dispersion of commodity prices or what might be called a commodity price convergence." Although some have suggested that there was a single world economy from at least c. 1500 (Wallerstein 1974), if not 5000 years ago (Frank and Gills 2000), O'Rourke and Williamson (2002) argued that the world was not truly globalized until the early nineteenth century, as a result of the then breakdown in long-distance trade monopolies and technological developments permitting the cheap transportation of bulk goods between continents. This view of a more recent qualitative shift is consistent with a recent observation of Chase-Dunn, Kawano and Brewer (2000), who identified three waves of trade globalization since 1795.

However, defining globalization in purely economic terms is unsatisfactory, since the term gives no indication of the extent to which parallel convergences are taking place in other important spheres such as political institutions, cultural practice and social relations. Chase-Dunn (2005) delineates two meanings of globalization; 'structural globalization', which denotes "economic, political and cultural international and transnational integration" (ibid: 183), and the 'globalization project', the political ideology of global corporate capitalism, which has drawn the attention of the anti-globalization movement. For the purposes of the present study, we equate the term globalization with the definition of structured globalization, unless otherwise indicated. This definition helps in the examination of why cultural and social integration has not kept up with the pace of economic integration, as Martinelli (2005: 241) contends: that although "we live in a world system as a growingly interconnected global order... a universal global society—as a network of social relations with mutual expectations plus a normative consensus reflected in commonly accepted institutions—does not exist yet."

It has been stated that "food embodies history like no other substance" (McMichael 2001: 216), and as such should represent a highly sensitive indicator of the consequences of globalization. Food has always been implicit in the many faceted process of globalization, from the late eighteenth century as part of the cargo of the mercantile sea trade that began with ship captains operating illegally in their self interest (Erikson and Bearman 2006) to much of the contents of standard sized cargo in the current peak of trade globalization (Chase-Dunn, Kawano and Brewer 2000). However, despite the current un-paralleled world trade peak, the world is not yet united in its tastes and stomachs, let alone in thinking, realising and operating as if we collectively belong to a "community of fate" (Martinelli 2005: 242). As such, the rest of this paper will address the effects of globalization on food consumption, and how this has changed within the period of human history characterised by a truly globalized economy.

Recent studies of food and globalization have tended to focus on the concept of convergence, which assumes a gradual homogenization of consumer choice in the modern global era (Traill 1997). For example, Gil, Gracia and Perez y Perez (1995) and Herrmann and Röder (1995) have demonstrated a general statistical convergence in food consumption patterns in the twentieth century, both globally and within the European Union respectively. Global trends such as the nutrition transition (Popkin 2003) and the livestock revolution (McMichael 2001) are explained in part by the moulding of taste by large multinational corporations, whereas large scale regional trends are strongly influenced by the policies of economic groupings dictating localized trends in agricultural production, such as the European Union and the North American Free Trade Agreement (Lang 1999). However, Traill (1997) argued that the evidence for food demand convergence is both mixed and subject to varying interpretation, citing cultural diversity and individualism as important factors leading to consumer resistance to global trends. Indeed, McMichael (2001) suggested that rather than representing the inevitable emulation of Western diets, the livestock revolution is more a product of 'Western developmentalism' fostered among emerging middle classes in developing countries by governments and multilateral agencies.

It is thus important to distinguish between general patterns of global food convergence, characterised by a worldwide shift towards a diet in which the principal sources of energy are derived

from the same food groups (i.e. the nutrition transition) (Popkin 2003), and more regional and class specific trends of continuity (or even divergence) in cuisine. Indeed, Triall (1997: 407) stated that “strong local and national patterns of consumption remain firmly entrenched,” which can be seen to be a product of a number of factors intrinsically related to globalization. Arguably most significant is the extent to which processes associated with globalization have caused increased divergence in income both between rich and poor countries, and between the rich and poor within countries (Nayyar 2006). Indeed, such inequalities (both within and between countries) have been cited as an integral part of the globalization process, both in the 19th century and the present day (Chase-Dunn 2005). As much as an increasingly globalized economy means that everyone (with sufficient resources) in the world has the opportunity to consume the same foods as everyone else, dietary homogenization is far from inevitable, and where it does occur is likely to reflect growing poverty through inequality. Not everyone is financially empowered to participate in the global market (many must fall back on traditional or cheap sources of nutrition), whereas those who are affluent enough to participate are often reacting against global mass-produced and processed foods to construct cuisines favouring fresh and diverse local produce (Lang 1999).

The Significance of Lipids: Food and Function

Lipid intake is essential for human life. A healthy adult needs approximately 5 grams a day of linolenic acid, an unsaturated fatty acid that cannot be manufactured within the body (McNutt and McNutt 1978). As a source of energy, lipids provide over twice as much per gram as carbohydrates or protein (Grigg 1999a), and are the most efficient means of meeting undernourishment where sheer calorific intake is the primary dietary requirement (Gunstone 1989). Since the early 1980s World Health Organisation dietary recommendations advise that around 30% of human calorific intake should come from fats, including 10% from saturated fats (Marr 1985). In addition, lipids provide a valuable source of fat soluble vitamins A, D, E and K (Vergoesen and Gottenbos 1975). Fats and oils can also have multiple uses beyond that as a food staple. For example, olive oil was being used as lighting fuel and the base ingredient for a range of medicines, soaps and cosmetics as early as the Roman period in Europe and the Mediterranean (Mattingly 1988).

Recent media attention has focused on the potential health side-effects of a high-lipid intake, in addition to the health benefits of consuming particular varieties over others. Excessive dietary intake of fats has been directly related to an increased risk of obesity, coronary heart disease and some cancers, with lipids high in saturated fats causing an elevation in blood cholesterol (FAO 1994). Accordingly, the British media now advises people in the UK (where the authors of this paper live) to consume less saturated fat (prevalent in animal fats such as butter and whole milk) and more unsaturated fats (prevalent in vegetable oils such as sunflower oil and olive oil). No doubt such stories of the damages that can be caused when an abundance of fats are available are increasingly a feature of the health related news in many other affluent nations. Often in those nations it is the working class who are most admonished for their consumption of cheaper and more heavily advertised products.

Perhaps in part relating to the changing role of fats and oils in health and nutrition, lipid consumption can also be seen as a means of marking social class, ethnicity and even religious identity in modern society. Bourdieu (1984) argued that an essential criterion defining differences between the working and the middle classes is the preference of the former for “taste of necessity, which favours the most ‘filling’ and the most economical foods” and the preference of the latter for the “taste of liberty – or luxury – which shifts the emphasis to the manner (of presenting, serving, eating etc.) and tends to use stylized forms to deny function.” Trichopoulou, Naska and Costacou (2002) report that individuals from lower socio-economic groups in Europe are known to consume more lipids and saturated fats than those from more affluent groups, and it is perhaps no coincidence that in recent years the working classes in industrialized countries have borne the brunt of obesity and other saturated fat related illnesses (e.g. Brunner et al. 1997). Indeed, analysis of the 1958 birth cohort in the UK revealed statistical linkages between lower social class and obesity (Power and Moynihan 1988). At the other end of the social hierarchy, a recent newspaper article extolling the health virtues of a range of obscurer vegetable oils reports that certain varieties have become so highly prized by wealthy connoisseurs that they sell for up to £40 per litre (Watson 2006). Ethnic minorities associated

with recent immigration streams are likely to include many people with a prejudice for oils from their area of origin, sometimes governed by religious prohibitions (for example, the Old Testament forbids the consumption of ox, sheep or goat fat: Leviticus 7:23-5; cited Gidez 1984: 1432).

In addition to marking vertical stratification in society, lipids have been noted for their ability to indicate specific horizontal or regional differences in global food consumption and cuisine (Grigg 1999a). The dual characteristics of being essential for human life with the capacity to signify a diverse range of regional styles of consumption make lipids an ideal bulk food commodity class to use to study globalization. The localized nature of lipid production and consumption is particularly significant in regard to elucidating global trends, distinguishing oils and fats from other important staples such as cereals and livestock, whereas other regionally specific food categories (e.g. spices) lack the tag of being essential dietary components. The regional patterning in lipid production and consumption is due to a combination of factors, including the specific climatic requirements of certain oil crops such as the olive (Grigg 2001); the capacity of wealthier countries to invest in technology to process oil crops hitherto unsuitable for human consumption (such as rape: Tanaka, Juska and Busch 1999); and a general world-wide bio-diversity of oil sources that remain viable for mass-exploitation in the modern era. Nevertheless, despite the obvious potential of fats and oils for illuminating global patterns of food intake, the geography of lipid consumption has received relatively little attention in recent years beyond the work of David Grigg (1993, 1999a, 1999b, 2001). However, before this is approached, the longer term history of lipid use in food preparation needs to be understood.

A Brief History of Lipids in Food

On an evolutionary scale, the consumption of lipids from dairy sources and refined vegetable oils is a relatively recent phenomenon, dating back c. 10-11,000 years for the domestication of sheep, goats and cattle, and c. 6000 years for the cultivation of olive oil (Cordain et al. 2005). Several other edible oil crops have enjoyed a similar history of cultivation to olive oil. For example, archaeological and documentary evidence suggests that sesame oil competed with the olive in the Mediterranean basin and India from at least 1137 BC (Horden and Purcell 2000); the Aztecs produced groundnut oil in South America long before the arrival of European settlers in the fifteenth century; and palm oil originated in West Africa and was spread to the Americas and Indonesia in the sixteenth century (Toussaint-Samat 1992). But only in the last century did the biggest changes occur in global lipid consumption. These changes can be attributed to the Industrial Revolution, in which a combination of technological development, and the beginnings of large-scale food production and a truly global market took place (Cordain et al. 2005; O'Rourke and Williamson 2002). For example, until the late nineteenth century, the only edible oil-bearing crop grown in Europe was the olive, with the rest of the continent relying on animal fats as the principal source of cooking oil (Grigg 1993). The principal technological developments include the advent of mechanically driven steel expellers and hexane extraction processes (increasing vegetable oil productivity), new purification processes (permitting the exploitation of hitherto non-food oils such as cottonseed), and new manufacturing procedures such as hydrogenation, allowing vegetable oils to take on atypical structural characteristics used in the production of margarine from 1897 (Cordain et al. 2005).

There have been several important changes to lipid production in the twentieth century. By the late 1980s the dominant vegetable oils in world markets were soya, palm, sunflower and rape (Gunstone 1989), yet none of these accounted for any significant proportion of global production in 1900 (Grigg 1999a). Most food may be consumed where it is produced, but that is no longer the case for lipids. Palm oil became an important global source from the 1920s when it began to be grown on plantations in south-east Asia, whereas rape, soya, and sunflower oil underwent rapid production increases from the 1950s in the United States (soya), USSR (sunflower) and Canada, China and northern Europe (rape) (Grigg 1999a). With the exception of palm oil (a tree crop), the most successful oils have either been by-products like soya, with their production controlled by demand for a product other than oil, or annual crops like sunflower and rape, which are able to respond more quickly to changing market demand (Gunstone 1989).

Although the transition away from animal products and towards vegetable oils containing polyunsaturated fatty acids could be an indicator of increased awareness of the beneficial health properties of these commodities, Grigg (1999a) argued that this is more likely a consequence of the

relative cheapness of vegetable oils relative to animal fats. Indeed, relative cost appears destined to be a major barrier to the widespread future consumption of the latest oils identified to have healthy properties, especially olive oil and oily fish (a source of omega 3), with only 1% of the earth's land surface suitable for production of the former (Grigg 2001), and the latter being dependent on rapidly dwindling world fish stocks (Brunner 2006). Therefore, the extent to which the majority of the southern hemisphere is "condemned to repeat the modernising northern hemisphere diet" (McMichael 2001: 217) is far from certain.

DATA AND METHODS: TOWARDS A GEOGRAPHY OF LIPIDS

Grigg's (1999a) study of international variations in the consumption of fats and oils in the early 1990s forms an important starting point for the present study, citing economic development, regional traditions and climate as major factors contributing to patterns of global diversity. However, Grigg was not explicitly concerned with using lipids to address the phenomenon of globalization, and consequently there remain a number of unresolved questions and issues. Paramount among these is the extent to which there have been changes in lipid consumption over a prolonged period of time, and whether or not it is possible to identify patterns of global convergence and/or regional conservatism and/or divergence. In Herrmann and Röder's (1995) quantitative analysis of global food consumption it was noted that vegetable oils did not exhibit statistically significant convergence, yet it is unclear whether this pattern holds true for fats and oils when considered as individual varieties. Therefore, to achieve more meaningful results it is important to compare the consumption of all varieties of fats and oils for each country or region, instead of concentrating on only the primary source of lipids (as per Grigg 1999).

In this study, emphasis is placed on the market availability and importation (as opposed to production and exportation) of lipids as a means of consciously addressing the issues of dietary preference and food choice. The raw data used in analysis have been acquired from the United Nations Food Balance Sheets (FAOSTAT 2006), which provides food-related data for nearly all of the UN member states from 1961 to 2003. Figures for food availability are obtained by taking those for production, adding imports and foods in store, and then subtracting exports and figures for food used in industry and animal feed (Grigg 1999a). In terms of utilization, a distinction is made between the quantities exported, fed to livestock, used for seed, processed for food use and non-food uses, lost during storage and transportation, and food supplies available for human consumption at the retail level, as the food leaves the retail shop or otherwise enters the household (FAO 2001). *Per capita* values in kilograms per year were then calculated by dividing the consumption figure in metric tons by a country's population in 1000s (FAOSTAT 2006).

Consequently, the Food Balance Sheets provide data primarily relating to food supplies available for human consumption at a retail level (FAO 2001), and thus can be used as estimates of direct consumption patterns. Although waste is accounted for based on figures obtained from the oil industry for individual oil crops (FAO 2001), these figures are only estimates. Not all food that is consumed is traded, with an additional problem being the omission of data from non-commercialised food production and consumption (FAO 2001), adding a further element of error into any subsequent analysis. Indeed, McMichael (2001: 215) stated that "only about 20% of the world's six billion population participate in the cash or consumer credit economy, and about 90% of the world's food consumption occurs where it is produced. While urbanites depend on the market for almost all their food consumption, rural populations consume 60% of the food they produce." It is envisaged that in the context of this paper the main effect of such distortion would be to under represent the diversity of fats and oils consumed in a particular country (although it is arguable that any significant non-commercial patterns of consumption would show up in the mass market anyway). Nevertheless, in spite of these factors, and in the absence of detailed international household surveys for the last 50 or so years, the Food Balance Sheets are thought to present a reliable overview of the principal differences in consumption patterns on a global scale (Grigg 1999). In short – can we detect changing in what we are becoming – from what we are now differently eating?

Per capita data on world lipid consumption and importation in 1961 and 2003 is presented in tables 1-4. These data were then interrogated using the multivariate technique of correspondence

analysis (hereafter referred to as CA), which presents a means of displaying trends in complex data-sets in two dimensions for visual display (using Minitab). CA is related to the more widely used multivariate method of principal components analysis (PCA), with the main difference being that CA is more suited to the analysis of categorical variables (Greenacre and Hastie 1987). Although not widely used in some social sciences such as geography, CA has become popular in other disciplines where large cross-tabulations of data are unwieldy for more basic statistical analysis, such as sociology (e.g. Bourdieu 1984), market research (Hoffman and Franke 1986) and archaeology (e.g. Shennan 1997; Cool and Baxter 2002; Pitts 2005). An added advantage of using CA over PCA is that it produces a pair of dual displays whose row and column geometries have similar interpretations (Hoffman and Franke 1986), with patterns in the first set of categorical variables or rows (types of lipid, for example) directly corresponding to the respective patterns in the second set of categorical variables (regional groupings of countries, for example).

The axes of the CA plots essentially measure the amount of variation from the average, with the most typical countries and the most widely consumed lipids occurring closest to the point where the graph axes cross, and the most unusual occurring at the plot extremes (see Greenacre 1993 for the mathematical underpinning of this technique). By default the components or axes selected by the computer software in CA are usually the first and second, which together account for the most inertia (the amount of departure from the average, or the amount of variability). However, it is sometimes necessary to look at other components (e.g. the first and third) if over-clustering of the first and second components renders visual interpretation problematic. All the CA plots here are symmetrically scaled. This means that the relationships between directly corresponding regions and lipids can only be assessed relatively, not absolutely. It is important to stress that CA is not intended as a form of absolute statistical testing. To account for this, any patterning of note was verified by reference to the original data-sets.

Interpretation of the CA plots shown here is as follows. Each run of CA produces two plots (relating to the rows and columns of the original tables of data), which can either be presented separately or superimposed on top of one another. In this example, one plot displays the different regional groupings according to their similarities and differences in lipid consumption (fig. 1b), whereas the other presents the individual varieties of fats and oils according to their availability or importation in different regions (fig. 1a). Regions with similar lipid availability or importation profiles will cluster in the first plot, while lipids consumed in similar localities will cluster in the second. The area of the first plot directly corresponds to the same area on the second, hence the term 'correspondence analysis.' Ideally, the plots should be presented overlapping one another on the same space (e.g. fig. 2) to aid interpretation (i.e. to spot which lipids characterise particular regional groupings and vice versa). However, in circumstances where there are large numbers of categories or excessive clustering it is sometimes preferable to display the row and column plots separately (e.g. figs 1a and 1b). In order to aid interpretation in this case-study, the main trends have been manually highlighted on the CA plots, with % inertia values labelled for all components.

For the purposes of analysis in this paper, food balance sheet data for 1961 and 2003 were directly compared (FAOSTAT 2006), representing the broadest possible timeline available from the FAOSTAT database. Supplementary data for the UK in intervening years were also selected, for the primary purpose of illustrating the rate of change in food availability and imports. Ideally it should be possible to plot consumption timelines for each UN member state, although this was not possible without severe overcrowding of CA plots, rendering visual interpretation impossible. The best compromise was to split the geographical data into eighteen regions, reflecting factors of locational proximity, economic well-being and living standards, agricultural and climactic regimes, and food cultures (selected regions exhibiting a strong degree of consistency with other notable attempts to map geographies of food habits, e.g. Dyson 1996, Grigg 1999b, and Millstone and Lang 2003). The main patterns are discussed in turn below.

Lipid Availability Per Capita, 1961 – 2003

Correspondence analysis of lipid availability patterns are presented in figures 1a-b and 2, with the corresponding *per capita* data in tables 1-2. Figures 1a-b display the CA results for individual fats and oils for 1961 and 2003, with the plot for lipids presented in figure 1a and that for the regions in figure 1b. In contrast, figure 2 presents the CA results for grouped fats and oils (e.g. animal fats), with lipids and regions overlapping on the same plot. Figures 1 and 2 both contrast lipid availability from 1961 and 2003, with supplementary points added at 3-year intervals for the UK as an additional case-study, which gives some indication of the rate and trajectory of change over time. In both figures 1 and 2, components other than the first and second were selected for CA (the second and third for fig. 1; the first and third for fig.2). This measure was taken to overcome the excessive clustering of data points when the first two components were initially plotted, thus facilitating visual interpretation. The main trends in the results are interpreted below.

In figure 1, the principal trends are indicated by the vertical axis (component 2), which can be seen to roughly represent change over time, with lipids favoured in 1961 largely occurring in the upper two quadrants and those favoured in 2003 being plotted in the lower two quadrants. Not only does this pattern indicate an almost linear shift in world lipid consumption over time (from the top two quadrants to the bottom two), it also indicates a transition from a picture of relatively diverse consumption in the early 1960s to one of increased homogeneity in 2003 (figure 1a), with eleven lipid varieties broadly corresponding to the majority of 1961 regions in the upper half of the plots, and only five oils corresponding to the bulk of 2003 regions in the lower two quadrants. The main characteristics of this transition include a reduced emphasis on animal fats and fish oils (in more wealthy regions, especially Australia and New Zealand, Northern Europe and the UK and Ireland) and certain vegetable oils (in less affluent regions, particularly sesame, palmkernel and groundnut oils in Central and South America), accompanied by a corresponding convergence on small number of vegetable oils, especially soyabean, rape and maize (figure 1a). This trend is clearly demonstrated by the supplementary points for the UK at three-year intervals, illustrating a gradual transition from animal and fish derived lipids to vegetable oils, in particular oilseed rape. Here the period of most rapid change appears to be from the mid-1970s to the late 1980s. Other notable patterning in this vein includes a general convergence of North, South and Central America on consuming soyabean oil, and the shift of temperate wealthy regions such as Australia and New Zealand and northern Europe from animal fats towards vegetable oils.

Nevertheless, there are several significant trends in figure 1 that do not fit the general pattern described above. A number of regions (all in the upper-right quadrant) fail to show any signs of convergence, particularly southern Europe (closely corresponding to olive oil as an outlier in 1961 and 2003), western Africa (a region partly blighted by war, poverty and famine throughout the period in question), and the former USSR (which shows a relative shift towards divergence with the consumption of sunflower oil in 2003). Conversely, the 1961 points for Japan & South Korea, East Asia and North America all feature in the 2003 dominated area of figure 1b (lower-left quadrant), highlighting these regions as traditional consumers (or even trend setters) in respect to the globalizing trend towards soya oil (all three regions) and rape oil (Japan and South Korea) (corresponding area of figure 1a).

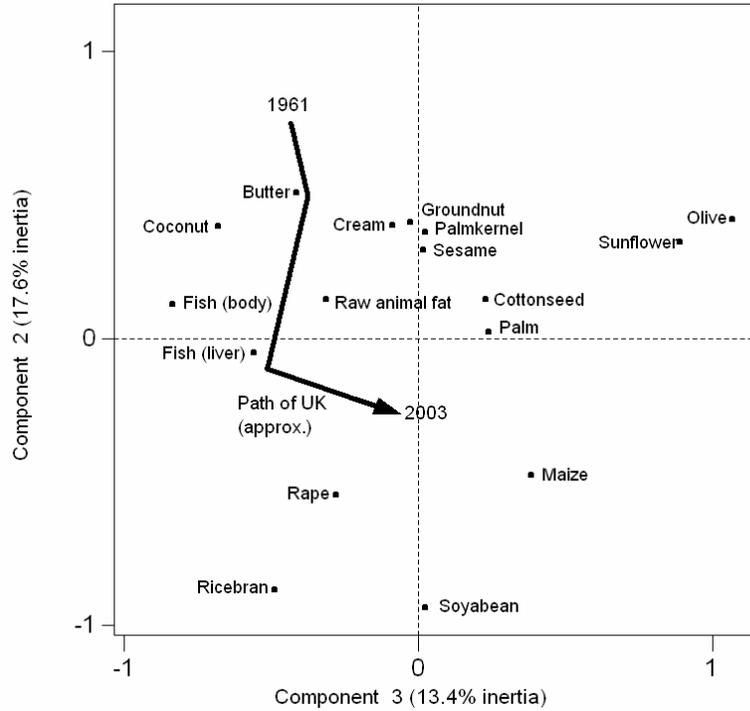


Figure 1a: Correspondence analysis – edible lipids plotted by their availability in different world regions in 1961 and 2003.

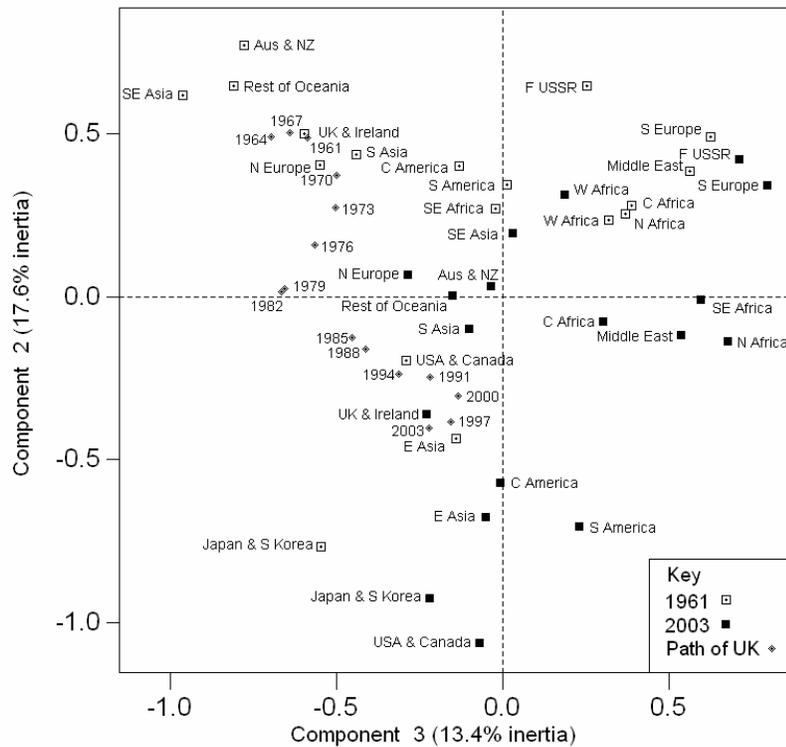


Figure 1b: Correspondence analysis – world regions plotted by the availability of different edible lipids in 1961 and 2003.

Table 1: World lipid availability, Kg/capita/year, 1961 (Source: FAOSTAT data, 2006).

1961 availability	Butter	Coconut	Cottonseed	Cream	Raw animal fat	Fish (body)	Fish (liver)	Groundnut	Maize	Olive	Palm	Palmkernel	Rape	Ricebran	Sesame	Soyabean	Sunflower
Aus & NZ	12.38	1.42	0.04	0.56	3.94	0.00	0.02	0.64	0.02	0.39	0.09	0.00	0.02	0.00	0.00	0.20	0.07
C Africa	0.06	0.00	0.15	0.00	0.18	0.00	0.00	0.80	0.00	0.10	2.76	0.30	0.00	0.00	0.01	0.00	0.07
C America	0.40	0.88	1.52	0.00	1.69	0.00	0.00	0.20	0.03	0.11	0.39	0.00	0.02	0.00	1.01	0.15	0.35
E Asia	0.03	0.02	0.12	0.00	0.24	0.00	0.00	0.22	0.01	0.00	0.06	0.00	0.18	0.02	0.10	0.43	0.02
F USSR	3.88	0.00	0.64	1.44	2.29	0.00	0.00	0.01	0.04	0.02	0.00	0.00	0.13	0.00	0.02	0.06	4.19
Japan & S Korea	0.11	0.17	0.20	0.00	0.60	0.23	0.06	0.03	0.00	0.00	0.00	0.04	0.80	0.32	0.00	1.05	0.00
Middle East	1.87	0.08	1.67	0.10	0.29	0.00	0.00	0.01	0.12	1.73	0.00	0.00	0.00	0.00	0.24	0.79	0.56
N Africa	1.10	0.07	2.27	0.00	0.66	0.00	0.00	0.26	0.00	1.08	0.02	0.00	0.53	0.00	0.00	0.50	0.33
N Europe	7.17	1.55	0.57	2.98	7.48	0.83	0.05	0.58	0.07	0.07	0.51	0.61	1.23	0.00	0.02	1.43	0.98
Rest of Oceania	0.48	0.51	0.00	0.00	0.40	0.00	0.00	0.45	0.00	0.00	0.02	0.00	0.07	0.00	0.00	0.00	0.00
S America	0.66	0.47	1.34	0.00	2.18	0.00	0.00	0.54	0.16	0.09	0.16	0.35	0.10	0.00	0.19	0.33	0.94
S Asia	1.00	0.38	0.26	0.00	0.09	0.00	0.00	1.84	0.00	0.00	0.00	0.00	0.78	0.02	0.22	0.04	0.00
SE Asia	0.02	1.61	0.03	0.00	0.40	0.00	0.00	0.48	0.01	0.00	0.09	0.02	0.00	0.01	0.12	0.03	0.00
SE Africa	0.62	0.29	0.34	0.00	0.51	0.00	0.00	0.42	0.65	0.02	0.03	0.01	0.06	0.00	0.01	0.03	0.28
S Europe	2.51	0.24	0.22	0.31	2.56	0.03	0.03	1.42	0.20	4.77	0.15	0.22	0.17	0.00	0.06	1.00	1.19
UK & Ireland	9.42	0.84	0.52	0.76	8.26	0.93	0.00	1.13	0.13	0.05	2.58	0.83	0.05	0.00	0.00	0.78	0.06
USA and Canada	3.68	0.70	2.92	1.12	7.19	0.00	0.00	0.19	0.72	0.15	0.16	0.11	0.04	0.00	0.00	6.54	0.00
W Africa	0.16	0.14	0.10	0.00	0.20	0.00	0.00	1.66	0.00	0.01	6.14	0.09	0.00	0.00	0.16	0.02	0.00

With many of the animal fats and vegetable oils lumped into composite categories, figure 2 confirms the principal trends apparent in figure 1. On this plot, our main interpretation rests on the horizontal axis (component 1), which appears to broadly indicate economic well-being, with wealthier regions (e.g. Europe and North America) generally plotted on the left half of the graph and those less affluent (e.g. parts of sub-Saharan Africa and south-east Asia) on the right. In addition, the passage of time is indicated by a convergence on the plot centre from 1961 to 2003, indicating a transition from relatively diverse global lipid availability in 1961 to one based more on soya and rape oil in 2003. Consequently, figure 2 draws more clear-cut distinctions between inter-regional groupings, particularly the temperate richer regions and their transition from animal fats to rape and soya oil consumption, and less-affluent countries largely corresponding to the composite vegetable oils category. As with figure 1, certain regions are characterised by a degree of resistance to global convergence, especially southern Europe (olive oil), the former USSR (sunflower oil) and the poorest regions (particularly West Africa, Central Africa and south-east Asia). The broader implications of the patterns highlighted from figures 1 and 2 are discussed below following an initial overview of the analysis of lipid imports per capita.

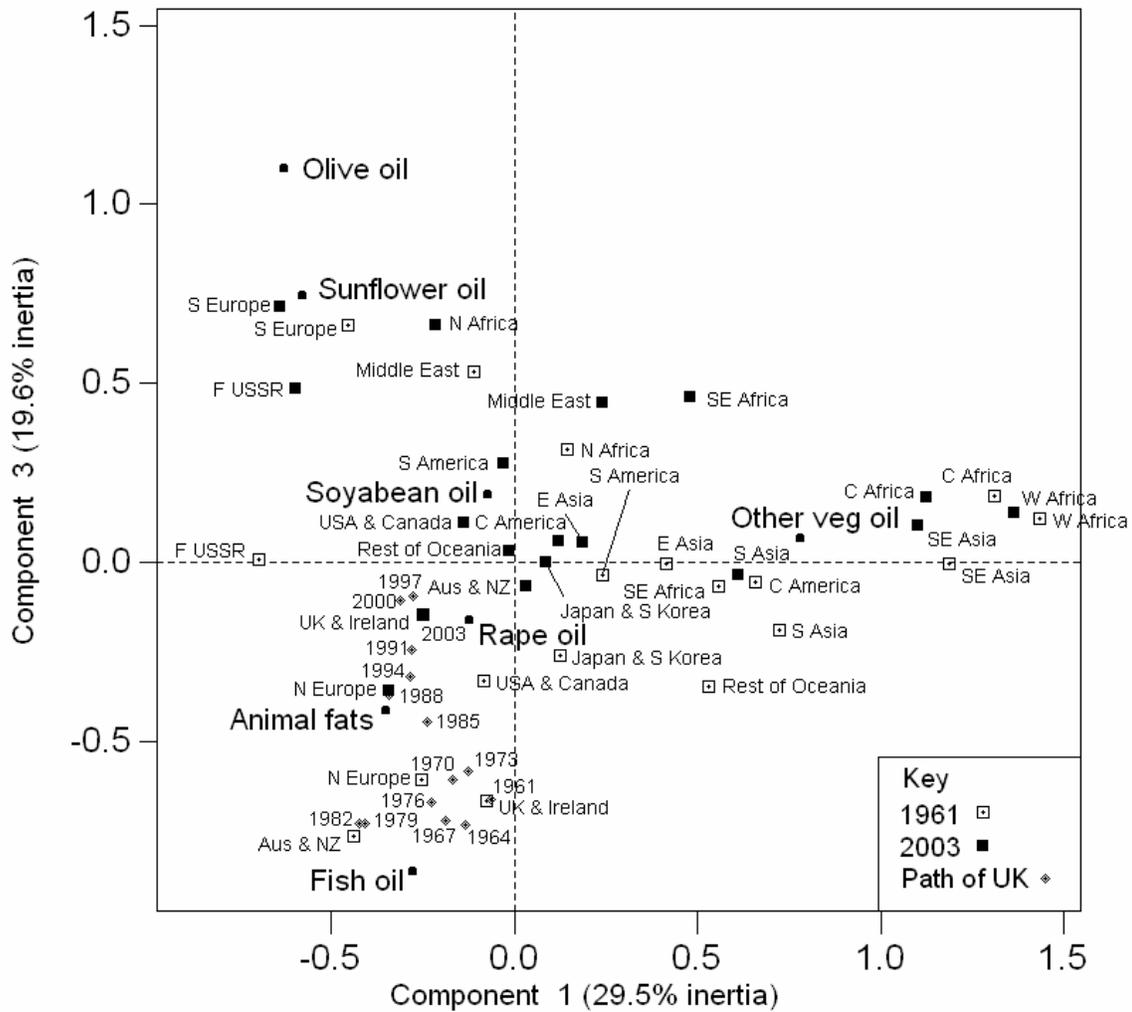


Figure 2: Correspondence analysis – the availability of simplified edible lipid categories by world region in 1961 and 2003.

Table 2: World lipid availability, Kg/capita/year, 2003 (Source: FAOSTAT data, 2006).

2003 availability	Butter	Coconut	Cottonseed	Cream	Raw animal fat	Fish (body)	Fish (liver)	Groundnut	Maize	Olive	Palm	Palmkernel	Rape	Ricebran	Sesame	Soyabean	Sunflower
Aus & NZ	4.45	0.65	2.04	0.03	3.58	0.00	0.02	0.12	0.20	1.36	4.07	0.00	5.11	0.00	0.15	1.39	1.64
C Africa	0.04	0.00	0.07	0.00	0.19	0.00	0.00	0.58	0.01	0.01	2.89	0.46	0.10	0.00	0.08	0.79	0.10
C America	0.52	0.50	0.29	0.12	2.38	0.00	0.00	0.04	0.34	0.09	1.95	0.00	0.60	0.00	0.02	4.48	0.64
E Asia	0.11	0.12	0.55	0.00	2.19	0.00	0.01	1.19	0.07	0.01	1.53	0.02	1.77	0.06	0.14	5.07	0.46
F USSR	2.29	0.02	1.22	1.50	1.89	0.00	0.00	0.00	0.24	0.03	0.00	0.00	0.15	0.00	0.00	1.09	6.92
Japan & S Korea	0.88	0.54	0.21	0.01	0.92	0.33	0.00	0.01	0.63	0.21	1.22	0.11	4.43	0.33	0.16	6.29	0.14
Middle East	1.59	0.08	1.18	0.15	0.45	0.00	0.00	0.01	0.87	0.92	2.70	0.34	0.14	0.00	0.24	3.03	2.13
N Africa	1.62	0.10	0.31	0.00	0.34	0.00	0.00	0.35	0.92	1.05	0.46	0.11	0.35	0.00	0.00	3.00	3.09
N Europe	4.76	1.32	0.00	5.43	7.14	0.20	0.00	0.38	0.30	0.42	0.81	0.14	4.39	0.00	0.06	3.90	2.34
Rest of Oceania	0.76	0.43	0.00	0.29	0.38	0.00	0.00	0.11	0.04	0.08	0.12	0.05	0.02	0.00	0.00	0.98	0.40
S America	0.52	0.04	0.59	0.03	2.23	0.19	0.00	0.07	0.43	0.09	1.87	0.11	0.05	0.04	0.01	7.24	1.90
S Asia	2.26	0.37	0.56	0.00	0.22	0.00	0.00	1.06	0.02	0.00	3.62	0.01	1.07	0.67	0.11	1.59	0.38
SE Asia	0.11	1.18	0.04	0.08	0.80	0.00	0.00	0.45	0.06	0.01	4.01	0.94	0.01	0.03	0.21	0.54	0.25
SE Africa	0.17	0.25	0.35	0.02	0.45	0.00	0.00	0.25	0.51	0.04	1.51	0.09	0.06	0.00	0.04	0.79	1.45
S Europe	3.19	0.29	0.12	2.60	4.14	0.13	0.01	0.43	0.65	6.61	0.44	0.05	1.18	0.00	0.04	2.78	7.53
UK & Ireland	3.36	0.47	0.01	0.32	3.44	0.19	0.02	0.12	0.36	0.78	1.22	0.01	6.38	0.00	0.04	4.05	1.30
USA and Canada	2.14	0.27	0.68	0.77	4.39	0.00	0.00	0.36	1.42	0.71	0.00	0.05	2.21	0.00	0.00	20.23	0.14
W Africa	0.14	0.14	0.53	0.00	0.28	0.00	0.00	3.30	0.01	0.01	4.29	1.15	0.05	0.00	0.18	0.47	0.03

Lipid Imports Per Capita, 1961 – 2003

Consideration of imports in their own right provides a potentially vital insight into the extent to which global changes in lipid availability (see above) are being driven by international trade or merely reflect local changes in agricultural production. In a similar manner to the availability data, correspondence analysis of lipid imports is presented in figures 3a-b and 4, with the corresponding per capita data in tables 3-4. Figures 3a-b display the CA results for individual fats and oils for 1961 and 2003, with the lipids plotted in figure 3a and the regions in figure 3b. In contrast, figure 4 presents the CA results for grouped fats and oils (e.g. animal fats), with lipids and regions overlapping on the same plot. Figures 1 and 2 both contrast imports from 1961 and 2003, with supplementary points added for the UK at 3-year intervals, again as an additional case-study, which gives some indication of the rate and trajectory of change over time. The main trends in the results are interpreted below.

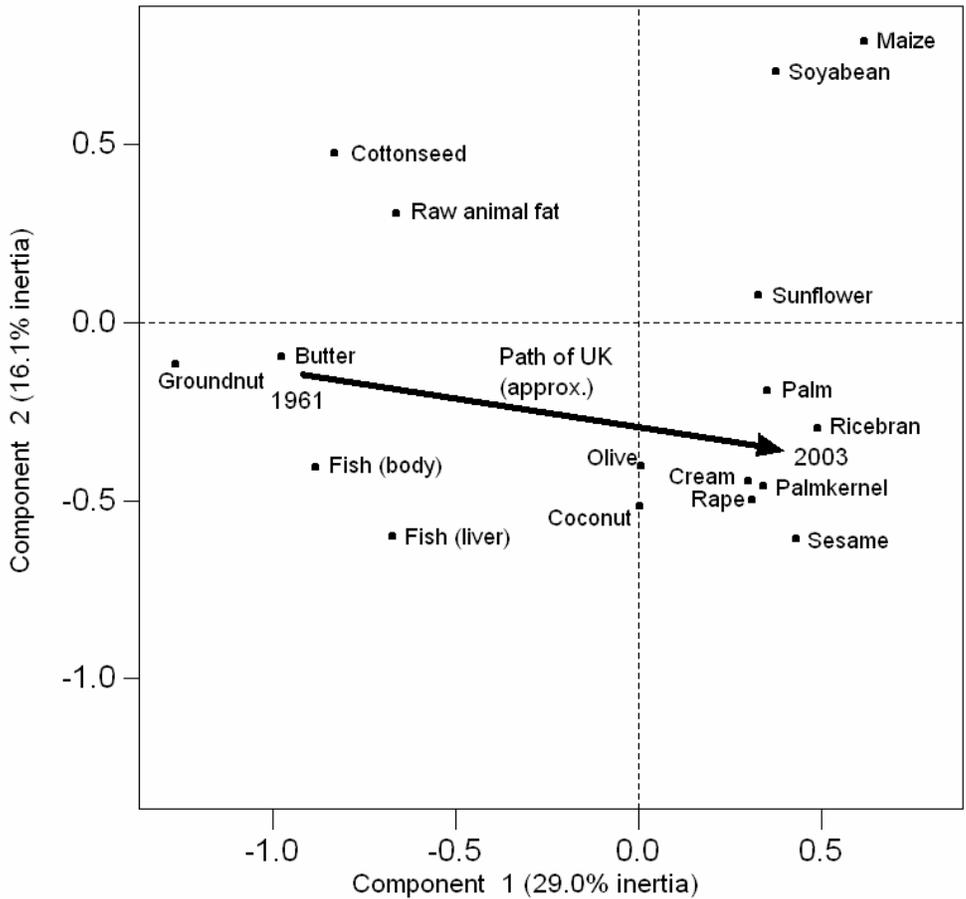


Figure 3a: Correspondence analysis – edible lipids plotted by their importation in different world regions in 1961 and 2003.

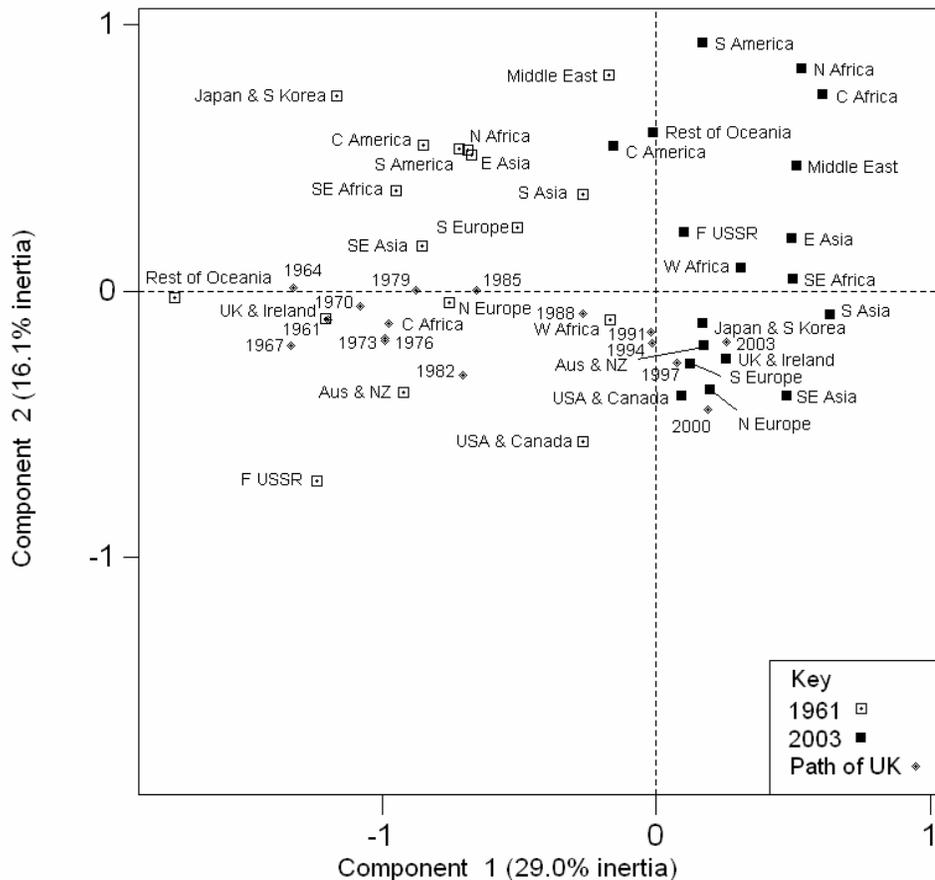


Figure 3b: Correspondence analysis – world regions plotted by the importation of different edible lipids in 1961 and 2003.

A prominent feature of figure 3b is the split between patterns of lipid importation in 1961 (on the left of the plot) and 2003 (on the right), with the horizontal axis (component 1) accounting for change over time, moving from left to right. Although this pattern indicates a general shift in the importation of fats and oils since 1961, figure 3a shows that the nature of convergence appears to be towards an increased diversity in lipid intake, especially of vegetable oils (i.e. olive, coconut, palm, ricebran, palmkernel, rape, sesame and sunflower oil), in the lower-right quadrant. The main characteristics of this transition are less pronounced than for availability, including a general global shift away from animal fats (with the exception of cream) towards vegetable oils (on the right two quadrants). Whilst affluent regions (i.e. Europe, North America, Japan & South Korea and Australia & New Zealand) closely converge on the cluster of vegetable oils in the lower-right quadrant, several poorer regions (e.g. Latin America, North and Central Africa and the Middle East) shifted towards the importation of maize and soyabean oil in the upper-right quadrant. Again, the gradual nature of the former pattern is illustrated by the supplementary points for the UK at three-year intervals, with the biggest changes apparently occurring in the mid-1980s. The main exceptions to this rich-poor split are less affluent regions in 2003 plotted on the edges of the wealthier cluster in the lower-right quadrant (especially parts of Asia and Africa), possibly indicating some localised trade in crops such as palm and sesame oil.

Table 3: World lipid imports, Kg/capita/year, 1961 (Source: FAOSTAT data, 2006).

1961 imports	Butter	Coconut	Cottonseed	Cream	Raw animal fat	Fish (body)	Fish (liver)	Groundnut	Maize	Olive	Palm	Palmkernel	Rape	Ricebran	Sesame	Soyabean	Sunflower
Aus & NZ	0.00	0.03	0.00	0.00	0.01	0.23	0.05	0.59	0.00	0.38	0.21	0.00	0.01	0.00	0.00	0.21	0.00
C Africa	0.04	0.00	0.01	0.00	0.12	0.00	0.00	0.05	0.00	0.10	0.02	0.01	0.00	0.00	0.00	0.00	0.00
C America	0.11	0.21	0.31	0.00	2.08	0.02	0.00	0.00	0.00	0.10	0.07	0.00	0.00	0.00	0.00	0.14	0.42
E Asia	0.00	0.03	0.00	0.00	0.07	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
F USSR	0.04	0.01	0.00	0.00	0.04	0.15	0.00	0.00	0.00	0.02	0.00	0.00	0.03	0.00	0.00	0.00	0.00
Japan & S Korea	0.00	0.00	0.04	0.00	2.15	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Middle East	0.16	0.04	0.21	0.00	0.32	0.01	0.00	0.00	0.00	0.03	0.17	0.00	0.00	0.00	0.00	0.63	0.26
N Africa	0.24	0.07	0.32	0.00	0.97	0.01	0.00	0.32	0.00	0.07	0.14	0.01	0.13	0.00	0.00	0.57	0.32
N Europe	0.30	0.46	0.59	0.00	2.39	2.17	0.07	0.28	0.01	0.08	1.40	0.10	0.08	0.00	0.00	0.53	0.77
Rest of Oceania	0.40	0.00	0.00	0.00	0.38	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
S America	0.05	0.08	0.03	0.00	0.61	0.01	0.00	0.04	0.00	0.07	0.05	0.01	0.00	0.00	0.00	0.19	0.02
S Asia	0.00	0.02	0.03	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.02	0.00	0.00	0.04	0.00
SE Asia	0.01	0.04	0.00	0.00	0.17	0.00	0.00	0.02	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
SE Africa	0.04	0.16	0.14	0.00	0.71	0.01	0.00	0.02	0.00	0.02	0.08	0.02	0.00	0.00	0.00	0.03	0.00
S Europe	0.05	0.14	0.01	0.00	1.25	0.22	0.01	0.63	0.00	0.71	0.57	0.06	0.01	0.00	0.00	1.02	0.04
UK & Ireland	7.83	0.74	0.14	0.00	5.87	2.98	0.04	0.67	0.00	0.05	3.19	0.02	0.00	0.00	0.00	0.42	0.06
USA and Canada	0.00	0.48	0.09	0.00	0.19	0.22	0.03	0.02	0.05	0.14	0.23	0.19	0.01	0.00	0.00	0.05	0.00
W Africa	0.02	0.01	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.01	0.12	0.00	0.00	0.00	0.00	0.02	0.00

Figure 4, showing CA of lipid imports lumped into composite categories, clarifies many of the trends highlighted from figure 3, in particular the global shift away from animal fat imports (in the left pair of quadrants) towards vegetable oils (on the right). Whilst the horizontal axis (component 1) reflects the passage of time, the vertical axis (component 2) seems to differentiate regions based on economic well-being, especially for 2003. Whereas clusters of poorer regions in 2003 correspond to soyabean oil (e.g. North and Central Africa in the upper-right quadrant), sunflower oil (e.g. West Africa, south-east Africa and South Asia to the right of the plot center), the bulk of richer countries converge towards olive oil, rape and other vegetable oils in the lower right quadrant. This is in stark contrast to the results of CA on overall availability per capita, which isolated olive oil as a predominantly southern European and Mediterranean staple. Indeed, the importation of olive oil (in addition to rape oil) seems to be a major factor distinguishing affluent regions from those less wealthy. The wider implications of the patterns highlighted in figures 3 and 4 are discussed below, alongside those trends already noted above in the analysis of lipid availability.

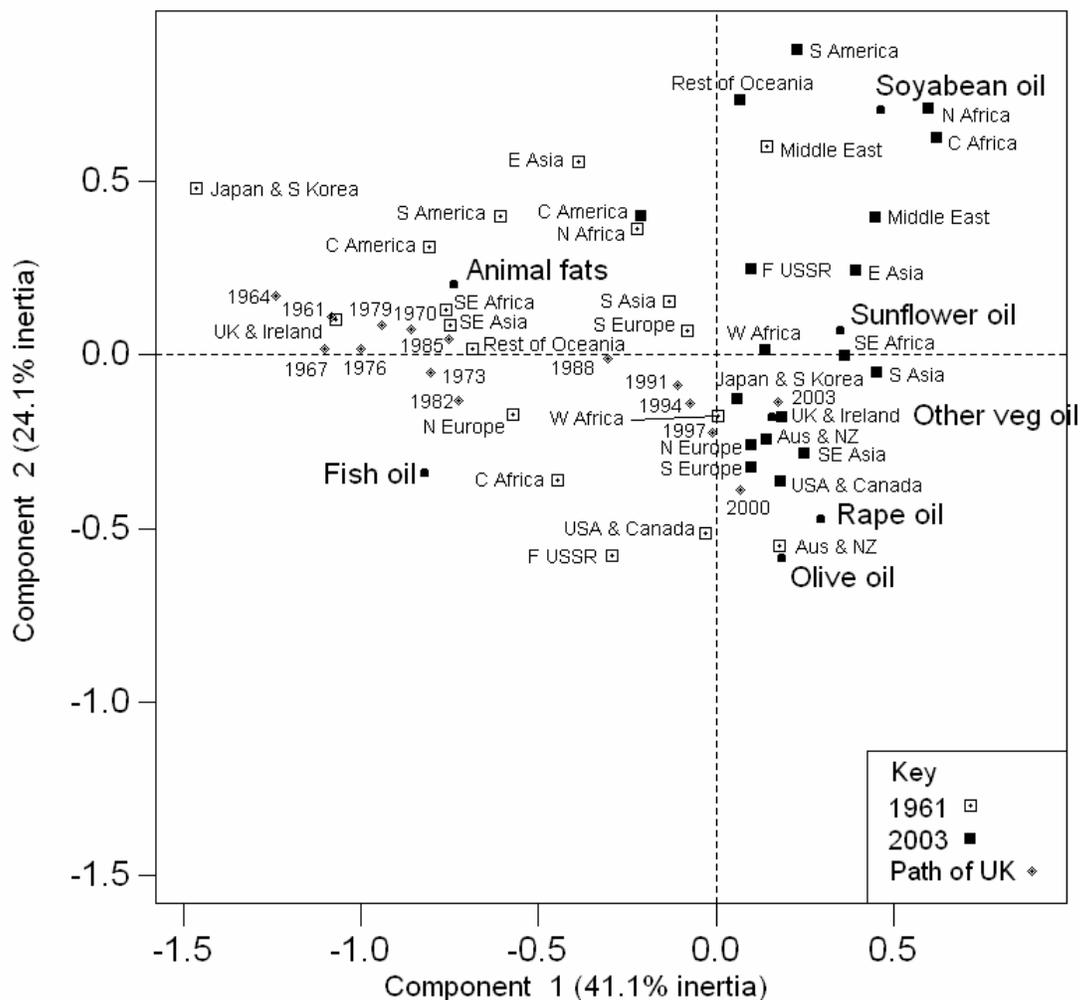


Figure 4: Correspondence analysis – the importation of simplified edible lipid categories by world region in 1961 and 2003.

Table 4: World lipid imports, Kg/capita/year, 2003 (Source: FAOSTAT data, 2006).

2003 imports	Butter	Coconut	Cottonseed	Cream	Raw animal fat	Fish (body)	Fish (liver)	Groundnut	Maize	Olive	Palm	Palmkerne	Rape	Ricebran	Sesame	Soyabean	Sunflower
Aus & NZ	0.37	1.11	0.23	0.17	2.10	0.43	0.02	0.07	0.13	1.37	6.03	0.55	1.12	0.00	0.07	1.54	1.68
C Africa	0.02	0.00	0.01	0.00	0.05	0.00	0.00	0.00	0.01	0.01	0.69	0.00	0.10	0.00	0.00	1.02	0.05
C America	0.37	0.23	0.11	0.12	4.82	0.05	0.00	0.00	0.25	0.09	2.43	0.30	0.53	0.00	0.00	2.94	0.64
E Asia	0.03	0.12	0.00	0.01	0.43	0.01	0.00	0.02	0.02	0.01	3.09	0.12	0.16	0.00	0.00	1.53	0.05
F USSR	0.63	0.38	0.05	0.04	1.09	0.01	0.00	0.00	0.10	0.03	1.83	0.08	0.17	0.00	0.00	1.16	1.57
Japan & S Korea	0.08	0.60	0.09	0.01	1.20	0.55	0.01	0.00	0.05	0.22	4.06	0.35	0.20	0.13	0.01	1.18	0.14
Middle East	0.43	0.11	0.10	0.04	0.84	0.01	0.00	0.00	0.85	0.07	6.16	0.43	0.16	0.00	0.01	4.75	1.51
N Africa	0.68	0.05	0.00	0.01	0.19	0.00	0.00	0.00	0.97	0.17	1.59	0.03	0.40	0.00	0.00	4.82	2.58
N Europe	1.95	3.74	0.01	1.19	3.75	1.86	0.03	0.31	0.26	0.48	15.69	2.47	4.73	0.00	0.02	3.20	3.72
Rest of Oceania	0.60	0.00	0.00	0.29	0.35	0.01	0.00	0.13	0.04	0.08	0.31	0.05	0.05	0.00	0.00	1.51	0.43
S America	0.03	0.01	0.00	0.01	0.96	0.19	0.00	0.00	0.06	0.08	0.44	0.11	0.03	0.00	0.00	2.23	0.49
S Asia	0.01	0.08	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	4.48	0.14	0.01	0.03	0.01	1.04	0.08
SE Asia	0.09	0.24	0.00	0.07	0.06	0.03	0.00	0.00	0.05	0.01	1.72	0.23	0.02	0.00	0.01	0.20	0.05
SE Africa	0.03	0.05	0.06	0.01	0.37	0.01	0.00	0.01	0.05	0.03	3.48	0.15	0.04	0.00	0.00	0.98	0.31
S Europe	0.95	0.90	0.05	0.92	2.29	0.42	0.01	0.47	0.43	3.19	6.25	0.53	1.27	0.00	0.01	1.21	3.32
UK & Ireland	1.93	1.65	0.01	0.27	2.17	0.91	0.08	0.14	0.07	0.90	12.93	1.27	2.38	0.00	0.05	2.51	5.74
USA and Canada	0.19	1.14	0.15	0.03	0.84	0.18	0.01	0.03	0.14	0.74	0.78	0.71	1.35	0.00	0.04	0.84	0.15
W Africa	0.03	0.01	0.02	0.00	0.62	0.01	0.00	0.01	0.01	0.01	2.31	0.03	0.05	0.00	0.00	0.58	0.01

DISCUSSION

Analysis of the global availability and importation of fats and oils for human consumption in the last 50 years reveals many inherent contradictions in the globalization of food. At a general level, both imports and the broad availability of edible lipids displayed an overwhelming degree of convergence from 1961 to 2003, especially in terms of a global transition away from animal fats towards vegetable oils. However, whereas the net *availability* of fats and oils shifted from a situation characterised by regional diversity in 1961 to a picture of increased uniformity and dependence on one or two dominant crop varieties in 2003 (i.e. soyabean and rape oil), the global *importation* of lipids paradoxically tended towards significantly increased diversity, especially of imports into more affluent regions. This suggests two complementary processes at work – firstly the homogenization of cheap mass produced food as a larger proportion of the world’s population becomes more integrated into a global economy, and secondly, a shift from regional food diversity to increased food choice in the supermarkets and delicatessens of wealthier regions (for those who have both the desire and means to consume internationally). To take one extreme national example, it is perhaps no coincidence that the mid-1980s, the period of highest growth in income inequality in the UK (Brewer, Goodman and Leicester 2006), also bears witness to the most rapid changes in fats and oils imports into the UK (kick-starting a trend that continued at a slower pace thereafter to define patterns of British edible lipid imports into the early 21st century; see figures 4 and 5). The net effect of globalization on the availability of fats and oils is to both homogenize consumption for the world’s majority, whilst simultaneously increasing consumer choice and hybridity for the wealthier minority. In this context, although there are undeniably health benefits from consuming more vegetable oils as opposed to animal fats, the causes of this general transition are inherently more likely to have resulted from the relative cheapness of certain vegetable oils as opposed to middle class health concerns.

Another notable feature of the analysis conducted in this study was its ability to distinguish trends in economic well-being. For example, in terms of lipid availability, the poorest regions such as Central Africa, Western Africa and south-east Asia clustered for 1961 and 2003, being among the most resistant areas to globalizing trends (figure 2), whereas in terms of lipid imports, the most wealthy regions clustered, being able to bring in a diverse range of fats and oils (figure 4). Patterns such as these reflect the changes in global lipid production in the last century, with richer countries at the forefront of the production of newer varieties (especially soyabean and oilseed rape), and the rest of the world catching up (although no doubt by the time they have tastes will have changed again). The relative inability of the world’s poorest regions to participate in this otherwise global phenomenon could be arguably cited as yet another indicator of the increasing gulf between the world’s haves and have-nots. Compared to the general availability of lipids, the patterns of imports are much more influenced by demand (of the more affluent sections of society), perhaps driven by current western middle-class values such as healthy eating, a little ethical consumption and even the need to distance oneself from the harsh inequalities of the global economic system. We contend that this more likely provides yet another example of the inherent role of inequality in globalization, rather than representing any counter-movement to globalization process.

The trends in global lipid availability and consumption we show illustrate how homogenization can occur that may appear to some as if collusion amongst transnational corporations is at work (Kentor 2005). That is not to say that there is evidence of any collusion or conspiracy among such corporations, as actual collusion is not necessary to produce such a pattern of homogenization (Nollert 2005). Others might see the homogenization of lipid consumption evidence of globalization or some kind of imperialism. After all globalization is often “a cleansed term for imperialism” (Laxer 2005: 318). Are we seeing the imposition of a hegemonic American diet worldwide? As Henry Kissinger is reported to have said in 1999 “[W]hat is called globalization is really another name for the dominant role of the United States” (Laxer 2005: 328). Studying the world geography of oils and fats for evidence pointing one way or the other of US dominance has a certain irony, especially given our environmental current fears that “if the Chinese eat as many eggs and drive as many cars per capita as citizens of the United States do, the global biosphere will fry” (Chase-Dunn 2005: 188).

Allaying fears of hegemonic cuisine dominance apart, in addition to providing an indicator of broad trajectories in food availability and imports, this study isolated some more specific spatial and

temporal trends of importance. Most striking was the distinctiveness of certain regions, such as the Mediterranean, which retained the unique association with olive oil with little relative change from 1961 to 2003. Although environmental determinists would see the Mediterranean as representing the logical optimum productive geographical area of the olive, it can be argued the impetus for the spread of the olive in the first place was political, to feed frontier armies and the urbanised core of the Roman Empire (Hopkins 1980; Woolf 1990). In a similar vein, it is apparent from the present study that more recent large geo-political formations have their own primary source of lipids (e.g. the EU – oilseed rape, the former USSR – sunflower oil, and the USA – soyabean), and that remnants of older political entities can be hitherto read in this fashion (e.g. the British Empire – animal fats, and the Roman Empire – olive oil). Indeed, it is worth noting that the biggest increase in oilseed rape availability in the UK is in the period following entry into the European Common Market in 1973 (figure 5; Tanaka, Juska and Busch 1999). These patterns seem to represent the impact of overarching food policy, creating regimes of production and consumption which have become synonymous with regional food cultures.

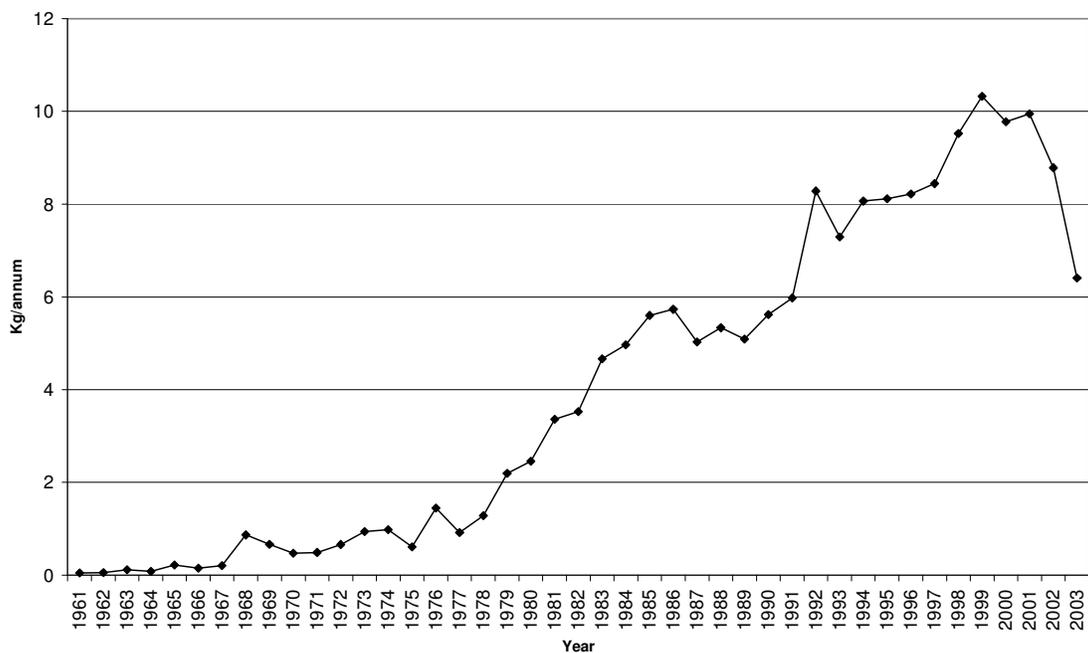


Figure 5: Rape oil availability in the UK, 1961-2003 (Source: FAOSTAT data, 2006).

CONCLUSION

This paper highlights the value of fats and oils in elucidating meaningful regional variations in food consumption, especially compared to other bulk food commodities (e.g. cereals). Our results appear to confirm the notion that global dietary shifts are filtered through relations of inequality (McMichael 2001), both in terms of class and regionality. As Bauman (1998: 2) states, “globalization divides as much as it unites; it divides as it unites – the causes of division being identical with those which promote the uniformity of the globe”. If it is true that “food embodies history like no other substance” (McMichael 2001: 216), then lipids can be seen to oil the regional machinations of such change over both long (centuries) and short (decades) time periods. In spite of the relatively crude resolution (using bulk commodity availability and imports per capita in lieu of figures concerning actual consumption), it has been demonstrated that edible lipids are particularly sensitive indicators of globalization processes. However, the extent to which the general homogenization of global lipid availability witnessed here is actively moulding new habits or being passively incorporated into local cultures of consumption (Jackson 2004) remains uncertain. A number of central questions beyond the

scope of our data remain unanswered, not least concerning the issue of consumer choice, which can more meaningfully be addressed from household survey data, trends in the international trade in processed foods, and the changing relationship between lipids and the content of regional cuisines across the world. In particular, further distinctions need to be drawn between the conscious choice of fats and oils for cooking within the household, and the consumption of lipids that have been already incorporated into processed fare by the food industry.

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**LONG WAVES, INSTITUTIONAL CHANGES, AND HISTORICAL TRENDS:
A STUDY OF THE LONG-TERM MOVEMENT OF THE PROFIT RATE IN THE
CAPITALIST WORLD-ECONOMY**

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ABSTRACT

In this paper we study the long-term movement of the profit rate and related variables in the UK, the US, Japan, and the Euro-zone. Since the mid-19th century there have been four long waves in the movement of the average profit rate and rate of accumulation. The average profit rate tended to fall between the late 19th century and the late 20th / early 21st century. The average profit share fell substantially in the transition from the UK hegemony to the US hegemony. The fall of the profit rate and profit share reflected rising wage and taxation costs. Our findings raise important questions regarding the future development of the capitalist world-economy.

INTRODUCTION

Capitalism as a historical system rests upon the pursuit of profit and accumulation of capital. The profit rate is a central indicator that determines as well as reflects conditions of capitalist accumulation. Through accumulation, it in turn affects the general performance of the capitalist world-economy and contributes to political and social changes.

Since the 1970s, there have been many studies of the profit rate, its determinants, and how the profit rate interacts with accumulation in the context of advanced capitalist countries. Most studies focused on the post-WWII period. There have been relatively few studies of the movement of the profit rate over longer periods and there has been no study that evaluates the long-term movement of the profit rate in the capitalist world-economy as a whole.

Capitalism is by nature a world system. Capitalist accumulation, division of labor, and the production and distribution of value take place within a world-economy that consists of multiple states and national economies. The basic laws of motion of capitalism, including those that regulate the long-term movement of the profit rate, operate not only within national capitalist economies, but also in the capitalist world-economy as a whole.

Based on and inspired by previous studies, in this paper, we take a preliminary step towards the understanding of the long-term movement of the profit rate and its determinants in the capitalist world-economy. Our study focuses on the experience of four leading capitalist economic units – the UK, the US, Japan, and the Euro-zone. The UK presided over the capitalist world-economy in the

19th century. The US has been the hegemonic state since the mid-20th century. In the late 1980s and the early 1990s, some speculated that Japan could replace the US to become the next economic superpower. Japan now remains the world's second largest national economy as well as the largest creditor nation. The Euro-zone is currently the world's second largest economic unit. In this study, we represent the Euro-zone with its three largest national economies: Germany, France, and Italy.

We are able to construct reasonably reliable and consistent data series for the UK and the US back to the mid-19th century. For Japan, our data series start with 1905. For the Euro-zone economies our data series is comparatively short, starting with 1963.

By studying the long-term movement of the profit rate in the leading capitalist economic units, we hope to provide new information that helps to deepen our understanding of the long-term historical dynamics of the capitalist world-economy. The next section reviews alternative theoretical approaches on capitalist long waves, stages of capitalist development, and the long-term historical trends of capitalism as well as previous studies on the long-term movement of the profit rate in advanced capitalist countries.

Section 3 discusses the relative size and significance of the selected leading economic units in the capitalist world-economy and explains the measurement of the profit rate and its determinants. Section 4 presents and discusses the long-term movement of the profit rate and related ratios in the four selected economic units. Section 5 presents and discusses the long-term movement of the average profit rate and related ratios in the capitalist world-economy. Section 6 discusses the relationship between long waves and institutional changes as well as certain long-term historical trends. The last section concludes the paper by discussing possible future developments of the capitalist world-economy.

THEORETICAL ARGUMENTS AND EMPIRICAL EVIDENCE

Long Waves and Stages of Capitalist Development

Many have studied the relationship between long waves of capitalist accumulation and the evolution of capitalist institutions. Long waves usually refer to the 40-50 year long cyclical movements of capitalist economies, with each cycle consisting of an expansionary phase (the phase of more rapid accumulation) and a contraction phase (the phase of sluggish accumulation and major crisis).

The "Social Structures of Accumulation" (SSA) school relates long waves to stages of capitalist development. According to the SSA school, at each stage of capitalist development, there are certain political, economic, and social institutions that form a social structure of accumulation. As long as the existing SSA provides a favorable environment for capital accumulation by ensuring relatively high and predictable profit rates, the capitalist economy tends to expand vigorously. However, over time, due to changing economic and social conditions as well as contradictions within the existing SSA, the profit rate tends to decline, undermining accumulation and eroding the existing SSA, resulting a period of economic crisis and intensified social conflicts. Various classes and social groups would fight for the direction of institutional change until a new SSA emerges (Gordon, Edwards, and Reich 1982; Kotz 1987; Bowles, Gordon, and Weisskopf 1990; Kotz, McDonough, and Reich 1994).

According to the SSA school, between the mid-19th century and the 1980s the US economy had experienced three long waves, each corresponding to a particular social structure of accumulation. The first, competitive capitalist SSA lasted from the 1860s to the 1890s. The second, corporate capitalist SSA lasted from the turn of the century to the 1930s. The third, regulated capitalist SSA lasted from the 1940s to the 1980s (Bowles, Edwards, and Roosevelt 2005: 158-164). There is a general agreement that since the 1980s a new, neoliberal institutional structure has emerged and consolidated. But there has been debate regarding whether neoliberalism constitutes an independent social structure of accumulation (Lippit 1997; Hossein-Zadeh and Gabb 2000; Wolfson 2002; Kotz 2004).

Like the SSA school, the Regulation school relates institutional changes to long waves, but with emphasis on patterns of technical change and the regulation of effective demand. According to the Regulation school, a certain technological style (e.g., Fordism) and a pattern of distribution and

consumption compatible with the underlying production system together form a regime of accumulation. A certain regime of accumulation in turn requires certain institutions constituting a “mode of regulation” regulating the conflict between capital and labor, between industrial capital and financial capital, between capital and state, and between different capitalist states. To the extent that these conflicts are effectively regulated, the prevailing regime of accumulation tends to promote rapid growth and economic stability. However, beyond a certain point, the underlying contradictions of the prevailing regime become increasingly more intensified, undermining profitability, productivity, and economic growth, leading to the disintegration of the existing regime (Lipietz 1987; O’Hara 2003).

Systemic Cycles of Accumulation and Financial Hegemonies

In *The Long Twentieth Century* and *Chaos and Governance in the Modern World System*, Giovanni Arrighi and others argue that the continual reproduction and the expansion of the capitalist world-economy over the past several centuries have been based on the successive recreation of increasingly more powerful leading capitalist organizations. There have been four “systemic cycles of accumulation,” each led by a particular governmental-business complex. The Genoese-Iberian cycle stretched from the 15th through the early 17th century; the Dutch cycle stretched from the late 16th through the late 18th century; the British cycle stretched from the mid-18th century through the early 20th century; the US cycle started in the late 19th century and, according to Arrighi, is now approaching its “terminal crisis.”

Each systemic cycle consists of a material expansion phase and a financial expansion phase. In material expansions, the emerging hegemonic power of the capitalist world system creates a set of new geopolitical and organizational conditions required for the emergence of wider and deeper divisions of labor, leading to rising profit rates and rapid expansion of material production and trade. However, as material expansion proceeds, eventually capital tends to be over-accumulated and profit rates tend to fall. In response to the crisis of material expansion, the leading capitalist agencies tend to keep a larger proportion of their capital in liquid form instead of re-investing it into material production or trade, thus leading to financial expansions in which financial capital dominates industrial and commercial capital.

Following Fernand Braudel, Arrighi sees the alternation of material expansions and financial expansions as a recurrent pattern of world capitalism. In this pattern, the phase of financial expansion represents the “autumn” of a systemic cycle. It allows the incumbent centers of world capitalism to temporarily re-inflate their power and wealth and enjoy a *belle époque*. However, the dominance of financial capital redistributes income and wealth from labor to capital and from debtors to creditors. Instead of resolving the crisis, financial expansion in fact deepens the over-accumulation crisis and leads to a crisis of legitimacy, intensifying inter-class and inter-state conflicts. The phase of financial expansion, therefore, had in the past preceded the “terminal crisis” of the incumbent hegemonic power (Arrighi 1994; Arrighi and Silver 1999; Arrighi 2005).

Dumenil and Levy (2004) also see important similarities between the current period and the early 20th century capitalism. Inspired by Marx’s “law of the tendency for the rate of profit to fall,” Dumenil and Levy argue that in certain historical periods, capitalist technological progress tended to be characterized by increased use of fixed capital, leading to falling capital productivity and profit rate, resulting in periods of “structural crisis.” In response to the “structural crisis,” capitalism underwent major transformations in institutions that tended to favor the interest of “finance” (or the upper echelon of the capitalist class) and restore profitability. According to Dumenil and Levy, the early 20th century was the first period of “financial hegemony” and the current period of neoliberalism is the second period of “financial hegemony.”

Historical Trends of Capitalism

Classical Marxism argues that all social systems are historical, and capitalism is a historically specific social system that is appropriate only under certain historical conditions and will have to give way to a new social system as the underlying historical conditions change.

In *Capital*, volume III, Marx advanced the famous hypothesis “the law of the tendency for the rate of profit to fall.” Marx argued that the development of productive forces under capitalism tends

to be characterized by rising “organic composition of capital” and leads to a falling rate of profit. In the long run, the tendency for the rate of profit to fall would undermine capital accumulation and deprive capitalism of its historical justification (Marx 1967: 211-266). The theoretical and empirical validity of Marx’s hypothesis has been intensely debated.

Like Marx, Immanuel Wallerstein sees capitalism as a historically specific social system that exists and functions under certain historical conditions. According to Wallerstein, the capitalist world-economy rests upon the endless accumulation of capital, which in turn leads to three secular trends: rising wage costs (resulting from the tendency for the bargaining power of the working classes to grow); rising taxation costs (resulting from the tendency for both the capitalists and the workers to demand increasingly more extensive state services); and rising environmental costs. As the three secular tendencies approach their respective asymptotes, capital accumulation is under growing structural pressures and becomes increasingly unfeasible, leading to the structural crisis of the existing world system (Wallerstein 1995; 1998; 2003).

The Long-Term Movement of the Profit Rate: Empirical Evidence

Since the 1970s, many have studied the movement of the profit rate and its determinants in advanced capitalist countries in the post WWII period. There is a general consensus that the profit rate had fallen in the US and other advanced capitalist countries between the mid-1960s and the early 1980s and the fall of the profit rate was a major factor that contributed to the economic stagnation and instabilities in the 1970s and the 1980s (among others, see Gordon, Weisskopf, and Bowles 1987; Armstrong, Glyn, and Harrison 1991; Moseley 1991; Shaikh and Tonak 1994; Moseley 1997; Brenner 1998; Shaikh 1999).

However, there have been relatively few studies of the movement of the profit rate over longer periods. In an earlier study, Poletayev (1992) studied the movement of the profit rate in the UK, the US, Germany, and Japan, for various periods between the 1850s and the 1970s, partly using second hand sources, and concluded that there existed long waves in the movement of the profit rate.

Dumenil and Levy (1993) studied the long-term movement of the rate of profit, the profit share, and capital productivity in the US private economy between 1869 and 1989. They found that during two historical phases, from the Civil War to the beginning of the 20th century, and from the 1940s to the 1970s, technical change had led to a falling capital productivity and a falling rate of profit, resulting in two structural crises. However, in response to the crises, capitalism underwent technological and institutional changes that restored the profit rate more or less to the previous levels. In the long run, both the profit rate and the profit share fluctuated around essentially constant trends.

Dumenil and Levy used a broad measure of the profit that does not take into account the effects of taxation costs. In a recent study, Li and Hanieh (2006) developed a new measurement of the profit rate in the US economy between 1869 and 2000, taking into account the effects of both wage costs and taxation costs, and identified four long waves in the movement of the profit rate. Li and Hanieh found that both the profit rate and the profit share had tended to fall over the long period from the 1870s to the 1980s, followed by some recovery in the neoliberal era.

Measuring the Profit Rate in the Capitalist World-Economy

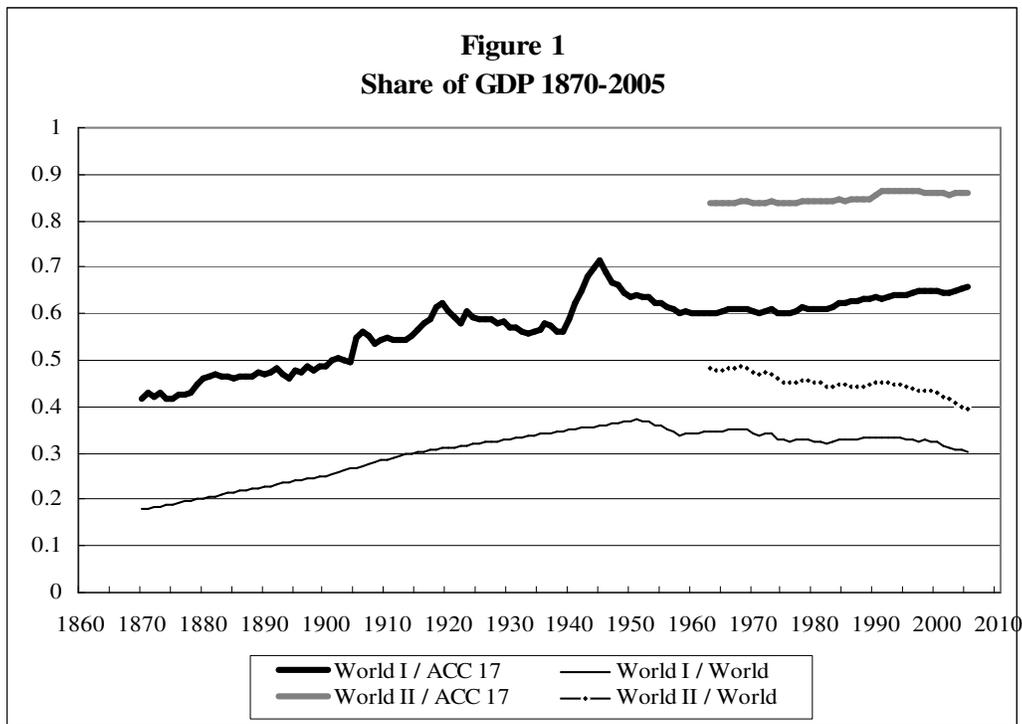
Capitalism is by nature a world system. The capitalist division of labor, the production and distribution of value, and the accumulation of capital take place in the context of a world-economy. To understand the historical dynamics of capitalism, it is necessary to study not only the movement of the profit rate in national capitalist economies but also that in the capitalist world-economy as a whole.

Ideally, one would like to calculate the average rate of profit for the entire capitalist world-economy. However, given the practical difficulty of constructing long-term profit rate data series that cover the entire world-economy, the second best option is to construct the data series for several leading economic units in the capitalist world-economy, the size and the significance of which are sufficiently large so that they may reasonably represent the overall conditions and trends of the system.

The UK, the US, Japan, and the Euro-zone have acted as the dominant or the leading players in the capitalist world-economy in different periods over the past one and a half century. In this paper, in addition to studying the movement of the profit rate and related ratios for each of these economic

units, we also study the weighted averages of their profit rates and related ratios. We construct average profit rates and other ratios for two different groups: “World I” and “World II.” “World I” refers to the UK and the US over the period 1870-1904 and UK, US, and Japan over the period 1905-2005. “World II” refers to the UK, the US, Japan, and the three Euro-zone economies (Germany, France, and Italy) over the period 1963-2005.

Figure 1 presents the share of “World I” and “World II” in the total GDP of 17 advanced capitalist countries (12 Western European countries, US, Canada, Australia, New Zealand, and Japan, representing the core zone of the world system) and in the total World GDP between 1870 and 2005. The UK and the US together accounted for between 40 and 50 percent of the total core zone GDP in the late 19th century. Throughout the 20th century, the UK, the US, and Japan together accounted for about two-thirds of the total core zone GDP and about one-third of the total world GDP. Since the 1960s, the UK, the US, Japan, Germany, France, and Italy combined have accounted for more than 80 percent of the total core zone GDP. Since the 1970s, the share of the core zone in the total world GDP has been falling and the fall accelerated over the past decade. Despite this relative decline, the six selected advanced capitalist countries now account for about 40 percent of the world GDP.



The growth performance of the UK, the US, and Japan correlates strongly with that of the entire core zone. The simple correlation coefficient between the three selected countries' average annual growth rates with that of the 17 advanced capitalist countries over 1871-2005 is 0.909.¹

The evidence suggests that the selected leading capitalist economic units account for a substantial portion of the world-economy and are of sufficient importance so that they could provide a reasonable representation of the overall performance in profit rate and accumulation for the capitalist world-economy, but especially for the core zone of the world system.

There are multiple definitions of the profit. Students in the Marxian tradition are traditionally interested in measures of surplus value, which equals the difference between the net value of output

¹ Long-term GDP data for the world and 17 advanced capitalist countries are from Maddison (2003) and extended to 2005 using growth rates in recent years.

and the total wage bill of production workers. In this paper we are interested in how the movement of the profit rate and its determinants affect the long-term performance of the capitalist system. The survival and the success of the capitalist system depend on the material fortunes and the governing ability of its ruling class – the capitalist class. The ability of the ruling class to rule in turn depends on the material resources at its disposal. The income and wealth of the capitalist class derive from various forms of property incomes: profits, interests, and the rent.

We define the profit as the sum of all property incomes that include corporate profits, non-corporate capitalist profits, net interests, and the rent. The profit equals the value of output less wage costs and taxation costs.

The output is measured by the net domestic product, which roughly corresponds to the Marxian concept of net value of output. The wage costs include the compensation of employees and an estimated labor component of the entrepreneurial income (also known as the proprietors' income).² The taxation costs are measured by the taxes on production and imports (indirect taxes) less subsidies.³

The profit rate is the ratio of the profit over the capital stock. The capital stock is measured by the net stock of private non-residential fixed capital.⁴

The profit rate is often analyzed as the product of the profit share and the output-capital ratio. The profit share is defined as the share of the profit in the net domestic product. The output-capital ratio (or capital productivity) is the ratio of the net domestic product over the net stock of private non-residential fixed capital.

Our main sources of data are various official and semi-official sources, including *British Historical Statistics*, *The United Kingdom National Accounts*, *Historical Statistics of the United States: Colonial Times to 1970*, *The United States National Income and Product Accounts*, *Estimates of Long-Term Economic Statistics of Japan since 1868*, *Historical Statistics of Japan*, and *OECD Economic Outlook*. In addition, we use some minor sources and our own estimates.

For details of data sources and construction, see the Appendix.

National Profit Rate Long Waves

Figure 2 compares the long-term movement of the profit rate in the UK, the US, Japan, and the Euro-zone, shown in 10 year moving averages to smooth out short-term fluctuations.⁵

The UK was the first industrial capitalist country. For the UK, we are able to construct the most complete data series that cover the 150-year long period between 1855 and 2005. The long-term cyclical movement of the profit rate is quite apparent. Defining a profit rate long wave as the period from one trough point in the ten-year average profit rates to another, then between the mid-19th century and the early 21st century the UK economy has experienced four long waves.⁶ The profit rate

² We assume that in the long run non-corporate capitalists earn about the same rate of return on capital as corporate capitalists. Based on our estimates, we assume that in the UK, the US, Japan, and the Euro-zone, respectively, 75, 90, 55, and 75 percent of the entrepreneurial income is labor income. For details of estimations and assumptions, see Appendix.

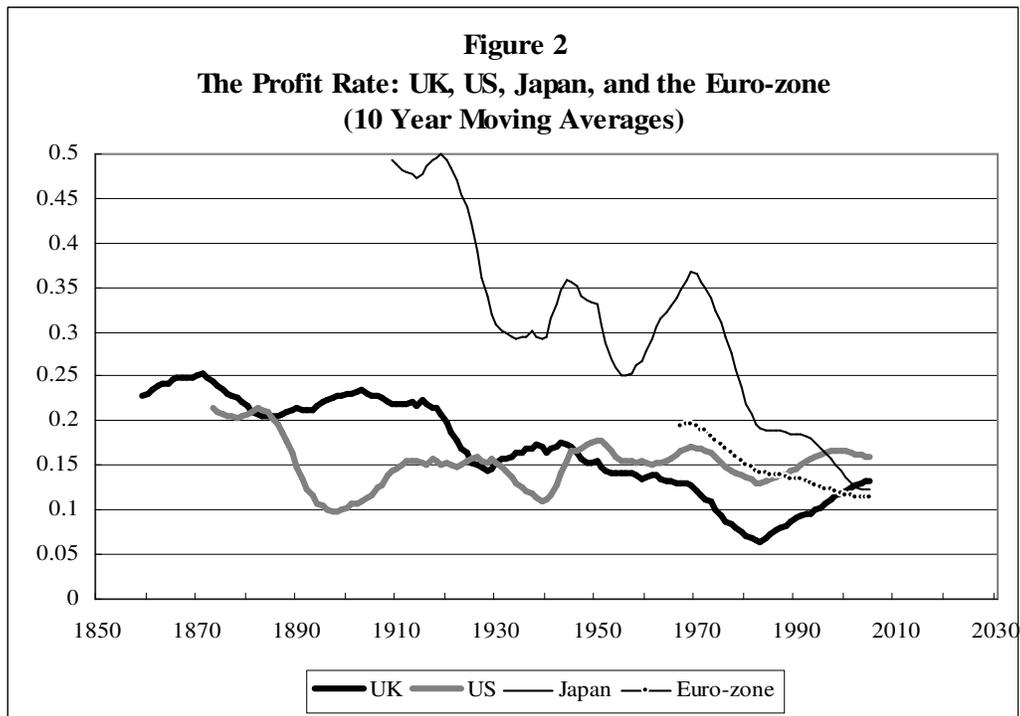
³ Ideally, the taxation costs should also include income taxes (direct taxes) on the capitalists. However, the income taxes paid by the capitalists cannot be easily separated out from those paid by the workers.

⁴ For the three Euro-zone economies, the capital stock is measured by the net stock of business sector non-residential fixed capital. The profit rates of the Euro-zone economies are therefore slightly overstated relative to the profit rates of other selected countries.

⁵ The first data point in each ten-year average series is five-year average, and the second, third, fourth, and fifth data points are six-, seven-, eight-, and nine-year averages respectively. The same is for the rest of the ten-year average series used in this paper.

⁶ A peak ten-year average profit rate is defined as the highest ten-year average profit rate after an extended period of time over which ten-year average profit rates tend to rise. Similarly, a trough ten-year average profit rate is defined as the lowest ten-year average profit rate after an extended period of time over which ten-year average profit rates tend to fall.

tended to fall through the first three long waves. It did recover strongly during the neoliberal era (from the 1980s to the present) but has yet to regain its peak in the previous long wave.



Between 1869 and 2005 there have been four long waves in the movement of the US profit rate. For the late 19th century long wave, there are data only for the second half (from peak to trough). The profit rate fell substantially between the late 19th century and the early 20th century. However, over the course of the 20th century, the trend of the profit rate had been slightly upward.⁷

The Japanese profit rate data series start with 1905. Between the early 20th century and the 1970s there had been three profit rate long waves. However, during the 1980s the Japanese economy had not seen an upturn in the movement of the profit rate and the fall of the profit rate accelerated during the 1990s.

For the Euro-zone (over the period 1963-2005), all ratios are weighted averages of Germany, France, and Italy. To calculate the average profit rate, countries are weighted by their capital stock in constant 1990 international dollars. The Euro-zone profit rate has tended to fall over the past four decades. The profit rate nearly halved between the early 1960s and the early 2000s. There has been no upturn at all in the neoliberal era.

We do not have data for the Euro-zone economies in earlier periods. However, given what we know of the profit rates that prevailed in the UK and the US in the late 19th century and the early

⁷ The trend of the US profit rate over the 20th century presented in this paper is somewhat different from that in Li and Hanieh (2006) largely because of different treatments of corporate income taxes. Li and Hanieh include corporate income taxes as a part of the taxation costs, while excluding individual income taxes on capitalists due to data limitations. This leads to inconsistent treatment of different property incomes. Their definition of profit includes some property incomes that are after-tax (corporate profits) and some other property incomes that are pre-tax (net interests, rent, non-corporate capitalist profits). To avoid this inconsistency, in this paper we treat the corporate income taxes in the same way as individual income taxes, excluding both categories from taxation costs.

20th century, the current very low profit rates of the Euro-zone economies are likely to be their historical lows.

Table 1 reports the peak and trough ten-year average profit rates for the UK, the US, Japan and the Euro-zone in successive long waves. The peak and trough years indicated refer to the ending years of the peak or trough ten-year periods.

Table 1. The Profit Rate Long Waves: UK, US, Japan, and the Euro-zone

	UK	US	Japan	Euro-zone
Late 19th Century Long Waves	Peak: 25.3% (1871) Trough: 20.5% (1885)	Peak: 21.6% (1873) ^a Trough: 9.9% (1897)		
Early 20th Century Long Waves	Peak: 23.4% (1903) Trough: 14.4% (1928)	Peak: 16.0% (1926) Trough: 11.0% (1939)	Peak: 50.0% (1919) Trough: 29.2% (1934)	
WWII and Postwar Recovery Years	Peak: 17.5% (1943)	Peak: 17.7% (1950)	Peak: 35.7% (1944) Trough: 24.8% (1956)	
Mid-20th Century Long Waves	Trough: 6.5% (1983)	Peak: 17.0% (1969) Trough: 13.1% (1983)	Peak: 36.5% (1969) Trough: 18.9% (1984)	Peak: 19.6% (1968) ^b
Late 20th / Early 21st Century Long Waves	Peak: 13.3% (2005 ?) Trough: ?	Peak: 16.7% (1998 ?) Trough: ?	Trough: 12.3% (2005 ?)	Trough: 11.4% (2005 ?)

^a Five-year average. ^b Six-year average.

(Peak and trough ten-year average profit rates)

In the late 19th century and the early 20th century, the UK profit rate led the US profit rate by about ten years. Between the 1890s and the 1910s, the UK profit rates were higher than the US profit rates by quite substantial margins. According to Arrighi, this was the *belle époque* of British imperialism.

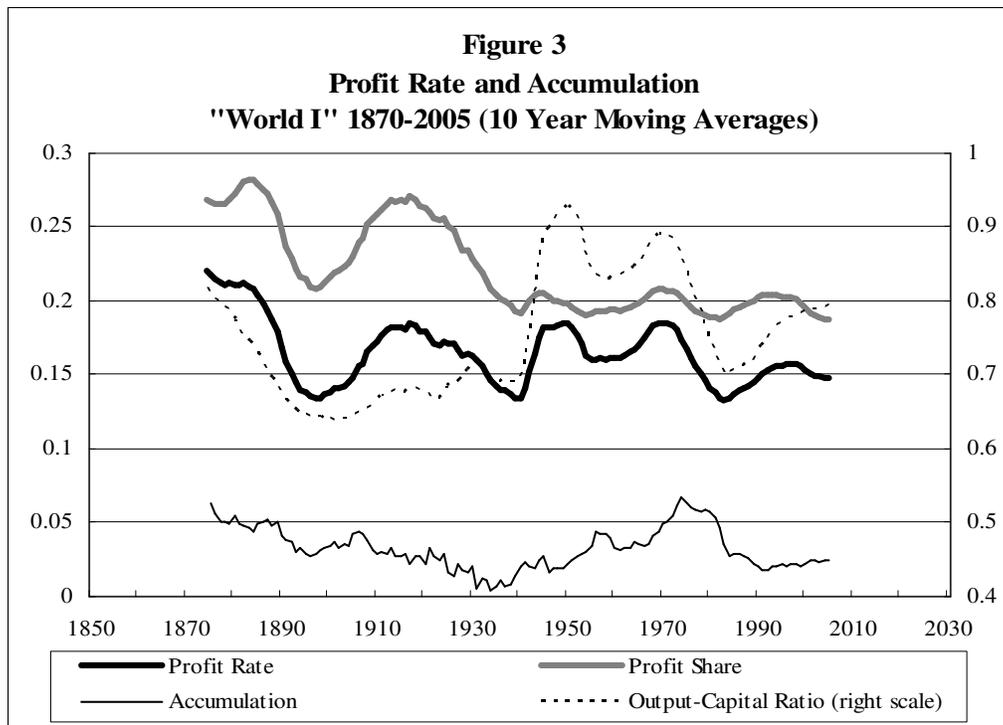
During the 1960s and the 1970s, there was relatively strong cross-country synchronicity in the movement of the profit rate although UK failed to participate in the profit rate boom in the 1960s.

Since the 1980s, the profit rate movements have again diverged across countries. While the US and the UK, the model neoliberal countries, have enjoyed substantial increases in profit rates, the Euro-zone and Japan have suffered sustained falls in profit rates. The US had lower profit rates than the Euro-zone and Japan at the beginning of the neoliberal era, but now has higher profit rates than every other large economic unit in the core zone.

In the long run, there appears to have been a tendency for the profit rates in different parts of the core zone to converge towards similar levels.

World Profit Rate Long Waves

We use the weighted average profit rates of the selected leading capitalist economic units to represent the world average profit rates. Figure 3 presents the average profit rate, profit share, output-capital ratio, and rate of accumulation of country group "World I" (the UK and the US for 1870-1904 and the UK, the US, and Japan for 1905-2005) over the period between 1870 and 2005. The Rate of accumulation is defined as the annual growth rate of real capital stock (measured in constant 1990 international dollars).



For the calculation of the average profit rate, output-capital ratio, and rate of accumulation, countries are weighted by their capital stock in constant 1990 international dollars and for the calculation of the average profit share, countries are weighted by their net domestic product in constant 1990 international dollars.

Both the profit rate and the rate of accumulation show patterns of long-term cyclical movements. Table 2 presents the peak and trough ten-year average profit rates and rates of accumulation in successive long waves.

Since the mid-19th century there have been four long waves in the movement of the profit rate and rate of accumulation. The second half of the late 19th century profit rate long wave, from peak to trough, lasted for 23 years or longer (1874 is the earliest data point). The early 20th century profit rate long wave lasted for 42 years and the mid-20th century profit rate long wave (including the WWII period) lasted for 44 years. Therefore, each of the previous profit rate long waves lasted for about 40-45 years. The current profit rate long wave started in 1983 and has lasted for 23 years. If the past historical pattern could serve as a guide, then the current long wave could come to an end in the coming 20-25 years.

By comparison, the accumulation long waves have had less regularity. The second half of the late 19th century accumulation long wave, from peak to trough, lasted for 21 years or longer (1875 is the earliest data point). The early 20th century accumulation long wave lasted for 40 years. The mid-20th century accumulation long wave lasted for 57 years. The expansion phase (when rates of

accumulation tended to accelerate) of this long wave was particularly long, lasting for 40 years. The current accumulation long wave did not start until 1991 and has by now lasted for 15 years. If the current accumulation long wave were to end in 20-25 years, it would have lasted for 35-40 years. This would make it roughly comparable to the early 20th century long wave in length.

Table 2. The “World I” Profit Rate and Accumulation Long Waves

	Profit Rate	Rate of Accumulation
Late 19th Century Long Waves	Peak: 22.0% (1874 ?) ^a Trough: 13.4% (1897)	Peak: 6.3% (1875 ?) ^a Trough: 2.7% (1896)
Early 20th Century Long Waves	Peak: 18.5% (1917) Trough: 13.4% (1939)	Peak: 4.4% (1906) Trough: 0.0% (1934)
Mid-20th Century Long Waves	Peak: 18.5% (1969) Trough: 13.2% (1983)	Peak: 6.7% (1974) Trough: 1.8% (1991)
Late 20th / Early 21st Century Long Waves	Peak: 15.8% (1997 ?) Trough: ?	Peak: 2.5% (2004 ?) Trough: ?

^a Five-year average.

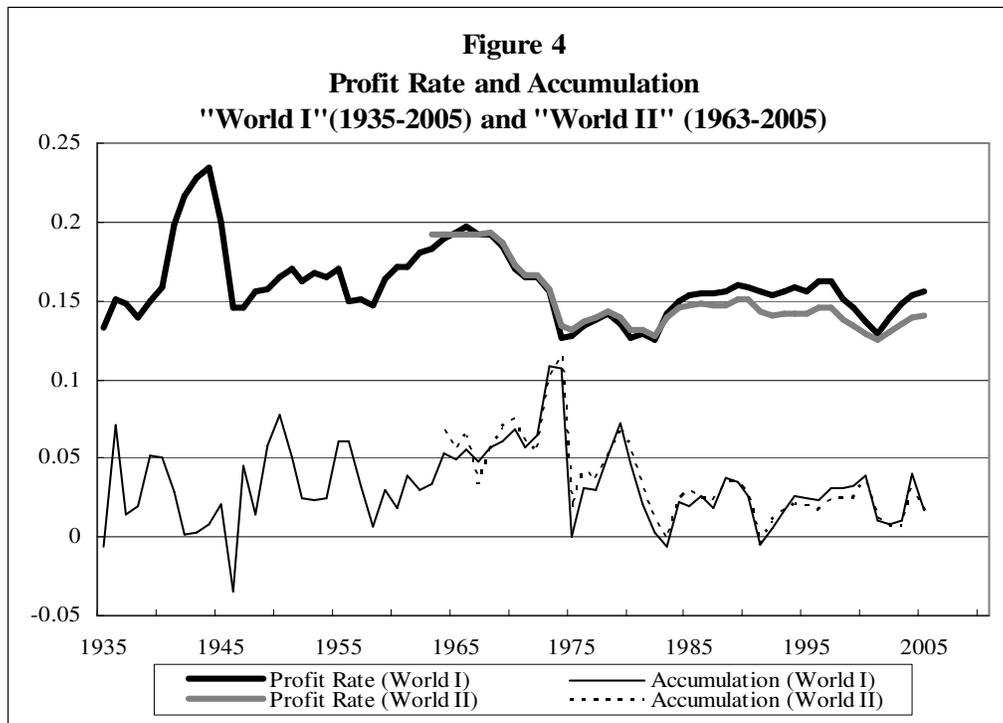
(Weighted averages of UK, US, and Japan, peak and trough ten-year averages)

The profit rate tended to fall between the late 19th century and the early 20th century and again tended to fall between the mid-20th century and the late 20th century. The current profit rate long wave actually reached a peak in 1997. If this peak were not to be surpassed in the coming years, the current long wave would turn out to have the lowest peak profit rate.

The late 19th century long wave and the mid-20th century long wave were characterized by relatively rapid accumulation. The expansionary phase of the current long wave has so far been characterized by the most sluggish accumulation in all long wave expansions.

Figure 4 presents the average world profit rates and rates of accumulation over the past 70 years, covering the entire mid-20th century long wave and the expansionary phase of the current long wave. The “World I” averages are compared with the “World II” (the country group that includes the UK, the US, Japan, Germany, France, and Italy) averages.

The mid-20th century profit rate long wave included four profit rate short cycles (1938-1947; 1947-1958; 1958-1974; 1974-1982) that corresponded to four accumulation short cycles (1934-1946; 1946-1958; 1958-1975; 1975-1983).



Between 1982 and 2001 there was a particularly long profit rate “short cycle”, lasting for 19 years. This long profit rate “short cycle” in fact encompassed two accumulation short cycles (1983-1991 and 1991-2002). We are now in the expansionary phase of the second short cycle within the current long wave. Towards the end of the current short cycle, the characters of the current long wave would become more apparent and the downturn of the current long wave might have been under way.

The “World II” average profit rates and rates of accumulation have closely correlated with those of “World I” but since the late 1980s the “World II” average profit rates have consistently stayed below the “World I” average profit rates, reflecting the poor performance of the Euro-zone economies.

Long Waves and Stages of Capitalist Development

The profit rate and accumulation long waves presented in this paper correspond to the successive stages of capitalist development or institutional structures that have been discussed in the existing literature. Table 3 illustrates the relationship between the profit rate and accumulation long waves and various schemes of periodization of capitalism.

Each set of long wave has corresponded to a distinct institutional structure. The 19th century long waves corresponded to competitive capitalism (small businesses, importance of skilled workers, limited government) and the last phase of the material expansion under the British hegemony. The early 20th century long waves corresponded to corporate capitalism (large corporations, growth of non-unionized semi-skilled factory workers, dominance of employers, emerging of central banks) and the financial expansion under the British hegemony. The mid-20th century long waves corresponded to regulated or big government capitalism (Keynesian macroeconomic policies, government regulations of product, labor, and financial markets, expansion of social spending, capital-labor compromises, emerging of transnational corporations) and the material expansion under the American hegemony. Finally, the current long waves correspond to what is commonly known as neoliberal capitalism (transnational corporations, global mobility of capital and outsourcing, decline of organized labor, weakening of government regulations, monetarist macroeconomic policies) and the financial expansion of the American hegemony.

Table 3. Long Waves and Stages of Capitalist Development^a

		Social Structures of Accumulation	Systemic Cycles of Accumulation (Arrighi)	Dumenil and Levy
Late 19th Century Long Waves	Expansion <i>Profit Rate</i> 1850s-1871 ^b <i>Accumulation</i> 1850s-1874 ^b	Competitive Capitalism 1860s-1898	British Hegemony <i>Material Expansion</i> 1740-1870	
	Contraction <i>Profit Rate</i> 1870s-1897 <i>Accumulation</i> 1870s-1896			
Early 20th Century Long Waves	Expansion <i>Profit Rate</i> 1898-1917 <i>Accumulation</i> 1897-1906	Corporate Capitalism 1898-1939	British Hegemony <i>Financial Expansion</i> 1870-1930	First Structural Crisis 1870s-1890s
	Contraction <i>Profit Rate</i> 1918-1939 <i>Accumulation</i> 1907-1934			
Mid-20th Century Long Waves	Expansion <i>Profit Rate</i> 1940-1969 <i>Accumulation</i> 1935-1974	Regulated Capitalism 1939-1991	American Hegemony <i>Material Expansion</i> 1870-1970	First Financial Hegemony 1900s-1920s Great Depression 1930s
	Contraction <i>Profit Rate</i> 1970-1983 <i>Accumulation</i> 1975-1991			
Late 20th / Early 21st Century Long Waves	Expansion <i>Profit Rate</i> 1984-1998? <i>Accumulation</i> 1992-2004?	Transnational Capitalism 1991-?	American Hegemony <i>Financial Expansion</i> 1970-?	Keynesian Compromise 1940s-1960s
	Contraction -?			
			American Hegemony <i>Terminal Crisis?</i>	Second Structural Crisis 1970s-1980s
				Neoliberalism or Second Financial Hegemony 1990s-?

^a The periodization of successive social structures of accumulation is from Bowles, Edwards, and Roosevelt (2005: 161). The phases of British and American systemic cycles of accumulation are from Arrighi (1994: 364). Dumenil and Levy's periodization of capitalism is from Dumenil and Levy (2004). ^b Peak years of the UK late 19th century long waves.

Further, the contraction phases of successive long waves, such as the 1880s and the 1890s, the 1920s and the 1930s, and the late 1960s and the 1970s, had been periods of major economic crises as well as political and social upheavals. In these periods, social classes and states fought for the future directions of institutional changes. Their struggles led to new social relations of forces that contributed to the demise of the declining institutional structure and paved the way for the rise of a new structure.

In the past, capitalism has succeeded in overcoming major crises through institutional changes within its own framework. The emergence and consolidation of new institutions after major crises contributed to rising profit rates and acceleration of accumulation, which led to new long wave expansions.

However, to the extent capitalism is a historical system that can operate only under certain historical conditions, it does not have indefinite and unlimited abilities of adaptation and self-adjustment. Through institutional changes, important parameters of the system have shifted, generating long-term historical trends. In the long run, these secular trends have led to fundamental changes in the underlying historical conditions and beyond a certain point, the existing world system would no longer be historically viable (Wallerstein 2003:57-64).

Table 4 reports the average profit rate, profit share, wage cost share, taxation cost share, and output-capital ratio for country group "World I" in phases of expansion and contraction of successive long waves (data are only available for UK for the expansionary phase of the late 19th century long wave).

Table 4. The "World I" Profit Rate, Profit Share, and Output-Capital Ratio

	Expansion ^a	Contraction ^a
Late 19th Century Long Wave	R = 24.5%; Π = 26.0% ω = 66.7%; τ = 7.4% Y/K = 94.4% (1855-1871) ^b	R = 17.8%; Π = 24.8% ω = 68.9%; τ = 6.3% Y/K = 71.0% (1870-1897)
Early 20th Century Long Wave	R = 17.2%; Π = 25.7% ω = 68.0%; τ = 6.3% Y/K = 66.6% (1898-1917)	R = 15.2%; Π = 21.8% ω = 69.3%; τ = 8.9% Y/K = 69.7% (1918-1939)
Mid-20th Century Long Wave	R = 17.7%; Π = 20.0% ω = 70.9%; τ = 9.1% Y/K = 88.1% (1940-1969)	R = 14.1%; Π = 19.1% ω = 72.3%; τ = 8.6% Y/K = 73.9% (1970-1983)
Late 20th / Early 21st Century Long Wave	R = 15.2%; Π = 19.6% ω = 71.7%; τ = 8.7% Y/K = 77.8% (1984-2005)	

^a Phases of expansion and contraction of profit rate long waves.

^b Ratios are for the expansionary phase of the UK late 19th century long wave.

(Weighted averages of UK, US, and Japan)

R = profit rate; Π = profit share; ω = wage share; τ = tax share;

Y/K = output-capital ratio

The average profit rate fell between the expansionary phase of the late 19th century long wave and that of the early 20th century long wave, and again between the expansionary phase of the mid-20th century long wave and that of the late 20th / early 21st century long wave. It tended to fall through the three phases of contraction. Overall, there has been a tendency for the average profit rate to fall between the late 19th century and the late 20th / early 21st century.

The average profit share tended to fall through the three phases of contraction. There was a substantial fall in the average profit share between the expansionary phase of the early 20th century long wave and that of the mid-20th century long wave and the average profit share in the neoliberal era has been no higher than in the expansionary phase of the mid-20th century long wave.

The average output-capital ratio tended to fall between the late 19th century and the early 20th century and again between the mid-20th century and the late 20th century but rose strongly between the early 20th century and the mid-20th century. There has not been a clear long-term trend in the movement of the average output-capital ratio.

The wage cost has fluctuated around 70 percent of output since 1870 with a slightly upward trend. The wage share tended to rise through the four phases of expansion and three phases of contraction.

The tax share fluctuated just above 6 percent of output in the late 19th century. It increased substantially between the early 20th century and the mid-20th century and fluctuated just above 9 percent of output during the 1950s and the 1960s. The neoliberal era has seen some modest fall in taxation costs. Since the 1990s the tax share has fluctuated just below 9 percent of output.

Wallerstein argues that in the long run capitalist accumulation tends to cause changes in social and political conditions that would in turn lead to long-term tendency for wage and taxation costs to rise. Our findings are largely consistent with Wallerstein's argument.

In *Chaos and Governance in the Modern World System*, Silver and Slater (1999) argue that the system-wide expansions of the capitalist world-economy have been based on successive social compacts between dominant and subordinated groups. The consolidation of each world hegemony presupposed the establishment of new "historical compromises" capable of accommodating rising groups and bringing social conflict under control. Previous hegemonic transitions had been characterized by the progressive widening of the social foundations of the hegemonic bloc.

In this paper we find that in the transition from the British hegemony to the US hegemony (from the early 20th century to the mid-20th century), there was a substantial fall in the average profit share resulting from rising wage and taxation costs. This suggests that periods of hegemonic transition provided opportunities for new social compromises to emerge and tended to bring about major redistribution of income and wealth.

Capitalism as a Historical System

In this study, we find that since the mid-19th century, there have been four long waves in the movement of the average profit rate and rate of accumulation. The average profit rate tended to fall between the late 19th century and the late 20th / early 21st century. The average profit share fell substantially in the transition from the UK hegemony to the US hegemony. The fall of the profit rate and the profit share reflected rising wage and taxation costs. The findings for the average profit rate and the related ratios are largely consistent with what we find for the national profit rates and their related ratios.

For the output-capital ratio, a crucial ratio for Marx's famous hypothesis of rising organic composition of capital and the law of the tendency for the rate of profit to fall, there has not been a uniform long-term trend.

These findings raise important questions regarding the future development of the capitalist world-economy. If the past pattern of profit rate long waves could serve as a guide, will the current long wave enter its declining phase and come to an end in the coming 20-25 years? Will the end of the current long wave bring about the demise of the neoliberal institutional structure? According to Arrighi, the current phase of financial expansion signals the last stage of the US hegemony before its "terminal crisis." If that were the case, would the demise of neoliberalism turn out to coincide with the demise of the US hegemony? Can the capitalist world-economy be successfully restructured in

the post-neoliberal era or is there evidence suggesting that capitalism may be approaching its own historical limit?

It is not the purpose of this paper to address these questions. However, we would like to suggest some tentative thought that might contribute to future studies. Our findings suggest that a profit rate long wave is likely to last for about 40-45 years. According to this pattern, the current, neoliberal long wave has by now probably reached its peak, and will enter its declining phase. Admittedly, there is not a well-developed theoretical framework establishing that a profit rate long wave necessarily lasts for 40-45 years and there is much less regularity in the pattern of accumulation long waves. Nevertheless, there is growing evidence suggesting that the current neoliberal global economy suffers from certain structural contradictions that would lead to major crisis in the coming years.

Many have argued that under neoliberalism, the global economy tends to suffer from insufficient aggregate demand and financial instabilities (Crotty 2000; Eatwell and Taylor 2000; Felix 2001; Greenhill 2003). In this context, the relatively rapid expansion of the US economy has played an indispensable role in stabilizing the neoliberal global economy. However, the growth imbalances between the US and the rest of the world have led to large and rising US current account deficits. At the current trends, the US current account deficit could approach 10 percent of GDP and the US net foreign liabilities could approach 120 percent of GDP by 2015 (Wolf 2005). When the US current account deficits eventually have to be corrected, the global economy could sink either into a prolonged stagnation or depression (Li 2004; Eichengreen 2004; Li and Zhu 2005).

The current capitalist world-economy depends heavily on oil as its major source of energy, which now provides for about 40 percent of the world's energy and 90 percent of the transportation fuels. Many now predict that global oil production is likely to peak and start to fall in the coming decade. All other sources of energy have serious technological and environmental problems and none of them can plausibly in the near future replace oil on a sufficiently large scale at comparable economic costs. If global oil production starts to fall irreversibly, oil price and other energy costs could experience sustained and sharp rises, severely depressing global profit rates and accumulation. Such an outcome alone could be sufficient to send the current long wave into its downturn.⁸

Past historical experience suggests that the declining phase of a profit rate long wave is likely to be accompanied by major political and social turmoil that undermines the existing institutional structure and paves the way for the emergence of new economic, political, and social institutions. If the coming crisis brings the neoliberal institutional structure to an end, can the capitalist world-economy be successfully restructured in the post-neoliberal era?

Our findings suggest that during the transition from the UK hegemony to the US hegemony, there was a substantial fall of the profit share, resulting from rising wage and taxation costs, which in turn reflected the growing bargaining power of the working classes and the growing demand on state services from both capitalists and workers. If the coming crisis, as Arrighi and others have argued, proves to be not only the crisis of neoliberalism but also the "terminal crisis" of the US hegemony, will the demise of the US hegemony pave the way for another wave of rising wage and taxation costs? If yes, will the capitalist world-economy be able to afford another major fall of the profit share and the profit rate?

In the neoliberal era, despite many attacks on the working people's economic and social rights, the capitalist class has accomplished only limited successes in lowering wage costs and taxation costs. If the working classes in the advanced capitalist countries are able to maintain their existing economic and social rights and to some extent expand their rights, given the current demographic trends, the governments of advanced capitalist countries may be forced to dramatically increase spending on health care and pensions in the coming decades, imposing higher taxation costs on capitalists or forcing the government debts to rise to unsustainable levels.⁹

⁸ On the coming peak of global oil production as well as limitations of coal, nuclear energy, and various renewable energies, see Heinberg (2003); Trainer (2003); Kunstler (2005); and Mckillop with Newman (2005).

⁹ According to Standard and Poor's simulation, given the demographic trend and the current fiscal stance, government debt as a ratio of GDP is projected to rise 221 percent in Germany, 235 percent in

The re-location of manufacturing and services industries from the core zone to other parts of the capitalist world-economy has contributed to the formation of larger industrial working classes in the periphery and semi-periphery (especially in China and India). In the post-neoliberal era, one may expect that as the working classes in the periphery and semi-periphery become larger and more effectively organized, they would demand a growing range of economic and social rights, pushing up the global wage costs and taxation costs.

In the 20th century, the capitalist world-economy was able to enjoy spectacular growth partly because it enjoyed cheap and abundant oil and could afford ignoring environmental costs. However, the global environmental costs have now risen to the point that the very survival of the humanity is at stake. Global warming is only one among many serious environmental consequences caused by the incessant drive of accumulation under the existing world system. Further, as the global oil supply is going to peak and start to decline, the capitalist world-economy faces the difficult and urgent problem of searching for alternative sources of energy that could support the endless accumulation of capital. There is no guarantee that the alternative sources of energy will turn out to be sufficient to support the current and increasingly higher levels of world energy consumption without undermining environmental sustainability.

The post-neoliberal restructuring could be further complicated by the lack of effective leadership of the capitalist world-economy. Historically, the successful restructuring of the capitalist world-economy had required the emerging of a new, more powerful hegemonic power. However, if the US hegemony proves to be no longer in a position to lead the restructuring, given the current configurations of global geopolitics, it is not obvious at all which of the other major powers or what combinations of major powers would be in a position to do so. Without such leadership, there is a significant possibility that the world may sink into persistent chaos in the post-neoliberal era. On the other hand, to the extent that the capitalist world-economy fails to restructure and reproduce itself, it may provide the opportunity as well as the imperative for a new, fundamentally different social system to emerge.

APPENDIX: DATA SOURCES AND CONSTRUCTION

Definitions

Profit rate = profit / net stock of private non-residential fixed capital

Profit = net domestic product – wage costs – taxation costs

Wage costs = compensation of employees + estimated labor component of the entrepreneurial income

Taxation costs = taxes on production and imports (indirect taxes) less subsidies

Estimating the Labor Component of the Entrepreneurial Income

We assume that in the long run the non-corporate capitalists earn about the same rate of return as the corporate capitalists. Reliable data for the rate of return on corporate sector capital stock are available for the UK over the period 1948-1996, for the US over the period 1929-2003, and for Japan over the period 1969-2002. Using the corporate sector rates of return, we calculate the imputed profit component of the entrepreneurial income by assuming that the non-corporate capitalists earn the same annual rates of return as the corporate capitalists. The imputed labor component is simply the difference between the actual entrepreneurial income and its imputed profit component.

We find that between 1948 and 1996, the imputed labor income averaged 69.3 percent of the entrepreneurial income in the UK; between 1929 and 2003, the imputed labor income averaged 89.4

France, 160 percent in UK, 239 percent in US, and more than 700 percent in Japan, by 2050. All of these government bonds would drop to junk bond status (Standard & Poor 2005).

percent of the entrepreneurial income in the US; and between 1969 and 2002, the imputed labor income averaged 53.0 percent of the entrepreneurial income in Japan.

The UK corporate profits include net interests. Therefore for the UK, the imputed labor incomes probably understate the true labor component of the entrepreneurial income. For the UK, we assume that 75 percent of the entrepreneurial income is labor income. For the US, we assume that 90 percent of the entrepreneurial income is labor income and for Japan, we assume that 55 percent of the entrepreneurial income is labor income. For Euro-zone economies, we assume that 75 percent of the entrepreneurial income is labor income, the same as in the UK.

The UK Data

Gross domestic product, net domestic product, compensation of employees, the entrepreneurial income, taxes on production and imports less subsidies, net stock of private non-residential fixed capital for 1948-2003 are from the *United Kingdom National Accounts* (<http://www.statistics.gov.uk>).

Total net stock of fixed capital for 1855-1980 are from the National Accounts tables in *British Historical Statistics* (Mitchell 1988). The logarithms of the net stock of private non-residential fixed capital (LNPNRFK) from *The National Accounts* are regressed on the logarithms of the total net stock of fixed capital (LNFK) from *British Historical Statistics* for 1948-1980. The results are used to estimate the net stock of private non-residential fixed capital for 1855-1947.¹⁰

Gross domestic product (at factor cost), income from employment (or compensation of employees), income from self-employment (or the entrepreneurial income), trading profits of companies (or corporate profits), the rent, and capital consumption for 1855-1947 are from the National Accounts tables in *British Historical Statistics*.

For 1855-1888, income from self-employment and trading profits are not separated out. Income from self-employment is assumed to be 70 percent of the sum of self-employment income and trading profits (the average ratio for 1889-1893 was 69 percent).

Indirect taxes for 1855-1947 are estimated to be the sum of customs, excise tax, stamps, and miscellaneous taxes and charges. Data for these taxes are from the Public Finance tables in *British Historical Statistics*.

Gross domestic product at market prices equals the sum of gross domestic product at factor cost and indirect taxes. Net domestic product equals gross domestic product less capital consumption.

The US Data

Gross domestic product, net domestic product, compensation of employees, the proprietors' income, corporate profits, the rental income, net interests, and taxes on production and imports less subsidies for 1929-2003 and the net stock of private non-residential fixed capital for 1925-2003 are from the US Bureau of Economic Analysis (<http://www.bea.gov>).

The statistical appendix of Dumenil and Levy (1993) provides the net stock of private non-residential fixed capital for 1869-1989. Dumenil and Levy's capital stock series is not directly comparable to the current Bureau of Economic Analysis (BEA) capital stock series. The logarithms of the BEA capital stock for 1925-1989 (LNBEANRFK) are regressed on the logarithms of the Dumenil and Levy's capital stock (LND&LNRFK). The results are used to estimate the net stock of private non-residential fixed capital for 1869-1924.¹¹

Net national product for 1897-1928 is from *Historical Statistics of the United States* (Bureau of the Census 1975), Series F 6-9. Gross national product for 1869-1928 is from *Historical Statistics of the United States*, Series F 1-5. The logarithms of net national product (LNNNP) are regressed on

¹⁰ Regression results: LNPNRFK = -0.5452 + 0.99285LNFK, R-square = 0.99837.

¹¹ Regression results: LNBEANRFK = 0.43285 + 0.97747LND&LNRFK, R-square = 0.99905.

the logarithms of gross national product for 1897-1928 (LNGNP). The results are used to estimate net national product for 1869-1896.¹²

Net domestic product for 1869-1928 is calculated by subtracting the net income from investments abroad from net national product. Net income from investments abroad is from *Historical Statistics of the United States*, Series U 1-25.

Total employees on non-agricultural payrolls for 1900-1929 are from *Historical Statistics of the United States*, Series D 127-141. Total farming sector labor force for 1900-1929 is from *Historical Statistics of the United States*, D 1-10. Average annual earnings of employees for 1900-1929 are from *Historical Statistics of the United States*, Series D 722-727.

Average annual earnings of non-farm employees and average monthly earnings of farm laborers for 1869-1900 are from *Historical Statistics of the United States*, Series D 735-738 and D 705-714. The average annual earnings of farmer laborers are simply calculated by multiplying the average monthly earnings by 12.

Using the total non-farm sector employees, the average annual earnings of all employees, the average annual earnings of non-farm employees and farm laborers, we calculate the implied farm sector employees in 1900. Assuming the ratio of farm sector employees to the total farm sector labor force for each year between 1900 and 1929 is the same as in 1900, we then estimate the farm sector employees for 1900-1929.

Multiplying the average annual earnings of all employees with the sum of the non-farm sector employees and the farm sector employees results in the total wage bill for 1900-1929. The index of the wage bill is then assumed to be the index of compensation of employees, which is used to calculate the compensation of employees for 1900-1928.

National income for 1919-1928 is from *Historical Statistics of the United States*, Series F 6-9. Total indirect taxes for 1919-1928 equal the difference between net national product and national income. For 1869-1918, total indirect taxes are calculated as the sum of federal government's customs and excise taxes and state and local governments' sales and property taxes, which are from *Historical Statistics of the United States*, Series Y 352-357, Y 358-373, 505-521.

National income for 1900-1918 is calculated by subtracting indirect taxes from net national product. The proprietors' income as percentage of national income for 1900-1928 is from *Historical Statistics of the United States*, Series F 186-191.

Total labor force in the farm and non-farm sector for 1860-1900 are from *Historical Statistics of the United States*, Series D 167-181. Using the non-farm sector labor force and the average annual earnings of non-farm sector employees, the farm sector labor force and the average annual earnings of farm sector laborers, we calculate the total wage bill for 1869-1900. The index of the wage bill is then used to estimate the total wage costs from 1869 to 1899.

The Japanese Data

Gross domestic product, net domestic product, compensation of employees, the entrepreneurial income, corporate profits, rent, net interests, taxes on production and imports less subsidies, and depreciation of fixed capital for 1955-2002 and the net stock of private non-residential fixed capital for 1969-2002 are from *Historical Statistics of Japan* (<http://www.stat.go.jp/english/data/chouki>).

Gross domestic product, net domestic product, and the agricultural sector gross and net domestic product for 1905-1940 are from *Estimates of Long-Term Economic Statistics of Japan since 1868* (Ohkawa, Shinohara, and Umemura 1974), volume 1.

Labor income share of non-farm sector output for 1905-1940 is provided by Ohkawa and Rosovsky (1973), basic statistical table 17. The non-farm sector labor income is calculated by multiplying the labor income share with the non-farm sector gross domestic product. The farm sector labor income is assumed to be 55 percent of the farm sector net domestic product. The sum of the farm and non-farm sector labor incomes amounts to the wage costs for 1905-1940.

Indirect taxes for 1905-1940 are from *Estimates of Long-Term Economic Statistics*, volume 7.

¹² Regression results: $LNNNP = -0.11487 + 1.00728LNGNP$, R-square = 0.99575.

Net stock of private non-residential fixed capital for 1905-1940 is from *Estimates of Long-Term Economic Statistics*, volume 3.

National income at factor cost for 1941-1954 is from Ohkawa and Rosovsky (1973), basic statistical table 18. Indirect taxes for 1941-1954 are estimated by assuming that the ratio of indirect taxes to net domestic product changes by following a “straight line” between 1940 and 1955. Net national product is calculated to be the sum of national income and indirect taxes.

Compensation of employees, income from the unincorporated enterprises (the entrepreneurial income), rent, income from investment (net interests), corporate profits, and net factor income from abroad for 1941-1954 are from Ohkawa and Rosovsky (1973), basic statistical table 18. Net domestic product is calculated by subtracting net factor income from abroad from net national product.

The logarithms of the total net stock of fixed capital for 1969-2002 (LNFK) are regressed on the logarithms of the depreciation of fixed capital (LNDEP). The results are used to estimate the total net stock of fixed capital in 1960.¹³

Total net stock of fixed capital for 1961-1968 is estimated by assuming the depreciation ratio (ratio of depreciation to total net stock of fixed capital) changes between 1960 and 1969 by following a “straight line.”

Gross capital stock in constant 1960 prices for 1939-1960 is from *Estimates of Long-Term Economic Statistics*, volume 3, reference table 3. Gross capital stock at current prices for 1939-1960 is calculated by multiplying the gross capital stock in constant prices with the price index of investment goods output. Total net stock of fixed capital for 1940-1959 is then estimated by assuming that the net stock to gross stock ratio changes between 1939 and 1960 by following a “straight line.”

The net stock of private non-residential fixed capital for 1941-1968 is estimated by assuming that its share in the total net stock of fixed capital changes by following a “straight line” between 1940 and 1969.

Extending the UK, US, and Japanese Data to 2005

The UK and US data are extended from 2003 to 2005 and the Japanese data from 2002 to 2005 by using the data from *OECD Economic Outlook* (<http://lysander.sourceoecd.org/vl=3966077/cl=22/nw=1/rpsv/ij/oecdstats/16081153/v115n1/s1/p1>).

For these periods, we assume that net domestic product grew in proportion to gross domestic product, wage costs grow in proportion to compensation of employees, and net stock of private non-residential fixed capital grows in proportion to net stock of business sector non-residential fixed capital (at current prices). Data for indirect taxes less subsidies are directly from *OECD Economic Outlook*.

The Euro-Zone Data

Gross domestic product, compensation of employees, property incomes, indirect taxes less subsidies, business sector non-residential fixed investment, deflator for business sector non-residential fixed investment, government sector consumption of fixed capital, and real net stock of business sector non-residential fixed capital for Italy (1961-2005), France (1963-2005), Germany (1991-2005), and West Germany (1961-1990) are from *OECD Economic Outlook* (<http://lysander.sourceoecd.org/vl=3966077/cl=22/nw=1/rpsv/ij/oecdstats/16081153/v115n1/s1/p1>).

Net stock of business sector non-residential fixed capital at current prices is derived by multiplying the real net stock of business sector non-residential fixed capital with the investment deflator.

Real business sector consumption of fixed capital is calculated by subtracting real business sector net investment (the annual changes in the business sector capital stock) from the real business sector gross investment (calculated by deflating the business sector fixed investment with the

¹³ Regression results: $LNFK = 2.27397 + 1.03446LNDEP$, R-square = 0.9585.

investment deflator). Business sector consumption of fixed capital at current prices is then derived by multiplying the real business sector consumption of fixed capital with the investment deflator.

Net domestic product is calculated as gross domestic product less consumption of fixed capital in the business and government sector.

The entrepreneurial income is calculated by subtracting compensation of employees, property incomes (which include business sector consumption of fixed capital), indirect taxes less subsidies, and government sector consumption of fixed capital from gross domestic product.

Conversion of the Values of Capital Stock and Net Domestic Product into Constant 1990 International Dollars

To calculate the weighted averages of the profit rates and profit shares of the selected countries, their values of capital stock and net domestic product need to be converted into the common measure of constant 1990 international dollars.

Real gross domestic product in constant 1990 international dollars of the UK, the US, Japan, Germany, France, and Italy for 1870-2001 are from Maddison (2003) and extended to 2005 by using economic growth rates of these countries in recent years.

To convert the value of capital stock of country i , at time t , into 1990 international dollars, the following formula is used:

$$\text{PNRFK}_{it1990} = \text{PNRFK}_{it} / \text{GDP}_{it} * \text{GDP}_{it1990}$$

PNRFK_{it1990} is the net stock of private non-residential fixed capital for country i , at time t in 1990 international dollars. PNRFK_{it} and GDP_{it} are the value of capital stock and gross domestic product at current prices of country i at time t respectively. GDP_{it1990} is the gross domestic product of country i at time t in 1990 international dollars.

A similar procedure is used to convert the net domestic product of the selected countries into 1990 international dollars.

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NEGOTIATION AND INCORPORATION ON THE MARGINS OF WORLD-SYSTEMS: EXAMPLES FROM CYPRUS AND NORTH AMERICA

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ABSTRACT

As originally formulated, the world-systems model postulated a relationship in which core states exploited peripheries for raw materials and made the latter into dependent satellites. This approach views indigenous people in peripheries as passive recipients at the mercy of political and economic forces beyond their control. While in many cases the impetus for change was from cores to peripheries, there were certainly instances in which the margins actively (and occasionally successfully) resisted incorporation. At times, they also had the ability to select the precise form of their incorporation. While in many cases this did not alter the consequences for indigenous people, there were occasions when natives not only reacted successfully, but also outlined the terms of the encounter. This is a process that I call negotiated peripherality. Underlying this perspective is a biological analogy: just as biological populations experience the greatest change at the borders of their territories where the effects of gene flow are felt first and most dramatically, so too do cultural changes occur at an accelerated rate in contact zones. This paper explores the nature of negotiated change through two case studies. The archaeological example examines how ancient inhabitants of Cyprus selectively adopted features from the Near Eastern and Greek cultures for whose world-systems the island served as a marginal periphery. The second example is an ethnohistoric study of how Native Americans managed the terms of their involvement in the fur trade with Europeans. Both cases demonstrate the active role of peripheral people as decision-makers.

INTRODUCTION

Various scholars pose several important questions concerning the nature of core-periphery interaction (Carlson 2001, 2002; Chase-Dunn and Hall 1997: 59-77). Some ask if the core-periphery construct is a useful one that illuminates intersocietal relations, what type of variation exists in this phenomenon, and if there are viable options to the hierarchical approach many have adopted in the past. I hold that the core-periphery distinction is still a viable way to think about what happens when different groups come into contact. What we need to do is examine the multiple dimensions of this interaction, rather than assume one particular form of relationship. Clearly, the original world-systems model of Wallerstein (1974) paid too little attention to the active role of people on the peripheries (see Hall 1986). In this paper I use the concept of negotiated peripherality (Kardulias 1999; Morris 1999) to explore how groups on the margins of great civilizations take matters into their own hands. By this term I mean the willingness and ability of individuals in peripheries to determine the conditions under which they will engage in trade, ceremonial exchange, intermarriage, adoption of outside religious and political ideologies, etc. with representatives of expanding states. We have to keep in mind that the representatives of the core are on foreign turf, and

their very presence (at least initially) is often on terms dictated by the natives. Therefore, the outsiders must negotiate the terms of their presence. This understanding may take the form of a contractual agreement, but can also be a fluid arrangement that meets particular needs under certain circumstances. Hall (1999) has pointed out that incorporation is a variable phenomenon. In the case of the North American fur trade (see below), the natives clearly held the upper hand in this process at the outset and had a major say in the terms of trade. This fact illustrates that even when the contact is between state and non-state societies, the hierarchical imperative of early world-systems formulations need not come into play. Native peoples have the option of accepting or rejecting symbolic as well as utilitarian objects (and practices, e.g., methods of food preparation). They can also alter objects and symbols as part of the process of adoption. Since the cultural divide runs both ways, we need to understand that core representatives also adapt their products and behavior in response to the demands of the natives; those who do not run the risk of losing a potentially lucrative market. In the premodern period it was a rare circumstance when a state could impose its will on a periphery in an unfettered manner, or if it did, the effects might not be long-lasting.

Because of the intriguing mixture of activities that comprised intersocietal interaction, the locations where such events occurred were areas of intense cultural ferment. Contact could take the form of violent confrontation, aggressive (but non-violent) displays to impress other parties, small scale barter, exchange of ritual objects, trade in practical commodities, mutual participation in rituals, and other events. Exchange involved both physical objects and information and certainly had an impact on both parties in the transaction. Such an admixture could easily stimulate changes in both groups through the processes of direct borrowing, adoption of new foods, and alteration of items or practices to fit the recipient group's interests and values. It would be at such core-periphery contact points that culture change would be at its most intense. I suggest that this situation is analogous to the process of gene flow. The greatest degree of genetic change tends to take place in the areas that border two breeding populations, or demes, because the admixture of individuals significantly increases the genetic variability (Park 2002: 76-77). Evolutionary biologists refer to such areas as hybrid zones (Futuyma 1986:115). Such genetic mixing, because it increases the size and diversity of the gene pool, is a vital mechanism in physical evolution. The archaeological and ethnohistoric records also indicate that core-periphery contact zones served a similar purpose, not only in terms of interbreeding, but also in the form of cultures being reshaped. The difference between the genetic and social forms of this contact is that the latter involves human motivation as a mechanism of change, as well as strictly biological processes.

Below I examine two examples of core-periphery contact in light of this model of negotiated peripherality. The first is on Cyprus where archaeological work has revealed a long-term process of adaptation between a rural area and surrounding polities (Figure 1). The second example deals with the incorporation of Native Americans into the fur trade. What this study indicates is the ability of world-systems theory to explain a wide range of phenomena from different geographic regions and time periods. Revisions to Wallerstein's original model over the past three decades have expanded the boundaries of investigation beyond the origins of capitalism in the long sixteenth century. Some (e.g., Stein 1999) argue that loosening the chronological and spatial constraints in this manner alters world-systems theory beyond recognition. Many others suggest the world-systems approach gains analytical and conceptual rigor by broadening its temporal and geographic horizons. Additional data from a variety of venues augmented evolutionary theory in the nineteenth and twentieth centuries. For example, while Darwin's notion of natural selection was a major breakthrough, he never figured out the specific mechanism of inheritance; subsequently, some viewed Mendelian genetics as an opposed paradigm, until the two ideas were merged in the New Synthesis. More recently, punctuated equilibrium has challenged certain aspects of gradualism, but without undermining the whole Darwinian edifice. In a similar manner, world-systems theory has been and should continue to be open to refinements that build on the original foundations. I view the concept of negotiated peripherality as one such effort.



Figure 1. Map of Cyprus showing location of Athienou and the Green Line that separates the Greek and Turkish sectors. The inset shows the location of Cyprus in the eastern Mediterranean area.

CYPRUS

Since 1990, the Athienou Archaeological Project (AAP) has conducted excavation and survey to determine the cultural dynamics of the Malloura Valley in central Cyprus over a period of eight millennia (Figure 2). The specific problem that guides this research is the degree to which rural areas or backwaters were assimilated into regional and interregional economic, political, social, and religious networks of material and symbolic exchange (e.g., see Knapp 1988). While the Athienou region, and in fact Cyprus as a whole, can be viewed as marginal in the evolution of western civilization, the project area can, nonetheless, be seen as a laboratory for the study of culture change. It is vital to study such rural areas to balance the overemphasis on urban centers in most examinations of ancient and medieval Mediterranean culture.

The combined data from prior work and that of the AAP provide a picture of occupation in the vicinity of Athienou (Figure 3). Lithics from three sites on the hills that border the western edge of the Malloura Valley reveal similarities to the assemblages from Aceramic Neolithic (AN) (7000-5500 B.C.) sites, so we have tentatively dated the sites to that time period (Kardulias and Yerkes 1998). The survey revealed no evidence of Ceramic Neolithic (5500-3800 B.C.), Bronze Age (2400-1050 B.C.) or Cypro-Geometric (early Iron Age, 1050-750 B.C.) period occupations in the Malloura Valley (Figure 3). It

appears that settlement during these periods was limited to adjacent areas north of the valley, such as the late Bronze Age site at Athienou *Pamboulari tis Koukouninnas*, a metal production facility. *Pamboulari* exhibits characteristics of a regional production center (Dothan and Ben-Tor 1983).

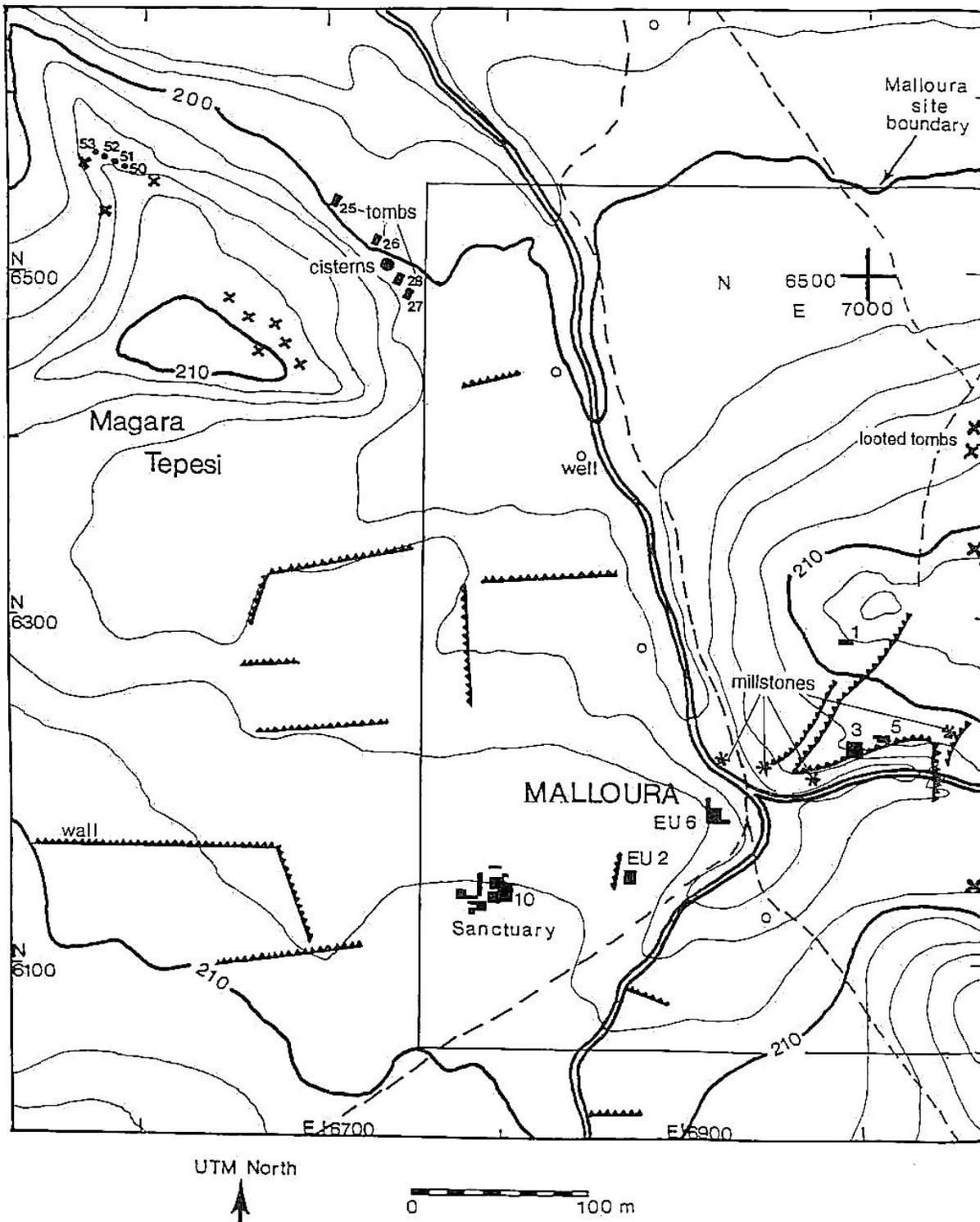


Figure 2. Contour map of region around ancient site of Athienou-Malloura. Locations of excavation units (EU), tombs, and the rural sanctuary are indicated.

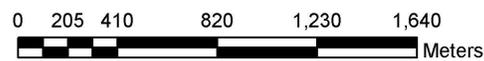
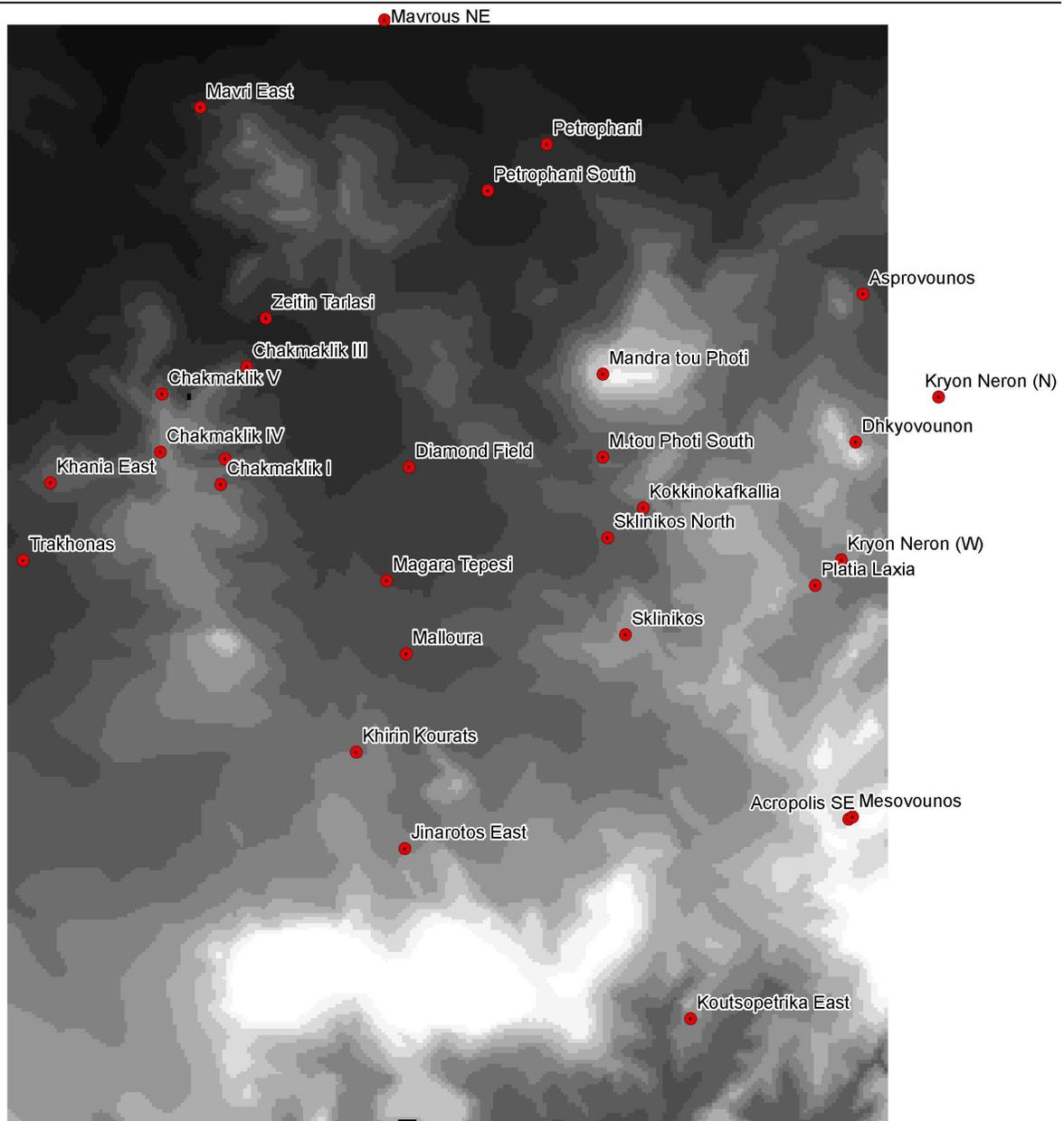


Figure 3. Digital elevation model of AAP project area showing sites discovered by systematic survey. Lighter sections indicate higher elevation.

The prosperity of the Late Bronze Age, the destruction during the era of the “sea peoples” (Drews 1993: 11-12), and the foundation of new cities on the coast (e.g., Salamis, Amathus and Kourion) during the early Iron Age, had very little impact on the more marginal areas of the island like the Malloura Valley. In the Archaic period, the focus of occupation in the region shifted to the area around the important Sanctuary to Aphrodite at Golgoi (Mbakalakis 1988). In this same period, the rural sanctuary at Athienou *Malloura* came into existence, and residents began to bury their dead in rock-cut chamber tombs in several locations near the new sanctuary. A large village developed at Malloura in the Roman period in the 1st century A.D. This was the major site in the valley from the Roman through Early Byzantine (50-647 A.D.) periods; after a hiatus during the late 7th through 12th centuries (originally as a result of Arab raids on the island), the valley and its main village were reoccupied in the Frankish era (1191-1489) and continued into the Venetian (1489-1571) and Ottoman (1571-1878) periods (Table 1).

Table 1. Chronological Chart of Cypriote Prehistory and History

Neolithic	10000-3800 BC
Chalcolithic	3900-2300 BC
Bronze Age	2300-1050 BC
Geometric	1050-750 BC
Archaic	750-475 BC
Classical	475-325 BC
Hellenistic	325-50 BC
Roman	50 BC – AD 395
Early Byzantine	AD 395-647
Arab-Byzantine Conflict	AD 647-965
Late Byzantine	AD 965-1191
Frankish	AD 1191-1489
Venetian	AD 1489-1571
Ottoman	AD 1571-1878
Modern	AD 1878 →

In world-systems theory terms, the Malloura Valley in the prehistoric and early historic period served the role of extraction zone for neighboring regions. In this context, incorporation takes on a different meaning since we have no evidence of settlements, just the use of valley resources. The exploitation of local chert may well have been in the form of embedded procurement forays (Binford 1980) by inhabitants of sites such as Idalion *Agridhi* to the west. Embedded procurement involves the inclusion of several different tasks within a primary one, e.g., stopping at a stone quarry while out on a hunting expedition; the search for food may take one close to another resource, which is then visited as a second-level priority. In this case we may have an example of a regional system, or small-scale world-system (Chase-Dunn and Mann 1998), comprised of a series of egalitarian groups. In such groups, governed by consensus, the voice of individuals must be heard. The evidence from various AN sites, such as Khirokitia, Tenta, Kholetria *Ortos*, and Shillourokambos (Guilaine et al. 1995) suggests scattered pockets of habitation throughout the period.

Despite the fact that the AN culture of Cyprus clearly derived from the Asian mainland, from the outset the islanders seem to have developed their own distinct identity, with certain common features, but also a number of unique elements. Not only do the sites on Cyprus and the mainland seem to be independent, the AN people on Cyprus itself also seem to have lived in autonomous social units with only a veneer of common features to link them together. In a world-system in which shared information is the highest level of interaction, one would expect to find evidence for self-reliance, shared traits of a technological nature, and perhaps some common stylistic/cultural features. The nucleated settlements

that existed in this period suggest small clusters of population who exploited the areas immediately around the villages, and went further afield for other necessary materials. The Malloura Valley seems to have served as one location where people from several settlements could come to extract workable stone. Kingsnorth (in Knapp and Given 1996: 346) suggests that blades and bladelets, which are found in some of the Sydney Cyprus Survey Project transects and may be AN in date, were locally produced from materials gathered throughout the region; in this region of the Troodos foothills, it seems that people in the AN utilized stone sources within a relatively small catchment area, although they did not inhabit the quarries proper. This is the same pattern we see in the Malloura Valley, where people mined Sites 9, 15, 21 and 28 (Chakmaklik I-IV in Figure 3) for chert that they then transported elsewhere for final reduction and use. What the Malloura Valley evidence may indicate is the spacing of AN settlements across the Cypriot landscape, that is, the early farming people placed their settlements on or adjacent to the most critical resources, primarily arable land and pasture for domesticated animals, but within reasonable distance of other necessary materials, such as flakable stone. The presence of non-local materials at a site indicate that Neolithic inhabitants knew how and where to obtain such resources (information network); we can trace the extent of this information by, for example, comparing the types of chert present at a site with the known sources of the stone. Since AN prestige goods are largely limited to ornaments made from certain types of stone found in several places on the island, the presence of various types of lithic materials at sites suggests an overlap between the information and prestige goods networks.

The pattern in which individual sites were strategically located to exploit both local and exotic materials continued into later prehistory. Such sites have evidence for both particular information and valued goods. While there are no Bronze Age sites in the Valley, *Pamboulari tis Koukouninias* just north of Athienou was a significant metal production facility; the Archaic sanctuary of Golgoi also developed in this sector. These sites represent the nesting of information and prestige goods networks (Chase-Dunn and Hall 1997: 52-55) in the region and are clear indicators of a growing connection with both other areas of the island and the international community.

The best evidence for the early historic phases comes from a rural religious sanctuary at the site of Malloura (Site 1) in the center of the valley (Figure 2). In the first phase of the survey we conducted a systematic collection over the entire surface area of the site (26 ha) in order to identify activity loci by time period and to create a baseline of artifact types and quantities for the remainder of the valley. The survey has worked in direct conjunction with excavation at Site 1, clearly the location with the longest occupation in the valley. In the sanctuary in the sw corner of Site 1, extant peribolos walls reveal the enclosed area was ca. 400 sq m. The major finds include large numbers of limestone statuary ranging in size from a few centimeters to over life-size; Cypro-Archaic and Cypro-Classical terracotta figurines of helmeted warriors, chariots, and animals; large amounts of decorated and plain pottery (mostly Archaic); limestone utensils (e.g., offering vessels, vessel lids); and a few bronze and iron artifacts. Several statuary pieces betray Egyptian, Near Eastern, and East Greek influences. A few examples of female figures were found, but the overwhelming majority of the statues represent male votaries and divinities such as Baal-Hammon, Herakles-Melqart, Apollo, and Pan (Toumazou et al. 1998; Figures 4 and 5).

At this point in the history of the Malloura Valley there is, thus, clear evidence of external influences. Some of the statuary betrays Phoenician influence, if not workmanship. There was a definite Phoenician presence (perhaps even colonies) at several coastal sites in this period, but there is much debate concerning the degree to which they penetrated the interior. What our data reveal is possible religious syncretism in which native Cypriots melded elements of foreign origin with their own version of the Greek pantheon; this process in some ways mirrors the blending of Christian elements with native religions in the Americas (Oakes 1969). Indeed, what we may be seeing here is the natives of the valley negotiating their peripheral status in the east Mediterranean world system, adapting outside elements to their own particular needs. In this sense, the level of incorporation still involves only the information and prestige goods networks (Chase-Dunn and Hall 1997).



Figure 4. Limestone statues from the Malloura Sanctuary. Herakles (at left) wears characteristic skin of Nemean lion from his first labor. The Herakles and Pan (right) figures fit directly into the Greek pantheon, while the Zeus-Ammon (center) reflects Egyptian influence.



Figure 5. *In situ* limestone relief figure of Egyptian god Bes in the Malloura Sanctuary.

This perspective is generally supported by burial evidence in the valley. Moderate scatters of Cypro-Archaic, Cypro-Classical, Hellenistic, and Roman material were found around the looted rock-cut tombs nw of the Malloura site at Magara Tepesi. Excavation and survey here revealed a cluster of four small looted chamber tombs on top of the hill (Tombs 50-53), and four large tombs (25-28) cut into the massive white chalk at the base of the hill. The typical construction plan was a stepped dromos leading down to a single chamber with three benches cut into the rock, a pattern that is common in many parts of Cyprus in the last half of the first millennium B.C. Excavation of Tomb 27 (the largest in the group) retrieved large numbers of artifacts that were overlooked by the looters, including prestige goods such as silver and bronze coins, scraps of metal vessels and nails, gold and silver finger rings and earrings, a gold jeweled necklace, local and imported lamps, and ceramic vessels dating to the Hellenistic/Early Roman periods (325 B.C./A.D. 150). The quantity and temporal range of the pottery recovered shows that these tombs seem to have been used for generations by extended families. Careful sieving of the fill from Tomb 27 also yielded skeletal material from no less than 105 individuals.

The burial and other survey material reveals the presence of an elite community with strong links to local and distant markets; the status of the Malloura region seems to have been that of a semi-periphery that encompassed bulk-goods and prestige-goods networks nested within large-scale political/military networks in Hellenistic and Roman times. While Chase-Dunn and Hall (1997:52-53) argue that prestige-goods networks exceed political/military networks in extent, and thus the latter are nested within the former, I suggest that the relationship between the two networks oscillates; large empires or super-states regulate the exchange of prestige goods to a much greater degree than small states, chiefdoms, tribes, and bands in which elite materials cannot be fully controlled by a central authority. When highly centralized states collapse, the access to prestige goods broadens.

World-systems theorists often present the semiperiphery as the location of major innovation and change (Chase-Dunn and Hall 1997:78-93). While scholars often think of rural areas such as the Malloura Valley as recipients of influences from cosmopolitan centers, it is important to consider the way that such patterns were transformed *after* they reached the hinterlands (cf. Schortman and Urban 1994, 1999). The prestige goods buried in the tombs probably reflect the direct emulation of elite lifestyles from urban centers by the local Malloura lords. The mixture of religious symbols in the sanctuary, however, reflects syncretism in which foreign deities were made palatable to residents of this particular region. The survey revealed the lack of a substantial settlement to correspond with the tombs and the sanctuary. We suspect that the limited evidence for habitation in the valley indicates extensive use of the land for agricultural production, as is still the case today. Chase-Dunn and Hall (1997:91) call this pattern of land use a “commodified mode of accumulation” in which agricultural products were grown and sold. Their assertion that this activity took place in “capitalist city-states in the semiperipheral interstices of empires dominated by the tributary mode of accumulation” (Chase-Dunn and Hall 1997:90) provides a useful model for Cyprus.

The pattern of nucleated settlement in the valley continued throughout most of the first millennium A.D. Several excavation units (EUs) at the Malloura site contain the remains of structures associated with the establishment of a substantial rural settlement at Malloura during the Early Roman period that continued through the Early Byzantine era (A.D. 395-647). In EU 3 in the se quadrant of the site, there is an Early Byzantine domestic structure that was burned in the mid-seventh century, early in the period of Arab/Byzantine (A.D. 647-965) conflict. Surface materials also suggest that the earlier settlement at Malloura was abandoned at this time. Just to the east, another structure of similar construction and orientation was discovered that dates from the Roman through Early Byzantine periods. The pottery associated with the building included imported African Red Slip, Phocian Red Slip, and Pompeian Red wares; the pottery here also indicates that the settlement was abandoned in the seventh century. Despite its location 15 km inland and behind the Vouyes ridges that overlook the Larnaca coast, Malloura may have fallen victim to the first Arab raids on Cyprus. This circumstance suggests that these raids were not confined to the littoral regions.

Materials dating to the Roman/Early Byzantine occupation of the Malloura Valley were not as common as Late Byzantine/Venetian artifacts in the survey tracts. Moderate scatters of Roman and Byzantine materials were present in the fields around Petrophani, at Site 16 in the northern portion of the survey area, and at Site 30 along the Nicosia-Larnaca road on the western edge of the valley, but it does not appear that there were substantial Late Roman/Early Byzantine settlements at these sites.

Our data on the Roman and Early Byzantine occupation of the valley directly reflect the development of a single political/military network (Chase-Dunn and Hall 1997:61). In fact, we can go back to the late Archaic period when the Persians made Cyprus into a province or satrapy, for an earlier example seen elsewhere in Cyprus. Particularly in such instances of conquest, it seems that political incorporation preceded economic incorporation. While there were certainly commercial contacts between Cyprus and Persia prior to the conquest, the level of integration increased significantly when the island became part of the Achaemenid empire. I would argue for a similar process in later times. From the late first century B.C. to the mid-seventh century A.D., Cyprus was a province of the Roman Empire and its successor, the Byzantine state. This thorough incorporation (by which I mean political and economic union of a periphery into the core, typically entailing colonial administration) involved not only a position in the imperial political structure, but also a role in the economic *oikoumene* in which economic exchange occurred regularly and largely peacefully across much of the Mediterranean basin as part of the *Pax Romana*. Even rural backwaters like Malloura enjoyed access to the products of this far-flung economic system. The presence of the various imported ceramic wares is testimony to this fact. Bulk goods of various types, probably including grains and animal products from Malloura, may have been key items exchanged among the Cypriot towns and regions, and sent abroad as well in return for the foreign finished goods. In addition, an important component of the information network that functioned to provide some social glue to the economic transactions was Christianity, which gained the virtual status of a state religion in the fourth century A.D. with its adoption by Constantine; of course, religion can be a divisive factor, as we have seen in Northern Ireland, Bosnia, and Iraq in modern times, but under the right conditions, it smooths relations by offering an element of common identity. Finally, the Arab raids that seem to have led to the abandonment of the Malloura Valley for a period of several centuries mark Cyprus as what Allen (1996; see also Cline 2000) calls a “contested periphery”, i.e., a region in the interstices between major states over which the latter fight for control. In fact, Cyprus can be defined as a contested periphery from antiquity to the present day because of its strategic location at the crossroads of Europe, Asia, and Africa.

The Frankish and Venetian periods represented in excavation and survey material from Malloura indicate a strong degree of incorporation into the respective world-systems of the western powers. For Cyprus as a whole, the historical documents demonstrate how the western knights thoroughly dominated the indigenous rulers and then pursued certain economic interests by turning many areas to the production of sugar cane. In this period, as in several previous ones, political incorporation preceded and facilitated economic incorporation. Under the Venetians, Cyprus became an *entrepôt*, a major base for their commercial empire. These efforts filtered into the hinterland at Malloura in the form of a resurgent village. Clearly, though, the ancient pattern of nucleated settlement remained in place. Once again, Malloura became one local node in an international system that produced substantial wealth in the village. The amount of grain processing represented by a number of large millstones suggests production at a level capable of providing a surplus that may have subsidized the purchase of fine ceramics for domestic and funerary uses. Whether we are dealing with direct Venetian control of the Malloura Valley, however, is not clear from the evidence at hand.

We have identified as lookout posts four sites from the Roman and later periods; we believe these reflect the continuing status of Cyprus and the Malloura Valley as a contested periphery. In part, these sites may reflect the clash of imperial giants (e.g., Venetians vs. Ottomans), and probably also the concern with raids by pirates or corsairs at various times (Figure 6). While the valley probably never offered the

kind of concentrated wealth found in urban centers, its location on the route between the port of Larnaka and the major city of Nicosia would have placed its residents and their agricultural produce at risk from marauders.



Figure 6. View of Site 14 on top of hill in northeastern part of AAP project area. A U.N. sentry post with barbed wire sits on top of the site. Both ancient and modern people have used the location as a vantage point because it provides a panoramic view of the valley and of the Mesaoria plain to the north. Facing east-northeast.

The decline of Malloura (Site 1) and the development of the village of Petrophani (Yerkes 2000) at the northern end of the valley were probably linked events in the past 125 years. The scatter of isolated farmsteads and lithic workshops from the modern period represent local management of resources and production of certain agricultural implements, such as threshing sledges (Kardulias and Yerkes 1996), within the context of a truly global world-system. Cypriot products of all types, including olives, oil, carobs, and today milk and cheese, moved from small villages to regional centers, and then into overseas markets via the British imperial system. The town of Athienou grew into a local market center that serviced both Greek and Turkish hamlets, such as Petrophani, and we suspect Malloura lost its residents to the emerging town. The culmination of many of these processes came in the 1970s when Cyprus, ever the contested periphery, was invaded by Turkish forces. The people of Athienou who lost

access to their farmland north of the town turned to the former Turkish-held land in the Malloura Valley and converted large tracts of land to barley production (Figure 7). The grain feeds large herds of milk cattle that have made the region one of the most productive dairy areas in that part of the Mediterranean. The people now market milk and cheese throughout Cyprus and the Levant. Despite the fractious political situation, the bulk-goods network has become a key component of the economic system. Here is yet another example of the the people of the Athienou/Malloura region taking an active part in defining their destiny.



Figure 7. View of the north end of the Malloura Valley. Barley fields reach to the edges of Athienou in mid-ground. To the right are pens for cattle; the dairy industry in the area developed after the Turkish invasion of 1974 when the people of Athienou lost access to their farmland shown in the background beyond the town. In the distance is the Kyrenia Range. Facing north.

THE NORTH AMERICAN FUR TRADE

This section examines the economic and social impact of the fur trade on North American Indian cultures. The Indian role in the fur trade can be described as a craft specialization, within the context of the emerging modern world-system. To explain the emergence of specialized production of furs among Native Americans, I subscribe to a decision model based on rational choice (Barth 1959; Homans 1958)

that considers both real and perceived needs. For North American Indians, these needs included the acquisition of European products and the development of alliances with Europeans to serve native concerns. While the specific *ends* that Indians and Europeans desired were different, the basic *process* was the same. Native peoples wanted objects both for their practical uses and relevance as status markers, while Europeans were ultimately interested in profit. Trigger (1991) also suggests that native peoples acted to benefit themselves, and he further notes that those interests shifted over time; he argues that Indians first saw European goods as prestige items, then as utilitarian objects, accompanied by a shift in their views of foreigners from exalted to inferior status.

Negotiation and maneuvering by both sides characterized the fur trade from the outset. The Indian role, influenced as it was by the desire to obtain Western goods, required modifications in various native practices to permit full exploitation of the network. Indians altered production strategies to suit their own perceived interests. They engaged in procurement, processing, and use/consumption activities that were embedded in the procurement sphere of the European market. Indian involvement in the fur trade was a microcosm of the larger world-system network (Figure 8). It is important to note that this process occurred prior to thorough incorporation, i.e., before Europeans established formal political dominion over the native groups. In this instance, trade led the process of incorporation. The logistics of Atlantic travel and the nascent character of political consolidation in sixteenth century European states prohibited the French and others from establishing political authority over indigenous people for over a century. The appeal of manufactured goods, however, drew Indians into economic relationships with the Europeans. While the indigenous people served their own ends, their role in the European system was primarily extractive.¹

Structural changes occurred in native societies to facilitate such shifts in economic emphasis and involved the development of craft specialization. Native Americans exhibited an entrepreneurial spirit in manipulating the system to their advantage and, in doing so, adopted specialized economic behavior. By entrepreneurial in this context I mean that indigenous people weighed advantages against risks and took the path that seemed most likely to accomplish their goals; in this respect they mirrored their European counterparts, even though the specific ends were different (see Brandão 1997). Native American societies exhibited remarkable flexibility in adopting, absorbing, and manipulating European goods and practices within an Indian context. Social practices, kinship structure, and other elements felt the impact of the fur trade, but the agenda for change was an Indian one, despite the inability of native groups to foresee the ultimately catastrophic effects of this involvement.

It is within this general framework that the production of furs for the European market by Indians is examined below. The primary contention is that the acquisition of furs by natives was transformed as a result of contact with whites from being one aspect of the economy to being its main focus. In this process, various Indian groups were not just passive recipients of European influence, but rather exercised the ability to select from amongst various options. Especially among the hunting and gathering societies of eastern and central Canada and the northern United States, the choice was most often to invest heavily in the hunting and trapping of fur-bearing animals, especially beaver. A number of horticultural groups also opted to pursue this route. This activity makes sense as a specialization only in relation to the European market which generated the demand for furs. In this way, the Indians became

¹ The fur trade had several other components that mark it as a prime example of the interconnected nature of the capitalist world system. Once the beaver coats were taken to France, Dutch ships transported them to northern Russia to remove the inner fur, that was then shipped to Amsterdam. Dutch merchants sold the beaver fur to manufacturers in England and France who transformed it into felt for hat production. Huguenot artisans who migrated from France to England after 1685 helped shift the center of hat production to the British Isles. Discarded hats were recycled by reducing the size and selling them to less affluent customers. Some old hats were reinforced with gum for the Spanish market. The Portuguese bought these recycled hats after they were discarded in Spain and Brazil, and then sold them in Africa (Kehoe 1992:253-254).

crucial members of an international economic system; they were, in fact, the productive source and thus an indispensable element in the system (Saum 1965).

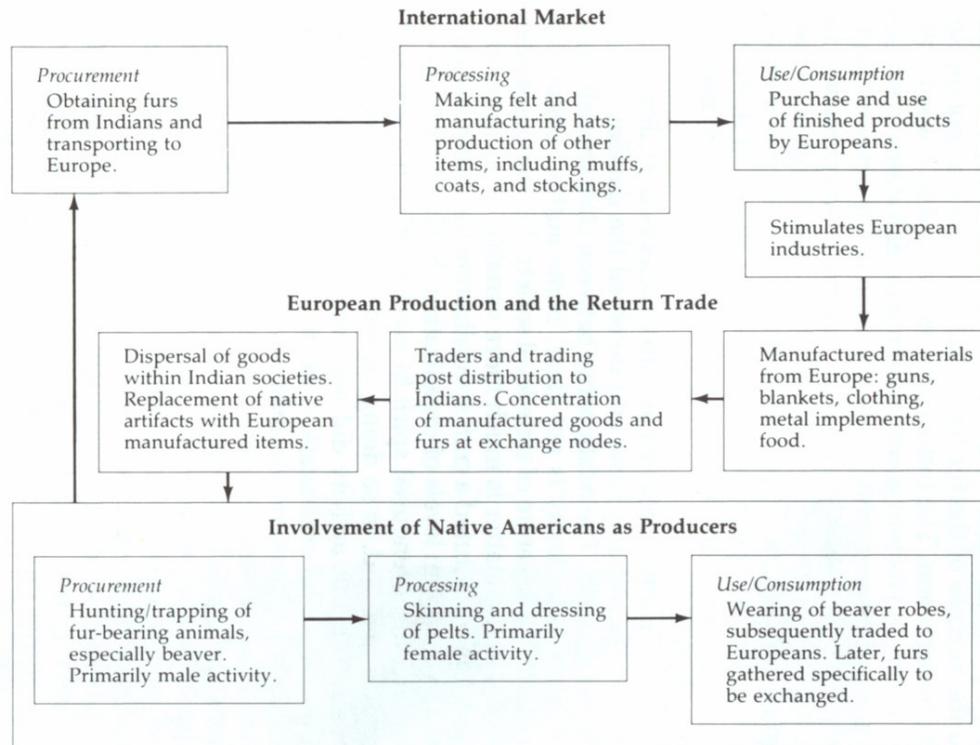


Figure 8. Diagram of Indian role in fur trade.

To better comprehend why the Indian role in fur production is deemed a specialization, it must be viewed on two levels. If viewed from the wider perspective of the international economic scene, Indians fulfilled the role of procurement specialists. They acquired the raw materials that were subsequently transformed into finished commodities in Europe, then distributed and consumed on that continent. In this scheme, the Indian was one cog in a highly diversified economic mechanism, i.e., one node in a commodity chain. On another plane, this procurement sphere can be seen as encompassing acquisition, processing, and consumption activities of its own, quite apart from the final disposition of furs in Europe. Natives captured the fur-bearing animals, dressed the pelts, and utilized the skins for immediate utilitarian or trade purposes. All of these activities were already part of Indian life well before the arrival of Europeans. In addition, Native Americans had developed complex trade networks well over a millennium before contact. For example, the Hopewell Interaction Sphere involved long distance trade in which prehistoric people of Ohio received obsidian from Wyoming, copper and some silver from the upper Great Lakes, mica from the Carolinas, pipestone and galena from Illinois, marine shells from the Gulf coast, and grizzly bear canines from the Rocky Mountains (Griffin 1967; Milner 2004:82-83), establishing an extensive Native American world system. More localized systems (small world-systems; see Chase-Dunn and Mann 1998) involved trade of various materials (including flint and probably some foodstuffs such as corn in the Midwest) within regions. However, this series of activities did not take on the stature of specialization until the trade with Europeans began. European demand stimulated the harvesting of furs at an unprecedented rate and diverted attention from traditional subsistence activities.

This trend gained momentum during the entire history of the fur trade and fostered significant modifications in native societies.

Fur as a Resource and its Exploitation

Animal furs were the subject of Indian exploitation before Europeans arrived in North America, but the advent of the latter spurred the production of pelts to an unprecedented degree. This trade had begun in the early sixteenth century with French and Basque fishermen exchanging metal artifacts for the furs (Eccles 1969; Turgeon 1998). Eventually, the skins of a variety of animals (bears, moose, deer, marten, fox, various felines, and later, buffalo) became involved in this traffic, but the most important by far for over 200 years was the beaver (Figure 9). This animal was known to possess an exceptionally fine fur, but the European variety was practically extinct in western countries by the 1500s, with only limited supplies available from Russia and Scandinavia (Eccles 1969). The fur had two layers: (1) An outer layer of rather stiff guard hairs, each about two inches long and hollow to provide insulation and prevent the fur from becoming waterlogged; this part is coarse and shiny and gives the animal its color. (2) A fine, thick, downy undercoat, with individual hairs one inch long; these hairs have tiny barbs that make the fur cling tightly together when it is matted, as in the production of felt for hats (de Charlevoix 1761). It was the latter feature that made beaver fur the ideal form for hat manufacture and accounts for its immense popularity.

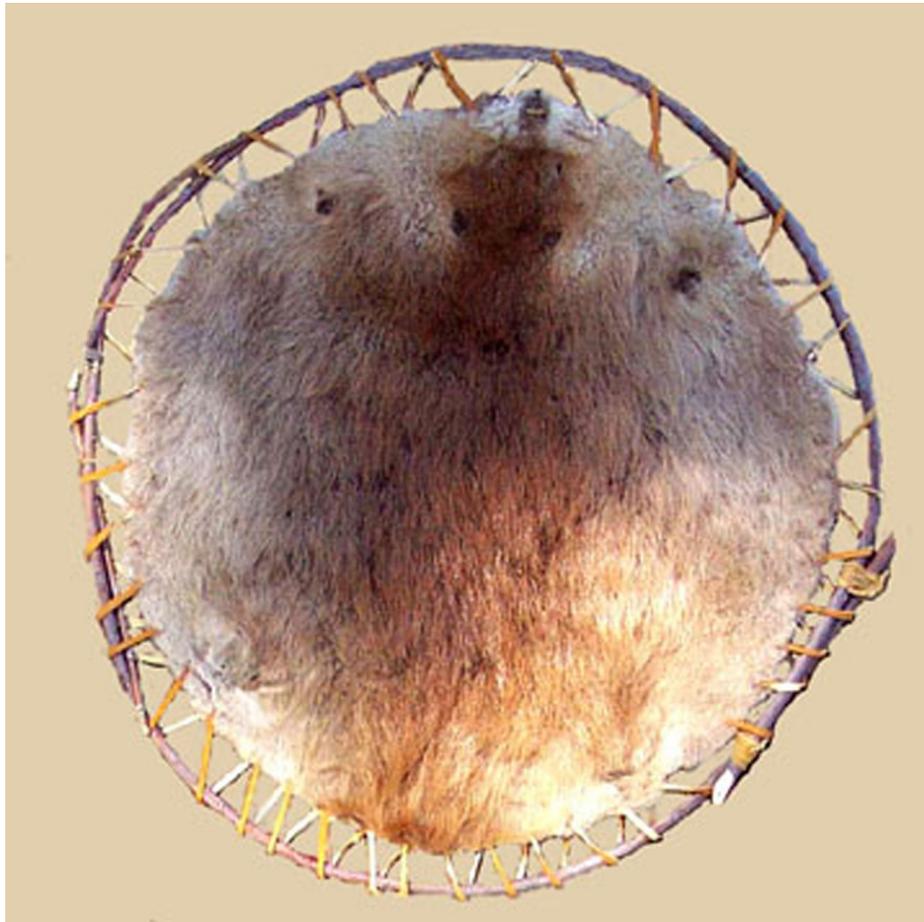


Figure 9. Prime beaver pelt. Photograph courtesy of Ned Eddins.

From the European perspective, American furs, in particular that of the beaver, possessed several virtues: (1) They represented a commodity in short supply in Europe. (2) Because of their light weight, furs offered high value relative to bulk, could be readily packed and transported, and as a result, were highly profitable; early in the trade, a manufactured item worth one livre could be exchanged for a beaver robe that sold for 200 livres in France. (3) Indians performed most of the work, including delivery of prepared furs to European settlements; an economic partnership developed between the two parties involved in such transactions (Eccles 1969; Innis 1956).

Material Cycle

This series of events involved the procurement, processing, and use of furs. Each of these areas is treated separately, first in terms of what the aboriginal practice was, and then in light of alterations due to European contact.

The procurement aspect of this cycle refers to the hunting of fur-bearing animals. This activity generally occurred from mid-autumn to early spring, a time when animal furs were in prime condition. Some scholars (Eccles 1969:19, 1983:351; Innis 1956:15, 35; Richter 1983:539; Trigger 1985:173, 305, 310) have suggested that quality of furs increased with latitude due to colder temperatures (see Starna and Brandão 2004:730 for an opposing view). As the principle source of high-grade fur, the beaver was one object of Indian hunting in the pre-contact period, although not to the same extent as during the historic era.

In a general economic sense, this hunting phase can be considered equivalent to the extraction of a raw resource. Prehistorically and to a degree after contact, fur-bearing animals such as the beaver also served as important parts of the native diet (*JR*, 26:129; Trigger 1969; Murphy and Steward 1968; Francis and Morantz 1983), but when Indians shifted to full involvement in the fur trade, these animals became more than just a food item. Fur became the medium of exchange by which Indians received the valued European products (Kroeber 1939). The Jesuit le Jeune quoted an Indian who put the issue in such a light: "The Beaver does everything perfectly well, it makes kettles, hatchets, swords, knives, bread; and, in short, it makes everything" (*JR*, 6:297). This statement demonstrates the native realization that a concentration on beaver hunting could provide substantial economic rewards; in this sense, the emphasis on fur hunting became a specialized activity. Individuals known to be superior hunters of particular animals were called on to exercise their particular talents. This extractive part of the process was almost exclusively a male occupation. On rare occasions, netting of beaver could become a family affair (Craik 1975). By the nineteenth century, trapping was entirely male work. Men would spend the entire winter alone, or only in the company of other hunters, while tending the trap lines (Robinson 1879).

The second phase of the material cycle involved preparation of the fur. This was largely the duty of Indian women (Axtell 1980). To make the skin pliable, the flesh side was often smeared with a concoction of decomposed animal brains and liver, set aside for several hours, and then vigorously rubbed between the hands. This latter treatment was a common means of tanning various kinds of hides throughout North America (Peale 1872; Shufeldt 1889; Innis 1956). Calcareous soils, bone dust, or flour served as absorbing agents to remove this paste and to eliminate any excess moisture and remaining fat (Mason 1891).

Workers cut the prepared pelts into rectangular shapes and sewed between five and eight of these pieces together with moose sinew to make a robe. Natives wore this garment with the fur next to the body during the cold months and fur side out at other times. After extensive wearing for fifteen to eighteen months, the guard hairs, whose deep roots had been loosened by the scraping, dropped out, leaving only the downy fur or cotanne. In addition, the skin and fur became well-greased through contact with the body oil of the wearer, while the smoky interior of the Indian hut acted to cure the pelt. Because of this conditioning and the lack of guard hairs, such fur robes were ideal for the felting process used by European hat makers (Innis 1956). The first European traders simply bartered for the old robes the

Indians had worn for some time, and for their part, the natives were more than willing to exchange an old garment for precious metal artifacts (de Charlevoix 1761).

As the fur trade developed, Indians increasingly focused on trapping in an effort to meet European demand for fur and, thus, obtain the valued manufactured commodities in return. Since not all of the furs could be treated in the elaborate manner of the robes, a system of grades developed, which, though framed in terms of European standards, Indians clearly understood. *Castor gras d'hiver* was the top rank fur that had undergone the whole treatment and so was devoid of guard hairs and was well-greased and supple. *Castor sec* or parchment beaver was prepared by drying, and still had guard hairs because it was not worn. *Demi-gras d'hiver* referred to robes that the natives had just begun to wear, so the skin had not turned completely yellow. *Castor gras d'ete* were robes made of pelts that had less fur and thicker skins because these had been taken in summer. *Castor veule* robes had been scraped thin and treated, but not worn. *Castor sec d'hiver* or *bardeau* were skins taken in winter but not made into robes due to holes and imperfections; these were poorly prepared and rather coarse. *Castor sec d'ete* had been trapped in summer and was not made into garments. Finally, *mitaines* and *rognures* were small pieces used for sleeves and mittens in native apparel (Innis 1956:64).

Indians attempted to regulate the market by providing more of the lesser grades of furs as they intensified their concentration on trapping as a major economic pursuit (Danzinger 1978). Since European hatters needed a 3:1 ratio of *castor gras d'hiver* to *castor sec*, a huge surplus of the latter developed since it was much more expedient for the Indians to produce this type. This imbalance is reflected in the records of Ft. Frontenac; in 1722, 4,435 pounds of dry beaver (*sec*) was taken in compared to only 168 pounds of fat beaver (*gras*) (Preston and Lamontagne 1958). The stockpiles had reached such levels by 1700 that prices dropped, a factor certain French merchants tried to counteract by burning some of their stock (Vandiveer 1929). It is important to note that the number of furs in the market in any particular year did vary by region, as native groups gained or lost access to trapping areas. Nonetheless, this sequence of events indicates that Indians attempted to regulate production levels of fur in terms of their own economic interests. By the mid-seventeenth century the vast majority of the beaver and other fur being trapped by Indians was being funneled into the trade with whites.

Native Americans as Traders

The consumption aspect of the material cycle for the Indians involved the exchange of the processed furs for European goods. Native groups were by no means strangers to trading activity. Archaeological evidence indicates long distance indirect trade between Iroquoian (including the Huron) and Algonkian groups throughout eastern Canada and the northeastern United States was well developed prior to the arrival of Europeans (Wintemberg 1942; Wright 1972). Similar conditions existed in the northern Plains, reached by French traders in the eighteenth century (Ewers 1972). With such a system in place, what was needed to spur the development of intensive fur-gathering by native Americans was a large market and desirable exchange goods, both of which Europeans provided (Lawson 1972). The existing trade networks could readily tap a vast hinterland in which the natives turned to fur production on a large scale once they realized the advantages of trade goods. As a result of this native exchange system, many Indian groups acquired European products well before any direct contact with whites. The Huron, who were at the center of an extensive exchange system with connections in all directions, received their first European goods from their Algonkian trading partners prior to 1603, before Champlain's first visit to the region (Heidenreich 1971). The Chippewa of Lake Superior were already familiar with European products when the Jesuits made initial contact with them in 1641 (Danziger 1978). From the outset, the Indian's role in the fur trade was instrumental in the success of the system. Not only did the natives trap the animals and prepare the furs, but they also transported the pelts to collection points, such as the trading posts.

Native involvement in the trade took two forms. At the most rudimentary level, the various Indian groups could present their furs directly to the European traders. This was the situation when

Indians initially encountered Europeans in the St. Lawrence region and in the coastal areas of the Maritime Provinces. The cod fishermen who came ashore to dry their catch bartered for the furs that the Montagnais, Micmac, and other hunting groups had collected themselves. So accustomed were the Indians to this trade by 1534 that when Jacques Cartier sailed into the St. Lawrence in that year, the Micmac enticed the French to trade by waving furs at the explorers (Trigger 1979). As Europeans penetrated the interior, they met still more groups who provided furs (Innis 1956; Marquette 1966; Norton 1974; Trigger 1976). The Europeans' need to maintain a large volume of business to cover their high transportation costs motivated this inland movement (Innis 1956:110). The seemingly insatiable European demand for furs led these and other Indian groups to concentrate on the hunting of fur-bearing animals to a much greater degree than had ever been the case prior to contact. As a result, traditional hunting grounds were quickly trapped out, and Europeans moved further afield in search of new Indian sources (Ray and Freedman 1978).

The second native form of involvement was an outgrowth of the declining population of fur-bearing animals in certain areas, combined with the desire of the Indians in such areas to continue the flow of trade goods. For a few groups in the proper geographical position, the major solution to the problem was to continue supplying the Europeans with furs by acting as middlemen. In this capacity Indians exploited the already existing trade networks. Such transactions concentrated on the acquisition of furs by the middlemen who in turn passed on some of their European materials to their native trading partners. Since the best quality furs were found in the cold regions north of the St. Lawrence and the Great Lakes, those groups that had regular contact with the northern hunters were in an enviable position.

In the first half of the seventeenth century, the Huron were the dominant middlemen in the French fur trade. Having rapidly exhausted the beaver supply in their home territory, the Huron used their considerable skills as traders to maintain the flow of manufactured products. They exchanged corn, tobacco, nets, and European goods for furs with northern groups such as the Nipissing (Trigger 1976). The Huron transported furs in large canoe convoys to French settlements on the St. Lawrence River. The French received 10,000 pelts annually, comprising anywhere from one-third to one-half of the total, in this manner from the Huron (*JR*, 60:211; Trigger 1976). When these people succumbed to Iroquois attacks in 1650, the Ottawa quickly filled the gap as suppliers. In addition to the external pressure imposed by the Iroquois, Huron society also underwent internal upheaval. The introduction of Christianity by the Jesuits probably contributed to divisions between converts and adherents to the traditional religion. In addition, Huron religion came under assault as traditional shamans and other practitioners proved unable to stem the disastrous effects of European diseases. This same pattern repeated itself again and again as whites progressed further west. When first contacted, Indian groups focused intensively on fur trapping as a specialized means of obtaining foreign materials. When the Indians exhausted their local supply they would attempt to maintain the trading structure by becoming middlemen or expanding their territorial control in an effort to tap new sources. The importance of Indian middlemen is reflected in the fact that at some Hudson's Bay Company forts, natives provided 70% of the furs traded (Ray and Freedman 1978).

Another persistent feature of this system throughout its history was the active encouragement whites provided. Europeans urged Indians to trap fur-bearing animals even at the expense of time that could have been used in traditional subsistence activities (Preston 1975). It is clear that whites depended on Indians whose talents in hunting, preparing pelts, and transporting the furs fueled the trade into the nineteenth century. This was especially true in the early years. Before 1630 there were only 100 Frenchmen in Canada on a permanent basis at any one time (Eccles 1969). These few men depended on the productive capacity of the natives to satisfy the large European demand. There was a similar reliance in New England. The fortunes of Plymouth were closely tied to furs, and the natives' ability to supply this commodity, from the inception of the colony (Moloney 1967). Indians recognized the value of their labor invested in producing furs and negotiated accordingly. To reiterate a point made above, I should note that while Native Americans and Europeans both thought out their involvement in the fur trade rationally, the two groups did focus on somewhat different economic aspects; Indians stressed the

functional value of the commodities they acquired and used directly in their daily lives, while European traders focused on profit. The native perspective is evident in how they bartered to receive the best and most goods possible under various trade conditions. The yearly rendezvous at Tadoussac at the mouth of the Saguenay River during the 1500s witnessed the gathering of over 1000 Algonkian, Etchimin, and Montagnais. These people learned quickly not to barter their furs with the first European ship to arrive; instead, they waited for others in order to bid up the price (Eccles 1969). Traders' accounts are full of comments regarding the shrewd bargaining abilities of various native groups, who often played the Europeans against one another by threatening to take their furs elsewhere if not satisfactorily compensated (*JR*, 6:299, 66:173; Preston and Lamontagne 1958). In addition, Indians were not satisfied with substandard goods. The Huron complained about guns that exploded and injured the user, cheap thread that made poor netting, and kettles that were too thin and wore out quickly (de Lahontan 1905). Indians often refused to take any metal object in trade that had even the slightest crack since they knew from experience that such breaks would expand in the cold northern climate (Ray 1980). The natives were not beyond deceit either, as they occasionally tried to pass defective furs as being of higher quality (Crowe 1974).

A quick review of some figures gives an idea of the volume of the trade and thus the degree of importance fur-bearing animals came to have. Between 1620 and 1630 the French exported anywhere from 12,00 to 30,000 beaver skins a year to Europe (Trigger 1976). By the 1680s the amount had reached 140,000 pounds/annum (one skin=one pound) (Innis 1956). New England supplied an annual average of over 40,000 pelts in the late seventeenth century (Norton 1974). In the early nineteenth century Europe received up to 200,000 beaver skins a year from America (Chittenden 1902). In return for this plethora of furs, Indians received a wide range of products. In 1722-1723, three French forts along the Great Lakes supplied the following goods in exchange for 16,677 skins (8,307, 49.8%, beaver): 1605 sewing needles, 632 catfish hooks, 273 men's shirts, 336 women's shirts, 214 children's shirts, 217 butcher knives, 2,109 other knives, 243 pounds of red and yellow copper cauldrons, 328 axes, 59 guns, 4,493 gun flints, 3,640 pounds of shot and balls, and 6,463 pounds of flour (Preston and Lamontagne 1958). Some of this material was used by the inhabitants of the forts, but most was passed on to the Indians. Other European goods involved in the trade included awls, hatchets, wool stockings, sewing thread, coarse white thread for nets, iron for arrowheads, glass beads, tobacco, soap, and sabers and cutlasses (de Lahontan 1905).

IMPACT OF FUR PRODUCTION

Dependence on Trade Goods

One important result of the tendency to specialize in fur production was an increasing dependence on European products and the trade system that developed as a means of attaining them (Kroeber 1939). Europeans made efforts to facilitate this process by establishing posts in strategic positions (Eccles 1969; *JR*, 66:69; Ray and Freedman 1978). Another factor that influenced the location of forts was European imperial rivalry, as the French attempted to restrict English access to the hinterland by setting up posts to maintain associations with Indians through trade, despite the saturated market in France (Eccles 1969, 1983) and the significant expense of providing gifts to native allies (Desbarats 1995)². The technological superiority of certain European items supplied the initial impetus, eventually reaching the point of dependence by the natives on the imported materials; this situation upset the balance in economies that had previously been largely self-contained (Callender 1962). As early as

² Desbarats (1995:629-630) demonstrates that French officials in the colony and at home complained about outlays for native alliances, but while these were substantial, it would have cost much more to have a larger contingent of soldiers in Canada.

1616, Indians in eastern Canada expressed their concern with maintaining the trade by offering to house Frenchmen whose fort had been destroyed by the British (*JR*, 3:71). By the 1630s the Huron had become dependent on European tools. Iron axes and hatchets enabled them to clear land more rapidly and allowed them to raise more corn which was exchanged for furs with their various native trading partners. Other metal cutting tools expedited a variety of manufacturing processes, thus freeing more time for trade. The Huron also required metal arrowheads which could pierce the wooden body armor used by their enemies the Iroquois. In addition, the Huron needed European trade goods to maintain the sophisticated system of intertribal alliances on which their security and prosperity rested (Trigger 1979). In 1647 the Huron, beleaguered by persistent Iroquois raids, undertook the hazardous journey to the French settlements under dangerous circumstances because of the need for hatchets, guns, ammunition, and other supplies (*JR*, 32:179).

A similar dependence on European products was evident among the Iroquois. By the 1630s this group used iron hinges, chains, harrows, hoops, and nails in house construction and other tasks. In the next decade guns, swords, axes, mallets, and clothing of European origin were also common in many Iroquois villages (Trigger 1976). The process of incorporation into the world-economy was well advanced, and it was from this point on that European traders were ascendant in relations with native trade partners.

This dependence on the fur trade had a number of repercussions for the Huron and other groups. By 1630 Huronia was essentially devoid of beaver because of excessive trapping. The Huron turned increasingly to the northern and western hunting groups to sustain the flow of furs, and encouraged this process by offering substantial amounts of French artifacts in return for furs. As a result, the hunters intensified their trapping and trading activities, and spent less time on fishing and hunting for subsistence. This led to an increasing reliance on agricultural peoples to make up the difference in foodstuffs. In eastern Canada, the Montagnais purchased much food from the French with a portion of their fur catch, but for other groups the Huron were a more reliable and cheaper source (Trigger 1976).

As a measure of the importance of obtaining European goods, there is the evidence of continued high levels of production and exchange even under adverse conditions. Between 1636 and 1640, approximately one-half of all Hurons perished in epidemics of diseases inadvertently introduced by the French. Despite this catastrophe, fur production increased in the 1640s. Trigger suggests this level of production required substantial organizational realignment. The Huron evidently encouraged Algonkian hunters to trap more beaver than before. This activity further undermined the traditional Algonkian subsistence base, but greater dependence on Huron beans and corn, probably a more secure means of alleviating starvation, balanced the situation. The Algonkian hunters may have been open to this change because of the loss of many skilled craftsmen in the epidemics, an event that made them dependent on European utensils they received from the Huron. For the latter group, more time had to be spent in clearing land and in cultivation. In addition, as a proportion of the remaining population, more men would have been involved in trading activities. When French trade goods could be substituted for traditional Huron products that required much time to make, the increasing demands of trade probably dictated that the foreign objects be adopted (Trigger 1976).

Territorial Expansion

The traffic in furs was a catalyst that exacerbated existing animosities between native groups and spurred aggressive expansionism. This was another consistent pattern in all the regions affected by the fur trade and arose out of the dependence on European goods discussed above. To assure the flow of goods, natives either had to control the production of furs or the system of dispersal. When home areas were trapped out, as happened early among the Huron and Iroquois, alternatives had to be found. In the eastern Great Lakes region, the increase in prehistoric populations due to agriculture triggered conflict well before whites arrived (Trigger 1982; Ritchie 1956). The advent of the fur trade added further fuel to an already volatile situation and enhanced the old rivalries. With their local sources exhausted, the

Huron zealously protected their middleman role and blocked the efforts of western groups to trade directly with the French and also kept their sources secret from the Europeans (Eccles 1969; Tooker 1964).

The Iroquois resorted to a more overtly aggressive plan when their local fur supplies dwindled. Since they were surrounded by other horticultural people who had little need for their food material, they could not engage in middleman exchange to the same degree as the Huron. The Iroquois opted instead for fur piracy and territorial expansion. They raided Huron and Algonkian trading parties and carried off the furs to trade with the Dutch. Some scholars (Brandão 1997) argue that the Iroquois did not engage extensively in fur piracy, focusing instead on territorial expansion as the critical element. Expansion was primarily to the west in an effort to control hunting grounds in Ontario (Trigger 1976). The raiding to the north was successful in almost completely shutting down fur expeditions along the western St. Lawrence and forced Indians heading to French posts to take the more circuitous northern route (*JR*, 40:211). The Iroquois also blocked groups to their south and west from transporting pelts to the Dutch traders (Kenton 1925).

The French, Dutch, and English were all drawn into this intense rivalry. The Europeans were often obliged to join in military alliances with their native trading partners whose requests for aid they could not refuse if the flow of furs was to continue (Ray and Freedman 1978). Indians thus had a great part in determining the structure of the fur trade system.

Those native groups equipped with guns held a distinct military advantage in central Canada in the search for more fur territory. Guns upset the pre-contact balance of power. European weapons helped the Cree dominate the flow of furs into certain British posts. In their turn, the Chipewyan intruded on Cree lands in search of more beaver. In the late eighteenth to mid-nineteenth centuries the Blackfoot regulated the fur trade in the foothills of the Canadian Rockies, taking and defending new hunting grounds primarily on the basis of superior force provided by firearms. It became clear to many native groups that if they lacked furs, they could not obtain European materials and were at a disadvantage vis-a-vis traditional enemies who had such access (Crowe 1974; Gillespie 1975; Lewis 1942; Saum 1965).

Changes in Social Structure

The social structure of native societies also yielded to the rippling effects of the traffic in furs. Lewis (1942) describes the alteration of marriage patterns among the Blackfoot due to exposure to the fur trade. The increased burden of preparing skins and hides placed a greater demand on female labor and thus enhanced their economic importance. As a result, polygyny developed to a level unprecedented for the Plains. In the 1780s, most men had one or two wives, with a maximum of six. By the 1830s some wealthy chiefs had eight wives while in the next decade most men had three, many six to eight, and a few as many as twelve wives. Later in the century, some men had twenty to thirty spouses. The largest increase in wives occurred after 1833 and coincided with the burgeoning buffalo hide trade in Canada and the United States. Lewis envisions a circular system in operation. Guns obtained in the trade were used both to hunt and conduct raids for horses. By using horses to purchase wives, men converted idle capital (extra horses) into productive capital (wives). The women served to process more hides which went to the trading posts in exchange for guns and other commodities (Lewis 1942). The greater emphasis on bride price measured in horses led to changes in marrying ages. A report from 1787 indicated girls were married at sixteen to eighteen, men at twenty-two and older. By the late nineteenth century, girls married between ten and sixteen, and men rarely before thirty-five. Fathers wished to marry off their daughters as soon as possible to obtain the bride price. A man, however, was not considered an eligible son-in-law until he had accumulated sufficient property through hunting and warfare. Within the household, status differences and animosities between senior and junior wives intensified since the sororate lost force as an ameliorating influence (Lewis 1942). This situation is a prime example of the "commodity chain" that Dunaway argues exploits women. She contends that "the

capitalist mode of production structures and reshapes households in ways that minimize production costs by allowing extensive use of conditions external to the production process” (Dunaway 2001:18).

Religious change also often accompanied Indian involvement in the fur trade. Indigenous foundation or creation myths described native groups as autochthonous, and provided an ordered universe. Some Indians considered the first Europeans they encountered to be supernatural beings, but they quickly came to see the strangers as humans (Trigger 1991). Active proselytizing by the French and English, combined with the devastation caused by epidemic diseases that native healers could not cure, undermined native beliefs and cosmology to some extent. In addition, some peoples adopted certain elements of Christianity into their native belief systems, creating an amalgam. The Europeans often used their particular brand of Christianity as another means of solidifying trading relationships. As noted above, the conversion of native communities at the outset was probably not complete, and thus set up internal divisions that festered. Various native societies adopted a cynical view, as indicated by the following quote by an Iroquois in 1711: “If the English sell goods cheaper than the French, we will have ministers; if the French sell them cheaper than the English, we will have priests” (Parkman 1892: I, 10). As the quote suggests, religion became one of the elements of negotiation.

Effects on Animal Populations

The greatest impact of this system was on the basic resources, i.e., the fur-bearing animals whose pelts were the Indians’ products. A frequent observation by both contemporary eye-witnesses and modern scholars refers to the excessive hunting of furs by natives to meet European demand that resulted in the wanton annihilation of many species. This behavior is often held to be contrary to the prudent exploitation in aboriginal pre-contact times. (de Charlevoix 1761; J.C.B. 1941; Sandoz 1964; Crowe 1974; Axtell 1980) Martin attributes this change, from the traditional abstemious approach to a rampant profiteering at the expense of the environment, to the deterioration of an ecological ethos that supernatural sanctions had bolstered. The native religious beliefs and world view lost their hold on the Indian mind when shamans proved utterly incapable of checking the ravages of epidemic diseases. With this traditional underpinning removed, there was no longer the fear of violating hunting taboos that regulated the amount of game that could be taken; a wholesale slaughter of animals for their furs ensued (Martin 1978).

Although this explanation is useful in comprehending some aspects of the problem, its ideational orientation is not open to empirical examination. On the other hand, economic motives can be found in the ethnohistoric record; it seems more likely that the desire for trade overrode the traditional conservation ethic, as Axtell (1980) posits. Natives did not abandon but rather amended hunting taboos due to the material conditions of a new economic reality, and this change may have been a contributing factor in the subsequent decimation of animal populations.

CONCLUSION

This study suggests that people who live in peripheries or margins can and do determine the nature and extent of interaction with core polities to at least some degree. Certainly, states can impose their will in some instances. However, as Hall (1999: 14) points out, “complete assimilation was almost never a goal” of premodern states in their interaction with other societies. Indeed, the analysis of such events loses much if influence is viewed as unidirectional; we must consider people in the periphery as active players. As a result, peripheral groups often retained a distinct identity even as they selectively adopted certain outside features. What I believe is clear in the ethnohistoric and archaeological records is that people on both sides of a cultural divide manage their resources in ways that they believe will benefit them best. The process involves a series of decisions about what to offer, when, and how. Individuals determine if the proposed exchange is to their advantage; rejection typically entails counteroffers, which

by definition is negotiation, the effort to get a better deal. The process is fluid rather than monolithic, often requiring a number of intermediate offers and counters (i.e., haggling), until an agreement is reached. The negotiation has to leave each participant sufficiently gratified so as to provide grounds for future transactions. While this general process is universal, I argue, variations do appear in different places and times because what people value may range broadly, from material objects such as furs, kettles, and foodstuffs, to nonmaterial elements such as prestige and status. The exact nature of what is exchanged may vary by place and time, but the *process* is universal because by default it requires negotiation. Peripheries are primary venues of negotiation because it is at these critical nodes that there is the greatest potential for two groups to acquire some things that their respective home ranges lack. Although no culture is ever entirely integrated or homogeneous, in peripheries societies that are more different than alike come into contact and the encounters act as catalysts for innovation. As Hall has noted, these peripheries or contact zones are like permeable membranes, through which certain things pass in both directions. In population genetics, the mating that occurs at the intersection of demes or breeding populations increases the size and variation of the gene pool. Variation is the very lifeblood of evolution, since it provides the material on which natural selection acts. The new forms may then influence the future direction of each deme if the interbreeding provides more adaptive individuals who then take their respective groups in new directions. So, innovation can often flow from the edges into the center. Continuing with the organic analogy introduced at the beginning of this study, it is thus at peripheries that culture change is most likely to occur, with significant ramifications for the respective groups. Incorporation, then, is a more comprehensive phenomenon, as Hall (1989) and others have argued.

In Cyprus, the nature of negotiation, and thus the degree of incorporation, varied over time. Initially, the Malloura Valley was exploited by early farmers only as a source of raw material for the production of basic tools necessary for a wide range of tasks. This use of local chert was probably one reason that Cyprus developed its own unique Neolithic culture. There was certainly contact with Anatolia and the Levant, since both the suite of domesticated species and the farmers themselves originated from the mainland, but Cyprus developed its own unique forms in various things from architecture to stone tool assemblages. It seems the people of the Malloura Valley and surrounding regions, and to a significant extent the whole island, modified portions of the Neolithic lifestyle to fit their particular interests. The fact that there is very little imported Anatolian obsidian on Cyprus in the Neolithic, while such material is widespread in the Levant, suggests early farmers on the island satisfied demand for a critical resource locally; this gave them the freedom to accept or reject other mainland traits. Later in time, the process of incorporation involved differential acquisition and display of religious symbolism by elites, and shifts in agricultural strategies by farmers to take advantage of certain opportunities. The material from the sanctuary and tombs starting in the Archaic period provides clear indication of culture contact that is both insular and international in nature, especially noticeable in artistic motifs that demonstrate connections with the Phoenician Levant, Pharaonic Egypt, and the Hellenized Aegean. The Malloura residents adopted certain elements from each area, creating a unique mixture of cultural elements that reflects the cultural variability available at such contact zones. In other periods, major empires intruded on Cyprus, and incorporation took on a more overtly exploitative form. In such times, negotiation could take the form of resistance; for example, despite the long periods of foreign domination of the central political system by the Venetians, Franks, Ottomans, and British, Cypriots largely retained their allegiance to Orthodox Christianity as a key element of national identity, while adopting certain features of the hegemonic culture, from a variety of Turkish words to the English practice of driving on the left side of the road.

In the North American fur trade, natives accommodated rapidly to the demands of a capitalist market economy. This action involved economic specialization in both production and distribution, by way of a series of conscious choices made after balancing what the Native Americans viewed as the appropriate available options. The Basque and French whalers and fishermen who made first contact with native peoples in the area around Newfoundland and the St. Lawrence region brought the products

of European metal technology to the New World. Indians immediately saw the value of these objects and made concerted efforts to acquire the objects, both utilitarian and decorative. In this process, the Native Americans bargained actively to obtain the optimum terms—they could and did accept certain things and reject others. In the sixteenth and well into the seventeenth century, Indians often held the upper hand since it was they who provided the furs that Europeans valued so highly. As a result, they had a means by which to obtain objects they desired, to augment existing alliances or build new ones, or to enhance status, and negotiated with the Europeans accordingly. Both sides in these transactions operated in a rational manner to maximize their respective interests at the least cost. While the specific economic interests of the Native Americans and Europeans were somewhat different (functional utility vs. capitalist profit, respectively), the interchanges shared the essential character of economizing behavior. Neither side foresaw the long-term consequences of these interactions. The ability of European capitalist states to marshal technical resources and manpower, plus the diminished numbers of indigenous people in North America due to epidemic diseases (see Diamond 1997), eventually overwhelmed Indian societies and gave them less leverage in their interaction with the intruders. However, that ability to negotiate remained an important feature of Indian-white relations into the nineteenth century. Furthermore, the process of incorporation varied for different groups such as the Huron and Iroquois, in part due to how they arbitrated their involvement with various European groups. In terms of Chase-Dunn and Hall's (1997:61-64) continuum, incorporation proceeded from weak to strong over a period of four centuries. I would supplement that model with the element of negotiation, which for indigenous peoples in the Americas went from strong to weak over that same span.

The great utility of world-systems theory is its ability to highlight critical patterns of interaction between cultures. In so doing, the approach allows us to focus on the fundamental similarities that all peoples share across time and space. Such generalization facilitates interdisciplinary research that draws on information from various fields. In the present study, I make use of archaeological, ethnohistoric, and historical data to trace the evolution of cultural interaction at peripheries, with a special focus on negotiation. The course of incorporation followed roughly similar trajectories in Cyprus and eastern North America. In both cases, the people in the peripheries exercised some level of control in managing their relationship with the outside world. The guiding principle in each place over time was the effort to extract maximum benefit in dealing with outside groups. What the case studies indicate is that, to paraphrase a business ad in a magazine, in cultural interactions, you don't get what you deserve, you get what you negotiate.

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FOREIGN DIRECT INVESTMENT AND WAGES: A BARGAINING POWER APPROACH

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ABSTRACT

This paper presents a cross-country empirical investigation of the impact of Foreign Direct Investment (FDI) on manufacturing wages. Our results indicate that FDI-Flows have a negative impact on overall wages in the manufacturing sector and this impact is stronger for female wages. We argue that one possible explanation for such an impact may be a decrease in the bargaining power of labor due to new labor market arrangements in a global economy where capital is free to move across countries in search of more favorable conditions. This decline in labor power also tends to have a greater impact on the more vulnerable workers female workers whose bargaining positions have been traditionally lower than male workers.

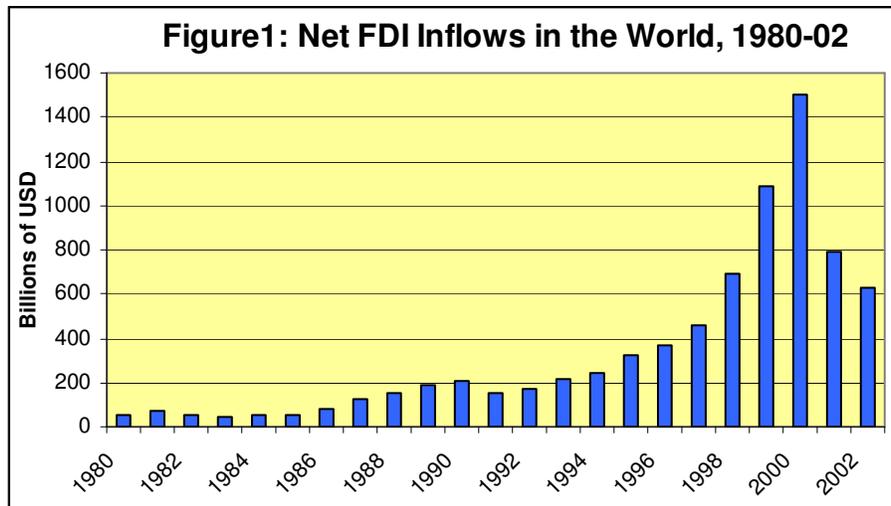
INTRODUCTION

Foreign direct investment (FDI) has gained considerable attention as a channel of knowledge diffusion and a source of accelerated growth in the economics literature. On the other hand a substantial literature in sociology has critiqued increased foreign capital penetration into developing economies as leading to debilitating economic dependency and slower economic growth. However in both the economics and sociology literature, there is very limited exploration of the impact of FDI on workers' wages across countries. In this study we combine elements of both streams of literature to investigate the impact of foreign direct investment on manufacturing wages for a panel dataset of both developed and developing economies.

We find that FDI-flows have a negative impact on average manufacturing wages and on female manufacturing wages. We argue that this negative impact can be understood in the context of a political economy framework where wages determination is based on a bargaining process between labor and capital. Increased capital mobility causes a decrease in the bargaining power of labor and can therefore have a negative impact on wages in both developed and developing economies. Moreover incorporating insights from feminist economics literature we also argue that existing inequalities in the labor market experiences of female workers make it more bargaining abilities make it more likely that the impact of the decline in bargaining decline in bargaining power is felt more strongly cause a gender differentiated pattern in the way in which FDI impacts worker's wages.

FDI TECHNOLOGY SPILLOVER AND ECONOMIC GROWTH

In the past two decades, FDI flows have increased to unprecedented levels and have become one of the major sources of financing for many countries in the world (Figure 1). The World Bank definition of foreign direct investment is the acquisition of “a lasting management interest (10 percent or more of the voting stock) in an enterprise operating in an economy other than that of the investor.” Due to the relative stability and long-run commitment to the firm, FDI is perceived as the type of capital that entails the greatest amount of direct and indirect benefits (spillovers) for the host economy¹.



The indirect benefit or spillover from FDI that has received wide attention in the economic literature is the potential access that domestic firms might get to new technologies that can improve their productive capacity¹. From a theoretical point of view, in order for foreign firms to compete effectively with locally networked firms, they must possess certain special characteristics in the form of cost advantages, advanced technologies or product superiority that justify their investment in a foreign country (Dunning, 1977)². For this reason FDI can imply an introduction of previously non-existent technologies and/or organizational patterns into the host economy. Moreover factor mobility in the host economy may lead to the spillover of these new technologies. That is, as the labor force moves from foreign firms to domestic ones they take away some of the knowledge previously acquired and spread it to the rest of the economy.

Dunning also argues that as local firms experience the presence of foreign firms, additional spillovers may also be triggered due to demonstration effects (i.e. copying the MNCs), backward linkages with the foreign firm, the opening of foreign markets for domestic suppliers, and the creation of better infrastructure due to the clustering of foreign firms in certain locations (i.e. agglomeration).

Measuring the size of such spillovers has been a major focus of the economics literature on FDI. The empirical studies however have in general been inconclusive and thus of little help to policymakers. For instance, Caves (1974), Globerman (1979), Blomstrom and Person (1983), Blomstrom (1986), and

¹ While the indirect benefits are discussed in more detail below, direct benefits from FDI come in the form of increased capital and the more rapid restructuring of the newly acquired firm

² Dunning (1977) in his OLI paradigm describes the conditions under which a firm chooses foreign investment over exports. These conditions in turn can justify the expectation of spillovers from FDI for the host economy.

Aitken, Harrison, and Lipsey (1995) all find positive evidence of productivity spillovers in Australia, Canada, Mexico and the U.S. On the other hand Aitken and Harrison (1999) find that the increase in the presence of foreign firms leads to lower productivity in Venezuelan firms and Konings (2000) finds no evidence of positive spillovers in firm level data for Bulgaria, Romania and Poland.

In the sociology literature on the other hand FDI has been viewed as part of the process of neo-colonial oppression where capital from the core developed countries continues to exploit the periphery. This dependency literature examined in the influential study by Bonschier and Chase-Dunn (1985) and in later works, suggests that through the repatriation of profits and interests to the core developed economies FDI continues to extract surplus from the periphery economies. In addition increased penetration of foreign capital also increases the focus on the exporting sector thereby preventing the development of a cohesive internal economic structure. In the same vein the power that foreign capital wields in an underdeveloped country can prevent the implementation of independent domestic policy intended to nurture new and fledgling domestic industries. Therefore FDI stunts long-term growth prospects in developing economies.

Like the economics literature on spillovers, the empirical evidence for the dependency theories has also been mixed. There has been considerable debate about the relevance of using different measures of FDI such as, flow, stock or the rate of FDI where the latter is the ratio of the flows to the stocks. For example Dixon and Boswell (1996) find a positive impact of the flow variable on GDP growth and a negative impact of the stock variable. This they argue is consistent with the long-term structural distortions caused by accumulating FDI. However Firebaugh (1996) questions this flow vs. stock distinction by showing a positive coefficient for the FDI rate in a growth regression. Firebaugh argues that if the rate has a positive impact on growth then the value in the denominator of the rate which is the stock, will have a negative coefficient as demonstrated by Dixon and Boswell.

FDI AND INEQUALITY

While the evidence for the impact of FDI on economic growth is mixed, there are also other channels through which FDI could have an impact on the host country. Specifically there is a strong potential for FDI to impact income patterns within the domestic economy. According to neo-classical economic theory the addition of new capital and the increases in knowledge brought about by the presence of foreign producers should lead to higher productivity of labor. This in turn should lead to higher wages since wages reflect the productivity of labor. Moreover with labor mobility, as workers move from foreign to domestic firms, they carry with them the knowledge they acquired and that is now embodied in them. Therefore labor productivity can increase in the entire economy. Thus there is a potential for wage increases to spillover to other sectors of the economy. Even if the technology is not directly embodied in the workers, the spread of disembodied ideas regarding new organizational and production methods and the higher levels of capital in the economy should increase the productivity of labor and therefore wages throughout the economy.

The few empirical studies on FDI and income in the economics literature have largely focused on measuring this wage spillover impact in case studies of developed economies. The results indicate positive spillovers for only a few developed economies. For example Girma, Greenaway, and Wakelin (2001) find FDI-related positive wage spillovers in the UK and Lipsey 1995 finds a positive wage impact of FDI for the US. There has been very limited focus in the neo-classical economics literature on the impact of FDI on incomes in developing economies. Moreover all the studies assume that there will be a positive or at best a neutral impact of FDI on wages due to the potential productivity increase that FDI brings about.

On the other hand theorists in the Marxist political economy tradition have long critiqued this assumption of a perfect link between productivity and wages. They argue that the wage is a result of the bargaining process between employees and employers and the outcome is dependent on the relative strengths of labor vs. capital (Reich 1985, Bowles and Gintis 1990). Extending this analysis the

diminishing power of labor when confronted with a capital that is highly mobile (FDI) might make it likely that the productivity gains are not passed on to labor.

Similarly the dependency literature in sociology also has a long tradition of examining the impact of FDI on inequality in developing economies. As foreign investments induce a distorted focus on the international (exporting) sector, an enclave of elite employment is created while at the same time displacing many workers by the adoption of capital-intensive technologies. This in turn increases income inequalities (Bornschiefer and Chase-Dunn 1985, and Evans and Timberlake 1980). Taking into account the critique of Firebaugh regarding the flow and stock variables later studies such as Alderson and Nielsen (1999) examine the impact of FDI on inequality by including the FDI stock as well as the FDI rate as explanatory variables. Alderson and Nielsen report that the FDI rate has a positive impact on income inequalities as measured by the gini-coefficient, therefore supporting the hypothesis of the dependency theories regarding FDI and increasing inequalities in developing economies.

The focus of the inequality and FDI literature in sociology is on developing economies and the dependent variable of choice is economy wide measures such as the gini-coefficient. Inequality here is viewed as a symptom of a country's position in the world system where the interaction of the core with the periphery causes inequalities in the periphery. Increasingly however globalization-related inequalities have also been a matter of concern in developed economies. While the tremendous growth in FDI inflows across the world (see figure 1) points to the heightened mobility that capital has been able to achieve, a majority of this movement continues to be between the developed economies. FDI inflows into developed economies continued to account for about 70 percent of total world FDI inflows in the years 2000-2003 (UNCTAD FDI statistics). This heightened mobility of capital has increasingly raised concerns about declining wages and declines in the bargaining capacity of relatively immobile labor in developed economies particularly in the manufacturing sector.

This suggests that in the new order of globalization in addition to the position of the country within the world systems, the position of (immobile) labor in relation to (mobile) capital also makes a difference to who benefits from globalization. It would therefore be valuable to extend this research on FDI and inequality to include both developing and developed countries.

Similarly the focus on wages as opposed to economy-wide measures such as gini-coefficients allow for a more nuanced understanding of the channels through which FDI can cause inequalities. It not only allows us to focus on specific sectors such as manufacturing, but it also makes it possible to focus on specific groups of workers. This is particularly important since feminist economics literature has provided strong evidence to suggest that one of the predominant trends in globalization has been the increasing dependence on and exploitation of female labor - a process referred to as the feminization of the labor force (Standing 1999, Cagatay, Ozler 1995). Thus focusing on wages as opposed to country-wide gini-coefficients allows for the comparison of the relative positions of female vs. male labor within the world system.

We therefore present an empirical analysis that extends the study of FDI and inequality by focusing on the impact of FDI on wages (male and female). We use the political economy bargaining power framework of wage determination to provide a theoretical basis for the specific impact of FDI on wages.

FDI-WAGES: A POLITICAL ECONOMY APPROACH

The importance of bargaining power in wage setting has gained attention in theoretical and empirical political economy analysis. For example, Reich (1985) and Bowles and Gintis (1990) lay the theoretical foundation for linking wages to bargaining power. They argue that while work contracts can specify the number of hours worked, they cannot guarantee the actual level of work effort during those hours. There is always the possibility that workers will display a "whistle-while-you-work" level of work effort. In other words, the labor contract is not automatically enforceable and is a "contested exchange". Therefore the employer and employees are always engaged in a process of bargaining to decide the actual work

effort and the wage. Reich (1985) finds that divisions amongst workers has a negative impact on wages in the U.S. since such divisions lower the collective bargaining ability of labor. Similarly Rodrik (1999) finds cross-country evidence to suggest that democracies pay higher wages. This is explained by the fact that there are greater collective bargaining opportunities for workers in a democracy.

The above political economy framework of wage setting can be used to question the neo-classical economic assumption that the technology gains from FDI will be passed on to the workers through increased productivity and wages. Different kinds of impacts can be expected on the wage bargaining process from the increase of foreign ownership in the economy. Elaborating on the wage bargaining process, Skillman (1991) summarizes three factors that influence the outcome (i.e. wage earned) - the cost of bargaining for each party (in this case the employer and the employee), the outside options of each party, and the rules governing the bargaining process. These factors can be useful in thinking about the influence of FDI. Since by definition FDI is mobile, it increases the outside options of capital (or employers). That is higher FDI presence in a sector could lead to lower bargaining power for labor vis-à-vis the capital that has the propensity to move to a lower cost destination. The final outcome may be that the weaker partner, in this case the worker, may have to accept a lower payoff (wage). Therefore wages may exhibit a tendency to remain low in sectors that have high capital mobility or high FDI.

In addition, rising competition that may stem from the new foreign firms may lead to increased pressure for domestic firms to engage in cost-cutting practices. This could lower workers' outside options even more and lower their bargaining power even further. Moreover the increased presence of FDI can also set into motion institutional changes that impact the rules governing the bargaining process. Blomstrom and Kokko (2003) survey several special incentives and changes in business rules that countries have undertaken in order to attract more FDI. These incentives range from special subsidies to foreign firms to changes in tax regimes and establishment of export processing zones (UNCTAD 1995). Each of these measures can have the dual impact of changing the bargaining rules in favor of capital and lowering the cost of bargaining for capital and therefore reducing the relative bargaining power of workers.

Another related and important empirical question that follows from the above political economy analysis is the differential impact of FDI on male and female wages. Feminist economic literature has provided strong theoretical arguments to suggest that bargaining power in labor markets has a distinct gender pattern and therefore leads to gender differentiated wage outcomes. Elson (1999) expounds a thesis that is similar to the contested exchange theory of Bowl and Gintis but with a gender perspective. Since employers have imperfect information about the actual work effort that potential employees will expend, they are more likely to favor specific groups who are historically perceived to be "better workers". Elson argues that employers "systematically underestimate the productive potential of women". In effect, men are more likely to be chosen to receive the higher wage in order to induce them to work harder. This underestimation of women's productive potential in the market economy stems from the largely unequal distribution of the burdens of 'non-market' household work. Feminist economists have argued that while household work is "non-market" only in the sense of not receiving the traditional market reward of wage, it is a vital input for the market economy. That is, it ensures the reproduction of the labor force. As Nancy Folbre (1994) argues, women "pay for the kids" (who then become the future labor force) through their greater participation in household labor or the care sector of the economy.

However since this work is not accounted for in the traditional free market analysis, it is not valued in the market. Instead women are penalized in the market for the time they spend in the care economy by the perception of low productivity. Moreover due to their greater participation in the care sector, women also have less mobility and time flexibility when taking up market work. This, in turn leads to lower outside options and therefore lower female bargaining power.

In this context increasing foreign presence need not necessarily have a uniform impact on men and women. While the increasing mobility of capital lowers both male and female bargaining power, it can have a greater impact on women's bargaining power since their options in the market economy are traditionally limited. On the other hand the potentially greater opportunities for skill advancements presented by FDI are more likely to be offered to men, given the perception of their greater productivity

vis-à-vis women. This pattern can therefore lead to a differential impact on male and female wages. In fact there is some empirical evidence suggesting that globalization increases the gender wage gap. Berik, et al. (2003) find that increased competition from foreign trade increases gender wage discrimination in Taiwan and South Korea. This has been attributed to the cost cutting pressures in female-intensive exporting industries and to women’s traditionally lower bargaining power in their wage negotiations.

As mentioned before very few studies examine the impact of FDI on wages, gender-differentiated or otherwise. In the economics literature, there are only a few case studies of a few economies such as Lipsey (1995) and Girma, Greenaway, and Wakelin (2001). These studies primarily focus on FDI in the manufacturing sector. In the sociology literature the focus is on overall measures of inequality such as the gini-coefficient and not on wages. Moreover the analysis is limited to developing economies. However the changes in bargaining power described above can occur in both developing as well as developed economies. There are no analyses that we know of that look at this possible impact of FDI on wages in both developed and developing economies.

In the following empirical analysis we test the impact of FDI on wages using a panel dataset that includes both developed and developing economies. We view FDI as having an impact on wages through the changes in the relative bargaining positions of labor and capital. Given the gender differences in bargaining experiences, we do also do a separate analysis of male and female wages. The analysis here is focused on manufacturing wages since this sector has been at the center of the globalization debate for most of the past decade. It is more recently that globalization in services has received considerably attention and consistent cross-country wage data for services are still not clearly defined or available. Moreover gender disaggregated average wage data is also most consistently available only for the manufacturing sector. The following section presents a derivation of the empirical equation followed by a description of the data.

EMPIRICAL MODEL

We start with the traditional economic specification of wages (Lipsey et al) where the wage is influenced by factors which impact productivity - the number of workers and the amount of (domestic) capital they have to work with and the general price level in the economy.

$$Wage = \alpha_1 Price + \alpha_2 Capital + \alpha_3 Labor..... (1)$$

The higher the amount of capital the higher the productivity and so capital should have a positive impact on wages. Similarly as the general price level rises, wages also tend to increase. On the other hand a larger number of workers (labor) lowers the productivity of labor and consequently has a negative impact on the wage.

This traditional approach however does not account for the possible impact of relative bargaining strengths of labor and capital. As discussed before bargaining power can be influenced in various ways by the presence of FDI. Since FDI represents greater capital mobility, it can have a negative impact on labor bargaining power in the foreign-owned firm. In addition, it can also lead to competitive pressures on local firms to look for lower labor costs, once again reducing worker bargaining power. We therefore expand the wage equation to include FDI.

We introduce the FDI variable as both a stock and a flow variable. Moreover in the empirical analysis we also introduce the FDI rate in order to test the Firebaugh critique, where a negative coefficient for the stock may be due to positive impact of the FDI rate. Since the empirical analysis is conducted on a diverse group of countries, it is important to also control for the relative size and level of development of the economies. We use the one period lagged value of GDP per capita as a control. Since wages in the current period are a component of the GDP in the current period, we used the lagged values of GDP per capita instead of current values in order to avoid causality and collinearity issues. We also log all the variables in order to account for non-linearities that are often present in a wage model.

DATA SOURCES

The empirical analysis is based on a panel dataset of a diverse group of countries. Since the surge in importance of FDI has been most evident since the late 80s, the panel ranges from 1987-2001 where the end year of the sample is determined by data availability.

Data on wages come from the International Labour Organization (ILO) database on labor statistics (LABORSTA). The database provides wage data disaggregated by gender and by economic sectors. In order to establish some consistency and given data availability, the average wage for the manufacturing sector is used for this analysis. The data used in this paper are female, male, and an average non-gender specific average manufacturing monthly wages for employees and wage earners.

Data on FDI is still sparse despite the growth of the phenomenon in the past decades. The only consistent source of sectoral FDI flows and stock is the series from the United Nations Conference on Trade and Development (UNCTAD). This dataset includes the total FDI from all source countries into the particular host economy, and therefore it is the ideal measure of sectoral (in this case the manufacturing sector) FDI. Unfortunately the overlap between the wage and FDI data is not complete and thus we are forced to leave out countries that only have data availability for FDI or wages. Price data come from the World Bank's World Development Indicators (WDI) consumer price index (CPI).

The total manufacturing employment data are from the ILO. Domestic capital data for total manufacturing are collected from the United Nations Industrial Development Organization (UNIDO). However, the cross-sectional coverage of such a variable is quite low, and thus we had to resort to a secondary measure of manufacturing capital. We therefore had to construct a proxy for manufacturing capital using total gross fixed capital formation data from the World Bank's World Development Indicators (WDI). We first converted the WDI capital data into a stock variable using the perpetual inventory method. We then multiplied total capital with the share of manufacturing value added

Table 1. Descriptive Statistics

Variables	Mean	St. Dev	Minimum	Maximum
Female wages (logs)	6.73	0.93	4.25	8.28
Male wages (logs)	7.12	0.86	5.30	8.47
Average wages (logs)	6.93	0.95	4.52	8.41
FDI-FLOW (logs)	6.91	1.8	1.8	10.82
Employment (logs)	13.4	1.03	11.51	15.68
Domestic Manufacturing capital (logs)	24.41	1.3	20.83	26.32
Price (logs)	3.23	4.46	-20.75	5.59
FDI-STOCK (logs)	22.52	1.54	18.18	25.08
GDP-Per Capita (logs)	9.32	0.99	6.86	10.50

Table 2. Country List

Australia	Mexico
Austria	Netherlands
Belgium	Norway
Brazil	Philippines
Costa Rica	Paraguay
Cyprus	United Kingdom
Denmark	Singapore
Finland	Korea(South)
France	Sweden
Ireland	

Table 3: Bivariate Correlations

	Wage	Male Wage	Female Wage	GDP	Capital	FDI-Flow	CPI	Emp.	FDI-Rate	FDI-stock
Wage										
Male Wage	0.48									
Female Wage	0.47	0.97								
GDP	0.93	0.59	0.58							
Percap										
Domestic Capital	0.50	0.04	0.03	0.53						
FDI-Flow	0.39	0.24	0.23	0.51	0.84					
CPI	0.09	0.19	0.19	0.23	0.42	0.52				
Employment	-0.02	-0.64	-0.66	-0.12	0.48	0.31	0.02			
FDI-Rate	-0.13	-0.07	-0.09	-0.09	-0.12	0.18	0.13	-0.08		
FDI-stock	0.53	0.38	0.83	0.63	0.83	0.82	0.3	0.22	-0.26	

in GDP for each country to arrive at the proxy for manufacturing specific capital. We found that the overall correlation between manufacturing capital from UNIDO and our created capital variable for countries that do have both variables available is very high at 95 percent.

Table 1 presents the descriptive statistics for each of the variables and Table 2 lists the countries used in the estimation. As mentioned earlier the list of countries is constrained by the availability of both the FDI and wage data. The bivariate correlations between all the variables are included in Table 3.

ESTIMATION AND RESULTS

To the basic estimation equation described before, we add the time and country indices i and t and introduce the constant and the error terms A and e_{it} .

$$\text{Log } W_{it} = A + \alpha_1 \ln \text{Price}_{it} + \alpha_2 \ln \text{Capital}_{it} + \alpha_3 \ln \text{GDP-percap}_{it} + \alpha_4 \ln \text{Emp}_{it} + \alpha_5 \ln \text{FDI-Flow}_{it} + \alpha_6 \ln \text{FDI-Stock}_{it} + e_{it} \dots (3)$$

As noted there are considerable differences in the trajectory of male and female bargaining power and therefore wages. Therefore separate equations are estimated for male and female wages.

For a panel dataset the two commonly used estimation methods are the fixed-effects and random effects models. In the fixed effects model, a separate constant term is estimated for each country in order to capture systematic differences that are unique to each country. In the random effects model, the differences between the cross-sections are treated as parametric shifts of the regression equation and so a common constant is imposed, with other country specific characteristics being treated as part of the random error term. The random effects model therefore allows the variation between countries to be used in the estimation of the regression coefficients and this could lead to more significant results. However since our dataset includes countries with different levels of development, the differences amongst them may be systemic, necessitating the fixed effects model (Greene 1990). In order to test whether such systemic difference exists the Hausman chi-square test (Hausman 1978) was implemented following Alderson and Nielson. For the male and female wage regressions, the test indicates that separate constant terms are necessary for each country and therefore the fixed effects model was adopted. For the average wage regression on the other hand, the test indicates that a common constant may be imposed, with country specific characteristics being treated as part of the random error term. Therefore the random effects model was adopted for the average wage regression. The Hausman test statistic is reported in the results tables.

Table 4 presents the results for the average manufacturing wage regressions. In Equation I the wage is a function of lagged GDP per capita, domestic capital, total employment, the price level, and FDI flow. Following Alderson and Neilson, equations II III are estimated with the FDI stock and the FDI rate and with the FDI-flow and FDI-Stock respectively. The coefficients of the per capita GDP is positive and statistically significant in all the equations indicating unsurprisingly that higher the level of development the higher the wages. The FDI-Flow is negative and significant in equation I. In equation II, neither the stock nor the FDI-rate is statistically significant. When we include both the FDI-flow and the stock in equation III, the flow remains negative and significant.

The next two tables present the results from the gender differentiated wage regressions. The influence of FDI on the female wage regressions reported in Table 5 is similar to the average wage regressions. The FDI-flow continues to have a negative and statistically significant impact on wages. The FDI-stock and rate on the other hand are not statistically significant. The GDP-per capita once again has a positive and statistically significant influence on wages. In the male wage regressions presented in Table 6, neither the FDI-flow nor the FDI-stock has a significant influence on the wage in any of the specification.

Table 4. Manufacturing Wage Regression, 1987-2000

Variable	<i>I</i>		<i>II</i>		<i>III</i>	
Ln GDP-PERCAP	0.410	**	0.683	**	0.688	**
	(3.89)		(9.44)		(9.78)	
Ln Capital	0.243	**	0.087		0.102	
	(2.25)		(1.13)		(1.36)	
Ln Employment	-0.078		.001		0.003	
	(-1.23)		(0.06)		(0.13)	
Ln CPI	0.051		-0.045		-0.021	
	(0.50)		(-.51)		(-0.24)	
Ln FDI-FLOW	-0.045	**			-0.056	**
	(-2.03)				(-2.36)	
Ln FDI-STOCK			-0.027		0.007	
			(-0.61)		(0.17)	
Ln FDI-RATE			-0.011			
			(-0.41)			
R-square	0.43		0.87		0.88	
Baltagi-Wu	1.76		1.65		1.68	

t-statistics in parentheses
 Hausman Test HO: Difference in coefficients not systematic
 Chi2: 6..35
 Prob> Chi2: 0.273,HO: Cannot Reject HO
 *Significant at 90% confidence interval
 **Significant at 95% confidence interval

Table 5. Female Wage Regression, 1987-2000

Variable	<i>I</i>		<i>II</i>		<i>III</i>	
Ln GDP-PERCAP	0.232	**	0.223	**	0.244	**
	(2.41)		(2.24)		(2.50)	
Ln Capital	0.379	**	0.327	**	0.311	**
	(6.89)		(4.11)		(4.22)	
Ln Employment	-0.926	**	-0.906		-0.906	**
	(15.22)		(-12.83)		(-14.39)	
Ln CPI	0.268	**	0.266	**	0.277	**
	(2.11)		(2.00)		(2.71)	
Ln FDI-FLOW	-0.021	*			-0.022	*
	(-1.63)				(-1.67)	
Ln FDI-STOCK			0.041		0.059	
			(0.91)		(1.42)	
Ln FDI-RATE			-0.001			
			(-0.08)			
R-square	0.54		0.56		0.56	
Baltagi-Wu	1.65		1.66		1.64	

t-statistics in parentheses
 Hausman Test HO: Difference in coefficients not systematic
 Chi2: 12411.6
 Prob> Chi2: 0.00, HO: Rejected
 *Significant at 90% confidence interval
 **Significant at 95% confidence interval

Table 6. Male Wage Regression, 1987-2000

Variable	<i>I</i>		<i>II</i>		<i>III</i>	
	0.311	**	0.297	**	0.317	**
Ln GDP-PERCAP	(3.42)		(3.18)		(3.41)	
	0.058		0.014		0.028	
Ln Capital	(0.80)		(0.15)		(0.32)	
	0.245		0.314	*	0.256	
Ln Employment	(1.45)		(1.82)		(1.53)	
	0.142		0.147		0.143	
Ln CPI	(1.02)		(1.01)		(1.02)	
	-0.013				-0.013	
Ln FDI-FLOW	(-0.83)				(-0.83)	
			0.017		0.024	
Ln FDI-STOCK			(0.38)		(0.57)	
			0.006			
Ln FDI-RATE			(0.33)			
R-square	0.26		0.32		0.26	
Baltagi-Wu	1.58		1.54		1.54	

t-statistics in parentheses

Hausman Test HO: Difference in coefficients not systematic

Chi2: 14.86

Prob> Chi2: 0.01, HO: Rejected

*Significant at 90% confidence interval

**Significant at 95% confidence interval

The above results provide support for the hypothesis that FDI could have a negative impact on wages in both developed and developing economies due to the changes it brings about in the relative bargaining positions of labor and capital. The FDI-flow variable can be particularly indicative of the volatile nature of global capital flows which increases options for capital which in turn reduces the bargaining position power labor.

The difference in the impact of FDI-flows on the male and female wage regressions is also supportive of the discussion presented in this paper. The changes in the relative strengths of labor and capital will have the most impact on the sections of the labor force that have the lowest bargaining abilities to begin with. As discussed before feminist economists have described the different gender constraints that create a disadvantage for female workers in the wage bargaining process. Therefore while male workers may be in a better position to benefit from the productivity improvements that FDI bring, it is women's wages that can be expected to experience the negative effects more strongly. This is also consistent with argument in the world systems literature that FDI can potentially increase inequalities by creating an enclave of elite employment.

CONCLUSION

The finding of a significant negative association between wages and the flow of FDI emphasizes the importance of questioning the distributional consequences of FDI. The link between FDI and wages cannot be assumed to be positive or at worse, neutral, as the productivity-based analysis in economic theory would indicate. Moreover the sectoral and gendered wage analysis presented here adds more detail

to the understanding of the mechanism through which FDI might impact inequality as compared to the gini-coefficient based studies in the world systems research literature.

As the emphasis on offering incentives to attract FDI is increasing, and FDI becomes an increasingly important component of economies, the potential changes to institutional structures within economies can be expected to increase. This analysis shows that even at current levels, FDI has had an impact on the wage setting process in the manufacturing sector. This negative impact of FDI can be explained if one looks at wage setting as a bargaining process. Since FDI represents more mobile capital, it lowers the bargaining capabilities of workers attached to the foreign firms. Moreover the foreign firms can also use the incentive of knowledge transfers as a tool to offer lower wages to their employees. This change in employee bargaining power can also spillover to the wage setting process in the domestic firms which face increasing pressure to cut cost and remain competitive with the foreign firms. As the above results do show a negative impact of FDI-flows on wages in the entire manufacturing sector, such a spillover does seem to have occurred.

Moreover the results also emphasize the different combinations of disadvantages within the world economic system. Besides the position of countries within the world system, the different positions of labor vs. capital indicates that even within developed economies there can be relative gains and losses. Similarly many feminist theorists have argued that gender adds to the dimensions disadvantages that are not always captured by class distinctions. For instance Hartmann (1981) points to the collusion between male workers and capital that keeps female wages low and ensures the supply of free household labor. In the case of FDI, while the overall bargaining position of labor might decline, groups of elite employees can gain from the contact with the foreign capital. These gains are also consistent with the economic analysis which focuses on the productivity gains from FDI. Given the gender history of labor market experiences, the elite groups are more likely to be male workers. The empirical analysis presented above indicates that this is indeed the case. The FDI-flow has a clear negative impact on female and overall average manufacturing wages but there is no corresponding significant impact on the male wages. As more sectoral wage and FDI data becomes available more such studies would be useful to emphasize the details that are often missing in the growth rate or overall gini-coefficient based studies.

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