Parental Wealth & Social Mobility:

The Impact of Wealth Inequality and the State on

Intergenerational Income Mobility

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Abstract

Equality of opportunity is a notion rooted in many societies as a conception of importance. The idea that one's life chances ought to be unrelated to the aspects of one's background upon which one has no say, such as the material wealth of one's parents, is generally one that is widely held. The term 'Intergenerational income mobility', describing, as it does, the interrelatedness of the incomes of parents with those of their children, is thus too a conception of some importance. Recent studies, looking at cross-sectional income inequality across a range of – primarily advanced – nations, have established a link between income inequality and intergenerational income mobility, suggesting that countries with high income inequality tend also to exhibit lower rates of mobility. With there existing increased attention upon wealth in recent times, and the importance of its magnitude and unequal distribution, this paper sets out to discern the nature of the relationship between wealth – as another marker of material well-being – and intergenerational income mobility, in high-, low-, and middle-income countries. Using mediating factors, state type and the wealth-income ratio, this study finds that wealth inequality is negatively correlated with intergenerational income mobility in high-income countries, and that the results for low- and middle-income countries are, as yet, unclear.

Keywords: Wealth Inequality, Intergenerational Income Mobility, State Typology, Wealth-Income Ratio, Intergenerational Earnings Elasticity

List of Abbreviations

The following are the sum of shortenings, contractions, initialisms and acronyms contained in the forthcoming thesis.

/cap.	–	per capita
BLUE	–	Best Linear Unbiased Estimator
exp.	–	expenditure
fig.	–	figure
GDP	–	Gross Domestic Product
Gini	–	Gini coefficient
govt.	–	government
IGE	–	Intergenerational earnings elasticity
N.	–	Number of Observations
NI	–	National Income
OECD	–	Organisation for Economic Co-operation and Development
OLS	–	Ordinary Least Squares
R^2	–	R Squared
SD	–	Social Democratic
S.E.	–	Standard Error
USD	–	United States Dollar
VIF	–	Variance Inflation Factor
W/Y	–	Wealth-Income Ratio

Country Codes & Income Classifications

The proceeding country codes correspond with those attributed to the given nations by the International Organisation for Standardization (ISO) (2016); they are listed below in alphabetical order (by code). The income groups are of the author's own designation, based, in part, upon the per capita income data of the World Bank (2016a) – though World Bank income group classifications are not used, for reasons described in unit 'a' of the notes section (A3) of the appendix.

Country Code	Country Name	Income Group
ARG	Argentina	Upper Middle Income
AUS	Australia	High Income
BRA	Brazil	Upper Middle Income
CAN	Canada	High Income
CHE	Switzerland	High Income
CHL	Chile	Upper Middle Income
CHN	China	Lower Middle Income
DEU	Germany	High Income
DNK	Denmark	High Income
ESP	Spain	High Income
FIN	Finland	High Income
FRA	France	High Income
GBR	United Kingdom	High Income
ITA	Italy	High Income
JPN	Japan	High Income
KOR	Korea (Republic of)	High Income
MYS	Malaysia	Upper Middle Income
NOR	Norway	High Income
NPL	Nepal	Low Income
NZL	New Zealand	High Income
PAK	Pakistan	Low Income
PER	Peru	Lower Middle Income
SGP	Singapore	High Income
SWE	Sweden	High Income
USA	United States of America	High Income

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1. Introduction

Few are the subjects in the disputatious spheres of social science that are without contention. The nature of economic inequality, its significance and just what – if anything – should be done about it, are all matters of no little contestation. Far less in dispute, across the spectrum of countervailing economic and socio-political ideologies is the principle that equality of opportunity is important, quite apart from inequality of outcomes that may result. This 'appeal to fairness' is based on the meritocratic notion that an individual's life chances, in material terms, ought to depend on their own aptitudes and application rather than on that of their forebears (Jäntti and Jenkins 2015, 815); equality of opportunity implies that inequities of outcome are inexcusable when they are the result of differential circumstances (Corak 2006, 153). There exists too an economic rationale for equality of opportunity, one that is based upon the inefficiency that the misallocation of human skills and aptitudes presents, as well as the diminution of productivity that the demotivation of inopportunity may bring (OECD 2010a, 184).

As an – albeit imperfect – indicator of equality of opportunity and the veracity of notions of societal meritocracy, social mobility is therefore a commodity of value, and it is agreed, with some measure of unanimity, that social mobility should be high (Piketty 2000, 431). The term social mobility describes the movement of an individual, dynasty, or other such grouping, between strata in a given hierarchical order or mode of stratification. The field of social science from which the interpreter of the term hails may heavily influence the precise meaning and means of analysis of social mobility. For sociologists, whose research on social mobility pre-dates that of economists, social mobility is often – but not solely – characterised by demarcation along class lines and in terms of educational or occupational attainment, whilst economists are, in the first instance, concerned with earnings and incomes (Esping-Andersen 2004, 290). Ergo, the titular expression 'intergenerational income mobility' refers, broadly, to the relationship between the income of parents and the income their progeny will attain as adults – movements in income *between* generations. The relative mobility of societies is dependent upon the interrelatedness of the income of parents and those of their offspring, with immobile societies being those in which the transmission of income advantage – and indeed disadvantage – is most prevalent, and persistence in earnings most ubiquitous; the inverse is, naturally true of mobile societies.

Independently and in unison, inequality and social mobility have, in recent times, gained a good deal of prominence in both academic discussion and the public sphere. As a

reflection of and indeed source of this, recent studies into intergenerational income mobility and income inequality, seem to indicate, with a high degree of consensus, that higher income inequality is correlated with lower intergenerational mobility – a relationship that has been called the 'Great Gatsby Curve' – with intergenerational earnings mobility low in countries with high inequality, such as Italy, the United Kingdom, and the United States, and far higher in the Nordic countries, where income is more evenly distributed (Corak 2013a).

While these studies are certainly of great interest and indeed value, there exists – it is my contention – a deficit in attention on the effects of *wealth* on inequality generally, and on the effect of wealth inequality on social mobility, *specifically*; "fewer empirical contributions have studied and detected associations between the wealth position of families and the labor [sic] market outcomes of young adults, such as earnings" (Pfeffer and Hällsten 2012). Though income is likely the main component of the intergenerational correlation of material well-being, wealth is likely a "very powerful transmission mechanism", and "any useful theory of intergenerational mobility must address this fact" (Piketty 2000, 446)

Studies of a number of – primarily advanced – economies, the most notable of which is Thomas Piketty's *'Capital in the Twenty-First Century'* – taken together with the broader research agenda of Piketty, his co-authors and others – have, if not popularised, then propagated the notion that wealth and its unmitigated transmission has, in the post-war period – as for much of history – played the preponderant role in increasing material inequality, above income, because the rate of return on capital has tended to exceed the rate of economic growth and, with low demographic growth – particularly in advanced economies – meant that quasi-stagnation has led to accumulated wealth inevitably acquiring disproportionate importance (Piketty 2014, 166); perhaps 'giving the lie' to the notion that "modern economic growth has led to the rise of human capital, the decline of inheritance, and the triumph of meritocracy" (Piketty 2011). Furthermore, with many making global projections of low rates of productivity and demographic growth in the very long run, ceteris paribus, inherited wealth will matter everywhere, coming to dominate new wealth accrued by labour earners, in the manner that it did under nineteenth-century-capitalism (Ibid.). Regardless of the verisimilitude of this assertion, wealth is likely an important aspect of the intergenerational transmission of earnings that is, currently, relatively neglected.

With all of the preceding in mind, it seems apt, therefore, to begin focussing greater attention upon the importance of wealth and its unequal distribution, in the determination of social mobility in modern societies, in a manner distinct from the analysis of income inequality and its social mobility implications.

2. Research Significance, Aims & Objectives

As stated in the introduction, previous studies have predominantly been concerned with the effects of *income inequality* on intergenerational earnings mobility denoted in *income* terms, with but a few – Clark & Cummins (2015), for example – directed at *wealth inequality*'s effect on *wealth* mobility; when one considers the role that wealth plays in enhancing individuals' material well-being, particularly over their lives' course, and the fact that, as aforementioned, wealth plays and is forecast to play an ever-increasing role in the economic prospects of individuals, relative to income (Piketty 2011), it seems remiss to leave unconsidered *wealth's* impact on *income* and income mobility over generations. This is a relatively unexplored area of research, which this thesis aims to illuminate.

That high levels of wealth inequality, with unmitigated transmission, should lead to greater persistence in income is, intuitively, quite conceivable. If there exist any advantages to be gained for children – in terms of education, health, opportunities, et cetera – from any advantages in material wealth – and most would agree, anecdotally, that there appear to be (in most every context) – it is rather feasible that places in which wealth is highly inequitably distributed, may exhibit lower rates of income mobility, due to the intergenerational transmission of advantage that wealth provides.

Now, this is all well and good, intuitively, however, it remains to be established empirically. The notion must be established empirically for wealth inequality in the same manner in which the Great Gatsby Curve (henceforth referred to as the 'Income inequality-IGE curve') has been for income inequality; it may be quite reasonable to make pronouncements about the increasing importance of wealth in Western societies and the increase in wealth inequality that has accompanied it – as Piketty and others have done –it is quite another, though, to 'sound the alarm' about wealth's possible future impacts on society without first confirming its deleterious effects, and then detailing the means by which this type of material advantage is transmitted intergenerationally. One curiosity, when one considers the possible relative impacts of wealth and income inequality, without any great depth of knowledge or analysis, is that "wealth inequality is much greater than income inequality" (Jones 2015), and generally high even in countries in which income inequality is low. The countries so crucial to establishing the Income inequality-IGE curve, the Nordic states, bear high rates of wealth inequality (Gini coefficients[1] of 91.9% for Denmark and

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[1] The Gini Coefficient is a statistical measure of aggregate inequality, in income or in wealth, which can range from 0 (perfect equality) to 1 (perfect inequality). It may also be given in percentage terms, as it is here (Todaro

81.4% for Sweden[2], for example), comparable to those at the other end of the income curve, so to speak – Switzerland and the United States (whose wealth Ginis are 81.7% and 83.9%, respectively). Therefore, any analysis of wealth inequality's impact on intergenerational income mobility must address this contradistinction.

This thesis identifies and explores two channels by which wealth inequality may affect intergenerational earnings persistence, in spite of the preceding (apparent) paradox. One of these is an established means, the typology of state regimes, the other is – though established in other contexts, novel in this field, and thus by mine own design – the wealth-income ratio (the relative size of a nation's stock of assets in comparison to its national income for a given year).

Whilst wealth inequality is hypothesised to increase intergenerational earnings persistence, the state may have a key role in mitigating or exacerbating persistence by shaping the milieu in which inequality may impact intergenerational earnings mobility. Countries exhibiting near-identical levels of wealth inequality may display vastly different levels of social mobility, purely as a result of the way in which the given states' fiscal and social policies affect the factors governing the potential impacts of wealth and indeed income. A typology of states will be utilised in assessing the veracity of the theoretical proposition that the nature of states' regimes may bear a preponderant influence on rates of social mobility in certain nations which, ceteris paribus, would bear rates of intergenerational earnings mobility that are somewhat more immobile.

The second mediating factor, of particular importance to the wealth inequality, is the wealth-income ratio. As a direct indicator of the degree to which wealth dominates income in an economy, wealth-income ratios, for reasons to be explored, are given to mediate the extent of wealth inequality's impact upon intergenerational earnings persistence. As with state types, the wealth-income ratio is hypothesised to be a factor in the existing contradistinction of wealth inequality and income mobility in certain contexts.

Implicit in the aforementioned précis of the current academic economic social mobility canon is the notion that such dynamics are largely restricted to the rich and

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[2] These figures, and the following Swiss and US Ginis, are six-year averages, the provenance of which may be found in table A1 of the appendix.

'developed' nations[3] of the world. This is in large part a result of the relative paucity of long-run household-level economic data available for 'developing countries' and, perhaps, an attendant predisposition for the study of the developed in preference to the 'developing world' – itself a cause of relatively poorer data availability. With the devotion of a sentence or so to their concession, the standard refrain in studies of intergenerational earnings mobility – barring those for whom developing countries are the sole concern – is that *'the study in question is concerned with the dynamics of rich countries, and that those of poorer will be necessarily different',* seemingly a result solely of the features that characterise their comparative economic 'weakness'. This study aims at some measure of redress; the proceeding will investigate, with the same empirical rigour, whether intergenerational earnings mobility – as much a concern in the developing world as the developed – bears the same basic transmission dynamics in low- and middle-income countries, in spite of the numerous economic, socio-political and demographic differences that exist. All that said, it remains a source of some regret that no African nation states could be included in this study; unfortunately, essential – methodologically compatible – mobility data could not be found for any African nations, therefore, in the minority of low- and middle-income countries included in this study, there exist none from the African continent.

Therefore, the above considered, this thesis aims to analyse the impact the distribution of wealth (wealth inequality) has upon intergenerational earnings mobility (social mobility), taking into account the relative weight or importance of wealth in a society, and the influence archetypal state types have on the association of wealth and income mobility over a generation, along with a brief exploration of the theoretical schema underlying. If the association is proved, the theoretical mechanisms by which wealth inequality may interact with income mobility are not this primary concern. The establishment of the relationship is, in itself, a substantial undertaking, and the task of potentially formulating an original theoretical basis for the relationship quite another. The latter of the tasks lies slightly beyond the delimitations of this thesis, therefore, an attempt at establishing the association between wealth inequality and income mobility will be made, before a brief analytical effort to see

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[3] Recognising that the terms developing and developed countries are in themselves contentious and arguably a dissatisfactory binary division, they are nevertheless necessary, for purposes of simplicity (with a typology already grouping countries, a further, non-binary division, would prove unhelpful to proceedings, both methodologically and analytically). Therefore, in the main, in this study there is no distinction made between low-income countries and 'emerging economies'/'middle-income countries. For the purposes of this paper, countries are first divided into income groups (to be found on page four of the text) according to per capita income, before being further grouped into developing and developed categories (high income into the developed and low- and middle-income into the developing.

where it might fit within the existing, prevailing, theoretical paradigm of transmission – human capital investment theory (to be explained shortly).

Below, in more concise terms, are the main questions this thesis seeks to answer:

I. Is wealth inequality negatively correlated with income mobility?

II. Does the degree to which wealth dominates income in an economy (using wealth-income ratios as an indicator) mediate the extent to which wealth inequality affects income mobility?

III. Do certain state types of amplify or mitigate the preceding dynamic?

IV. Do low- and middle-income (developing) countries adhere to or depart from dynamics traditionally observed in high-income (developed) countries?

3. Theoretical & Conceptual Framework

Before proceeding to address the stipulated aims of the study, it is important to say a little more about the key concepts and underlying theories, upon which this study is focussed. In the course of this, existing literature, pertinent to the relevant subject matters, shall duly be explored.

3.1. Wealth

3.1.1. What is Wealth?

Based in part on the definition of Piketty (2014), wealth is, in this study, defined as the total market value of all tradeable assets owned by the residents of a given country at a given point in time. It is the sum total of nonfinancial assets (including land, buildings, commercial inventory, machinery, etc.) and financial assets (bank accounts, stocks, bonds, pension and mutual funds, etc.), minus total liabilities (debt) (Piketty 2014, 47-48). Financial assets are, in general, consistently more significant in the wealth portfolios of the rich than they are for the remainder of the population. Homes and land are the predominant middle-class assets and, with the poor too impoverished to own real estate, durable consumption goods and cash comprise the wealth of those at the bottom of the wealth distribution (Roine and Waldenström 2015, 544).

I have chosen to consider only the assets and liabilities of private individuals, ergo wealth, for the purposes of this study, is in fact private wealth. Public wealth is, in most countries relatively insignificant (indeed negative, in many cases), thus "private wealth accounts for nearly all of national wealth almost everywhere" (Piketty 2014, 48). Additionally, as the purview of this treatise is the putative impact of familial wealth, the use of private wealth seems both logically and intuitively sound.

As a simplification, where the word should appear, 'capital' is used interchangeably with 'wealth', as though they were wholly synonymous[4]; hence, private capital is equated to private wealth, financial capital with financial wealth, and so on. Human capital is excluded from this conception of wealth, though it is given to hold a rather important role in the

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[4] This is an area of some contention, with many, such as David Weil (2015) questioning Piketty's definition of wealth being based on tradeable assets alone, excluding such sources of wealth as human capital and public transfer wealth. The definition proffered in this paper is not a conscious effort nor dogmatic decision to enter this debate but a reflection of this study's disposition and primary concern, which is the influence of those assets available to households, as well as a personal partiality for simplicity in such matters as are not of immediate pertinence.

intergenerational transmission of economic advantage – the precise details of which are to be explored in sub-section 3.3.3. This seems as good a point as any to clarify another point of order – of which one may already have taken note. Thenceforth, and indeed previously, to allay confusion, earnings and income shall be used interchangeably to refer income drawn from labour[5], unless it is explicitly stated that the income in question is that derived from wealth (capital income) or that income is inclusive of capital income.

Returning exclusively to the subject of wealth, the most common sources of wealth data are estate tax returns (probate records), wealth tax returns, the investment income method (using capital income and an assumed or observed net rate of return), household surveys, and journalistic rich lists. The most reliable of these, with respect to the exploration of long-run changes in wealth distribution, is estate records (Roine and Waldenström 2015, 512). Unfortunately, they are relatively few for most countries over time, so wealth distribution data from this source is utilised where available but is predominantly drawn from historical estimates based on survey data, compiled and published by the research institute of the international bank and wealth management institution Credit Suisse, in their annual 'Global Wealth Reports' (2010-2015). Theirs are reports of some renown and, furthermore, are compiled by some of the most prominent academics currently writing on the subject of wealth, including but not limited to James B. Davies and Anthony Shorrocks.

3.1.2. Wealth Inequality

Wealth inequality describes the unequal distribution of wealth, as it is previously defined, amongst a given population. The wider is the distribution between the rich and poor of a populace, the higher wealth inequality is. The wealth distribution is assessed by estimating the wealth share held by various fractions of the population, by dividing the observed top wealth holdings for specific fractiles by a reference total for all private wealth in an economy (Roine and Waldenström 2015, 517). The group most consistently represented in tax listings throughout history are the rich in any given populace, thus they are the most homogenously

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[5] The terms 'income' and 'earnings' have thus far also been used rather synonymously, though in this context they are perhaps less suited to synonymy even than capital and wealth. Some scholars, when writing on the subject, take great care to distinguish income from earnings because, in the former case, they refer to individuals' revenue stemming both from labour-income and capital income, whereas earnings is used to describe labour-income exclusively. Whilst it would seem important therefore, in the context of this paper, to make such a distinction also – dealing as one is with both labour and capital income – it is in fact not so imperative. The intergenerational earnings/income elasticity data utilised in the construction of this study hail from papers that refer to the term and the concept of income variously, but all take the statistic to refer to labour earnings or wage.

observed group over time and studying the top of the distribution and its wealth therefore means that almost all private wealth is being studied (Ibid.).

There are specific challenges associated with estimating top wealth shares, not limited to: the measuring of the reference total of net wealth of the whole population (wealth tax data typically only cover the top households that have paid wealth tax); different wealth data sources displaying the wealth distribution for different entities (tax data and surveys reflect the distribution of the living population, estate tax and probate reflect the distribution of the deceased – who are not a representative sample of the living population; and tax avoidance and evasion – the extent of which is unclear, and may differ for parts of the distribution, across time, and countries, making caution in comparison important (Ibid. 518-9). In this study, the measure of wealth inequality utilised is the wealth Gini coefficient, for it provides useful comparison with the income Gini, enabling their relative explanatory power to be more easily compared, both within this study, and in cross-comparability with those previous in the income mobility field. Additionally, as an indicator that measures across the distribution, it is perhaps more appropriate for these purposes than others, such as 'top decile share' (the overall percentage of wealth owned by the most wealthy tenth of the populace), as the study of income mobility is concerned with persistence at the *bottom* of the distribution, as well as the top.

3.1.3. The Wealth-Income Ratio

The wealth-income ratio is a measure of significance, for it signifies the overall importance of capital in a given society, and is a crucial component for understanding the impact of wealth inequality in a particular context. Its calculation is as simple as any to be found in the field of economics, consisting as it does of all prior accumulation of wealth (as a stock) divided by national income (a flow) for a given period (usually a year) (Piketty 2014, 50-51); the most apposite way to measure the stock of wealth in a particular country is to divide said stock by the annual flow of income. For the sake of brevity, the wealth-income ratio may, henceforth, occasionally be referred to in its notational form, W/Y.

The wealth-income ratio, consisting in part of national income, is dependent upon economic growth, which, in the long run, is dependent on demographic parameters (largely, fertility rates) and on productivity-augmenting factors (particularly the pace of innovation) (Piketty and Zucman 2015, 1345). A slowdown in growth, stemming from a decline in population or productivity growth will tend to lead to higher wealth–income ratios (Ibid.).

Countries with identical per capita GDP growth can end up with different wealth-income ratios simply as a result of differing demographic growth rates, and vice versa (Piketty 2014, 166-7). Taking this into consideration, demographic and productivity factors are controlled for in the regressions undertaken in this study.

On the other side of the equation, the size of *wealth* may be dictated by price and or addition to its volume. Irrespective of the reason for its increase[6], the relative volatility of asset prices – in comparison to consumer prices – means that the value of a nation's private wealth may be prone to fluctuations that make analysis of wealth's comparative import difficult to assess, across space, if single-year measures are used. Controversies such as the famous Kotlikoff–Summers–Modigliani (KSM) controversy, wherein estimates of a variable for only a single year produced wildly contrasting results, bear testimony to that (Piketty and Zucman 2015, 1328). Thus, the wealth-income ratio ought to be observed over some years or a decade or more, rather than a year or two (Piketty 2014, 169). Therefore, wealth-income ratios, in this study, are averaged over fifteen years. A more fulsome explanation of their provenance and calculation may be found in sub-section 4.1.3. of the chapter entitled 'Methodoloy'.

3.2. Social Mobility

Broadly speaking, the study of intergenerational mobility involves the measurement of a single bivariate joint distribution of income, across time, in a given polity, in order to pronounce on the degree of mobility (Jäntti and Jenkins 2015, 808). As detailed in the introduction, greater mobility is deemed socially desirable because equality of opportunity is a principle that is widely supported, irrespective of attitudes to inequality of outcomes. However, intergenerational earnings mobility does not, in itself, provide a perfect measure of equality of opportunity but is in fact merely a measure of labour market success, the influences on which parental prosperity is but one.

The extent that intergenerational earnings mobility is a direct measure of equality of opportunity rests on the notion that the advantages associated with parental background are

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[6] There is a contentious debate, amongst Piketty and Rowthorn (2014) and others as to whether increased wealth-income ratios of recent times result from volume effects – an increase in the capital share of national income – or from price effects – secular increases in asset prices. The truth of this is reasonably unimportant for our purposes; that wealth has increased relative to income, and that individuals and family units experience the psychological effects and attendant economic implications of this is what is important.

entirely summarised by parental income (Ibid. 815). Labour market outcomes are also the result of other *non-economic* familial factors (social connections that facilitate access to education and jobs; family culture and investments that influence skills, beliefs and motivation; and the genetic transmission of ability) the elimination of which would require a degree of state intervention that citizens in most societies might find indefensible (Corak 2006, 153-4).

Additionally, social policies that promote equality of opportunity for certain groups may in fact result in closer association of parent-child incomes. Generational income elasticity (parent-child income association) rose for women post-war period in the United States and other countries, reflecting the fact that *privileged* women – among the first cohorts – were best-placed to seize new opportunities; a rise in elasticity (to be outlined shortly) reflected improvement, not decline, in equality of opportunity (Ibid. 154). Taken in conjunction with questions as to the lack of an optimal figure for earnings mobility, it becomes clear that care must be taken when considering intergenerational earnings mobility statistics.

That is not to diminish their utility entirely though; indices of inequality of opportunity are strongly correlated with indicators of generational mobility (such as earnings or in education), consequently, inequality of opportunity can be considered the link between inequality and intergenerational mobility – if higher inequality reduces mobility, it is likely because opportunities for economic advancement are unequally distributed (Corak 2013a). Therefore, intergenerational mobility statistics remain a fascinating and crucial indicator of the degree of 'fairness' and socioeconomic dynamics that exist in our variously equitable societies. What their interpretation requires is a more fine understanding of the workings of parental influence under specific labour market structures, and how they interact with and are shaped by the policies of the state. Though intergenerational income mobility may not capture social mobility in its entirety, it is, most likely, positively correlated with that which is immeasurable also.

That concession made, it seems wise, at this point to explore, in greater depth, the concept in question, intergenerational earnings mobility, with respect to its precise nature, and its theoretical and practical estimation.

3.3. Intergenerational Earnings Mobility

3.3.1. The Concept

As noted above, intergenerational earnings mobility is based upon the measurement of a bivariate joint distribution of income, across time. There exist observations for N individuals for two time periods, the first income distribution of which is x, and second distribution of which is y (for the second period); there is a bivariate joint density $f(x, y)$. Overall earnings mobility for the population may then be conceptualised as the transformation linking marginal distribution x with marginal distribution y (Jäntti and Jenkins 2015, 811).

Intergenerational earnings mobility is traditionally measured as the elasticity[7] between paternal earnings and a son's adult earnings; intergenerational earnings elasticity (henceforth denoted as IGE) – using data on a cohort of children born (approximately) during the early-to-mid 1960s and measuring their adult outcomes (Corak 2013a) – is estimated by applying least squares to the regression of a logarithmic[8] measure of son's earnings on a log measure of father's earnings, with controls for the ages of both sons and fathers (Solon 2002). This elasticity, IGE, refers to the fraction of income differences between parents that, on average, is observed among their offspring in adulthood. For example, if the incomes of two sets of parents differ by 100 percent and the incomes of their children differ by 70 percent, the generational persistence of incomes is said to be 70 percent, since this is the proportion of the difference in parental incomes that is passed on to their children; the intergenerational income elasticity of this nation would then be 0.7, which represents a rather large degree of persistence and relatively high immobility (Corak 2013a).

The estimates of intergenerational earnings elasticity that I have utilised in this study are derived, as with Corak (2006), (2013a), (2013b) and others, from methodologically comparable, published studies, which use nationally representative data, and correct for the measurement errors described by Solon (1992) and Zimmerman (1992) (to be elucidated in sub-section 3.3.4.). A complete list of intergenerational earnings elasticity data sources may be found in-text, in table 1a of sub-section 4.1.1.

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[7] Elasticity: The responsiveness of one variable to a change in another (Begg, Fischer and Dornbusch 2005, 48-61). In the case of IGE, elasticity is always positive, lying between zero and one.

[8] Logarithm: The power to which a given value (base) must be raised to obtain another particular value (Chiang and Wainwright 2005, 267-8).

3.3.2. The Model

As aforementioned, most income inequality-IGE studies have derived intergenerational earnings elasticity from a regression-to-the-mean model, usually as the least squares estimate of the β coefficient in the formula 1.1 (below), with Y representing 'permanent earnings' for individuals from dynasty i, across generations t and $t-1$. ϵ represents other influences on the child's adult earnings not correlated with parental income. The constant term, α, captures the trend in average incomes across generations, resulting from, changes in productivity, international trade, or technology, for example. In much of the literature, Y usually refers to the earnings of fathers and sons, avoiding the more complicated analysis necessary to address the changing role of women in the labour force (Corak 2013a). With literature on the father-son relationship far more abundant than those exploring parent-daughter association, the IGE statistics utilised in this paper hail from studies whose focus is on fathers-son earnings correlations, in order that the number of countries for which comparison can be made may be maximised.

$$Y_{i,t} = \alpha + \beta_{i,t-1} + \epsilon_i \qquad (1.1)$$

3.3.3. The Evidence

As noted in the introduction, research examining the relationship between intergenerational earnings mobility and income inequality suggests, with a high degree of consensus, that income inequality is negatively correlated with intergenerational income mobility. The relationship is often presented using a scatterplot, plotting the estimated IGE in different countries on the vertical axis and estimated income inequality (often close to the parental generation, *t-1*), on the horizontal, and adding a linear bivariate regression line (Income inequality-IGE curve) – the interpretation of which suggests that countries with higher income persistence are also those with greater inequality, and vice versa (Jäntti and Jenkins 2015, 889). This relationship could be reflective of national differences in the degree of upward mobility for sons born to low-income fathers, or differences in the 'stickiness' of intergenerational earnings for those born to top-income fathers (Corak 2013a).

This apparent empirical relationship can also be accounted for by various theoretical models, the most representative, prominent and commonplace of which is to be detailed presently. The vast majority of studies on income inequality and intergenerational economic

mobility, adopting or adapting the Becker and Tomes (1979) model of income mobility, base the theoretical underpinnings of the dynamics of intergenerational transmission upon human capital investment – due to the direct link between human capital, labour productivity and earnings (OECD 2010a). Reconciling the *intragenerational* – inequality *within* generations – with the *intergenerational* – income mobility *across* generations – they posit, on the understanding that parents both care about and have the capacity to influence the earnings capacity of their children, that parents duly allocate time and money between the binary alternatives of current consumption and investment in the human capital of their children – investments that will in turn augment their children's future earnings potential (Corak 2006, 156).

A simplified version of the model presented in Solon (2004), which itself adapted the classic model of Becker and Tomes (1979), the modelled budget constraint of a father from dynasty *i*, of generation *t–1*, bearing one son, of generation *t*, is presented in formula 1.2, below.

$$\Upsilon_{i,t-1} = C_{i,t-1} + I_{i,t-1} \tag{1.2}$$

The father must allocate his lifetime earnings $\Upsilon_{i,t-1}$ between his own consumption, $C_{i,t-1}$, and investment in his son's human capital, $I_{i,t-1}$ (Solon 2014). Without delving into the mathematical expressions by which they are derived, the above stipulation, along with numerous others, of lesser importance for these purposes, yields the conclusion that steady-state intergenerational earnings elasticity is a straightforward function four key factors/parameters: the strength of heritability of income-generating traits, the efficacy of investment in children's human capital, the earnings return to human capital, and the progressivity (of relatively greater benefit to the relatively less well-off) of public investment in children's human capital (Solon 2004, 46). The implications of this are clear: if a country has higher intergenerational income elasticity (displays less intergenerational mobility) than another, this may be a result of said country having stronger heritability, more productive human capital investment, higher returns to human capital, or less progressive public investment in human capital. As is natural with such a process, the preceding factors will also tend to increase income inequality (Ibid.).

Human capital investment is not comprised of monetary investments in education (particularly higher education) alone, but also of investments in the physical and mental

health of children as well as aspects of their social development (Corak 2006, 156). It is in the interaction between income inequality (which determines the extent of variance in human capital investment by parents within given nations), the earnings return on human capital/education (which tightens the link between parent and child incomes), and the progressivity of public investment in education (which loosens the parent-child income association) that the relative intergenerational earnings mobility of different nations is given to be determined (Solon 2004, 46). Simply put, greater levels of income inequality in certain nations enable the proportionally larger income-rich to make larger human capital investments in their children, which leads to greater intergenerational income persistence (lower social mobility), whilst more progressive state taxation and spending (which necessarily leads to lower income inequality) results in lower intergenerational income persistence. All of this is given to be mediated to a great extent by the educational system and policies which exist in a country, also of course the prerogative of the state, and arguably as reflective of the 'progressiveness' of states as their fiscal policy.

Therefore, broadly speaking, the reasons for differences in intergenerational elasticity across countries – in the income inequality model – result from differences in the balances struck between parents, the labour market, and the state in determining the life chances of children (Corak 2013a). If parents are able to exert sufficient influence on the prospects of their children, then it is only natural that, in contexts in which economic power is highly unequal, parental influence will result in earnings persistence, and further income disparity. The institutions of the state, the family, and the labour market determine the degree to which valuable labour market traits are transmitted between parents and children, the efficacy of private and public investments in generating human capital, and the labour market returns to human capital, all of which are given to be essential propagators of intergenerational income mobility (Ibid.).

In the Becker-Tomes model, upon which many subsequent studies are theoretically based, parents are able to borrow as much as is necessary to invest in their children's education, given certain expected future returns to said investment – in the form of their children's labour earnings (1979). This, of course, rather a grand oversimplification and there results a rather unrealistic assumption; in reality, family units experience credit constraints, upon which asset ownership, or wealth is a source of alleviation (Pfeffer and Hällsten 2012). This is indicative of one sense in which an augmented model, in which wealth is taken under consideration, may provide a more holistic picture through which to view the intergenerational income mobility process.

In order to measure, to some extent, the veracity of the human capital investment theory of income transmission, the regression analysis undertaken included variables directly related to or existing as proxies of the earnings return to human capital, and the progressivity and efficacy of public investment in children's human capital, as factors dictating the degree of intergenerational income mobility in societies[9]. These variables, and the *actual* nature of their reputed relationship with IGE are to be examined in the 'Analysis' chapter.

3.3.4. Data Issues & Measurement Error

The extreme stringency of data requirements inform many of the numerous issues involved in making estimates of intergenerational income mobility, and are the origin of a good deal of the potential inadequacies in such estimates. This is to the extent that Corak himself argues, "the most significant way to advance knowledge in this field involves the development of appropriate data" (Corak 2006, 147). The ideal data sets for intergenerational processes rarely exist. Representative longitudinal surveys that capture data from young people in their formative years and follow them through time, before obtaining information from them in adulthood, as well as measures of their parent's income do not exit currently (Ibid). Thus, information from other sources such as administrative sources (government programs), surveys, cross sectional surveys (containing retrospective information) are another, comparatively less optimal means of undertaking generational analysis (Corak 2006, 148). Moreover, and perhaps most crucially, it is "difficult to draw valid inferences about cross-country differences in generational income mobility by comparing independently completed studies" (Ibid.). In the past, estimates for individual countries have been so wide as to make international comparisons entirely questionable. Though results may differ between and within countries for substantive reasons, they may also differ because of a host of data and methodological decisions and measurement errors made by researchers (Ibid 149). It is for this reason that the selection of studies of relative methodological equivalence, which correct for the errors described imminently, is essential.

The first measurement errors concern data limitations related to observation numbers the ages at which paternal and progeny incomes are assessed. Lacking in lifecycle data,

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[9] The heritability of traits was held as being relatively consistent over such comparable countries as the analytical groupings produced. Genetic inheritance of ability affects the extent of intergenerational income mobility, but its effects are not likely to vary systematically between countries (Causa and Johansson 2009, 9).

researchers must content themselves with a few annual 'snapshots' of economic status for father-son pairs and, given these observations, try to construct an estimate of the father's and son's lifetime (or permanent) status; using short-term proxies, such as annual earnings, for lifetime economic status, results in estimates 'tainted' by transitory fluctuations. "This measurement error causes the variance of observed status to exceed the variance of permanent status, causing ordinary least-squares estimates of β to be biased downward" (Zimmerman 1992). Errors-in-variables bias could be expected to depress estimates of by more than 30 percent (Solon 1992). The complication of fathers and sons typically being observed at different stages in their earnings lifecycle could also bias estimates of β (Ibid.).

The most common empirical approach for resolving measurement error variance caused by transitory fluctuations is to take multi-year averages of parental income – an approach first used by Solon (1992) and Zimmerman (1992), and now customary in the literature – and the solution to variation in observation ages also rather simple: to use observations of filial income at similar points in their lifecycle as that of their father (Grawe 2006).

3.3.5. Other Approaches to Intergenerational Mobility

Sociologists tend, as has been mentioned, to pursue the study of social inheritance in a manner distinct from that of economists. For sociologists, the intergenerational transmission of advantage is important for what it says about the nature of social divisions and the role of heritability in propagating such structures, whilst economists are more concerned with equality of opportunity and labour market functions (Esping-Andersen 2004, 290). Sociologists and economists tend also to diverge methodologically, with economists preferring the familiar comfort of liner estimation of mean individuals, to sociologist's non-linear analysis of discrete categories of individuals (Ibid.). There even exists some contrast between the sociological and economic views regarding current directional trends in social mobility (Bukodi, et al. 2015). That said, the two approaches bear similarities in perhaps the most important areas, converging as they do in their primary mobility variables, occupational class (sociologists) and earnings (economists), which are of course very highly correlated, and in deeming education (human capital theory) the chief mediating variable in intergenerational mobility (Esping-Andersen 2004, 290-1).

Irrespective of countervailing aspects of similarity and dissimilarity, it is important to recognise that there exist a number of inadequacies in economic paradigms of

intergenerational transmission on which sociological viewpoints may be of use. When one considers that, in most countries, much of the inequality increase of recent times is driven by changes within the top strata of the income distribution, it suggests that an explanation of increasing inequality and the intergenerational transmission of top incomes must include a mechanism that confers an increasing income advantage *within* the very top groups, for whom educational differences – and the premiums granted therein – are few (Roine and Waldenström 2015, 557; 567). This is something the *income inequality-income mobility* paradigm arguably does not currently provide for. These non-linearities, within discrete groups and indeed between them (downward mobility from the top of the earnings distribution is far less likely than upward mobility from the bottom) (Esping-Andersen 2004, 292), may in part be explained by the effects of class, neighbourhood, and social network associations, and 'cultural capital' explanations of which sociological practitioners of social mobility research are more fond (Ibid.). Though perhaps immeasurable by purely economic means, the preceding are arguably more closely entwined with wealth associations than that of income (Savage 2015).

The point remains though, the utilisation of various sociological conceptions and methods may be crucial if scholars on the economic side of intergenerational mobility research are to gain as fulsome an understanding of the means of transmission as they would hope. Which leads us rather nicely to a stalwart of sociological research used in the completion of this study, the comparative typology of states.

3.4. The State

3.4.1. State Typologies & Mobility Regimes

The term typology refers to a classification of entities according to a fixed set of properties or variables (Capecchi 1968). The grouping of countries according to a given set of characteristics is a useful analytical, and indeed statistical tool, with which to prise apart seemingly impenetrable or chaotic conceptions and draw forth explanation and meaning.

Gøsta Esping Andersen's seminal regime typology, based upon a comparative historical analysis of social policy development in 18 OECD countries, asserts that the degree of decommodification – "the degree to which individuals, or families, can uphold a socially acceptable standard of living independently of market participation" (Esping-Andersen 1990,

37) – and the kind of social stratification fostered by social policies, are the key to understanding the three distinct regimes[10] and welfare models that result: the Liberal (Anglophone countries), the Conservative/Corporatist (continental Europe and Japan), and the Social Democratic (Scandinavian) regimes (Ibid.).

The construction of this typology of welfare regimes and the grouping of countries on these terms was extremely influential and has heavily influenced the manner in which studies such as this one may be conducted, however, this particular typology is not beyond reproach and has received heavy criticism for the omission of states, hybrid cases and exceptionalism of other still other cases (Ebbinghaus 2012), however, it provides a fine basis or starting-point for the construction of a typology that, in conjunction with another fitting typology – DiPrete's classification of intragenerational mobility regimes, which relies on an examination of the role of public and private social insurance (DiPrete 2002) – may be the bed upon which analysis of wealth and social mobility interactions may rest. The names of the regime types originally tendered by Esping-Andersen – Liberal, Conservative, and Social Democratic – shall however be adopted in this study.

The typology of states will be utilised in assessing the veracity of the theoretical proposition that the nature of states' regimes may influence rates of social mobility given levels of wealth inequality in certain nations which, ceteris paribus, would bear rates of intergenerational earnings mobility that are somewhat more immobile. As one has perhaps already considered, it might be considered foolhardy to apply typologies and generalised findings from advanced, open economies to 'less developed' contexts (Ebbinghaus 2012), so, to avoid the prohibitively difficult task of assigning ill-fitting categorical labels to developing countries and (inadequately) statistically controlling for economic differences, while continuing to be unable to control for the many likely societal ones, the decision has been made to create a fourth – rather unsatisfactory – grouping, simply – and rather unimaginatively – entitled 'Developing countries'. While there exist a good many theoretical and analytical reasons not to group these states such, given the multiplicity of state roles

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[10] Liberal regimes are characterised by market provision of social benefits and services, with the state providing support only to those who cannot support themselves in the market. State-provided benefits tend to be modest and restricted, with strict eligibility requirements, and there is an active encouragement of private welfare schemes. This regime is only weakly decommodifying (Danforth 2014). Conservative regimes are those in which primacy is given to the family, in the provision of support, with the state intervening only if a family's capacity to fulfill basic needs is undermined. Most social benefits are delivered through social insurance schemes, organised according to occupation-based solidarities. This regime's emphasis on upholding class differences is said to limit its decommodifying impact (Ibid.). Finally, Social Democratic regimens are identified as those that seek to "emancipate the individual from both the family and the market" through the provision of generous and universal, state-sponsored social rights. This regime gives high priority to social equality and economic redistribution and seeks to secure citizens' welfare for their entire life's course. This regime is highly decommodifying, though fiscal necessities require commitment to full employment (Ibid.).

within the group of selected countries, practical concerns relating particularly to the already small sample size of developing countries has meant that further subdivision into a typology of developing state regimes is at this time unrealistic. Therefore, a broad explication of the typological grouping of these countries is their levels of per capita income and the *relative* lack of social security proffered – many, of the countries could not be described as being 'welfare states' by conventional definitions. In fact, if one is struggling to reconcile the inclusion of low- and middle-income states in a typological design of this manner, it may be better to consider the grouping outside of the sphere of typology altogether.

The categories of a typology needn't necessarily be mutually exclusive, indeed there is no reason to assume that real cases have to fall fully within just one of the analytically derived conceptual boxes (Ebbinghaus 2012). The extent of hybrid and non-adhering cases mean that the not all of the categorised countries will fit squarely into the typological groupings utilised, and may be considered rather inappropriate, especially if we were to be selecting wholly according to Esping-Andersen's original definition of the relative regimes. That said, "the consistency of categorization [sic] is perfect or relatively high in the case of some prime cases: in particular Sweden (also Denmark and Norway) as Social Democratic [states] (Ibid.). Thus, the typologies used must be seen as defining the rather exceptional Social Democratic group of countries, whose exclusion from part of the analysis to come, will serve to define that which may be considered customary. It may be conceptualised thus, in order to discern and define the rule, we must first, for clarity, eliminate the exception to that rule.

The complete list of countries included in this study, along with the relevant typological classification is provided in Table A3 of the appendix.

3.4.2. Parental Wealth & the State – Private vs. Public Insurance

In response to the putatively unsatisfactory notion of permanent or lifetime income, on which the economic conceptions of income mobility are based, DiPrete (2002) contended that intergenerational mobility analyses suffer from the erroneous assumption of income stability throughout adulthood, which, in reality were subject to sometimes large volatility of employment and earnings in many nations. States ameliorate such situations by providing various types of insurance that affect the *intragenerational* mobility, preventing significant downward income mobility that may result from the cessation of labour market careers (Pfeffer and Hällsten 2012).

Pfeffer & Hällsten (2012), expanding DiPrete's theoretical framework to include intergenerational mobility processes, reconsider the essential role of different forms of insurance against negative intergenerational income mobility outcomes, arguing that the assessment of comparative mobility ought also to consider forms of 'private insurance' that may be in operation, in addition to or in lieu of state/'public insurance' schemes. They propose that the most effective form of private insurance is provided by familial wealth and demonstrate the manner in which monetary wealth facilitates intergenerational mobility in systems with fundamentally different public insurance schemes (Ibid.). While the extent to which economic assets may purchase access to educational opportunity is dependent on specific national institutional features, the insurance function of wealth – they argue – appears to be universal (Ibid.).

Concisely, parental wealth may be said to influence intergenerational mobility because it offers a form of private insurance that "serves as a functional substitute for missing or inadequate public insurance schemes" (Pfeffer and Hällsten 2012). Wealth may play a vital role in shielding individuals from the risks associated with educational and the early stages of occupational careers "more so than any other component of families' socioeconomic position" (Ibid.).

Social mobility literature proposes a number of mechanisms through which wealth may influence the opportunities that later become manifest in income. They may be grouped into two broad categories: the *'purchasing function'* of parental wealth and the *'insurance function'* (Pfeffer and Hällsten 2012). The purchasing function of parental wealth is said to be particularly effectual in the early stages of life – absent of intergenerational transfers. Parental wealth, especially housing wealth, may purchase access to neighbourhoods and schools that positively influence children's educational outcomes – particularly contexts with high levels of socioeconomic segregation of schools and uneven school quality (Ibid.). Housing wealth may also provide home environments generally more conducive to children's development (Ibid.). The capital gains from wealth and potential windfalls from asset sales give wealth a further, more literal, purchasing function, as regards parental investment in the education of their children (DiPrete 2002).

Parental wealth does not just, like income, affect the purchasing power with regards to the enhancement of human capital, but its sociopsychological characteristics further affect choices that go on to dictate their future earnings. Familial wealth can act as a crucial bulwark against income volatility that (in the form of unemployment, for example) that can impair the ability of parents to invest in their children's human capital (Ibid.), but also

mitigates against the risk involved in educational careers – failure to complete higher education – giving wealth its insurance function (Pfeffer and Hällsten 2012). Children able rely upon parental wealth when experiencing misfortune or adversity are more likely to opt for long-term human capital investments, such as tertiary education, or select particularly competitive or lengthy career paths, which are likely to result in relatively augmented incomes. Parental wealth, as a form of private insurance, thus provides "important real and psychological safety nets" for children, which produce important behavioural effects that influence educational and occupational choices (Ibid.).

The state may diminish this dynamic, either directly, by altering the wealth distribution, or indirectly, by loosening the association between parental wealth and child-income – through the provision of *'public insurance'* that diminishes the importance of wealth's *'private insurance'* function (and the impact of wealth inequality) – or by reducing the purchasing function of wealth, through education policies and funding arrangements that lower the risks of education and its costs, for the relatively less wealthy (DiPrete 2002).

With reference to developing countries more specifically, although the assessment of relationships between parental wealth the educational and the labour market success of their children has largely been limited to developed countries, Torche and Spilerman (2006, 2009) and Torche and Costa-Ribeiro (2012) have found strong associations between parental wealth and indicators strongly associated with children's material well-being – such as education and occupational status, in Brazil, Chile, and Mexico (Pfeffer and Hällsten 2012). This study will, in due course, assess whether there exists more direct link between wealth and earnings mobility, and in so doing, confirm the preceding assertions.

4. Methodology

The nature of such research lends itself most obviously to a quantitative, repeated cross-sectional research design; the manner of the relationships explored necessitates objectivity, generalizability, and numerical quantification and expression, while the methodological rudiments of data collection on non-manipulable variables such as intergenerational earnings elasticity and the wealth Gini coefficient demand a repeated cross-sectional design (de Vaus 2001, 173-175). In plain terms, this thesis consists of a quantitative analysis of intergenerational earnings mobility, wealth inequality, and the wealth-income ratio, for a basket of twenty-five countries.

4.1. Data & Data Sources

4.1.1. IGE

The necessary estimates of IGE for the twenty-five countries included in this study are sourced from methodologically comparable studies, which correct for the known data and measurement errors detailed in sub-section 3.3.4; they are presented in table 1a, below.

Table 1a. Estimates of Intergenerational Earnings Elasticity – Organised by study, then country

Study	Country	β
Azevedo & Bouillon (2010)	Brazil[†]	0.58
Bauer (2006)	Switzerland[†]	0.46
Corak (2006)	Denmark*°[†]	0.15
	Finland*°[†]	0.18
	France*°[†]	0.41
	Norway*°[†]	0.17
	Sweden*°[†]	0.27
d'Addio (2007)	Chile[†]	0.52
	Italy°	0.48
	Peru	0.60
	Spain°	0.32
Gibbons (2010)	New Zealand[†]	0.29
Gong, Leigh & Meng (2010)	China[†]	0.60
Grawe (2004)	Canada^*°[†]	0.19
	Germany^*°[†]	0.32
	Malaysia^	0.537
	Nepal^	0.436
	Pakistan[†]	0.463
	United Kingdom^*°[†]	0.50
	United States^*°[†]	0.47

Jiménez & Jiménez (2009)	Argentina[†]	0.49
Lefranc, Ojima and Yoshida (2013)	Japan[†]	0.34
Leigh (2007)	Australia[o†]	0.29
Ng, Shen and Ho (2009)	Singapore[†]	0.44
Ueda (2013)	Korea (Republic of)	0.24

[^] Appears in Grawe (2004)
[*] Appears in Corak (2006)
[o] Appears in OECD (2010a)
[†] Appears in Corak (2013b)

It is for reason of the errors detailed previously that aspects of methodological compatibility have been taken into careful consideration when selecting IGE data to include in this study. The assembly of a collection of estimates that are comparable across countries has required that the specifics of the study design be taken into account, especially the extent to and means by which corrections for measurement errors are undertaken (Corak 2006, 151). The use of IGE statistics already compiled by authors such as Corak (2013b) has helped in this regard.

4.1.2. Wealth Gini Coefficient

As discussed in the conceptual exploration of intergenerational earnings mobility, studies based on income inequality tend to regress income mobility data of cohorts of children born, roughly in the early-to-mid 1960s against income inequality data from the early-to-mid 1980s (Corak 2013a). Whilst this is not ideal methodologically, as it would be preferable to have inequality statistics from a period encompassing perhaps the first decade and a half or so of the formative years of children's lives, due to statistical realities – a lack of necessary data for such a period – do is made with inequality data from as early a period as possible, given the requisite number of countries. Equally, due to an even greater paucity of wealth inequality data, geographically – for such a spread of countries – and temporally, wealth inequality data is therefore averaged from the decade and a half proceeding the year 2000.

Whilst this is not, of course methodologically ideal, it does mirror the ubiquitous approach of such studies. Though the wealth Gini figures utilised are a decade or so more recent than those Ginis used in income inequality studies, such studies have only more recently been able to incorporate inequality data from a period approaching the optimal one; they were in earlier times forced to, as I am now, utilise data more modern than is perhaps preferable, thus, it is an established principle. We are conceivably two or three decades from studies of intergenerational mobility of income that may be described as completely rigorous,

in scientific terms, however, until such time, studies such as this and its precursors provide valid, interesting and necessary insight into the dynamics of the intergenerational transmission of advantage and inequality.

One might find oneself contemplating, in light of the diversity of countries incorporated in this analysis, the comparability of wealth inequality across developing countries and developed; whether some 'Kuznetzian' process might follow the progress of wealth inequality as structural change occurs, in the – contentious – manner reputed of income (with inequality first increasing with industrialisation before diminishing (Kuznets 1955)) and make such comparison unsuitable. Well, empirical evidence does not "unambiguously support the idea that wealth inequality increases in the early stages of industrialization [sic]" (Roine and Waldenström 2015, 541). Industrialisation may result in the creation of wholly new stocks and types of wealth, but it does not necessarily result in a large increase in wealth concentration (Ibid.). Thus, there cannot be said to exist an empirically observed correlation between the process of structural change and that of the accrual of wealth; the wealth inequality characteristics of developing countries and developed can, therefore, theoretically be studied concurrently, without specific consideration for the process of structural change.

The wealth and wealth inequality data used in this thesis is, as aforementioned, adapted from the annual Global Wealth Reports of Credit Suisse (2010-2015).

4.1.3. Wealth-Income Ratio

Wealth-income ratios, in this study, are averaged over fifteen years, for reasons of volatility – as discussed in sub-section 3.3.3. The wealth-income statistics utilised are calculated by the author and are comprised of net wealth – as compiled in the Credit Suisse Global Wealth Report databooks between 2010 and 2015 – divided by GDP figures for the relevant years – as measured by the World Bank (2016b). Both net wealth and national income figures are in current U.S. dollar prices, and remain comparable due to the compatibility of Credit Suisse and World Bank pricing, resulting from Credit Suisse's utilisation of World Bank data.

Again, whilst the time-period covered by the data is, methodologically, slightly dissatisfactory, it is comparable in this regard to most every other study in the field and, unfortunately, born of technical necessity that will provide suggestive interpretations if not cast-iron scientific results. Average wealth-income ratios for all countries may be found in table A1 of the appendix.

4.1.4. Other Statistics

Statistical measures relating to other pertinent variables that have been included in regression models or employed as controls, are drawn from the sources presented in table 1b, below. All variables, for each country, are data averages of statistics for as many years as had were available, between the years 2000 and 2015. A table of the most pertinent of these averages may be found in table A1 of the appendix.

Table 1b. Data Sources – Other Variables

Source	Variable
Credit Suisse (2010-2015)	Population (000s)
	Adult Population (000s)
	Debts per Adult (USD)
	Debt-Wealth Ratio (%)
World Bank (2016 [c,d,e,f,g,h])	Income Gini coefficient (%) [c]
	Govt. Expenditure (% of GDP) [d]
	Education Exp. (% of Govt. Exp.) [e]
	Education Expenditure (% of GDP) [f]
	Primary School Exp. per Student (% of GDP/cap.) [g]
	Tax Revenue (% of GDP) [h]
OECD (1998 & 2000-15)	Private Rate of Return on Tertiary Education (Males %)
OECD **(2016)**	Income Gini coefficient (%)*
Singapore Ministry of Finance **(2015)**	Income Gini coefficient (%)**

* Income Gini coefficients for Japan, New Zealand, and Korea (Republic of). All other income Ginis (Singapore excepted) from World Bank (2016c).
** Singaporean income Gini only.

Here, it is important to concede that there exists a relative lack of what may loosely be termed, human capital investment theory proxy control data – that which is used to attempt to ascertain the veracity of human capital theory as a mechanism of intergenerational income transmission. Some proxies, such as the 'private rate of return on tertiary education for males', exists only for OECD countries, and can even be called 'patchy' for those – covering relatively few years for each country for which data is available. Additionally, there exist the same measurement period concerns cited previously, of other measures.

4.2. Methods

With a view to providing some measure of comparability and demonstrating compatibility with earlier studies in the field (income inequality-IGE studies), simple correlations of income Ginis and IGE have been undertaken, alongside equivalent correlations for wealth Ginis and IGE. Thereafter, simple OLS regression[11] commenced, with each of the pertinent variables (wealth Gini, income Gini, W/Y) regressed separately against IGE. This was undertaken in order to ascertain the nature of the relationship of each with the dependent variable, before undertaking yet more regressions with combinations of the preceding variables, along with the control and other variables listed in table 1b. These more complex multivariate regressions were executed with stepwise entry of the variables into the relevant models, in order that the impact, import and strength of the various variables and models may be understood, before a reversion to normal entry upon discernment of the variables and models of greatest significance. This significance was ascertained with recourse to t-test statistics (denoting the statistical significance of individual variables), and F-statistics and Prob(F-statistics) (denoting the overall significance of the regression model.

Each model of promise (adequate explanatory power and statistical significance), was scrutinised to ensure they satisfied the Gauss Markov assumptions[12], and all distributions of variables checked visually and statistically to ensure normality of distribution. All models were also tested for collinearity and multicollinearity.

The utilisation of typology for this analysis necessitated the subdivision of cases into smaller clusters. The first division made was a bifurcation of the group into developed and developing countries, necessary to ascertain the verisimilitude of the fourth stated research question. This division was followed by a replication of the econometric techniques outlined above. After this first division, there resulted a further division of the subset of developed countries, into 'Social Democratic countries', which were excluded from further analysis, and a joint grouping of 'Liberal and Conservative countries'. This design was felt necessary to determine whether certain state types affect the dynamics given to result in differential cross-sectional rates of intergenerational income mobility. In order to prove the importance of state

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[11] OLS Regression: A statistical technique that allows the determination of the existence and nature of linear relationships between two or more given variables, by minimising the sum of all squared error terms for each observation, when placing a regression line of best fit through hypothetical data points (Pepinsky and Tobin 2003).

[12] Gauss Markov assumptions must necessarily be met for OLS estimators to be designated BLUE (Ibid.). BLUE: When the Gauss Markov conditions are satisfied, OLS estimators (models) are considered to be BLUE – the Best (presenting the smallest variance compared to any other estimator), Linear (the relationship between dependent and independent variables is linear), Unbiased (on average, the estimate=true value), Estimator.

types, the removal of the *exception* to the rule was felt necessary to substantiate of the existence of a rule at all. If there existed more countries with serviceable data, the groups could perhaps have been split entirely, and an analysis conducted on each typological grouping individually, however, given the limited amount of available cases (countries) and data, this seemed likely the best design. Given even the existence of a far larger dataset, for these purposes it may still constitute the best design.

In spite of the relative paucity of supplementary data for countries in the Developing Country grouping, their inclusion in this study was deemed essential, as attempts to include low- and middle-income countries in such analyses are so few and far between. Additionally, it was felt that the inclusion of 'developing nations' in such an analysis would serve to further bolster the credibility of theoretical postulation (that wealth impacts upon intergenerational income mobility), providing as they do, evidentiary commonality in spite of contextual differences and disparity in characteristics, and enhance the external validity of the study (Bryman 2012, 54; 205).

5. Analysis

5.1. Results

In an effort to adhere to the methodological normalcies of the field, an effort was first made to recreate the income inequality-income mobility findings of previous published works, using previously published IGE statistics and my own averaged income Ginis, before conducting a replication of these same methods with regards to the chosen wealth variables – inequality (Gini) and the net wealth-income ratio – in order to test the given hypotheses. In light of this adherence to convention, first, analysis was undertaken with all countries, before the dataset was bifurcated into 'Developed' and 'Developing' countries. The developed grouping was further divided into typologically inspired clusters[13].

To aid interpretation, the totality of countries will be presented first, before developed countries, the subsets that stemmed therefrom, and finally the results from developing countries. This is certainly not to be taken as any reflection of their relative import or scrutiny given but a choice made in the service of comprehension. A chart containing data averages utilised in the forthcoming graphed correlations and regressions may be found in 'Table A1' of the Appendix (along with sources), and sources of the intergenerational earnings elasticity so crucial to this research to be found on the table succeeding (A2).

5.1.1. All Countries

The proceeding graph, figure 1, presents a replication of the feted 'Great Gatsby Curve'; the data points and linear trendline confirm the existence of a reasonably strong correlation between income inequality (plotted on the x-axis) and intergenerational earnings elasticity (on the Y) for twenty-five countries of varying income levels. The correlation confirms, as have others, that countries with greater inequality of incomes tend to be those in which a greater proportion of economic advantage and disadvantage is transmitted between parents and their progeny (indicated by *higher* intergenerational earnings elasticity). It is interesting

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[13] *5.1.5. Statistical Notes:* In the interest of openness and transparency, it is important to here note that all of the models presented in section 5.1. satisfied the Gauss Markov conditions, meaning that the OLS estimators are considered to be BLUE. All modelled variables followed normal population distributions, with optic/visual analysis of histograms and Q-Q plots, as well as statistical tests such as the Shapiro-Wilk test resulting in acceptance of the null hypothesis of normal distribution (each variable, under testing, was statistically *insignificant*, resulting in acceptance of the null hypothesis of normal population distribution). All models were also tested for and proved absent of collinearity and multicollinearity, unless otherwise stated.

to note here, that the majority of low- and middle-income countries included in this analysis are clustered towards the right extreme of the distribution, demonstrating both high income persistence and inequality, whilst the 'Social Democratic' grouping are to the lower-left extreme – with opposing features – and those countries deemed Liberal and Conservative are spread between the two extremes.

Fig. 1 – Inequality & Income Mobility (All countries)
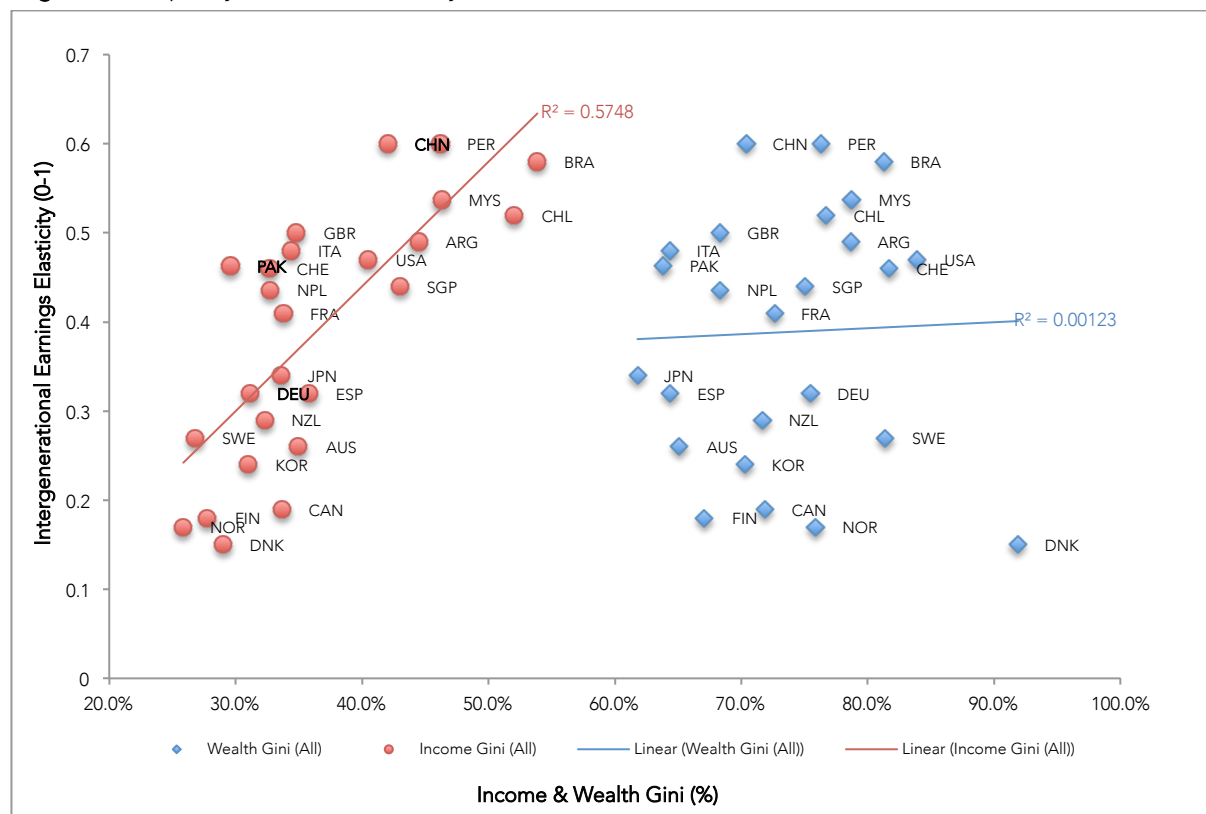
Plotted alongside, for ease of comparison, is the correlation between wealth inequality (wealth Ginis – also presented here in percentage terms) and IGE. As one might have noticed, all of the depicted nations are far more unequal in terms of wealth than they are in income – the least wealth iniquitous (Japan) still almost ten points more so than the *most* unequal in respect to income. It is also noticeable that the association between wealth inequality and IGE is far less strong than that of income; so weak in fact as to become almost imperceptible (as the exceedingly low R^2 adjacent to the trendline attests). The countries previously equitable in income have been far less so when it comes to wealth, with all of the Social Democratic countries bearing wealth Gini coefficients comparable to the remaining countries and, in Denmark's case, far exceeding them.

This is supported by the Ordinary Least Squares regressions in which, in various models, intergenerational earnings elasticity was regressed against numerous variables – all of which may be found in table A1 – in order to estimate the beta parameters that might indicate the explanatory power of a given x variable in the value of y (IGE). The below table (2), shows the results of the most pertinent of these regressions, detailing the unstandardised and standardised (beta, β) coefficients, standard errors, and significance of various models and coefficients.

Table 2. Regression Results for All Countries

Model:	1	2	3	4	5	6
(Constant)	0.339	-0.120	0.376	0.281	-0.306	-0.253
	(0.295)	(0.093)	(0.085)	(0.382)	(0.116)	(0.243)
Wealth Gini	0.001			0.001		-0.001
β	0.035			0.061		-0.035
	(0.004)			(0.005)		(0.003)
Income Gini		0.014			0.16	0.016
β		0.758***			0.0858***	0.861***
		(0.003)			(0.002)	(0.002)
Net Wealth-Income Ratio			0.005	0.009	0.045	0.043
β			0.032	0.059	0.309**	0.295*
			(0.031)	(0.035)	(0.019)	(0.021)
R-squared:	0.01	0.575	0.001	0.004	0.660	0.661
Adjusted R-squared:	–	–	–	-0.087	0.630	0.613
S.E. of Regression:	0.144	0.094	0.145	0.148	0.086	0.088
F-Statistic:	0.028	31.092	0.024	0.044	21.391	13.673
Prob(F-Statistic):	0.868	0.000***	0.879	0.957	0.000***	0.000***
$F_{crit\ (5\%\ Significance\ Level)}$:	4.28	4.28	4.28	3.44	3.44	3.07
N: 25						

Standard errors are reported in parentheses.

***, **, * Indicates significance at the 99%, 95%, and 90% levels, respectively.

Collinearity Present in Model: •

β: Beta

The table above confirms what was demonstrated graphically; that income inequality is highly significant, with model 2 demonstrating that a single unit (1%) increase in the income Gini is accompanied by an increase in IGE of 0.014, and the variable maintaining considerable explanatory power (reasonably high R^2) while remaining significant at the 1%

level[14]. Wealth inequality, on the other hand, is – as expected – not statistically significant when regressed on IGE in the bivariate model (1) but, strikingly, is not in fact significant in any of the models presented, nor was it in any of the models tested with innumerable control variables, proxies and other parameters.

Whilst this might at first appear to be a cause for concern for one whose intuition is supportive of notions of wealth impacting social mobility, it proved not to be the death knell for wealth. The introduction of the wealth-income ratio (W/Y), a key indicator of wealth's predominance over income in a given society, provided some measure of solace, as it showed some measure of significance when incorporated in models alongside the income Gini, and – to a lesser extent – the wealth Gini coefficient. Clearly though, when taking the multitude of countries together, wealth and wealth inequality appears to be of lesser significance, which perhaps is to be expected, given the diversity therein. With this in mind, the first division was made within the dataset, dividing high-income countries from low-to-middle-income countries. The results of this shall be revealed presently.

5.1.2. Developed Countries

Table 3, below, displays the results of models identical to those previous but for developed countries alone. Other models, including variables such as government expenditure as a percentage of GDP, primary school expenditure per student (as a % of GDP/cap.), and the private rate of return on tertiary education, amongst others, were – again – also included in these and regressions for all other groupings but did not prove significant for any cluster. This is quite a striking finding. Considering the integral nature of human capital to economic conceptions of social mobility, one would expect such indicators to be more significant. However, there are several mitigating factors that likely explain this, the most important of which is the lack of strong data. As noted in the 'Other statistics' sub-section, there exists little adequate data relating to human capital, and for countries for which it does exist, it is still relatively sparse. When one also considers the disparity in timeframe between the methodologically ideal and the collection period – a particular issue with *these* variables – one is inclined to place too great an emphasis on the poor performance of these variables in these regressions. That said, as a result of the lack of significance of all supplementary

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[14] Significance at the 1% level means that there is a 99% certainty that the relationship between the income Gini and IGE is not spurious.

variables, table 3, and indeed those subsequent, uniformly display models of the same three variables, as they are those most significant and relevant to the matters at hand.

As with the previous model two (in table 2), the income Gini model (2) in table three retains reasonably strong explanatory power and significance at the 1% level, though it is slightly diminished (likely a result of the reduction in sample size). What is most noticeable from table 3, however, is that the net wealth-income ratio appears to be the variable of greatest relative importance, having a very high R^2 in the bivariate model (3) and being the parameter with the highest beta in models which all retain significance at the 1% level – as the variable itself does.

Table 3. Regression Results for Developed Countries

Model:	1	2	3	4	5	6
(Constant)	*0.445*	*-0.273*	*0.010*	*-0.277*	*-0.274*	*-0.533*
	(0.276)	(0.169)	(0.068)	(0.224)	(0.123)	(0.210)
Wealth Gini	*-0.002*			*0.003*		*0.003*
β	-0.114			0.233		0.216
	(0.004)			(0.003)		(0.002)
Income Gini		*0.18*			*0.011*	*0.011*
β		0.676***			0.408**	0.397**
		(0.005)			(0.004)	(0.004)
Net Wealth-Income Ratio			*0.106*	*0.118*	*0.080*	*0.093*
β			0.775***	0.868***	0.589***	0.680***
			(0.022)	(0.024)	(0.021)	(0.022)
R-squared:	0.013	0.457	0.601	0.646	0.732	0.771
Adjusted R-squared:	–	–	–	0.596	0.694	0.718
S.E. of Regression:	0.121	0.090	0.077	0.075	0.065	0.063
F-Statistic:	0.197	12.641	22.566	12.799	19.143	14.61
Prob(F-Statistic):	0.663	0.003***	0.000***	0.001***	0.000***	0.000***
$F_{crit\ (5\%\ Significance\ Level)}$:	4.54	4.54	4.54	3.74	3.74	3.41
N: 17						

Standard errors are reported in parentheses.
***, **, * Indicates significance at the 99%, 95%, and 90% levels, respectively.
Collinearity Present in Model: •
*β*: Beta

Simply put, for all models in which it is entered, the wealth-income ratio now appears to be the variable that is most strongly correlated with intergenerational earnings elasticity. Holding all other variables constant, there is a significant, strongly positive linear association between the net wealth-income ratio and IGE; the larger is the proportion of a nation's wealth

to its national income, the higher will tend to be their immobility of income intergenerationally. The strength of this association is detailed graphically in figure 2, below.

Fig. 2 – W/Y & Income Mobility (Developed Countries)
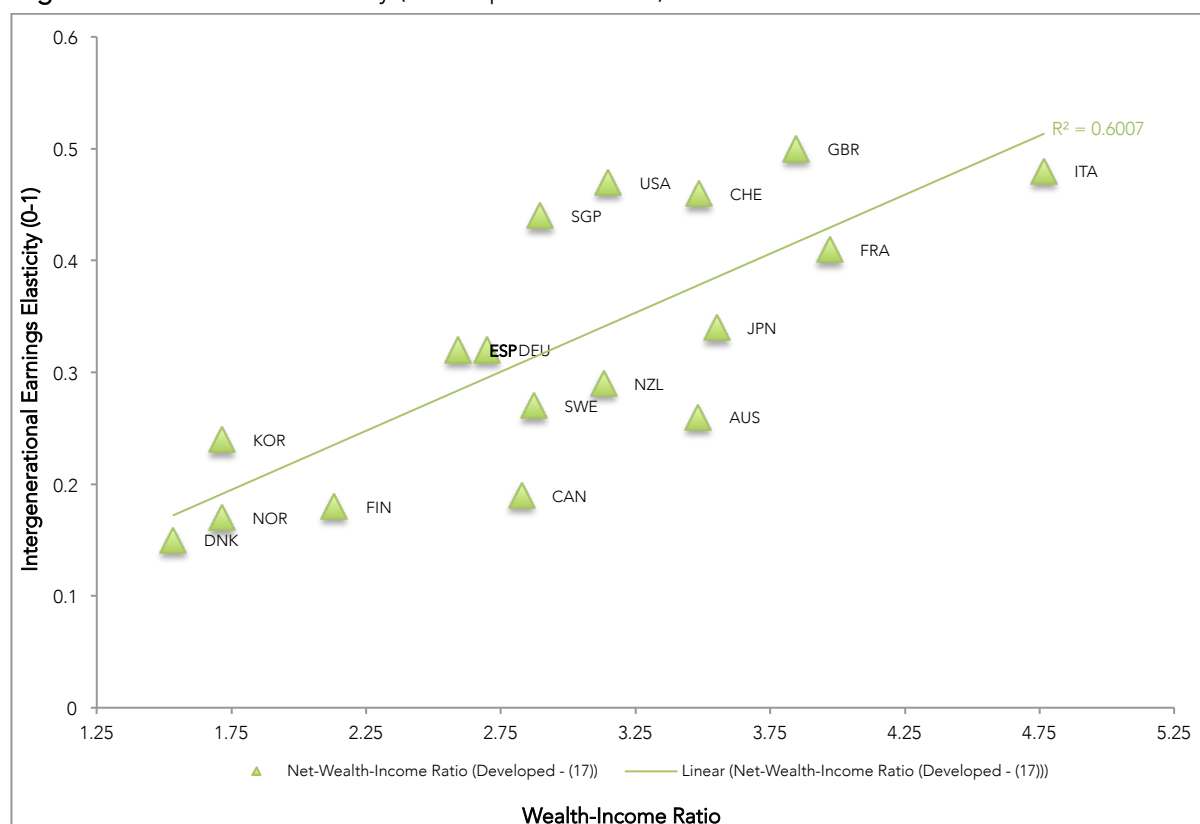
With regards to the OLS estimation, it is also interesting to note that one begins to witness, as hypothesised, the interaction between the proportion of wealth in an economy (as signified by W/Y), wealth inequality, and IGE. Now, the presence of the wealth-income ratio in models tends to increase the significance of wealth inequality, with it only narrowly failing the t-test at the 10% level[15]. These results on their own are rather interesting and bear further scrutiny (which they will receive in section 5.2.), however, in order to ascertain whether state types indeed affect the impacts wealth factors and income inequality have upon income mobility, the next step, given the results thus far, is to see whether the exclusion of countries fitting the state type said most to mitigate the impacts of material inequality (social democratic) appreciably affects results.

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[15] T-test: Tests the significance of a coefficient. If the variable *were* to be statistically significant at the 10% level, it would mean that there is a 90% certainty that the relationship between it and the dependent variable is not spurious. Correspondingly, a 5% level means there is 95% certainty, and a 1% level, 99% certainty.

5.1.3. Liberal & Conservative Grouping

Table 3 details the results of regressions against IGE, undertaken using data from countries deemed, under the applied typology, 'Liberal' or 'Conservative'. It is noticeable now, that both Gini coefficients lack significance as sole parameters, with the income Gini fairing particularly badly, relative to previous results, both alone and in multivariate regression – though this would likely be ameliorated by an increased number of observations (statistics for applicable countries).

The model most notable is perhaps the fourth, which shows, for the first time, some measure of proof of the hypotheses that wealth inequality is negatively correlated with earnings mobility, and – secondly – that the degree to which wealth dominates income in an economy may indeed mediate the extent to which wealth inequality affects earnings persistence. The fact that, in the fourth model, wealth inequality appears to be a factor with a moderately strong level of explanatory power and is significant (at the 10% level), and the fact that it is only so once the wealth-income ratio is taken into account seems to attest to some degree of acceptance of the first two of this thesis' stated hypotheses.

Table 3. Regression Results for Liberal & Conservative Countries

Model:	1	2	3	4	5	6
(Constant)	*0.034*	*-0.103*	*0.091*	*-0.435*	*-0.316*	*-0.637*
	(0.317)	(0.280)	(0.108)	(0.270)	(0.236)	(0.288)
Wealth Gini	*0.005*			*0.007*		*0.005*
β	0.300			0.443*		0.354*
	(0.004)			(0.003)		(0.003)
Income Gini		*0.013*			*0.012*	*0.009*
β		0.450			0.406*	0.307
		(0.008)			(0.006)	(0.006)
Net Wealth-Income Ratio			*0.084*	*0.096*	*0.080*	*0.091*
β			0.614**	0.705***	0.584**	0.663***
			(0.033)	(0.029)	(0.029)	(0.028)
R-squared:	0.090	0.203	0.377	0.566	0.541	0.652
Adjusted R-squared:	–	–	–	0.479	0.449	0.536
S.E. of Regression:	0.102	0.096	0.084	0.074	0.076	0.070
F-Statistic:	1.085	2.794	6.664	6.508	5.899	5.616
Prob(F-Statistic):	0.320	0.123	0.026**	0.015**	0.020**	0.019**
$F_{crit\ (5\%\ Significance\ Level)}$:	4.84	4.84	4.84	4.10	4.10	3.86
N: 13						

Model six may further attest to the aforementioned, with the explanatory power of the wealth Gini coefficient seeming to surpass that of the income Gini for the first time (0.354 > 0.307). This bears a deal of logical consistency; if wealth dominates income to a greater extent in a number of the countries in the grouping, it stands to reason that wealth inequality might affect social mobility – and a good many other things – to a greater extent than does income in those states. That said, the qualifier made earlier, concerning the effects of sample size may still hold, thus, the foregoing, secondary evidence may be taken under advisement.

Immediately below this paragraph lie the graphs relating to the data for the Liberal and Conservative grouping. Figure 3 presents scatterplots of the income and wealth Gini coefficients for countries designated liberal and conservative, with their given IGEs.

Fig. 3 – Inequality & Income Mobility (Liberal & Conservative Countries)
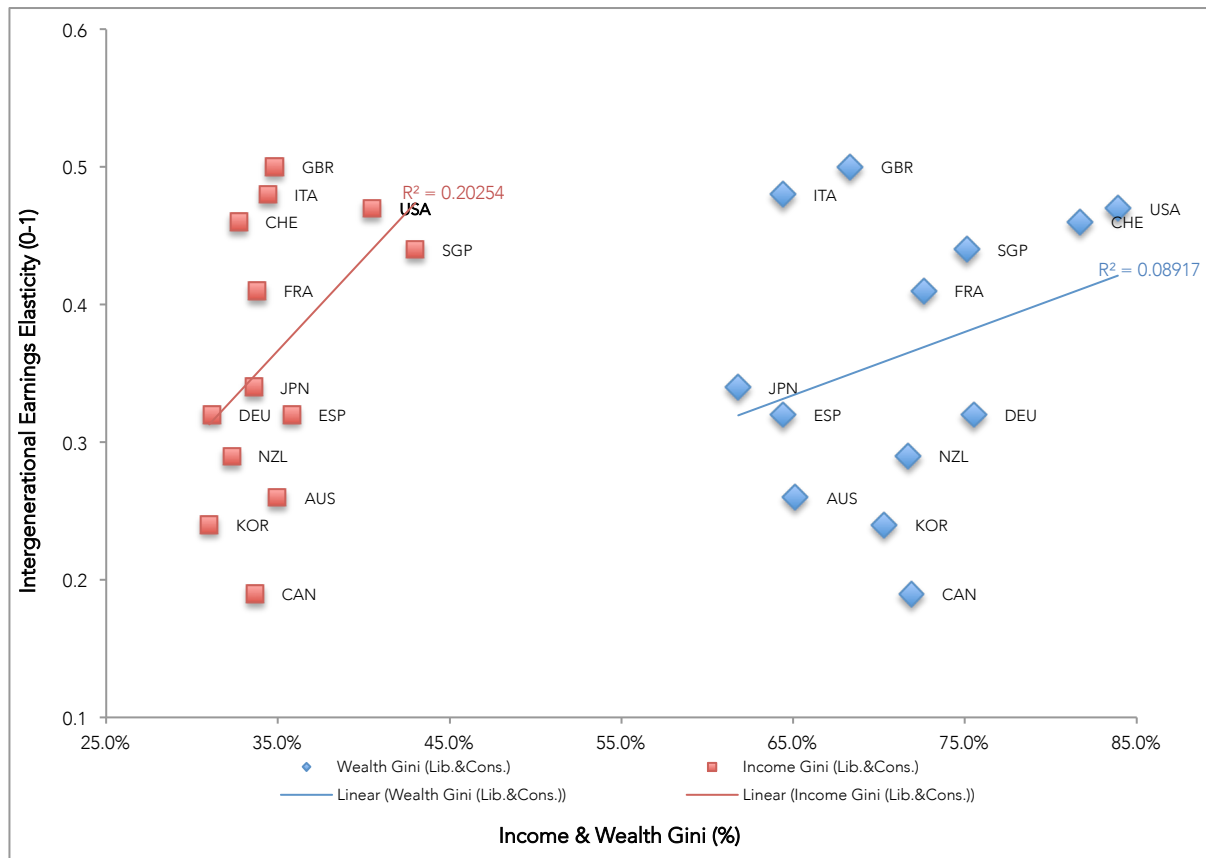
Figure 4, below, presents the net wealth-income ratio and relevant IGEs for countries in the Liberal & Conservative grouping. As evidenced by the goodness of fit of the curve and the relatively higher R^2, W/Y does appear to be the variable most keenly associated with intergenerational earnings elasticity.

Fig. 4 – W/Y & Income Mobility (Liberal & Conservative Countries)
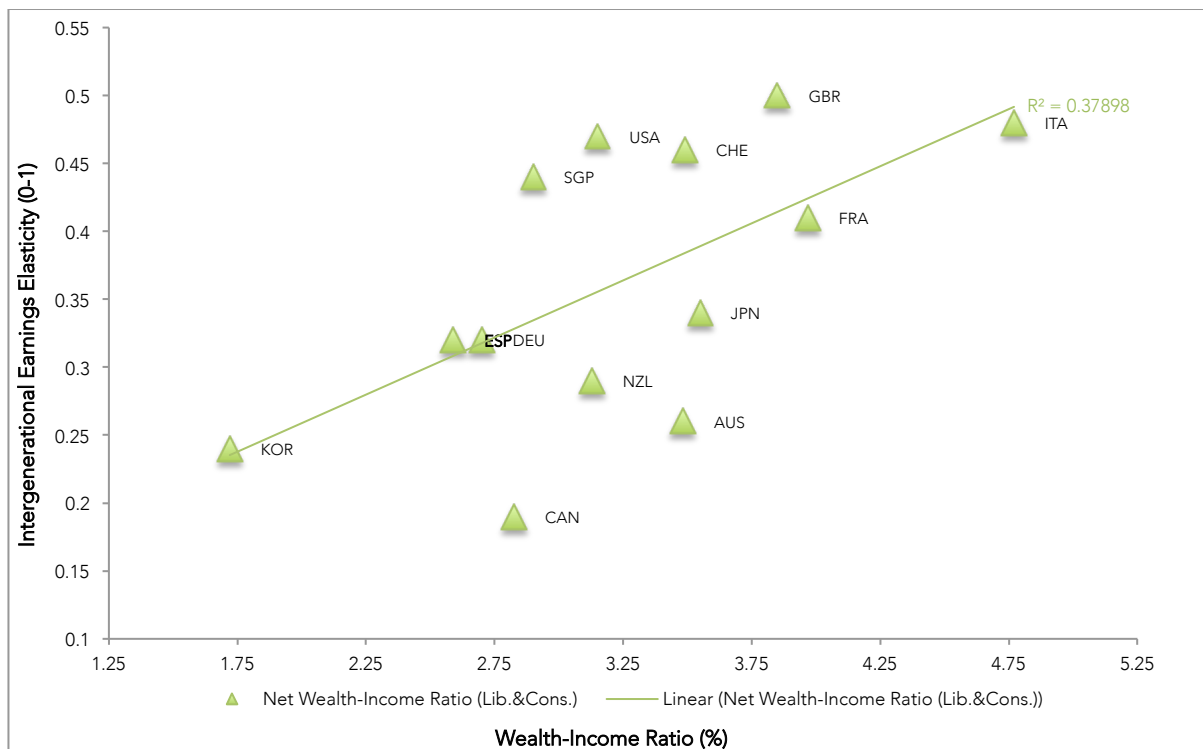
A more fulsome appraisal of these results and their implications will follow shortly, though first an evaluation of another of the central facets of this paper must be examined, the dynamics of material inequality and income mobility in low-income and middle-income countries and the degree to which these dynamics differ from those in higher-income regions of the world.

5.1.4. Developing Countries

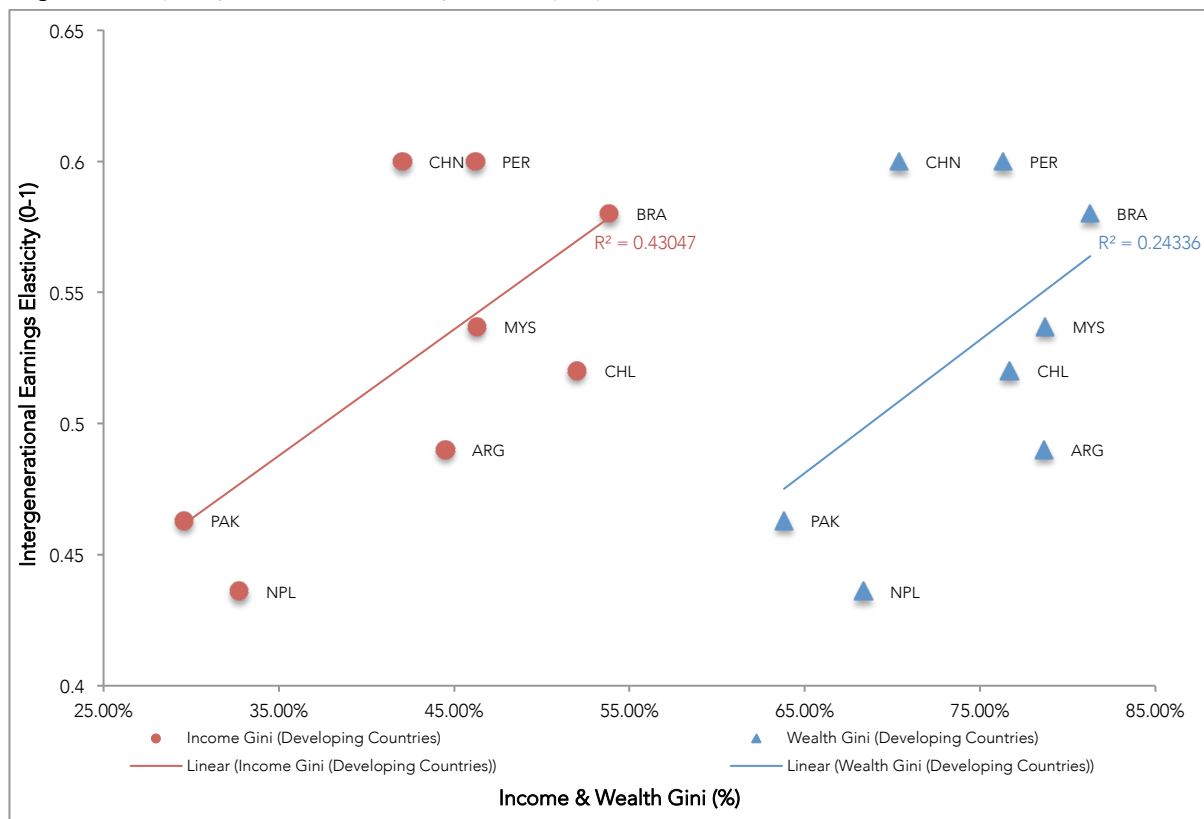As with the preceding groupings, income inequality appears to be highly correlated with income persistence in developing countries. Intriguingly, it also appears to be the case with wealth inequality and IGE, as the graph below (figure 5) demonstrates.

Fig. 5 – Inequality & Income Mobility (Developing Countries)

Now, while the preceding pictorial depiction tells one story, the table below tells a far more nuanced, interesting and indeed frustrating one. Upon a cursory first appraisal, wealth inequality seems to a variable of greater explanatory power than has been the case in any of the preceding sets of regressions and, along with the net wealth-income ratio, seems to be indicating, as with the Liberal & Conservative grouping, that wealth inequality and W/Y tend to be strongly positively correlated with intergenerational earnings persistence.

Table 5. Regression Results for Developing Countries

Model:	1	2	3	4	5	6•
(Constant)	*0.151*	*0.319*	*0.505*	*-0.606*	*0.082*	*-0.275*
	(0.272)	(0.100)	(0.069)	(0.276)	(0.106)	(0.423)
Wealth Gini	*0.005*			*0.013*		*0.006*
β	0.493			1.261***		0.613
	(0.004)			(0.003)		(0.007)
Income Gini		*0.005*			*0.008*	*0.004*
β		0.656*			1.043***	0.592
		(0.002)			(0.002)	(0.004)
Net Wealth-Income Ratio			*0.12*	*0.090*	*0.061*	*0.078*
β			0.142	1.057**	0.711**	0.909*
			(0.035)	(0.024)	(0.021)	(0.029)
R-squared:	0.243	0.430	0.020	0.772	0.786	0.820
Adjusted R-squared:	–	–	–	0.681	0.700	0.685
S.E. of Regression:	0.059	0.051	0.067	0.035	0.034	0.035
F-Statistic:	1.930	4.535	0.124	8.482	9.158	6.071
Prob(F-Statistic):	0.214	0.077*	0.737	0.025**	0.021**	0.057*
$F_{crit \ (5\% \ Significance \ Level)}$:	5.99	5.99	5.99	5.79	5.79	6.59
N: 8						

Standard errors are reported in parentheses.

***, **, * Indicates significance at the 99%, 95%, and 90% levels, respectively.

(Multi)collinearity present in model: •

β: Beta

Although wealth inequality appears, in figures 5 and model 1 of the table, to be more significant than it has been at any stage thus far, it is – in reality – much less so, failing to achieve statistical significance at the 10% level as a coefficient or as a model. When entered into a model along with W/Y (model 4), it appears to achieve substantial explanatory power and significance at the 1% level, however, the fact that both betas exceed the bounds of (-1,1) suggests that there may be some degree of collinearity[16] between the wealth Gini and net wealth-income ratio. That said, reasonably low standard errors and VIF[17] statistics mean that it's not conclusive. The tolerance, VIF statistics, high R^2 and low significance among coefficients in model 6 though, are indicative of multicollinearity amongst the parameters in the model(s) for the developing country cluster.

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[16] Collinearity & Multicollinearity: Collinearity occurs when two independent variables in a multiple regression have a non-zero correlation (the value of one variable may be linearly predicted from another). Multicollinearity occurs when three or more independent variables are inter-correlated (Chen 2007).

[17] VIF: Variance Inflation Factor; a measure of the severity of multicollinearity in an OLS regression analysis.

This is, perhaps, to be expected, and goes to the heart of the problem of IGE research generally, and IGE research in relation to developing countries specifically, the relative lack of data. With regression models dependent upon information on the variation between predictors (x variables) and variation in the *y* variable (IGE) to compute estimates, the number of cases or observations is of crucial importance to the statistical power of a model. As *n* (the number of cases, or sample size) increases, more information is garnered for estimation and the greater is the statistical power of the analysis – as there exist more cases that present increased variation, relative to each other (Baguley 2012). With a relatively smaller sample size for developing countries, it appears that the analysis conducted lies on the cusp of statistical significance, but for a few more observations to bolster it.

Therefore, one can but conclude that although there has been some manner of indicative utility in including the group of low- and middle-income countries in the analysis, particularly when considered with all countries as a whole, data availability – or the lack thereof – means that one is unable to conclude with any degree of certainty, whether the mobility dynamics of so-called developing countries, under such parameters, are similar or otherwise from developed ones. The attempt to discern this may seem rather hubristic, given others' stated difficulties of doing so, however, it is my contention that attempts ought to be made to do so. The results still bear utility and are likely few more than a handful of further observations (added countries) away from producing models of statistical significance.

5.2. Discussion

5.2.1. *Research Questions I, II, III & IV*

As the preceding results have demonstrated, wealth inequality appears to be, under a specific set of conditions (namely, a higher incidence of wealth – relative to income – and certain state characteristics), associated with persistence in intergenerational earnings, confirming the first of this thesis' hypotheses[18]. These conditions are evidenced, in the main, by the results of regressions when the wealth-income ratio is introduced into models, and results when typologically-inspired grouping portion the dataset. Taking the first of these, in order to see some measure of proof that W/Y does not enjoy some spurious association with IGE, one would expect to see the introduction of the wealth-income ratio to models affecting the relative explanatory power of income and wealth respectively (the β of income going down

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[18] Wealth inequality is negatively correlated with income mobility.

and β of wealth going up). This is precisely what occurs, consistently, when W/Y is introduced to the models in the Developed country and Liberal & Conservative country regressions, confirming the second of the stated hypotheses[19]. Addressing the second of the specific conditions, the fact that the preceding dynamic occurs in both groupings but, as theorised, only becomes statistically significant when countries of exceptional state characteristics are removed from the analysis, indicates that state type is also significant in the determination of the extent of association of wealth inequality and intergenerational income mobility, confirming the third specified hypothesis[20].

A conclusive answer to the last of the stated inquiries[21], unfortunately, cannot be stated with any conviction. There are simply not enough observations with which to make definitive statements about the adherence or otherwise of low- and middle-income countries to the proffered rule, of wealth's impact upon the intergenerational transmission of income. That said, despite not quite achieving statistical significance, there are indicators that this may be the case, and intuitive reasons for believing so. Whilst the spectre of statistical insignificance remains, however, it is perhaps unwise to make comment upon the dynamics of these relationships in the context of developing countries.

Regarding the supplementary aspect of this thesis' remit, quite how the preceding results fit within the existing theoretical framework for the intergenerational transmission of advantage (human capital investment theory), one is remiss to frame the insignificance of the proxies entered into this analysis too prominently. The noted data issues, allied with the considerable volume of literature attesting to the existence of such links, means that much less than a refutation of this aspect of the results garnered may be unwise. In spite of this, a brief consideration of this aspect of results will follow before this paper's end.

5.2.2. Questions I & II: A Tale of Size & Distribution

The preceding results say plenty of correlation and association, but what of causality? It is possible to speculate, as Corak and others do of income inequality, that wealth inequality and the relative magnitude of wealth affect intergenerational income mobility. For reasons to be explored, wealth inequality may impact the extent of intergenerational mobility in income,

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[19] The degree to which wealth dominates income in an economy mediates the extent to which wealth inequality affects income persistence.

[20] Certain types of state may amplify or mitigate the preceding dynamic.

[21] Do low- and middle-income (developing) countries adhere to or depart from dynamics traditionally observed in high-income (developed) countries?

having greater influence (not relative to income but secularly) when wealth is of greater economic prominence, with all of this being subordinate to and a function of the characteristics of the state. This may be depicted mathematically, but for ease of comprehensibility, lucidity, and for levity, let us take a brief flight of fancy and illustrate this figuratively…

A society consists of just three families, each comprised of one adult and one child, and this society is one in which income is used for only two things, subsistence – necessary to reproduce the family unit – or the purchase of luxuries. Wealth, on the other hand, may be used for purchasing luxuries and another, contrasting purpose, to boost the human capital of children, through payment to an exogenous entity. It is a materially unequal state, in which the vast majority of wealth resides with one family, a minority with a second, and none with the third, whose child will posses a basic amount of human capital. In such a scenario, there exist three distinct variables that will dictate the extent to which the three parents, facing a binary choice between using wealth for luxuries or their progeny, may influence their children's human capital and future incomes therein: the *incentives* to acquire added human capital, the *cost* of human capital accumulation, and, crucially, the secular *volume* of wealth in the society.

If the incentives are such that there is much to be gained from expending one's wealth to purchase added human capital for one's child (returns to education are high), then wealth inequality might impact upon intergenerational income mobility[22]. However, this is primarily dependent on the interaction of the remaining two factors, the cost of purchasing human capital, and how much wealth exists to purchase human capital at the relevant price. If, given a set incentive and cost structure, the absolute amount of wealth in the society is small, its unequal distribution may have little effect upon children's relative human capital and IGE in turn. As to sociopsychological and insurance factors resulting from wealth's very existence, the volume of wealth will likely also affect them too, as it dictates the extent of wealth's real value in adverse situations.

If one were to view the individuals in the preceding allegory as aggregations, of classes or economic strata of many millions of individuals, one hopefully gains some insight into the esoteric dynamic. It is, of course, a vast oversimplification – for one thing, income, an arguably key affecter of IGE, is omitted for clarity and ease of comprehension – however, it captures, in some sense, the essence of the putative relationship between wealth (both its

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[22] The disadvantages associated with only having the basic amount of human capital will also come into play here, as part of the wider incentive structure.

distribution and incidence), and the state (in its influence on the incentive/risk structure) and their influence upon intergenerational earnings mobility.

It is of course eminently possible – indeed it is probable – that it is high intergenerational persistence of incomes, in certain nations, which leads to accretions of wealth over time that both increase wealth inequality and the wealth-income ratio – relative to other nations. However, without knowing the way in which IGE has changed over time, across all these states, it's hard to say for sure. We can but speculate, though it seems reasonable to posit that the dynamic between IGE and wealth is likely mutually reinforcing, with each impelling the perpetuation of the other. An intergenerational process such as this one is unlikely to be perpetuated without a certain consistency in context, and intergenerational income persistence is a phenomena so much of its context. So, without whether first the chicken bore the egg, or vice versa, it is plausible that the high incidence of wealth in a society, allied with its highly uneven distribution, reaffirms the persistence of incomes – and indeed of wealth – that resulted in its original accrual, and so continuing, ad infinitum. In this way, wealth and income persistence are two sides of the same perpetually spinning coin.

5.2.3. Question III – The State

The notion proffered throughout this thesis is that the state plays a preponderant role in shaping the degree to which material advantage can occur, and the extent to which it may affect social mobility. Though not perhaps wholly conclusive on this front, the results garnered suggest that state type *is* associated with differences in not only income inequality but in wealth interactions and dynamics, both of which are associated with intergenerational income persistence. Social democratic (SD) states tend to exhibit lower income inequality, and lower wealth-income ratios, which appear to have a bearing upon IGE. With SD states' provision of welfare goods requiring – in the interest of fiscal prudence – relatively higher and more progressive rates of taxation, to meet the higher levels of public expenditure, relatively lower wealth inequality and lower accruals of wealth (lower W/Y[23]) are the logical upshot of this. When such progressive welfare spending is also directed towards policy which are also deemed conducive to greater income mobility, such as free or subsidised childcare

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[23] Taking into consideration similar rates of economic and demographic growth characteristics in developed countries (Piketty and Zucman 2014, 1282-4).

(Esping-Andersen 2004), the impact of state type on the dynamics of income mobility may be more clearly discerned.

More indirectly, the various psychological and economic motives for saving and wealth accumulation are also hugely influenced by the economic milieu that is shaped by the state, in terms of the various incentives and risks associated with bequeathing or otherwise one's wealth to one's children. If the gains to be derived (for progeny earnings) from bequests are suitably high, as a result of state education policy – for example – increasing the purchasing function of wealth, or the risks associated with educational careers and or income volatility also suitably high, as a result of a relative lack of public insurance against such risk (DiPrete 2002), both incentives and risks, as dictated – in part – by the state, may result in the motivation and preference to bequeath, on average, being augmented. The state influences the incentive/risk landscape that determines the level of bequests, thereafter, the wealth distribution then plays a role in dictating the extent to which this intergenerational transmission may occur.

5.3.4. Human Capital Investment Theory

It would be remiss of me to leave unexplored the possibility that the interpretation of the human capital related results is erroneous, and that education-related factors were rightly insignificant and do not explain intergenerational earnings persistence. It may well be that the means of transmission truly lies elsewhere, perhaps more closely tied to sociological conceptions such as class. Inter-class differences in mobility run counter to standard economic theory, however, there may exist inbuilt barriers to mobility between distinct social strata (Esping-Andersen 2004). This 'class-closure' may be loosely related to economic indicators such as income and wealth but might not be wholly or even predominantly captured by economic conceptions, meaning that human capital explanations of transmission may be false. There may be cultural capital explanations, relating to the social skills, personality traits, and cultural resources that lead to hiring and promotion advantages, which may in fact hold precedence (Causa and Johansson 2010). Many are the possible factors that may govern the intergenerational transmission of advantage and disadvantage, however, their precise discernment and discussion lies beyond the scope of this paper, which must now reach its end.

6. Concluding Remarks & Research Prospects

In closing, this thesis, the aim of which has been to incorporate wealth into the social mobility 'discussion', in terms of earnings mobility, has perhaps three clear findings, one ambiguous conception and a few rather intriguing new avenues of possible research. As to its findings, it has been established that:

I.   Wealth inequality is negatively correlated with earnings mobility.

II.   The degree to which wealth dominates income in an economy mediates the extent to which wealth inequality affects earnings persistence.

III.   Certain state types may amplify or mitigate the preceding dynamic.

Though suggestive, statistical insignificance and data inadequacies mean that it is still unclear whether low- and middle-income (developing) countries adhere to or depart from dynamics traditionally observed in high-income (developed) countries. The precise mechanisms by wealth which wealth's incidence and distribution may come to bear in cross-sectional rates of intergenerational earnings mobility is, likewise, unclear, and presents a rather interesting prospect for future research. Further research into the import of wealth's magnitude and intergenerational flow, presents another. Irrespective of this, discussions surrounding material inequality, social mobility, and equality of opportunity seem, as some of the esoteric, hot-button issues of the moment, set to continue.

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8. Appendix

[Tables to follow on proceeding pages]

Table A1. Data & Data Averages used in Regression Analysis

Country	IGE[1]	Wealth Gini (%)[2]	Income Gini (%)[4]	Wealth-Income Ratio[2,3]	Net Wealth-Income Ratio[2,3]	Debt-Income Ratio[2,3]	Debt-Wealth Ratio (%)[2,3]	Govt. Expenditure (% of GDP)[5]	Education Exp. (% of Govt. Exp.)[6]	Primary School Exp. per Student (% of GDP/cap.)[7]	Private Rate of Return on Tertiary Education (Male %)[9]	Tax Revenue (% of GDP)[8]
Argentina	0.49	78.7%	44.50%	1.44	1.40	0.0334	3%		15.80%	12.28%		
Australia	0.26	65.1%	34.94%	4.53	3.48	1.0512	23%	25.68%	13.38%	18.67%	8.70	23.18%
Brazil	0.58	81.3%	53.87%	1.45	1.31	0.1448	11%	24.55%	12.77%	15.89%		15.13%
Canada	0.19	71.9%	33.68%	3.64	2.83	0.8104	22%	15%	12.34%		9.03	12.95%
Chile	0.52	76.7%	52.00%	1.60	1.38	0.2233	14%	19.13%	17.33%	13.99%		17.37%
China	0.6	70.4%	42.06%	3.42	3.35	0.0640	3%					9.84%
Denmark	0.15	91.9%	29.02%	2.86	1.53	1.3274	46%	38.43%	15.29%	24.65%	6.70	32.49%
Finland	0.18	67.1%	27.74%	2.63	2.13	0.5027	20%	33.34%	12.34%	18.10%	11.18	21.17%
France	0.41	72.6%	33.78%	4.56	3.97	0.5879	13%	39.17%	10.3%	17.73%	9.30	20.18%
Germany	0.32	75.5%	31.14%	3.35	2.70	0.6537	19%	25.66%	10.40%	16.51%	7.83	11.14%
Italy	0.48	64.4%	34.41%	5.25	4.77	0.4879	9%	36.38%	9.20%	22.70%	7.17	22.15%
Japan	0.34	61.8%	33.6%*	4.32	3.55	0.7728	18%	19.02%	9.87%	22.47%	7.50	9.96%
Korea (Republic of)	0.537	70.3%	31.0%*	2.44	1.72	0.7234	30%	18.12%		17.74%	10.87	14.28%
Malaysia	0.24	78.7%	46.30%	1.56	1.22	0.3419	23%	18.70%	20.29%	14.53%		15.12%
Nepal	0.436	68.4%	32.75%	2.05	2.00	0.0481	2%	15.39%	21.48%	12.91%		10.68%
New Zealand	0.29	71.7%	32.3%*	4.35	3.13	1.2195	29%	36.45%	17.41%	18.96%	8.57	29.39%
Norway	0.17	75.9%	25.86%	2.53	1.71	0.8119	32%	33.58%	16.08%	19.34%	7.58	27.09%
Pakistan	0.463	63.8%	29.59%	2.49	2.44	0.0549	2%	16.54%	12.25%	8%		9.86%
Peru	0.6	76.3%	46.21%	2.02	1.89	0.1372	7%	17.93%	15%	8.43%		14.67%
Singapore	0.44	75.1%	43.0%**	3.65	2.90	0.7567	21%	14.31%	20.49%	10.35%		13.07%
Spain	0.32	64.4%	35.79%	3.36	2.59	0.7702	23%	21.81%	10.64%	19.06%	8.33	14.35%
Sweden	0.27	81.4%	26.81%	3.58	2.87	0.7103	20%	31.92%	13.22%	23.89%	7.25	27.45%
Switzerland	0.46	81.7%	32.70%	4.65	3.49	1.1684	25%	15.99%	16.02%	22.96%	7.35	9.52%
United Kingdom	0.50	68.3%	34.81%	4.77	3.85	0.9202	19%	39.60%	12.93%	19.73%	13.82	26.28%
United States	0.47	83.9%	40.46%	4.02	3.15	0.8700	22%	19.45%	14.70%	20.66%	12.70	10.42%

Source: (1) Multiple – Sources may be found in table 1a, located on pages 28 & 29

(2) Credit Suisse (2010-2015)

(3) World Bank (2016b) / (4) World Bank (2016c) / (5) World Bank (2016d) / (6) World Bank (2016e) / (7) World Bank (2016g) / (8) World Bank (2016h)

(9) OECD (1998 & 2000-15)

(*) OECD (2016)

(**) Singapore Ministry of Finance (2015)

Table A2. Country Groupings

Country Grouping	Country
DEVELOPED COUNTRIES	
	Australia
	Canada
	Denmark
	Finland
	France
	Germany
	Italy
	Japan
	Korea (Republic of)
	New Zealand
	Norway
	Singapore
	Spain
	Sweden
	Switzerland
	United Kingdom
	United States
DEVELOPING COUNTRIES	
	Argentina
	Brazil
	Chile
	China
	Malaysia
	Nepal
	Pakistan
	Peru
LIBERAL & CONSERVATIVE COUNTRIES	
	Australia
	Canada
	France
	Germany
	Italy
	Japan
	Korea (Republic of)
	New Zealand
	Singapore
	Spain
	Switzerland
	United Kingdom
	United States
SOCIAL DEMOCRATIC COUNTRIES	
	Denmark
	Finland
	Norway
	Sweden

A3. Notes

a. On the income classification of countries: The income classification of some countries in this study differs from those provided by the World Bank. The reasons for this are twofold. Firstly, although certain countries have progressed up the World Bank income classification in the last half-decade or so – such as Argentina, which, since February of 2015 has been a high income country – for the majority of the historical period under analysis, the countries have been otherwise located in the classification. Therefore, the decision has been taken to place countries in the income group most reflective of their average position, during the time period in which most of the data utilised in the study refers. Secondly, and more broadly, 'developed countries' are taken to be those that adhere to the following definition – as subjective as it is: Countries that have undergone a structural change consisting of – in the main – a change in the relative GDP contribution of sectors of the economy (with the secondary and tertiary sectors largely taking precedence over the primary), a shift in factor allocation between sectors and regions (greater urbanisation), an increase in the long-run savings rate, and demographic transformation (Syrquin 1988). 'Developing countries' are thus taken to be those that have not undergone, to the author's mind, a complete transition to the preceding.