

ABSTRACT

RIZK, STEPHANIE CARISSA. Service Sector Growth and Income Inequalities: A Longitudinal Analysis from an International Sample. (Under the direction of Michael Schulman)

The rise of the service sector has been offered as a possible reason for rising income inequalities in highly developed countries. Here, data from 1980, 1990 and 1995 are analyzed to investigate the effects of growth in the service sector on income inequalities for 77 nations around the world. Statistical models examine the effects that the state, through redistribution efforts, has on income inequality. Results of random effects models show that 1) service sector growth has a positive relationship with income inequality, 2) that level of development has a strong positive relationship with income inequality, and 3) that redistribution efforts have had little impact on income inequality over time. Some support is given to the idea that there is an interaction effect between service sector growth and relative placement within the overall world system. This raises the question of whether service sector growth affects the income inequality of a nation differently based on where they are ranked in the hierarchy of world development.

**SERVICE SECTOR GROWTH AND INCOME INEQUALITIES:
A LONGITUDINAL ANALYSIS FROM AN INTERNATIONAL
SAMPLE**

By
STEPHANIE CARISSA RIZK

A thesis submitted to the Graduate Faculty of
North Carolina State University
In partial fulfillment of the
Requirements for the Degree of Master of Science

SOCIOLOGY AND ANTHROPOLOGY

Raleigh

2003

APPROVED BY:

The image shows three handwritten signatures in black ink. The first signature is on the left, the second is in the middle, and the third is on the right. They are all written over a horizontal line.

Chair of Advisory Committee

BIOGRAPHY

Stephanie C. Rizk is a graduate student in Sociology at North Carolina State University, Raleigh. She is researching the area of international economic inequalities and social change, with aspirations to become involved in international planning and development.

ACKNOWLEDGEMENTS

Thanks to Dr. Michael Schulman for first introducing me to the idea and then letting me run with it. Also, thanks for the editing and comments along the way as well as personal support with everything else. Thanks to Dr. Ted Greenstein and Dr. Randy Thomson as well, for encouragement and helping me tie up all the loose ends. Thank you to Bill Clifford and the Sociology and Anthropology Department for purchasing the WDI dataset used in the analysis.

Thanks to my husband who has done far more than his share to keep things smooth and peaceful at home. To my parents, Barber and Rizk, you've given me the strength of character and motivation to get to this point and I remember you always. Rami, if it wasn't for you I wouldn't be where I am or do what I do. For all the lives that you've changed, I want you to know that I have to be the happiest of them all at the outcome so far...let's not stop here. Finally, to all my other family and friends, especially Kristin, Meagan and Cynthia for keeping me sane, thanks.

TABLE OF CONTENTS

LIST OF TABLES	v
LIST OF FIGURES	vi
1. INTRODUCTION	1
2. LITERATURE REVIEW	2
2.1 Theoretical Background: Society and Economy.....	2
2.2 The Service Sector	5
2.3 Redistribution.....	8
3. CONCEPTUAL AND MEASUREMENT ISSUES FOR WORLD SYSTEMS RESEARCH.....	10
3.1 Designating the Core, Periphery and Semiperiphery.....	10
3.2 Inequality, Employment and State Policy Indicators.....	13
3.3 Common Development Indicators	14
4. DATA AND METHODS	15
4.1 Dependent and Control Variables.....	15
4.2 Independent Variables	16
4.3 Methods.....	18
5. ANALYSIS.....	21
5.1 Descriptives.....	21
5.2 Techniques	21
5.3 Results.....	22
6. DISCUSSION.....	25
7. CONCLUSIONS.....	26
8. LIST OF REFERENCES	30
9. APPENDICIES	36
9.1 Appendix A: List of Countries Used in Analysis	38
9.2 Appendix B: List of World System Placement Index scores.....	39

LIST OF TABLES

1. Zero order Pearson Correlation Coefficients of Model Components.....33
2. Unstandardized Coefficients for the Regression of the GINI Coefficient: Random Effects Model Estimates for 160 observations on 77 countries (1980-1995).....34

LIST OF FIGURES

1. Structural Equation Model Indicating a Fixed Effects Analysis35
2. Structural Equation Model indicating a Random Effects Analysis36
3. Conditional Effects of Service Growth on GINI Coefficients.....37

INTRODUCTION

Income inequality remains a chief concern to many who study social issues of the development process. The objective of this paper is to assess the impact of shifts in the employment sector towards services on income inequalities, as well as the extent to which these shifts are conditioned by place in the world-economy. The possibility that income inequality could be curtailed internally by national redistribution policies is also examined.

We are living at the foot of a crossroads. Even as scholars and policy implementers are working together to employ new methods of integrated development, the world economy continues to falter and confidence in world leadership is challenged. Although these conflicts are a cause for concern, they also serve as a broad reminder of the complex global nature of our present society. We are also increasingly aware of the lifestyles experienced by those both near and far from us. Radio, television, internet and print media allow the majority of people in the world to see, firsthand, both excruciating poverty and exuberant wealth. In short, we have become aesthetically aware of inequality.

This study attempts to deal with a subset of these complex issues, primarily the effect of service sector employment growth on income inequalities. A small section of research has previously drawn a connection between service sector growth and inequality, hypothesizing that the inherent nature of the service sector simultaneously creates the very rich and the very poor. (Evans and Timberlake 1980, Nelson and Lorence 1988, Sassen 2000, Carruthers and Babb 2000). This analysis seeks to explain how the service sector has influenced national income inequality over the last 30 years, looking specifically at whether position in the world system contributes to inequality outcomes.

LITERATURE REVIEW

Theoretical Background: The Society and Economy

Within the discipline of sociology, modernization theory represents the first major approach to the study of development. Drawn from a Keynesian theoretical base, modernization theorists argued that international employment levels, trade and exchange rates could be stabilized through regulation of a nations' import/export structure (Gereffi 1994). Elaborating on simplistic economic models (Ward 1962, Rostow 1966) modernization theorists first connected social and economic well-being. Their analyses did not, however, provide a satisfactory explanation of why some countries were much farther developed than others. McClelland (1964) and Inkelas (1964), for example, provided social-psychological explanations of why some cultures exhibited more "modernity" and economic achievement than others.

The modernization school is marked by influences from functionalist and evolutionary theory. Modernization theory assumes that social systems inherently desire to maintain homeostasis. A drive toward modernity requires the movement of all systems in conjunction. Also, modernization is a transformative process by which traditional beliefs are shed and modern thought inspires development. This transformation is eminent. Like biological organisms, society travels in natural progression. Traditionalism represents a stage of infancy in social development, and it is inevitable that growth, often measured by differentiation and integration, will lead to modernization (see So 1990).

Evidence of the influence of evolutionary theory on modernization includes the presence of discernable phases, the movement toward increasing homogenization, and the fact that all societies are moving towards an endpoint, represented by Western society. Modernization is a linear, irreversible and lengthy process. Much of the research centered on abstract, system-level measurements. All models assume that Western-type modernization is inherently good for all

people. Modernization theories also assume that poor countries will rise to the level of the modern nations by following the same industrialization path taken successfully by Western nations (Shen and Williamson 1997).

Modernization theories incorporate Kuznets' finding that inequality presents an inverted U-shaped relationship with industrialization measures (1963). This allows modernization theorists to contend that industrialization leads to a sharp increase in income inequalities, but that as modernization continues, levels will drop to original levels (Crenshaw 1992, Crenshaw 1993, Firebaugh and Beck 1994, Firebaugh 1999). This "trickle-down" process is assumed to provide relatively quick and efficient benefits to an "underdeveloped" society. This assumption also draws support from an underlying belief that economic elites encourage national infrastructure and democratic political reforms as an investment in the future of large-scale economic growth within the populace (see Crenshaw 1992).

The belief that modernization was the same in all societies and could be catalyzed by the infusion of Western money and ideology pervaded development literature until the 1960s. However, the economic prescriptions given by Western organizations failed to equalize poorer nations with the West. Devastating debt required poor nations to borrow more and more just to stabilize their economy. From one of the hardest hit areas, Latin America, dependency theory rose as a theoretical alternative to modernization. Dependency theorists pointed out that new capitalist nations have completely different obstacles to development than earlier capitalist nations (Frank 1969, Dos Santos 1971, Amin 1976, Cardoso and Falleto 1979). In fact, countries that first underwent a capitalistic reformation were boosted by the exploitation of poor nations through colonialism. Countries attempting to develop now have no exploitative power and are at the same time competing with fully industrialized nations. Dependency occurs when dominant nations (core) maintain self-sufficient economic expansion but all other nations (periphery) are

Service Sector and Income Inequalities 4

reliant on this expansion to experience successful economic results (Dos Santos 1971).

Dependency theory disagrees with the modernizationist assertion that development is an internal function. There are powerful external forces, such as colonial rule, that hindered the transition from traditional to modern society in many nations. The dependency school moved the discussion of development from the transition between traditionalism and modernity to the economic disparity between core and peripheral nations. Economic analysis returned as a way to measure the dependency of one nation on another. Revealing the staggering nature of uneven development, many dependency theorists became convinced that development would never occur under the current world system. Despite this pessimistic outlook, more recent studies focus on development possibilities, given a structure of dependency, such as state sponsored growth and protectionism (Cardoso 1977, Evans 1983).

Immanuel Wallerstein produced the next theoretical advance, world systems theory. Dependency and world systems theory are close cousins, as they share a strong neo-Marxist theoretical base. Both endeavor to see development from the point of view of those in the periphery. Issues of power are fundamental to understanding the complexities of development. However, world systems theorists believe that understanding current issues of power, domination and development requires an understanding not just of how all systems within the society interact over time, but also their interaction with other societies. The correct unit of analysis for all development inquiries is the world system, not the individual nation state. In Gereffi's review of the international economy he states that, "world-systems theory offers the possibility of a truly comprehensive sociology of development," as it emphasizes the embeddedness of both domestic and international networks (1994).

The historical methodological approach touted by the world systems school allows for comparisons and conclusions easily missed when the focus is on individual nation states. In

respect to economic growth, this methodological assumption leads to two different conclusions. On the one hand, some find economic growth as a helpful component for development, despite its tendency toward income inequality (Firebaugh and Beck 1994, Firebaugh 1999, Dollar and Kraay 2001). These analyses ignore the possibility that large power structures might interfere with the equalization of inequalities within a nation. On the other hand, Wallerstein has pointed out a pattern of contradiction between economic growth and income inequalities (1988). It is impossible to obtain both goals within the confines of free market capitalism, taking into account the power structure inherent to the current world system. This type of analysis would lead to the assumption that growth in employment might create new income inequalities, especially in those nations that have less power in the world system.

This type of analysis also assumes that income inequality, as measured by the GINI coefficient, is inherently bad for development outcomes. The goal of development should be to increase the freedom and happiness of individuals. Pure economic growth often does not provide these returns for all members of the population, even over time. Economic growth can actually be confining to more people than freeing, if wealth is generated for the few at the expense of the many. Not only does this create unnecessary poverty, but it creates long-term divisions between the haves and have-nots which can impede true development for long periods of time.

The Service Sector

The composition of employment has long been an interest within development research. For modernizationists, a significant shift from agricultural to industrial employment signaled a healthy modern transition. Sector dualism is a popular measure, which gauges the size of the agricultural sector in respect to the size of the industrial sector. As Kuznets first described by looking at the historical transition of developed nations, a shift in laborers from the “traditional” (agricultural) sector to the “modern” (industrial) sector increases inequality, but as the economy

stabilizes, these inequalities decrease (1963). Recently, many studies have challenged Kuznets' assertion, revealing a rise in income inequalities within core nations over the past 30 years (Harrison and Bluestone 1988, Levy and Michel 1991, Atkinson 2001, Caminada and Goudswaard 2001, Alderson and Nielsen 2002). In fact, Nielsen (1994, Nielsen and Alderson 1995) reports that increasing sector dualism has a strong positive effect on inequality over time. These findings provide researchers with an interesting question, namely, what is causing this rise in income inequalities? To answer this question, it seems feasible to look towards employment in different economic sectors, as rising income inequality corresponds with a noticeable decline in the traditional manufacturing sector of core nations.

The decline of the manufacturing sector in core nations has two explanations. First, it is necessary for the capitalist to produce a commodity for the cheapest possible price. In the 1970s, when corporations realized that they could manufacture the same product in peripheral nation for less, there was a rapid outsourcing of manufacturing jobs from core to peripheral nations. Second, capitalism requires that the consuming population is constantly growing. If demand for expensive manufactured goods is limited only to the handful of countries that can afford them, capitalists have a potential problem. Using cheap labor to produce inexpensive goods opened up new markets in both core and periphery nations (Knapp and Spector 1991).

These explanations provide an abstract understanding of the 1980's manufacturing employment decline. They do not, however, explain how services rose as an important sector of employment. Establishing the exact causes of this transition is much more difficult. Two main reasons help provide an explanation. These include demographic changes in employment structure/trends and the globalization of financial flows. First, traditional industrialization, as it continues to spread across the globe, is embedded within demographic changes. As more women join the workforce around the world, the need for childcare and pre-packaged/manufactured

Service Sector and Income Inequalities 7

goods rises. Also, as populations experience a decrease in infant mortality, as well as increases in lifespan, there is also an increased need for elder care, education and general medical services, just to name a few.

Secondly, as capitalism spreads it creates new developing markets in which business can take place. Saskia Sassen (2000) has argued that the globalization of financial flows, mediated by multinational corporations (MNC's), has increased the importance of urban centers. Sassen also argues that as cities continue to increase their global connections, they shift to a service based economy. One impact of such a shift is an increase in income inequality, because "services produce a larger share of low-wage jobs than manufacturing does." (Sassen 2000:125). On the one hand, the growth of global financial markets has increased the demand for high-end service employees, including professional and managerial jobs. On the other hand, individuals who occupy high-income service sector jobs have more disposable income and can afford more leisure, which creates more low-income service jobs.

Most research on service sector growth concentrates on core nations. However, given Sassen's assertion that urban areas are growing globally to form transnational networks, income inequality should show a similar progression as the service sector grows. Evans and Timberlake (1980) produced one of the first studies to link service sector growth and income inequalities using data from peripheral nations. They find that an influx of foreign capital, as measured by foreign direct investment (FDI) from Western nations causes unusually rapid growth in the service sectors of periphery nations. FDI is the mediating factor between dependency and income inequality within a nation (Evans and Timberlake 1980). Evans and Timberlake's findings support Sassen's assertion about cities, arguing that foreign investment generates new centers of population, which create a need for transportation, restaurants, housing and other services. Although this creation of jobs seems to be a positive product of development, the creation of

high-end jobs for the locals is limited.

Shen and Williamson (1997) also speculate that FDI is a root cause of service sector employment growth and income inequality within developing nations. FDI is assumed by Shen and Williamson to create a limited amount of high paying technologically advanced jobs, while doing little or nothing to aid in the creation of jobs for the poor and low skilled. In fact, commodities are rarely produced for consumption within the local community. Capital accumulation increases if commodities are exported for consumption in core economies. Service sector growth, therefore, can be expected to have a positive association with income inequality over time for all countries.

Redistribution

Within the past three decades, increasing attention has been given to understanding the embeddedness of the state, the economy and society (see Riain 2000, Evans 1995). Development theorists are divided on the issue of whether or not governments should guard and monitor their economic systems. Neoliberal development policy regards state regulation as the enemy to free-market capitalism. Neoclassical economists contend that the root of inequality is to be found in repressive state guidelines that do not allow the flow of capital to proceed as it should. In fact, if financial markets were allowed to exist unfettered, inequality would eventually become less or disappear, again, as the “trickle-down” effect took place. Free market policy might speed up the Kuznet’s curve process, leading to a quick decrease in inequality over the process of modernization (Dollar and Kraay 2001, Crenshaw 1992, Firebaugh and Beck 1994). For neoclassical scholars, restrictions on financial markets lead to a decrease in the amount of capital that can be accumulated, and therefore, less money that will trickle down to the masses.

For dependency scholars, the need for increased regulation of the world-wide economic market is necessary for decreasing exploitive capitalist behavior. These types of reforms aid high

income nations in mediating income inequality (Caminada and Goudswaard 2001, Atkinson 1999). However, it has become increasingly difficult for individual nations to impose strict regulatory guidelines within their borders. Electronic transfers have increased the rate and anonymity of capital movement. Despite calls by many within the field for states to increase their regulation over capital flows to favor an increase in social programs that produce sustained economic growth, the power of financial institutions remains strong. In his critique of World Bank policy for promoting economic development in the 1990s, Fishlow (1994) reports that open trade structures are not the defining factor in promoting economic growth. In fact, he asserts, such a policy places an intense burden on developed nations to keep their markets open, making their domestic products vulnerable. In their analysis of the increasingly globalized market and the issues that technology has imposed on development and stabilization, Giron and Correa (1999) state that it is important “on economic, political and social ground to construct new terms of development co-operation in which ... financial stability is a priority”. However, such cooperation is an extraordinary task that might take decades. For this reason, internal social welfare and redistribution policies provide a more expedient method for decreasing income inequalities within national borders.

Internal redistribution:

Every society has *de facto* inequality. This distribution of wealth and income is often a result of racism, sexism, classism or any other variety of past discrimination. Redistribution requires intervention by a regulatory power, which seeks to equalize otherwise uneven distributions (Shanahan and Tuma 1994). Although many countries have been successful in decreasing inequality through the process of social redistribution, similar efforts often prove difficult or impossible for low and middle income countries. Specifically, IMF and World Bank financial assistance usually comes with the penalty of forcing a nation to drastically cut state

programs in order to initiate economic growth. The World Bank stated in its 1991 development report that “strong evidence links productivity to investments in human capital” (Fishlow 1994). Unfortunately, provision of public needs rarely prevails over stabilizing the economic situation. Many authors point out this discrepancy and/or at the same time question the financial stability of the “developed” economic model (Onis and Aysan 2000, Camindada and Goudswaard 2001). It is assumed, therefore, that variables measuring internal redistribution attempts will be negatively associated with income inequality.

To summarize, income inequalities are counterproductive and do not exhibit an inverse-U shape in correlation with economic growth, even over time. The rise of the service sector has exacerbated income inequalities in all countries. The persistence of income inequalities is especially apparent in countries exhibiting less power relative to other countries within the same time frame. The role of the state is important in quelling income inequalities, through redistribution and regulation policies. At this point I will turn the discussion to empirical issues, such as how to construct a measure of world systems placement and what factors should be included in such a measure. The following sections discuss the complexity of this issue and link other empirical measures with the theoretical background.

CONCEPTUAL AND MEASUREMENT ISSUES FOR WORLD SYSTEMS RESEARCH

Designating the Core, Periphery and Semiperiphery

Any comprehensive cross-national analysis should include measures that differentiate between core, periphery and semiperiphery nations. This is important, as each nation plays a different role in the world system. Nations do possess the power to move either up or down in the hierarchy throughout time, but their ability to do so relies heavily upon the historical and contextual consequences that stem from earlier relationships. In their review of Wallerstein’s

world systems theory, Chirot and Hall (1982) note that, “the core needed peripheries from which to extract the surplus that fueled expansion,” while semiperipheries stand “between the core and periphery in terms of economic power [and] deflect the anger and revolutionary activity of peripheries.”

Chase-Dunn (1993) has designated three historical types of world-systems according to their modes of accumulation. These include, kin-based, tributary, and capitalist mode dominant. Within each, there exist a core-periphery-semiperiphery hierarchy, organized according to the characteristics specific to that world-system. This analysis is concerned primarily with income inequality stemming from effects that have emerged only within the past half-century. Therefore, designations that represent the capitalist mode will be utilized.

The discussion concerning which measures are most effective in describing the differences between core, periphery and semiperiphery nations is hotly debated. The following is based primarily on the work of Christopher Chase-Dunn, specifically his discussion on measuring core/periphery relations in the current political economy (1993). Placement depends on two factors: measurements of internal differentiation relative to other societies in the system; and measures of the hierarchy of political, economic or ideological domination in the system. Measures of differentiation could include size, complexity or technological productivity. While the range of indicators available are numerous, not all indicators are available for all nations. For example, the number of internet connections is a measure of high technology, but it does not delineate between low-end nations to the extent that a broader measure such as prevalence of telephone lines would. As for connections between nations, trade is one of the most basic measures, although Chase-Dunn warns against making value judgments about import/export structures specifically. Kentor (2001) has shown support for this movement by utilizing a measure of total trade instead of separate measures of imports and exports in his analysis of the

Service Sector and Income Inequalities 12

long term effects of globalization on income inequality, population growth and economic development. As Kentor concludes, “ it is not productive to construe globalization as simply ‘good’ or ‘bad’. Rather, we need to explore the (sometimes competing) effects of the various components of this global process” (2001:451). Similarly, multiple measures of economic exploitation and weakness are important to establish the hierarchy, such as amount of development aid awarded and the extent of external government debt.

Chase Dunn also mentions the need for a placement indicator that allows for variation and generalization. There is a disagreement between he and Wallerstein when it comes to designating between subsystems. While Wallerstein and many of his followers have labeled nations categorically, in terms of the typical tri-part designation, Chase-Dunn refers to the difference as a continuum. The world system designation used in the following analysis creates a standardized continuous variable that is allowed to change from time point to time point. Chase-Dunn hypothesized that such a designation should be negatively associated with income inequalities. “In the modern world-system there is typically less income inequality among households within core societies than within peripheral societies” (1993:863).

An effective measure of world system placement would show the extent to which a nation had autonomous control over social, political and economic decisions. Therefore, a continuous measure, including the combined effects of GDP per capita, foreign direct investment, use of IMF credit, total trade and number of telephone mainlines, will be utilized. The combination of factors assembled here should result in an indicator, based on economic power, autonomy and global dependence, that exhibits a negative association with income inequality. This prediction is drawn from the assumption that although core nations have experienced an upswing in income inequalities over the past 30 years, they have been able to self-generate control over these inequalities to a greater extent than periphery or semi-periphery nations.

According to the definition of dependency, the lower a country falls in the world-system hierarchy the more their level of income inequality is based on the policies and procedures dictated by the core nations.

Inequality, Employment and State Policy Indicators

The GINI Coefficient measures the extent to which the distribution of income (or, in some cases, consumption expenditure) among individuals or households within an economy deviates from a perfectly equal distribution within quintiles (WDI, 2001). A GINI index of zero represents perfect equality, while an index of 100 implies perfect inequality. Some debate exists about the maximum utility employed by a GINI coefficient of inequality developed from the Lorenz curve. Results have been shown to be significantly better when utilizing “truer” measures of income inequality, such as income % of the GDP for each quintile separately or one based on deciles (Evans and Timberlake, 1980). However, distinctions are often highly technical, and the GINI remains the standard measure for income inequality within both the sociology and economics literature.

This analysis tests the assumption that service sector growth is currently one of the primary factors in increasing income inequalities. Here, the amount that service sector goods contribute to a nation’s overall gross domestic product is used, relative to the two remaining primary sectors, industrial/manufacturing and agricultural. Research has shown that the service sector promotes extreme polarization between low and high earnings jobs (Nelson and Lorence 1988, Nielsen and Alderson 1995, Sassen 2000). For the purposes of this research, the service sector is defined in terms of the World Bank designation. This includes, “wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services” (WDI 2001).

One of the major considerations of this paper is the role of the state in equalizing income

inequality. The extent to which a state views itself as a provisionary structure of basic public goods is an important consideration. There are a variety of measures for redistribution procedures, from progressive taxation to land reform. According to Dagdeviren et al.(2002), the pertinence of a redistributive instrument depends on the classification of the nation to which it will be applied. A measure such as transfer of social security payments does not capture redistributive attempts in low-income countries, because these countries are often concerned more with provision of basic goods than generalized, non targeted programs (Dagdeviren, van der Hoeven and Weeks 2002). Measures of public expenditure on education, health, infrastructure and public works are common redistributive measures throughout all national income levels. World Bank data supplies the most robust data on public education expenditures, therefore, this measurement is utilized in the following analysis.

Common Development Indicators

Population growth and literacy rates are commonly used control indicators for development. Kentor's (2001) utilization of population growth supports the assertion that, overall, population growth has a negative effect on economic development. This also supports Firebaugh's (1999) hypothesis. Returning to an initial assertion of this paper, that economic growth and income inequality are competing factors, population growth should prove to be positively associated with income inequality. Also, as Alderson and Nielson (1999) and Kentor (2001) have found, increases in educational attainment signal a decrease in inequality, presumably also aiding in the creation of a broad middle class. Consequently, a drop in the illiteracy rate is assumed to lead to a drop in income inequalities as well.

The previous literature review leads to four main hypotheses:

Hypothesis 1: Service sector growth leads to an increase in income inequality within nations.

***Hypothesis 2:** Nations that score lower on a scale of system involvement (those with higher dependency) will exhibit higher levels of income inequality*

***Hypothesis 3:** As a nation's effort to redistribute wealth among the population increases, the level of income inequality will drop.*

***Hypothesis 4:** The effect of service sector growth on income inequality is conditional on the level of position within the world system, with high power core countries better able to mediate inequality than low power peripheral countries.*

DATA AND METHODS

Comprehensive data with which to conduct a cross-national analysis is difficult to find in fully desirable form. Due to the scarcity of research that combines indicators for both economic structure and state redistributive policies, even datasets from the United Nations and other similar organizations were not comprehensive enough. By far, the most comprehensive set of variables was found in the World Development Indicators dataset compiled by the World Bank. Data for the WDI includes data for 207 countries over a 40-year period. The following data for all time points comes from the WDI, with the exception of the GINI coefficient data. The data is taken from three time points; 1980, 1990 and 1995. After applying all control and independent variables for the models, the analytic sample size was reduced to 160 time points for 77 total countries.

As with all international-level datasets, there exists a large amount of missing data in the WDI, especially from the poorer peripheral nations within the world-system. However, as the final sample shows, a good representation of nations is included. For a listing of countries used in the final data analysis, see appendix A. In addition to this standard problem, another measurement issue common to cross-national research exists and needs to be addressed at the outset. Although this study's measurements were chosen after careful consideration and review of the literature, judgment calls were made in instances where the best measurement simply did not provide enough data to support its usefulness to the analysis. This was largely the case with

the measurement of redistribution policies, which vary widely between core and periphery nations. In these instances, measures were chosen by finding the best balance between sample size and theoretical relevance.

Dependent and Control Variables

GINI Coefficient: The GINI Coefficient for the most recent time point (1995) is taken from the “World Development Indicators Table 2.8: Distribution of Income or Consumption” (WDI, 2001). GINI Coefficients for the two remaining time points came from the Deininger and Squire dataset (1996), which is commonly reported to be the most reliable source of time series GINI coefficients (Nielson and Alderson, 2002). If acceptable GINI coefficients were not available for the exact time points of 1980 or 1990, the most recent GINI score given *after* the exact time period was utilized, within a maximum of 5 years. Two assumptions were made. First, that barring historical anomalies, changes in income inequality are subtle over a time frame of only a few years; second, changes in the GINI coefficient over time are far more sound theoretically if they are slightly lagged beyond the true data point. In other words, if a choice were necessary for a country at the 1980 time point, 1982 is better than 1978.

Population Growth (annual %): Population growth is measured by subtracting the death rate of the time point from the birth rate. Here, it is used as a control variable, following Kuznet’s (1963) curvilinear model, which has been shown to best reflect the variance of income inequalities in development models.

Commercial energy use (kg of oil equivalent per capita): Commercial energy use refers to apparent consumption, which is equal to indigenous production plus imports and stock changes, minus exports and fuels supplied to ships and aircraft engaged in international transport. (WDI, 2001). This variable is logged, to reduce variation between nations and to reduce problems that existed in the covariance structure between variables.

Independent Variables

Service, value added: (% of total GDP): Service value added to the GDP (gross domestic product) of a country includes wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional, and personal services such as education, health care, and real estate services. Also included are imputed bank service charges, import duties, and any statistical discrepancies noted by national compilers as well as discrepancies arising from rescaling. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs (WDI, 2001).

Public spending on education, total (% of GNI, UNESCO): Public expenditure on education (total) is the percentage of GNI (gross national income) accounted for by public spending on public education plus subsidies to private education at the primary, secondary, and tertiary levels.

World-System Placement: Kentor's (2000) recent work has closely followed the guidelines proposed earlier by Chase-Dunn (1995). His measure of position in the world economy includes three dimensions, including economic power, military power and global dependence. This measurement focuses on economic power, autonomy and global dependence, as well as adding a measure of internal differentiation as suggested in the review of the literature.

The following are utilized to construct the measure:

→*GDP per capita:* Given in current Constant 1995 US\$. GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (WDI, 2001).

→*Foreign direct investment, net inflows (% of GDP):* Foreign direct investment is net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and

short-term capital as shown in the balance of payments. This series shows net inflows in the reporting economy (WDI, 2001).

→ *Use of IMF credit*: Data are in current U.S. dollars. Use of IMF credit denotes repurchase obligations to the IMF for all uses of IMF resources (excluding those resulting from drawings on the reserve tranche). These obligations, shown for the end of the year specified, comprise purchases outstanding under the credit tranches, including enlarged access resources, and all special facilities (the buffer stock, compensatory financing, extended fund, and oil facilities), trust fund loans, and operations under the structural adjustment and enhanced structural adjustment facilities. This measure was also scaled by total population, so data was standardized according to \$US IMF credit per person within a country. (WDI, 2001).

→ *Trade*: Given as a percent of the total GDP. It accounts for “the sum of merchandise exports and imports” (WDI, 2001).

→ *Telephone mainlines*: Given as the number of lines per 1,000 people within the population (WDI, 2001).

Although this measure is by no means a comprehensive index of world system placement, it does include many of the indicators discussed in the literature section on World Systems theory and dependency. The index was calculated using standardized z-scores and compiling them, with those indicators measuring negative world system effects (here, external debt) multiplied by -1 before final calculation. Means and standard deviations were drawn from the data from countries utilized in the final analysis. Also, the indicator was indexed with the means and standard deviations specific to each time point, as to reduce for wide variation across this 15-year analytical period. For a listing of scores, see Appendix B.

Methods

Using ordinary least squares analysis on longitudinal data introduces a variety of problems. First, autocorrelation between the same indicators at multiple times poses extreme difficulty in creating dependable standard errors. A standard OLS procedure cannot distinguish the independence of events from time point to time point. Although the slope estimates are often reliable in standard OLS regression, the standard errors are not, causing a great possibility of Type I or Type II errors when attempting to reject the null hypothesis. Fixed and random effects

models are commonly used to remedy these issues in time series data. Both models allow the effects of repeated observations to be pulled out with the use of a simple identification for each unit of observation, in this case, the country.

The equation for both fixed and random effects is based on OLS regression and is given as:

$$Y_{it} = \lambda_t + \beta_{it} + \alpha_i + \varepsilon_{it}$$

Here, λ represents all the effects linked to the time specific indicators which can change, but are not tied to the specific observation from which it is drawn. In this analysis all variables included in the model are time specific. The α represents all of the effects that are stable over time, which may be linked to the observation, but not the specific time period, such as geographic location. In a fixed effects model, the time variant β coefficients specific to each country at the given time point are assumed to be correlated with α_i . In effect, this allows for absorption of the effects of any time-invariant factors that the researcher is unaware of or has not included in the model.

In sociological longitudinal analysis, it is often assumed that exogenous factors affect both the independent variable and the covariates. However, in large aggregate level datasets, especially those using country level data, random effects modeling is more common for a variety of reasons. First, random effects modeling is usually preferred when the population in question is large and aggregate data is utilized (Allison 1994). Secondly, fixed effects models disregard between-country variation, because the variation is perfectly fitted with the indicator variables (Nielsen and Alderson 1995, Brady 2003). To test this assertion, fixed effects models were run. In these models, none of the indicators were significant, including the control variables. All variation between the countries had been absorbed into the additional error term, which leaves no room to interpret what is actually going on in the relationship. The random effects model allows for closer estimation of the true relationship, allowing for differential effects between countries.

In order to test the significance between the fixed and random effects models, structural equation models were used according to Teachman et al (2001). AMOS, a standard program for constructing structural equation models (SEM), was utilized. Two models were built using the same data from the same sample used in SAS. The following models are comparable to Model D from the SAS random effects models because they do not include the final interaction term. The first SEM is based upon the assumptions of the fixed effects model, where the unknown effect (z) is allowed to covary with the dependent variable as well as the independent variables (see Figure 1). The second model is based upon the random effects assumption that the unknown effect (z) does not covary with the independent variables over time (see Figure 2). Although there is a noticeable difference in the chi-square statistics reported between the fixed and random effects models, the RMSEA, a common fit statistic for SEMs, shows almost no difference in fit. The Akaike information criterion (AIC) statistic also shows a slight difference in favor of the fixed effects model. Somewhat of a difference is to be expected, as the constraints of the fixed effects model guarantee a better fit in most situations. However, the differences here are fairly small, giving support to the assertion that no significant predictive power will be lost if the random effects analysis is used.

For these reasons, random effects models are used, allowing for randomization between countries. The following random effects model, therefore, assumes that unknown exogenous effects are, in effect, controlled for by classifying by country, and do not have further direct effects on the time-variant covariates within countries. Proc Mixed is used in SAS, which is based on restricted maximum likelihood (REML), which computes Type I and Type III tests of fixed effects and REML estimates of variance parameters.

ANALYSIS

Descriptives: It should be noted that intercorrelation exists between energy consumption and population growth, with a measure of -0.62627 and energy consumption and World System Placement (WSP) index with a value of 0.62577 (see table 1). Although this level of intercorrelation can cause multicollinearity in longitudinal data, this analysis exhibits no obvious symptoms of the problem, such as the a high fit statistic result without the presence of any significant indicators. The average GINI coefficient for the analytic sample is 41.2. Averages for the two main independent variables, service value added and education expenditures rates are approximately 50.29% and 4.14%, respectively. Most socialist nations¹ were excluded from the analysis, after determining that they clouded the findings. Therefore, the following analysis cannot be generalized to socialist nations, primarily because their socialist systems guard against income inequality regardless of shifts in the employment sectors. The proposed hypotheses are not adequately tested if these systems are included in the model. Even when these nations were included, the measure of educational expenditure did not become significant, adding nothing pertinent to the remaining analysis. Singapore was also excluded because of its “city-state” status, which makes it an entirely different unit of analysis. The extent of this difference can be supported through its World System Placement (WSP) index scores, which reached over 15.5 on the scale, which otherwise ran between -4.8 to 7.6. Overall, the WSP index was correlated with other measures in the model sufficiently to believe that its measurements are correct and valid (see Table 1). A complete listing of the WSP index scores can be found in Appendix B.

Techniques

Income inequality functions differently within the specific historical context of every nation. This analysis seeks to report trends that exist between nations of similar standing within

¹ Nations excluded: Norway, Netherlands, Sweeden, Switzerland, Finland, Denmark

the world-system within a 15-year time frame. Model A in Table 2 shows the effects of the control variables on the GINI coefficient by using indicators for population growth and energy consumption.

By eliminating all missing data at the onset of analysis, the second model is nested within the first. Model B reflects the measurement of the main independent variable, service sector strength and growth over time. Model C utilizes the WSP indicator as a measure of how involved a country is in the global economic system, inferring the amount of power the country itself has to act as an “independent” actor. In other words, how dependent or “independent” a country is from the aid of another country to keep its economy viable on the world market. Model D adds redistribution to the model to look for differences about the GINI coefficient that exist when a country attempts varying levels of redistribution of wealth, for the prosperity of a larger portion of the population.

A final model seeks to determine whether an interaction effect, found in my preliminary research using cross-sectional data from 1995, occurs between world systems placement and the emergence and strength of the service sector. In other words, does the growth of the service sector and its effect on income inequality affect countries differently depending on their world system placement?

Results

The final sample size for all models is 160, which includes differing numbers of time points for the 77 included countries. Model A, which looks at the effects of the controls, reports a -2 Log Likelihood of 1048.3. Energy consumption is not statistically significant in this model. Population growth is a statistically significant predictor of income inequality (Table 2). Therefore, Model A predicts that for every one percent increase in population growth rate of a nation, over time that the GINI coefficient of income inequality rises by 3.72 units.

Service Sector and Income Inequalities 23

In Model B, an indicator for the strength and importance of the service sector as part of a nation's overall economy is added. The -2 Log Likelihood score for this model (1048.2) is effectively the same as the previous model (1048.3), which does not allow the null hypothesis about the difference between the two models to be rejected. In other words, there is no difference, statistically, between the predictive power of Model B over the simpler Model A. The addition of the service sector variable is barely significant. This result does allow for the interpretation that for every one percent increase in service value, a country should see a rise of 0.12 units in the GINI coefficient. The controlling covariates do not change in significance or strength between the models. There remains a lack of explanation of why income inequality changes over time, other than differences in population growth rate. However, at this point, there is no contextual comparison between countries over time, which is rectified in the following model.

Model C includes the world systems placement index, in addition to the factors considered in the previous model. With a t-value of 3.16, it is clear that world systems placement does effect the understanding of income inequalities. The -2 Log Likelihood also supports this conclusion. With a value of 1038.9, the incremental chi-square value from Model B is 9.4. With only $df=1$, the null hypothesis that there is no statistically significant difference in the predictive power of Model C over Model B is rejected. The service sector variable becomes insignificant, considering the effects of world system placement. Net of the effects of all covariates in the model, for every unit increase in WSP, Model C predicts that there was a decrease of 1.08 units for the GINI coefficient. In other words, as world system placement rises, income inequality seems to decrease.

Theoretically, the state's attempts to redistribute according to social welfare policies should also be a factor in reducing income inequality over time. Model D provides the addition

of governmental education expenditure as an indicator of redistribution efforts. With a -2 Log Likelihood that is almost the same as Model C, an incremental chi-square test is not needed. The null hypothesis cannot be rejected. Including a nation's attempts to redistribute wealth does not statistically significantly aid in predicting income inequality within a nation over time. Also, the inclusion of a redistribution measure does not affect the statistical significance of WSP, service value added, illiteracy or population growth rate in predicting the GINI coefficient.

Preliminary cross-sectional research found that there was an interaction between world system placement and service sector growth. To test this finding with the longitudinal data, an interaction between world system placement and service sector value is added for the final model (E). Service sector growth could affect nations that are already enjoying high economic levels differently, in reference to the world-system, than those that are still struggling in either low or middle income economic placements. The incremental chi-square test between Model E and Model D is not needed. Again, the -2 Log Likelihood score is larger than either Models D or C, so the null hypothesis cannot be rejected. Model E provides no additional predictive power over Model D.

However, effect of the World System placement variable becomes insignificant, while the service variable becomes statistically significant for the first time. Along with the fact that the interaction term is significant, this suggests that service sector growth has significant effects on income inequality only when world systems placement is taken into consideration. Although the incremental chi-square test is not significant, the interaction effect should be considered important. Because service sector growth becomes significant and world systems placement becomes insignificant, it might be the case that the effect of world system placement on income inequalities is mediated by the effect of service sector strength. In other words, Model E shows that a nation's placement within the world system does not directly effect its level of income

inequality, but that it mediates the way that service sector dominance predicts differences in the GINI coefficient.

DISCUSSION

This paper attempts to understand what factors contribute to income inequalities within nations. The two factors which are assumed to increase or decrease income inequality are growth of the service or tertiary sector and redistribution efforts. Hypothesis one is marginally supported in the initial model, but support decreases once a measure of World System Placement is added. The percentage of value added to the total GNP of a nation from the service sector is not a significant indicator in models C or D, although it becomes statistically significant in model E. Taken all together, this information tends to support the first hypothesis. Although the relationship needs to be specified, as the service sector grows, in reference to the primary and secondary sectors of a nation, it creates more income inequality.

The second hypothesis is supported (see Model C). A strong statistically significant negative relationship exists over time between world system placement and income inequality. That is, the higher a nation is, in reference to other nations regarding important economic and social ties, the less severe the income inequality within that nation. This relationship seems to be misspecified, however. The fact that the world systems indicator loses statistical significance when the interaction between WSP and service sector strength is introduced leads to the conclusion that it is, perhaps, the effect that world system placement has on service sector growth that predicts income inequalities over time. In any case, world system placement should be considered as an important variable in understanding how the GINI coefficient changes over time.

Hypothesis three is not supported. The effect of education expenditure, as a measure of redistribution commitment, is never statistically significant. This finding could be a result of a variety of factors. One consideration is that the redistribution system of many peripheral

countries is under complete control of outside forces. Most multilateral organizations enforce strict policies, often disabling any kind of redistribution, in return for supplying billions of dollars in loan money. Therefore, countries that have suffered from extreme income inequality over time are unlikely to have strong redistribution systems. Secondly, core countries often do not have strong redistribution systems. A large amount of present literature supports the fact that many core nations have large degrees of income inequality, even though their aggregate level of development and world domination is very high. Third, education expenditure may not be the best possible indicator of redistribution. Its effect in core countries may be quite different than its effect in peripheral nations. Dealing with these factors, from a conceptual reality to an operationalized statistical reality, should be a major goal of future research.

Hypothesis four is supported, to some extent. Figure three clearly shows differential outcomes for the interaction between service sector growth and income inequality, depending on where the nation is placed in the world system. These findings from Model E support the final hypothesis. Service sector growth is shown to be a statistically significant, positive predictor of income inequality. This is only true, however, when world systems measurements are given the opportunity to interact with the original service/GINI relationship. The final outcome of this analysis shows that redistribution, manifested in education expenditures, do little to buffer the effects of income inequality. Furthermore, service sector growth should be closely monitored in semi-peripheral and peripheral countries, as they can do little to defend themselves from increases in income inequality.

CONCLUSIONS

The first section of this paper looks at national trends surrounding the rapid growth of the service sector within the context of the world system and the effects that service sector growth has on income inequality. Attention is also given to the effect that redistribution has on income

inequality. Key research questions are as follows: first, does growth in the tertiary sector increase income inequality? Second, can redistribution, as a function of each individual sovereign nation state effectively protect its citizens from inequality in the face of world-wide deregulation of capital? The findings indicate that service sector growth does increase income inequalities, but redistribution does not, unfortunately, decrease them.

Figure three shows the predicted effects of service sector growth on income inequality for three different levels of placement in the world system. The figure shows that those countries with the lowest world system placement are most effected by a rise in the service sector. It also shows a prediction that service sector growth leads to a slight decline in income inequalities for those nations who are near the top of the world system. Overall, it is clear that world system placement does interact with the effect that service sector growth has on income inequalities.

What is it about position in the world system, as it is measured in this analysis, that effects this relationship? For this, I turn back to the dependency argument and the importance of cities to the global economy. It has been hypothesized that megacities in the periphery, which continue to grow immensely, serve as outlets for multi-national capital. While a core nation uses the city to expand provision of high-level services, the locals are left with the promise of capital growth, but the reality of low-level service jobs. The world system placement index also measures the level of independence a country has in relation to other countries in the model. The more relative strength, or independence, a country has, the greater the ability to choose which types of investment they accept from external sources. This economic strength and stability also allows countries to enforce minimum wage requirements for low paying jobs, including low-end service jobs.

The intent of this analysis is to provide practical information, useful to multilateral foreign policy, on what factors effect income inequalities. In order to do this effectively, the

conceptualization of these models needs to be specified and strengthened, working within the constraints posed by the real world economic system. As it exists now, the most important result of this analysis suggests that international development policy should be concerned with the effect that service employment growth has on the income inequality of non-core nations. The question of whether these nations are gaining long term advantages from the presence of core companies should not be pushed aside. Although this analysis shows that national redistribution efforts do not suppress the effect of service sector growth on inequality, this does not mean that policy is ineffective for controlling income inequalities. Perhaps a minimum or living wage would improve the situation of low-paid service workers. In any case, income inequalities are not falling in most parts of the world and attention needs to be paid to this fact.

The overall results provide promising new insight into income inequalities within nations, according to the context of the overall world system. There are two ways in which this analysis might be strengthened in future research. Perhaps there are theoretically important time-invariant characteristics that could be controlled for within the random effects model. If measures such as post-1930 colonization could be included as class variables in a random effects model, the outcomes might be more favorable (see Nielson and Alderson, 1995). Also, the use of structural equation modeling provides a variety of advantages over traditional random effects analysis in SAS. First, structural equation models constructed in AMOS allow for better utilization of missing data. AMOS's ability to estimate means is a great asset to cross-national datasets, which exhibit persistent problems with missing data. Second, structural equation modeling allows for the error terms of exogenous variables to be correlated, greatly reducing inherent heteroscedasticity problems. The advantage of this option is clear in the fit statistics of the structural equation models. Comparable AIC statistics between Model D from the SAS analysis and the similar random effects model in AMOS show a decrease of over 500 points (from 1042.8

to 509.168, respectively). Also, when the exact same model seen in figure two was run without allowing the correlation between error terms, the AIC became 578.866. This is clearly a worse fit to the data than the model which allows the error terms to be correlated, showing that heteroscedasticity problems can be controlled when using structural equation models.

The preliminary evidence above should stimulate more research, possibly using structural equation modeling. This analysis provides a new way of looking at issues of national income inequality within the context of the entire world system. Not only does it provide a new path for academic research, it should also be considered by policy makers and economists interested in decreasing inequalities throughout the world.

REFERENCES:

- Alderson, Ather and Francois Nielsen. 1999. "Income inequality, Development and Dependence: A Reconsideration". *American Sociological Review* 64(4): 606-631
- , 2002 "Income Inequality Trends in OECD Countries". *American Journal of Sociology*. 197(5): 1244-99.
- Allison, Paul. 1994. "Using Panel Data to Estimate the Effects of Events". *Sociological Methods and Research* 23:174-99.
- Amin, Samir. 1976. *Unequal Development: An Essay on the Social Formation of Peripheral Capitalism*. New York: Monthly Review Press.
- Atkinson, A.B. 2001. "A Critique of the Transatlantic Consensus on Rising Income Inequality". *UNESCO*. Blackwell Publishers.
- Brady, David. Forthcoming. "The Poverty of liberal Economics". *Socio-Economic Review*.
- Caminada, Koen and Kees Goudswaard. 2001. "International Trends in Income Inequality and Social Policy". *International Tax and Public Finance*. 8:395-415.
- Cardoso, Fernando H. 1977. "The Consumption of Dependency Theory in the United States." *Latin American Research Review*. 12:7-24.
- Cardoso, Fernando H. and Enzo Faletto. 1979. *Dependency and Development in Latin America*. Berkeley: University of California Press.
- Carruthers, Bruce G. and Sarah L. Babb. 2000. *Economy/Society: Markets, Meanings and Social Structure*. London: Pine Forge.
- Chase-Dunn, Christopher and Thomas D. Hall. 1993. "Comparing World-Systems: Concepts and Working Hypotheses" *Social Forces*. 71(4): 851-886.
- Chirot, Daniel and Thomas D. Hall. 1982. "World-System Theory". *Annual Review of Sociology*. 8:81-106.
- Crenshaw, Edward. 1992. "Cross-National Determinants of Income Inequality: A Replication and Extension Using Ecological-Evolutionary Theory." *Social Forces*. 71(2):339-363.
- , 1993. "Polity, Economy and Technoecology: Alternative Explanations for Income Inequality". *Social Forces*. 71(3):807-816.
- Dagdeviren, Hulya and Rolph van der Hoeven and John Weeks. "Poverty Reduction with Growth and Redistribution". *Development and Change*. 33:383-413.
- Dollar, David and Aart Kraay. 2001. "Growth is Good for the Poor". Development Research Group: World Bank. work in progress

- Dos Santos, Theotonio. 1971. "The Structure of Dependence." Pp. 225-236 in K.T. Kan and Donald C. Hodges (eds.) *Readings in the U.S. Imperialism*. Boston: Extending Horizons.
- Deininger, Klaus and Lyn Squire. 1996. "A New Data Set Measuring Income Inequality." *World Bank Economic Review* 10:565-91.
- Evans, Peter B. and Michael Timeberlake. 1980. "Dependence, Inequality, and the Growth of the Tertiary: A Comparative Analysis of Less Developed Countries". *American Sociological Review*. 45(4): 531-552.
- Evans, Peter B. 1983. "State, Local and Multinational Capital in Brazil: Prospects for the Stability of the 'Triple Alliance' in the Eighties." Pp. 139-168 in Diana Tussie (ed.) *Latin America in the World Economy: New Perspectives*. New York: St. Martin's.
- , 1995. "Embedded Autonomy: States and Industrial Transformation". Princeton University Press.
- Firebaugh, Glenn. 1999. "Empirics of World Income Inequality". *American Journal of Sociology*. 104(6): 1597-1630.
- and Frank D. Beck. 1994. "Does Economic Growth Benefit the Masses? Growth, Dependence, and Welfare in the Third World". *American Sociological Review*. 59(5): 631-653.
- Fishlow, Albert. 1994. "Economic Development in the 1990s". *World Development*. 22(12):1825-1832.
- Frank, Andre Gunder. 1967. *Capitalism and Underdevelopment in Latin America*. New York: Monthly Review Press.
- Gereffi, Gary. 1994. "The International Economy and Economic Development". Pp 206-235 in *The Handbook of Economic Sociology*. Princeton University Press: New Jersey.
- Giron, Alicia and Eugenia Correa. 1999. "Global financial markets: financial deregulation and crises". UNESCO. Blackwell Publishers.
- Harrison, Bennett and Barry Bluestone. 1988. *The Great U-Turn: Corporate Restructuring and the Polarizing of America*. New York: Basic Books.
- Inkeless, Alex. 1964. "Making Men Modern: On the Causes and Consequences of Individual Change in Six Developing Countries" Pp. 342-361 in Amitai Etzioni and Eva Etzioni (eds.) *Social Change*. New York: Basic Books.
- Kentor, Jeffery. 2001. "The Long Term Effects of Globalization on Income Inequality, Population Growth, and Economic Development". *Social Problems*. 48(4): 435-455.
- , 2000. *Capital and Coercion: The Economic and Military Processes that have Shaped*

- the World Economy 1800-1990*. New York: Garland Publishing, Inc.
- Knapp, Peter and Alan Spector. 1991. *Crisis and Change: Basic questions of Marxist Sociology*. Chicago: Newlson-Hall Publishers.
- Kuznets, Stanley. 1963. "Quantitative Aspects of the Economic Growth: Growth of Nations Distribution of Income by Size". *Economic Development and Cultural Change*. 11(2):1-80.
- Levy, Frank and Richard C. Michel. 1991. *The Economic Future of American Families: Income and Wealth Trends*. Washington, DC: Urban Institute.
- McClelland, David. 1964. "Business Drive and National Achievement." Pp. 165-178 in Amitai Etzioni and Eva Etzioni (eds.) *Social Change*. New York: Basic Books.
- Nelson, Joel I. and Jon Lorence. 1988. "Metropolitan Earnings Inequality and Service Sector Employment". *Social Forces*. 67(2): 492-511.
- Nielsen, Francois and Authur S. Alderson. 1995. "Income Inequality, Development, and Dualism: Results from an Unbalanced Cross-National Panel". *American Sociological Review*. 60:674-701.
- Onis, Ziya and Ahmet Faruk Aysan. 2000. "Neoliberal globalisation, the nation-state and financial crises in the semi-periphery: a comparative analysis". *Third World Quarterly*. 21(1):119-139.
- Riain, SO. 2000. "States and Markets in an Era of Globalization". *Annual Review of Sociology*. 26:18-213.
- Rostow, W. W. 1966. *The Stages of Economic Growth*. New York: Cambridge University.
- Sassen, Saskia. 2000. *Cities in a World Economy: Second Edition*. London: Pine Forge.
- Shanahan, Suzanne Elise and Nancy Brandon Tuma. 1994. "The Sociology of Distribution and Redistribution." Pp. 733-765 in Neil Smelser and Richard Swedberg eds., *The Handbook of Economic Sociology*. Princeton: Princeton University Press.
- Shen, Ce and John B. Williamson. 1997. "Child Mortality, Women's Status, Economic Dependency, and State Strength: A Cross-National Study of Less Developed Countries". *Social Forces*. 76(2): 667-700.
- So, Alvin Y. 1990. *Social Change and Development: Modernization, Dependency, and World-System Theories*. Newbury Park: Sage Publications
- Teachman, Jay and Greg J. Duncan, W. Jean Yeung and Dan Levy. 2001 "Covariance Structure Models for Fixed and Random Effects. *Sociological Methods & Research*. 30(2):271-288.
- Wallerstein, Immanuel. 1988. "Development: Lodestar or Illusion." *Economic and Political*

Weekly. 23 (39): 2017-2023.

Ward, Barbara. 1962. *The Rich Nations and the Poor Nations*. New York, W.W. Norton & Co., Inc.

World Bank. 2001. [DATASET]. *World Development Indicators 2001*. Washington, DC; The World Bank.

TABLES

TABLE 1

Zero order Pearson Correlation Coefficients of Model Components

	GINI	POPULATION GROWTH	log ₁₀ ENERGY	SERVICE GROWTH	WSP	EDUCATION EXPENDITURES
GINI	1.00000					
POPULATION GROWTH	0.57182 <.0001	1.00000				
log ₁₀ ENERGY	-0.28553 0.0003	-0.62096 <.0001	1.00000			
SERVICE GROWTH	0.07784 0.3325	-0.19815 0.0129	0.35940 <.0001	1.00000		
WSP	-0.31563 <.0001	-0.37711 <.0001	0.64770 <.0001	0.39121 <.0001	1.00000	
EDUCATION EXP.	-0.11194 0.1628	-0.18390 0.0211	0.39030 <.0001	0.31190 <.0001	0.32580 <.0001	1.00000

N=160

TABLE 2

*Unstandardized Coefficients for the Regression of the GINI Coefficient: Random Effects Model
Estimates for 160 observations on 77 countries (1980-1995)*

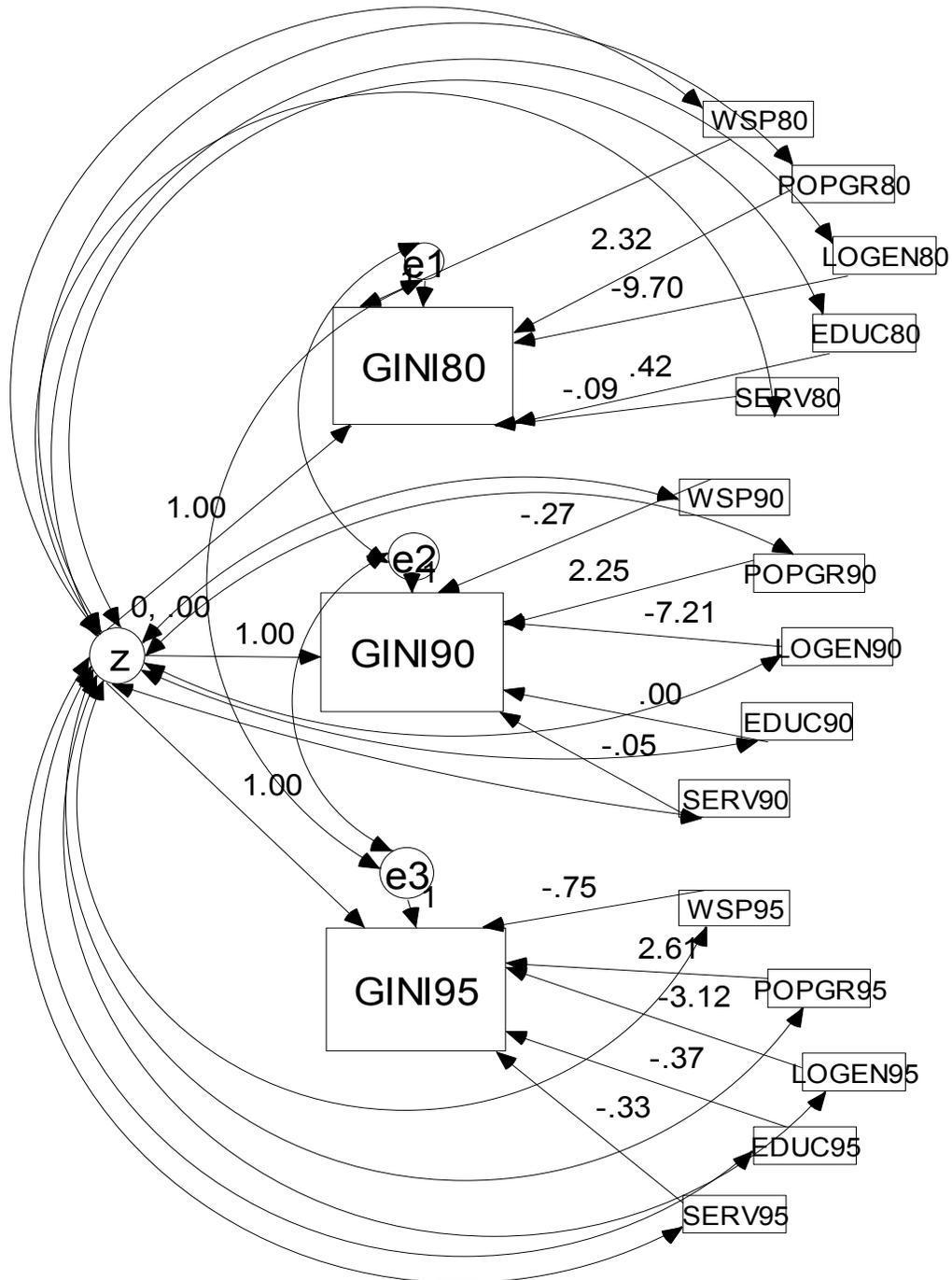
Variable	Model A (controls)	Model B (ServiceSector)	Model C (WorldSystem)	Model D (Redistribution)	Model E (Interaction)
-2 Log Likelihood	1048.3	1048.2	1038.9	1038.8	1039.0
AIC	1052.3	1052.2	1042.9	1042.8	1047.7
Intercept	34.28***	30.86***	16.00	16.09	15.64
Population Growth	3.72*** (0.76)	3.90*** (0.74)	4.25*** (0.73)	4.26*** (0.74)	4.40*** (0.72)
log ₁₀ ENERGY	0.12 (2.72)	-0.81 (2.73)	4.06 (3.04)	3.96 (3.10)	3.94 (3.02)
Service Value Added		0.12* (0.06)	0.11 (0.06)	0.11 (0.06)	0.14* (0.06)
World System Placement Index			-1.08** (0.34)	-1.08** (0.34)	2.20 (1.43)
Education Expenditure				-0.069 (0.40)	-0.21 (0.40)
ServiceValue*World System					-0.06* (0.02)

Note: N=160

Table entries are unstandardized (metric) regression coefficients (standard errors of estimates are in parentheses). *indicates $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

FIGURE ONE

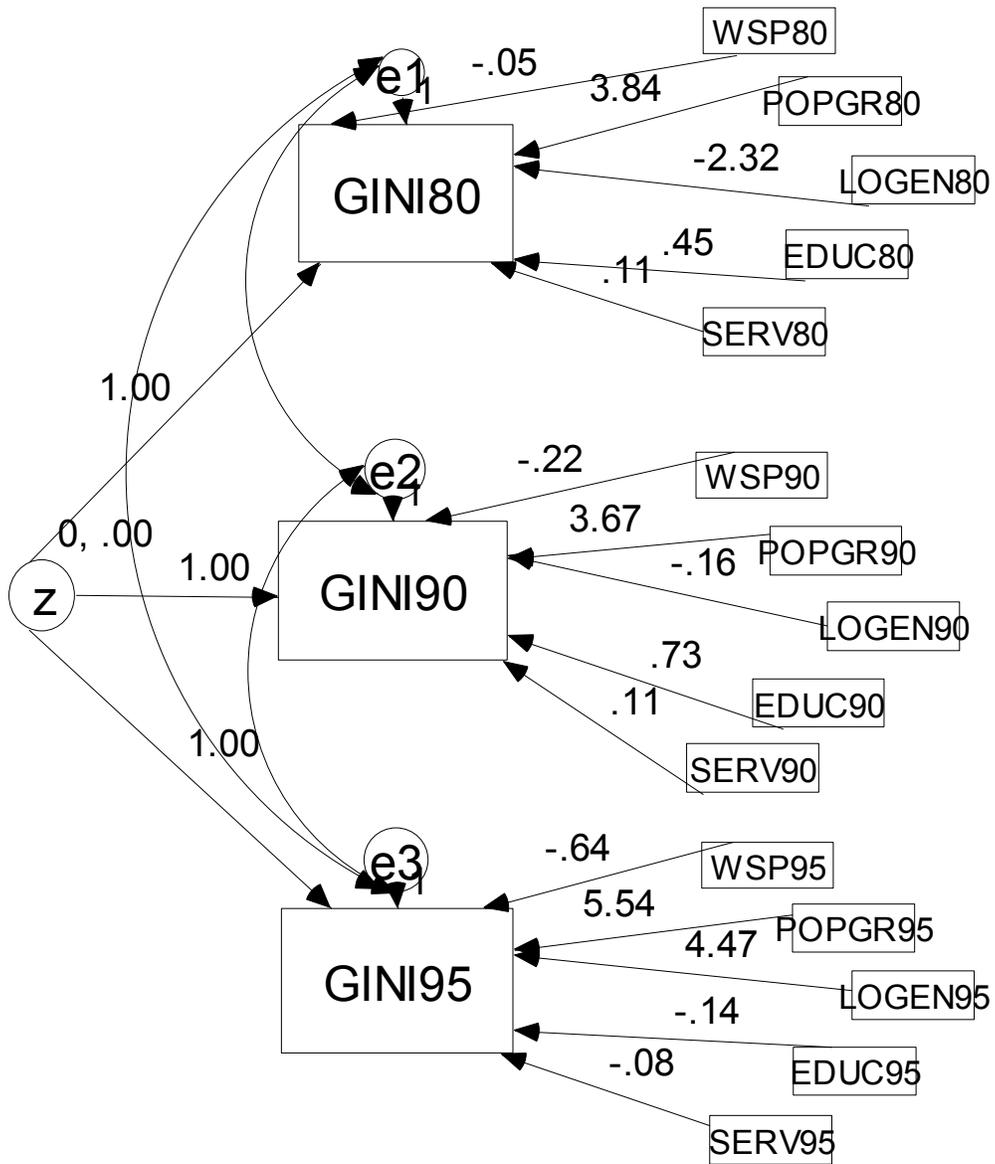
Structural Equation Model Indicating a Fixed Effects Analysis



Note: Chi-square = 328.371 (p=0.000 with 106 df), RMSEA = 0.147, AIC = 494.371

FIGURE TWO

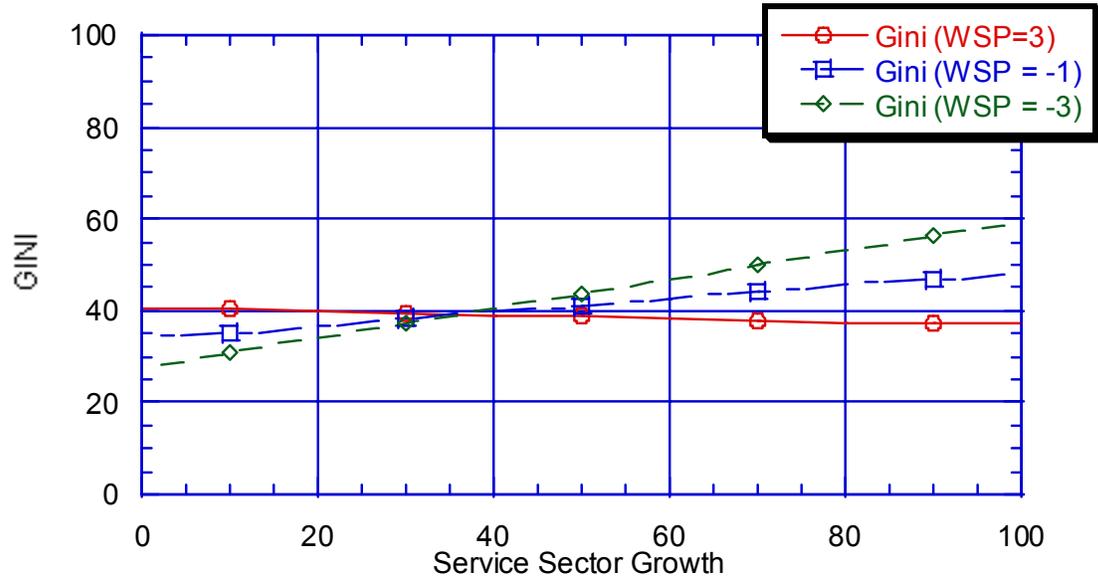
Structural Equation Model Indicating a Random Effects Analysis



Note: Chi-square = 371.168 (p=0.000 with 120 df), RMSEA = 0.148, AIC = 509.168

FIGURE THREE

Conditional Effects of Service Growth on GINI Coefficients



Appendix A: List of Countries Used in Analysis

Algeria Argentina Australia Austria Azerbaijan Bangladesh Belarus Bolivia Brazil Bulgaria
Cameroon Canada Chile China Colombia Costa Rica Croatia Czech Republic Dominican
Republic Ecuador Egypt, Arab Rep. El Salvador Estonia Ethiopia France Gabon Ghana Greece
Guatemala Honduras Hungary India Indonesia Iran, Italy Jamaica Jordan Kazakhstan Kenya
Korea, Rep. Kyrgyz Republic Latvia Lithuania Malaysia Mexico Moldova Morocco Nepal
Nicaragua Nigeria Pakistan Panama Paraguay Peru Philippines Poland Romania Russian
Federation Senegal Slovak Republic South Africa Spain Sri Lanka Tanzania Thailand Trinidad
and Tobago Tunisia Turkey Ukraine United Kingdom Uruguay Uzbekistan Venezuela, RB
Vietnam Yemen, Rep. Zambia Zimbabwe

Appendix B: List of World System Placement Index scores

1	Argentina	1995	-4.81030	56	Colombia	1995	-1.04712
2	Mexico	1995	-4.55668	57	Morocco	1995	-0.97514
3	Jamaica	1980	-4.23460	58	Kyrgyz Republic	1995	-0.92813
4	Zambia	1995	-4.14140	59	El Salvador	1990	-0.90533
5	Trinidad and Tobago	1990	-3.68190	60	El Salvador	1995	-0.86815
6	Argentina	1990	-2.74235	61	Thailand	1980	-0.86562
7	Venezuela, RB	1990	-2.67894	62	Colombia	1980	-0.85445
8	Turkey	1980	-2.55246	63	Vietnam	1990	-0.84990
9	India	1990	-2.49483	64	Indonesia	1980	-0.83308
10	Bangladesh	1990	-2.48138	65	Dominican Republic	1995	-0.83275
11	Zambia	1980	-2.44187	66	Jamaica	1990	-0.83224
12	India	1995	-2.44044	67	Kenya	1980	-0.82886
13	Ghana	1990	-2.40665	68	Sri Lanka	1990	-0.81983
14	Bangladesh	1980	-2.36477	69	Colombia	1990	-0.81919
15	Algeria	1995	-2.35079	70	Dominican Republic	1980	-0.79287
16	India	1980	-2.33079	71	Mexico	1980	-0.76184
17	Ghana	1995	-2.32295	72	Turkey	1990	-0.73322
18	China	1980	-2.31412	73	Philippines	1990	-0.72973
19	Pakistan	1995	-2.26366	74	Brazil	1980	-0.70875
20	Peru	1990	-2.24377	75	Cameroon	1980	-0.67839
21	Ethiopia	1995	-2.21379	76	Paraguay	1980	-0.67309
22	Mexico	1990	-2.16661	77	Ecuador	1990	-0.65561
23	Nepal	1980	-1.93747	78	Philippines	1995	-0.64362
24	Senegal	1995	-1.87335	79	Romania	1990	-0.62908
25	Morocco	1980	-1.83858	80	Jamaica	1995	-0.61813
26	Russian Federation	1995	-1.83306	81	Egypt, Arab Rep.	1990	-0.60039
27	Pakistan	1980	-1.79496	82	Uruguay	1990	-0.58113
28	Peru	1980	-1.78503	83	Uzbekistan	1995	-0.57451
29	Bolivia	1990	-1.75770	84	Sri Lanka	1980	-0.56321
30	China	1990	-1.73364	85	Chile	1980	-0.53288
31	Philippines	1980	-1.67480	86	Honduras	1995	-0.52348
32	Zambia	1990	-1.67332	87	Panama	1995	-0.52164
33	Pakistan	1990	-1.63617	88	Guatemala	1980	-0.52148
34	Senegal	1990	-1.59854	89	Kazakhstan	1995	-0.45434
35	Brazil	1995	-1.52825	90	Tunisia	1995	-0.43516
36	Guatemala	1995	-1.50963	91	Turkey	1995	-0.35700
37	Nepal	1995	-1.50702	92	Jordan	1995	-0.34665
38	Sri Lanka	1995	-1.41392	93	South Africa	1990	-0.34213
39	Yemen, Rep.	1995	-1.40313	94	Bulgaria	1995	-0.30929
40	Algeria	1990	-1.38674	95	Nicaragua	1990	-0.30192
41	Kenya	1995	-1.34075	96	El Salvador	1980	-0.29554
42	Tanzania	1990	-1.32952	97	Nigeria	1995	-0.28990
43	Iran, Islamic Rep.	1980	-1.32240	98	Honduras	1980	-0.17458
44	Egypt, Arab Rep.	1995	-1.29616	99	Poland	1995	-0.14229
45	Zimbabwe	1990	-1.28787	100	Hungary	1990	-0.13367
46	Indonesia	1995	-1.23341	101	Nicaragua	1995	-0.11297
47	China	1995	-1.23158	102	Costa Rica	1980	-0.07236
48	Panama	1990	-1.21803	103	Uruguay	1995	-0.04958
49	South Africa	1995	-1.21568	104	Paraguay	1995	-0.04532
50	Kenya	1990	-1.19019	105	Nigeria	1990	-0.04027
51	Guatemala	1990	-1.13334	106	Argentina	1980	0.00668
52	Morocco	1990	-1.12592	107	Vietnam	1995	0.12768
53	Chile	1990	-1.12274	108	Ukraine	1995	0.21273
54	Ecuador	1995	-1.06179	109	Slovak Republic	1995	0.21930
55	Indonesia	1990	-1.05748	110	Paraguay	1990	0.27872

Service Sector and Income Inequalities 41

111	Venezuela, RB	1980	0.29596
112	Thailand	1995	0.41843
113	Chile	1995	0.42830
114	Moldova	1995	0.44707
115	Azerbaijan	1995	0.50340
116	Latvia	1995	0.51607
117	Korea, Rep.	1980	0.57874
118	Thailand	1990	0.62676
119	Tunisia	1990	0.63034
120	Lithuania	1995	0.63251
121	Costa Rica	1995	0.67390
122	Croatia	1995	0.71083
123	Slovak Republic	1990	0.71159
124	Gabon	1980	0.80856
125	Uruguay	1980	0.83984
126	Belarus	1995	0.84543
127	Bulgaria	1980	0.88656
128	Hungary	1995	0.95710
129	Costa Rica	1990	1.13427
130	Panama	1980	1.15262
131	Tunisia	1980	1.16985
132	Bulgaria	1990	1.37618
133	Hungary	1980	1.41852
134	Trinidad and Tobago	1980	2.20710
135	Jordan	1980	2.29555
136	Korea, Rep.	1990	2.42528
137	Malaysia	1980	2.52817
138	Estonia	1995	2.58434
139	Czech Republic	1995	2.93419
140	Jordan	1990	2.93560
141	Greece	1990	3.03140
142	Spain	1995	3.11396
143	Korea, Rep.	1995	3.12031
144	Greece	1995	3.16390
145	Italy	1990	3.77575
146	Italy	1995	4.21832
147	Malaysia	1990	4.34183
148	Australia	1990	4.36165
149	Australia	1995	4.76791
150	Malaysia	1995	4.85744
151	United Kingdom	1990	4.96971
152	United Kingdom	1995	5.02046
153	Canada	1990	5.71382
154	France	1990	5.91287
155	France	1995	6.16237
156	France	1980	6.44701
157	Austria	1990	6.88602
158	Austria	1995	6.97086
159	Canada	1980	7.51162
160	Austria	1980	7.6269