An Exploratory Cross-Country Analysis of the Relationship between Entrepreneurial Propensity and Income Inequality

Poh-Kam WONG
Entrepreneurship Centre,
National University of Singapore
Level 5,
21 Heng Mui Keng Terrace
Singapore 119260
pohkam@nus.edu.sg

Yuen-Ping HO *
Entrepreneurship Centre,
National University of Singapore
Level 5,
21 Heng Mui Keng Terrace
Singapore 119260
vuenping@nus.edu.sg Tel:
+65 6516 5964
Fax: +65 6777 6990

* Corresponding Author
ABSTRACT

In the extant literature, the effect of entrepreneurship on income distribution is ambiguous and entrepreneurial propensity in the form of new firm entry has not been addressed empirically. We develop a framework combining the Kirznerian and Schumpeterian views of entrepreneurship to illustrate the opposing income-distributive effects of new firm entry. Using data on 32 developing and advanced economies, we found income inequality (as measured by Gini coefficient) to increase with the rate of new firm entry, with the effect being mitigated by rising levels of national income. Policy implications for developing economies are discussed.

Keywords: Entrepreneurship, Entrepreneurial Propensity, New Firm Entry, Income Inequality, Income Distribution, Developing Economies
1. INTRODUCTION

Economic growth and wealth/income distribution represent the two fundamental concerns of the development economics literature (Yusuf, 2009). While the role of entrepreneurship in creating employment and driving economic growth has been substantively documented in recent years (see e.g. Thurik and Wennekers, 2004; van Stel, Martin, Carree and Thurik, 2005; Wong, Autio and Ho, 2005), the same cannot be said of the link between entrepreneurship and income inequality, even though inequitable distribution of wealth and income has been identified as a fundamental problem in lower-income economies, exacerbating poverty and stalling the growth process by entrenching these nations in a vicious cycle of underdevelopment (Aghion and Garcia-Penalosa, 1999; Deininger and Squire, 1998).

While there have been numerous studies on the factors that influence income inequality, including demographic factors (e.g. literacy and fertility rates), macroeconomic variables (e.g. unemployment and inflation), and policy measures (e.g. taxation and interest rate), the potential role of entrepreneurship appears to have been less well-researched. There is a conventional presumption that entrepreneurship is associated with higher income inequality (Kimhi, 2009). However, while there is some theoretical literature supporting this relationship (Meh, 2005; Cagetti and De Nardi, 2006b), the actual available empirical evidence appears to be limited and mixed, with positive findings based only on US and Italian data, while other prior studies in selected developing and transitional economies have found a negative association. There appears to have been no systematic assessment on a cross-country basis.

This paper attempts to address this empirical knowledge gap by exploring the relationship between entrepreneurial propensity and income distribution, utilizing a broader set of cross-national data covering both developing and advanced economies. In particular, we took advantage of the UNU/WIDER World Income Inequality Database (WIID) version 2.0c, as well as data on new firm registrations across different economies from the World Bank’s Entrepreneurship
Survey (WBES). We explore the direct effect of new firm entry on income distribution, and further investigate how it may vary in economies of differing income levels. We found that income inequality tends to increase with the rate of new firm entry among developing and advanced economies. In addition, we found that this disparity-widening effect of new firm entry decreases with rising levels of development. Our findings suggest a number of concrete implications for development policies.

The paper is organized as follows. In Section 2, we review the prior literature on entrepreneurship and income distribution, highlighting the ambiguous empirical evidence, especially the conflicting findings for advanced vs. transitional and developing economies. In Section 3, we propose an analysis framework and a set of testable hypotheses on the cross-sectional relationship between national entrepreneurial propensity and income inequality, and present the data and analysis methodology. Section 4 presents the key results, while Section 5 concludes the paper by highlighting the key contributions of the paper, their implications for development policy, and directions for further research.

2. ENTREPRENEURSHIP AND INCOME DISTRIBUTION: LITERATURE REVIEW

There have been several different streams of prior studies that examined the link between entrepreneurship and income inequality from different theoretical perspectives, but the predicted relationship appears to be ambiguous due to the presence of many possible contingent factors, and the limited available empirical evidence reflects this ambiguity.

At the macroeconomic level, economists have extensively examined the theoretical relationship between inequality and stages of development, specifically the Kuznets (1955) hypothesis that inequality rises during the early stages of development, and declines as economies become more advanced, giving rise to the inverted U-shaped Kuznets curve. While these
macroeconomic studies do not directly address the relationship between entrepreneurship and income distribution per se, some indirect implications can be drawn. In particular, Deutsch and Silber (2004) decomposed the income sources of a small 23-country dataset, including entrepreneurial income as a component. They found the declining section of the Kuznets curve to be caused in part by decreasing importance in income accruing to entrepreneurs in developed economies. The implication of this finding is that in advanced or developed economies, it is the share of entrepreneurial income in total national income that is significantly associated with income inequality. A corollary for developing economies may be inferred, although empirical findings suggest that the significant determinants of inequality in developing economies are wages (Deutsch and Silber, 2004), the degree of urbanization and industrial mix in the economy (List and Gallet, 1999).

The theoretical mechanisms by which entrepreneurship could affect income inequality have been addressed by several scholars who have studied wealth concentration at a more disaggregated level using quantitative general-equilibrium models with heterogeneous households as agents. The theoretical models of Banerjee and Newman (1993) and Aghion and Bolton (1997) are illustrative of this stream of research, featuring risk-neutral agents, fully-specified credit markets and entrepreneurs that face ex-post production risks. Banerjee and Newman (1993) found that due to the non-convexities of technology choices faced by entrepreneurs, the long run distribution of wealth may be dependent on initial conditions. Aghion and Bolton’s (1997) model is equilibrated by an endogenous interest rate in the credit market; because of this adjustment mechanism, wealth accumulation by entrepreneurial agents will eventually lead to falling wealth inequality as interest rates fall. Lloyd-Ellis and Bernhardt (2000) expand on these early works to include entrepreneurial skills as a driver in the equilibrium development process. In developing economies, initial expansion of entrepreneurial activity worsens income inequality. Subsequently, the distribution of entrepreneurial skill in the economy becomes crucial in determining the pattern of growth and changes in wealth distribution. If entrepreneurial skills are distributed evenly, the
long run effect is falling income inequality as the economy matures. If entrepreneurial skills are scarce and skewed towards richer households, distributional cycles appear as the economy matures; income inequality worsens during recessions and improves during booms.

A later thread of research in this mold has developed general equilibrium models that are primarily concerned with investigating how tax systems, interest rate regimes and other fiscal and monetary policy measures influence income distribution, through their impact on household savings and investment decisions. Entrepreneurship is typically introduced as an intermediary activity through which policy measures affect the wealth accumulation behavior of agents. The work of Quadrini (1999) serves as the basis for this tradition of modeling income inequality. Quadrini (1999) explicitly formalized the entrepreneurial choice of households in a dynamic general equilibrium model and showed that entrepreneurial activities generate a high concentration of wealth as entrepreneurs demonstrated higher wealth accumulation. This is attributed to three factors that create incentives for higher propensity to save among entrepreneurs: cost of external financing, self-funding of entrepreneurial projects and the offsetting of entrepreneurial risk in the form of income uncertainty.

Building on Quadrini’s (1999) framework, a number of other studies have refined the modeling approach to study the labor versus entrepreneurial income process under different financial conditions and how this affects wealth distribution. Quadrini (2000) showed that a model that incorporates individual specific technologies (entrepreneurs) and financial frictions can generate more wealth inequality than that implied by a pecuniary motive, for a given process of individual ability, or “labor” income. Castaneda, Diaz-Gomez and Rios-Rull (2003) reconstructed an exogenous income process that matches earnings and wealth dispersion, with results that imply very large earnings risk for the highest-income earners, including business-income earners or entrepreneurs. This large risk associated with high-income realizations is the driving force that generates a large saving rate for the richer households, which is the fundamental mechanism driving extreme wealth inequality. Cagetti and De Nardi (2006a)
modeled entrepreneurial decisions in the presence of borrowing constraints. They found that the tightness of borrowing constraints and voluntary bequests are main forces influencing the number of entrepreneurs and size of entrepreneurial firms in the economy, and resulting from that, the concentration of wealth and accumulation of capital. These studies collectively suggest a positive correlation between entrepreneurial activity and the extent of wealth or income inequality.

However, Meh (2005) investigated the importance of entrepreneurs when quantifying the distributional effects of switching from a progressive to a proportional income tax system, and found that the effects were negligible when entrepreneurship is considered in the model economy, while the effects were large when entrepreneurship is omitted. This finding contrasts with results from other general-equilibrium studies. In Meh’s (2005) model, switching to proportional taxes implies an increase in entrepreneurial investments and induces higher demand for labor. The resultant rise in wage rates drives down the average returns to entrepreneurship and narrows the income and savings gap between workers and entrepreneurs, hence reducing the degree of wealth inequality in the economy. This finding echoes an earlier conclusion by Kanbur (1982) that the direction of the relationship between income equality and entrepreneurship is dependent, among other things, on the progressivity of the tax regime.

Notably, the theoretical literature thus far reviewed did not elaborate on the role of the entrepreneur in the general equilibrium framework, beyond distinguishing it from that of wage earners and other economic agents. While there is a substantive body of work on entrepreneurship in the economics literature, there is little overlap between this and income distribution studies. There are several exceptions, as we will describe below, but the question of income distribution remains largely unexplored in the mainstream of entrepreneurship research.

A conceptual paper by Mamede and Davidsson (2004) supports Saemundsson and Kirchhoff’s (2003) suggestion that entrepreneurship scholarship should place greater focus on the role of entrepreneurship in economic development, which is couched in terms of wealth distribution as an overarching goal in the pursuit of enhanced national well-being. Mamede and
Davidsson (2004) posit three mechanisms through which entrepreneurial activity contributes to wealth distribution, namely new firm creation, innovation and competition. These arguments follow from Saemundsson and Kirchhoff’s (2003) reiteration of Schumpeter’s (1934, 1942) view that the innovative entrepreneur is rewarded with profits from a temporary monopoly situation, leading to "creative destruction" and the redistribution of wealth.

In a recent review of the various alternative theories of entrepreneurship, Spencer et al. (2008) further develop the ideas in Saemundsson and Kirchhoff (2003) by linking these different views of entrepreneurship to their potential wealth distribution effects. Drawing on illustrative case studies of disruptive technologies that have spawned new industries, they argue that it is new firms that embody Schumpeter’s (1934) original emphasis on the wealth distribution function of independent entrepreneurs, and that this has been overlooked by subsequent theories of entrepreneurship that have been adopted in the various general equilibrium models. The role of entrepreneurs in the creation and redistribution of wealth is realized through the dynamic process of Schumpeterian “creative destruction”, which Spencer et al. contend does not occur continuously and smoothly, but in waves of dis-equilibrating radical technological change followed by periods of incremental change. As such, the effect of entrepreneurship on income and wealth distribution is dynamic and may vary over time.

The above brief review of the conceptual literature suggests that, in view of the large number of contingent factors that influence the relationship between entrepreneurship and income inequality, the actual relationship in any economy could turn out to be positive or negative, and hence can be settled only through empirical observations. Unfortunately, the empirical evidence available in the literature appears to be limited, and they point to conflicting findings between developed and developing/transitional economies.

Notwithstanding the common supposition that entrepreneurship causes inequality in developed economies in general, we are able to find only a few studies in the prior literature that provided empirical support of this supposition. Quadrini (1999) provided empirical evidence to
show that the presence of entrepreneurial households explained the high concentration of wealth and income in the USA. Other studies using US and Italian data have also confirmed the role of entrepreneurship in shaping wealth and income distribution patterns, with the presence of entrepreneurial households typically contributing to greater inequality (Cagetti and De Nardi, 2006a; Rodriguez, Diaz-Gimenez, Quadrini and Rios-Rull, 2002; Quintano, Castellano and Regoli, 2006). However, similar empirical evidence for other advanced economies besides the US and Italy is lacking. It is also worth noting that "entrepreneurs" in these empirical studies are typically defined as business-owners or a broader category of self-employed individuals. The perspective of new venture creation or new firm entry, much discussed in the entrepreneurship literature, is not specifically addressed.

In contrast to the studies on advanced economies, a number of studies on non-OECD economies have postulated that entrepreneurship should redistribute income more equitably. Berkowitz and Jackson (2006) provided three rationales for this expected relationship in the context of transitional economies: new small firms are the sole source of job creations as state-owned firms are restructured; new firms exhibit higher productivity than the state-owned firms that they replace; and higher rate of new firm entry increases competitiveness of both the product and labour markets, erasing monopoly rents over time. Their empirical work on Russian and Polish income distribution indicate that new firm creation is associated with both higher income level and a larger portion of income distributed to the lower quintiles, hence lower income groups were better off in both absolute and relative terms. Moreover, Poland achieved a more drastic redistribution of income towards greater equality, attributable in part to a higher rate of firm creation and spin-offs from former state-owned firms, in comparison to the Russian experience. Kimhi (2009) found that a uniform increase in entrepreneurial income reduced per capita household income inequality in the developing economy of Southern Ethiopia. However, increasing the number of entrepreneurs per se did not affect income inequality.
In summary, our review of the theoretical and empirical literature suggests that there is no consensus view on the relationship between entrepreneurship and income inequality. The theoretical relationships between entrepreneurship and income distribution are complex, and the empirical evidence is mixed: while there is some evidence of a positive relationship in the US and Italy, the converse was found in the transitional economies of Russia and Poland, and in Ethiopia, a developing economy. There has been no attempt at a more systematic empirical analysis covering a cross-section of both advanced and developing economies. Moreover, the empirical literature from developed economies has examined entrepreneurship as broadly measured by self-employment and business ownership. In contrast, the potential redistributive effect of new firm creation has received little empirical attention.

3. ANALYSIS FRAMEWORK AND HYPOTHESES

The conflicting empirical findings from the literature suggest that the relationship between entrepreneurship and income distribution is not straightforward and may be dependent on the level of development of economies and how entrepreneurship is measured and defined, among other factors. Broadly, there have been two approaches to operationalize entrepreneurship in studies of income distribution. The first approach considers the relative share of entrepreneurial income or income accruing to entrepreneurial households (Quadrini, 1999; Cagetti and De Nardi, 2006a). In this paper, our interest is in the second approach, which examines the degree of entrepreneurial propensity in an economy. Entrepreneurial propensity may be understood as the prevalence of entrepreneurs in an economic system, or more generally as the proclivity for agents in an economic system to engage in entrepreneurial activities.

As highlighted in the vast entrepreneurship literature, the concept of entrepreneurship is complex, and a wide variation of definition exists for what constitutes an entrepreneur, and what
counts as an entrepreneurial activity. The earliest definitions of entrepreneurship in the literature refer to economic agents that bear risks in a business process. These concepts were later expanded to include the role of such agents in combining factors of production. Contemporary views of entrepreneurship emphasize the creation of innovation (Schumpeter, 1939; De Jong and Vermeulen, 2007), opportunity recognition (Kirzner, 1973, 1997; Shane and Venkataraman, 2000) and the creation of new organizations (Schumpeter, 1934; Kirchhoff, 1994; Wennekers and Thurik, 1999; Davidsson, 2003).

Our focus is on entrepreneurial activity that results in the creation of new enterprises. As argued by Spencer, Kirchhoff and White (2008) and Spencer and Kirchhoff (2006), it is new firms – especially technology-based start-ups – that are well placed to redistribute wealth in the economy by introducing discontinuous change that disrupts the control of resources and economies of scale held by large firms. This view casts the entrepreneur in the Schumpeterian mold of the innovator who engenders creative destruction in the economy (Schumpeter, 1934, 1942). Essentially, Schumpeterian innovators either generate new wealth by creating new market demands with innovative products or services that did not exist before, or capture value from existing firms through innovating superior products or processes that take market share away from the incumbent firms (the destructive part of creative destruction).

While Schumpeter saw entrepreneurial creative destruction as a way of mitigating concentration of wealth in large incumbent firms, a view shared by Spencer and Kirchhoff (2006) and Spencer et al. (2008), the effect of increased Schumpeterian entrepreneurial activity on income distribution is in fact not straightforward. This is because the new Schumpeterian firm, when successful, may become the new dominant firm, with its owners, employees and suppliers capturing most of the new wealth created, in addition to appropriating most of the wealth previously owned by large firms that now have severely reduced market shares (Schumpeter, 1934). Thus, even as the new Schumpeterian entrepreneur reduces the concentration of wealth and income in incumbent large firms, it may create new locus of concentration of income at the
same time. The net effect of Schumpeterian entrepreneurial entry on income distribution is therefore ambiguous, and depends on the extent of income concentration prior to its entry as well as the size of its creative destruction effect.

While Schumpeter's entrepreneur is seen as a force that pushes markets away from equilibrium (Schumpeter, 1942), Kirzner (1969, 1973) portrays entrepreneurs as "arbitragers" who bring markets into equilibrium by exploiting opportunities created by exogenously initiated changes. Kirzner's entrepreneur is alert to opportunities present in undiscovered, undervalued resources and plays a key role in achieving efficient allocation of resources. While Kirzner’s view of entrepreneurs (and subsequent elaboration of it by others such as Baumol's (1993)) thus emphasizes the entrepreneur’s novel opportunity exploitation role, whereby the entrepreneur generates new sources of income through finding better ways to exploit undervalued resources, it also suggests an alternative imitative role, whereby the entrepreneur merely seeks to copy what has been earlier discovered by other entrepreneurs in the hope of capturing a share of the market being created. Such imitative entries are likely to lead to income re-distribution, as the initial rent of the original opportunity discoverer gets dissipated. The net effect of Kirznerian entrepreneurial entries on income distribution is therefore ambiguous – while the novel opportunity seeking entries are likely to increase income inequality, the imitative entries are likely to lead to more equal income distribution.

Notwithstanding the different roles of entrepreneurs in the Schumpeterian and Kirznerian perspectives, both views cast the entrepreneurship process as being driven by the actions of new entrants into the market. For the purposes of our analysis framework, we therefore focus on new firm entry as the central construct of interest to measure entrepreneurial propensity, rather than the prevalence of self-employment or business ownership activities in general.¹

In a discourse on wealth distribution, new firm entry assumes great significance because of the job creating dynamics of firm birth. After accounting for exits and deaths of existing firms, startup firms have been found to be responsible for almost all net job creation in the US, with
gross job creation by newly-formed startups averaging 3 million a year in the period 1992 to 2006, four times higher than any other age group for established firms (Kane, 2010). This effect is similarly observed in Singapore, where employment at startups grew faster than at established firms especially in the services sectors, and young firms aged 5 years and below contribute 16% of the national jobs pool (Wong, Ho and Singh, 2011).

Integrating the insights of both the Schumpeterian and Kirznerian perspectives, we can posit that the dynamics of new firm formation in any economy consists of a mix of stylized Schumpeterian and Kirznerian entries, with the former endogenously creating opportunities and the latter recognizing and exploiting opportunities that arise exogenously. While the rent-capturing Schumpeterian and novel opportunity-seeking Kirznerian entries are likely to generate new loci of income concentration, the Schumpeterian wealth creation effect (through creative destruction of established loci of income concentration in incumbent firms) as well as the income redistribution effect of the imitative Kirznerian entries are likely to lead to lowering of income inequality over time. The net effect of entrepreneurial new firm formation on overall income inequality therefore depends on the relative size of these opposing effects, and whether it is positive or negative can only be determined empirically. Figure 1 illustrates the stylized representation of the two opposing effects of both Schumpeterian and Kirznerian entries.²

(Insert Figure 1 here)

These alternative perspectives of entrepreneurship have not been considered in the prior studies reviewed in the literature survey section of this paper. The theoretical predictions in the economics literature (Meh, 2005; Cagetti and De Nardi, 2006b) suggest implicitly that the dominant rent-capturing Schumpeterian and novel opportunity-seeking Kirznerian effects dominate the Schumpeterian wealth creation and Kirznerian imitative effects. We draw on this prior literature to test the following hypothesis, mindful that the opposite effect may be observed:
**H1:** There is a significant positive association between the rates of new firm entry and levels of income inequality in a cross-section of advanced and developing economies

While both effects from Kirznerian and Schumpeterian types of entrepreneurial firm formation occur in every economy, we posit that their relative incidence will vary with the characteristics of the economy, especially the level of its development. In particular, we posit that the mechanisms for the income redistributive (i.e., decreasing inequality) effects of new firm entry are better established in advanced economies. From a Schumpeterian perspective, the creative destruction and wealth creation effects of new firm entry are more likely to be observed in markets conducive to the development and introduction of new ideas and innovations. This technological dynamism in advanced economies allows for rapid entry of new firms to create new wealth and to appropriate the wealth of existing firms, thus minimizing the probability of new loci of wealth concentration being created. From a Kirznerian perspective, novel opportunity-seeking entrepreneurs are expected to prosper in advanced economies where there are ample innovation opportunities, hence concentrating income distribution. However, this is countered by imitative entrepreneurs, who are also more likely to gain traction in advanced economies compared to developing economies which lack the knowledge-base, infrastructure and systems to support innovation, hampering the capability of potential imitative entrepreneurs to capitalize on imported innovations. Given our assumption that the creative destruction effect of Schumpeterian entries and imitative effect of Kirznerian entries are more likely to cause income inequality to decrease, we can therefore make the following additional prediction:

**H2:** The positive association between the rates of new firm entry and levels of income inequality is stronger the lower the level of income of the economies

The method and data used to test these hypotheses will be described in the next subsection.
4. METHOD AND MEASURES (a) Analysis method

To test the above hypotheses, we perform cross-country multivariate regression analyses, with the rate of new firm entry as a predictor, together with various control variables that have been identified in the prior literature as having an influence on income inequality. In order to test hypothesis H2, an interaction term between new firm entry and level of development is included. The basic analysis model thus takes the general form of a regression equation:

\[ \text{Inequality} = \alpha + \beta_1 (\text{Control Variables}) + \beta_2 \text{New Firm Entry} + \beta_3 \text{New Firm Entry} \times \text{Level of Development} \]

Log transformation is performed to scale all variables, except variables measuring change or growth.

(b) Dependent variable: income inequality

For the dependent variable, Income Inequality, we have taken advantage of the cross-country database provided by the UNU/WIDER World Income Inequality Database (WIID) version 2.0c, which provides a consistent measure of Income Inequality in terms of the Gini coefficient computed using methods developed by Shorrocks and Guang (2005). Gini coefficient values for the year 2005 are used, which provided the most extensive cross-section of economies for which recent data are available. The Gini coefficient is expressed in natural logarithmic form.
(c) Explanatory variable: new firm entry

Data for the explanatory variable are drawn from the World Bank Entrepreneurship Survey (WBES) which records the number of formal business registrations in each economy (Klapper et al., 2007). The explanatory variable in our analysis is the rate of new firm entry, referred to as "Entry Rate" by the World Bank. This is computed as the share of newly registered businesses within a calendar year in the total stock of registered businesses as at the end of the calendar year.

New firm entry rates for the years 2003 and 2004 are alternated as the explanatory variable in the regression analysis. These rates lag behind the dependent variable by design, in order to establish a causality effect in the hypothesized direction - that it is new firm entry that influences income distribution rather than the other way around.\(^3\) The rate of new firm entry is entered in logarithmic form.

(d) Control variables

A number of control variables are included to account for factors that have been identified in the prior literature to influence income distribution. There are a myriad of hypothesized determinants of income inequality, including tax structures and inflation. Due to constraints of data availability and limited degrees of freedom, we have restricted the choice of control variables to a small number of factors that are of particular relevance in a cross-economy context.

_GDP per capita_ measures the income level or level of economic development of individual countries in the analysis sample. The squared term _GDP per capita squared_ is included to control and test for the Kuznets (1955) curve effect, which hypothesizes an inverse U-shaped relationship between per capita income and inequality of wealth distribution. In the early stages on an economy’s development, income inequality increases before reaching a peak and decreasing as the economy matures into industrialized status. As documented by Acemoglu and Robinson
(2005), there is mixed empirical support for the Kuznets curve and evidence from more recent development experiences is less supportive. 4 GDP data for 2005 are used and both the level and squared terms are entered in logarithmic form.

_Growth in Real GDP_ is measured as the average annual percentage change in real GDP between 2001 and 2005.5 Theoretical views are sharply divided on the relationship between growth and inequality, with traditional Keynesian-based ideas predicting that growth promotes income inequality while modern political economy arguments suggest a negative relationship. While the empirical literature establishes a significant relationship between growth and inequality, there are contrasting findings on the direction of causality (eg. Li and Zhou, 1998; Perotti, 1996; Barro, 2000).

_Total Taxation collected as a share of GDP_ is included as a proxy measure to control for possible income redistributive effects of government taxation policy. Prior literature has highlighted the progressive nature of government taxation in most countries, and hence predicts that higher government taxation would lead to lower income inequality.

The final dataset comprises 32 developing and advanced economies that have the full set of useable data covering the range of dependent and control variables included in our analysis (see Annex Table 1 for full list). The correlation coefficients and descriptive statistics for the dependent, control and independent variables in both datasets are presented in Annex Table 2.

5. RESULTS

(a) Exploratory analysis of direct correlations

Before reporting the detailed results of the regression analysis, we first examine the direct correlations between Income Inequality and the rate of new firm entry before the inclusion of
control variables. As can be seen from Annex Table 2, the direct correlation between income inequality in 2003 and new firm entry in 2003 is positive, but insignificant (0.09). When new firm entry in 2004 is used, the correlation is negative but also insignificant (-0.08). The pattern of correlation is illustrated graphically in Figure 2, which shows the scatterplots of the raw Entry Rate data for 2003 and 2004, and Gini Coefficient data for 2005 in the 32 economies. To verify if this relationship remains or is strengthened when the inter-economy differences in the various control variables are taken into account, we need to turn to the multivariate regression analysis results reported in the next sub-section.

(Insert Figure 2 here)

(b) Regression results

For all reported results in this paper, multicollinearity diagnostics were generated to test that multicollinearity is not present in any significant way. Before computing multiplicative variables such as the squared term on income and the interaction between entry rate and income level, the base terms were centred to mean to remove potential collinearity between the base and multiplicative variables.

The regression results using new firm entry lagged by 2 years (Entry Rate 2003) are shown in the third and fourth columns of Table 1. To facilitate comparison, the results using new firm entry lagged by 1 year (Entry Rate 2004) are presented side by side in the last two columns of the table.

(Insert Table 1 here)
The adjusted R-squared values are 0.63 and 0.57 respectively when *Entry Rate 2003* and *Entry Rate 2004* are used as the entrepreneurial propensity measure, suggesting reasonably good model fit. Looking firstly at the control variables before the entrepreneurship predictors are introduced, both the Income and Income squared terms are negative, with the coefficient on Income squared being significant. The negative coefficient on the Income term shows that the Kuznets curve hypothesis is not supported by our data and model. (However, as noted in Footnote 3, it has been argued that conclusions regarding the Kuznets curve should not be drawn when cross-sectional data are used.) Instead of an inverse U relationship, Income Inequality is significantly and negatively associated with Income Per Capita in our sample of economies. This is in line with Fields (2001) who conducted a country-by-country review and asserted that the dominant pattern is for inequality to fall as national income rises. Alternatively, assuming the validity of the Kuznets hypothesis, this finding might suggest that the economies included in this analysis fall along the downward sloping section of the Kuznets curve, as the sample comprises mid-income developing and high-income advanced economies, and excludes the poorest nations in the world. In addition, consistent with expectation, taxation as a share of GDP is found to have a significant negative effect on income inequality. The level of economic growth was also observed to have a significant and negative effect on income inequality.

The estimated coefficient on *Entry Rate 2003* was found to be significant and positive, indicating that higher shares of new firms in the economy's total population of registered businesses are associated with greater income inequality. The direct effect of *Entry Rate 2004* was also found to be positive and weakly significant at 10%. Using the lagged values of new firm entry rates, we find support for the first hypothesis (H1) of a significant positive relationship between new firm entry and income inequality. We also observe that the estimated coefficient on *Entry Rate 2003* is higher than the estimated coefficient on *Entry Rate 2004*. The impact of new firm entry on income distribution is stronger in the 2-years lag model compared to the 1-year lag model.
Hypotheses H2 predicts that the level of entrepreneurship worsens inequality to a greater extent in lower income developing economies compared to high income nations. To test this hypothesis, we introduced an interaction term Entry Rate * Income level for both the 2003 and 2004 values of new firm entry. As seen in Table 1, the estimated coefficient on the interaction term turns out to be negative and significant for both, lending support to Hypothesis H2.

6. DISCUSSION AND CONCLUSION

Based on the results reported in Section 4, a key finding is that increasing rates of new firm entry are associated with widening income inequality. This finding is consistent with previous studies on two advanced economies, the US and Italy, and suggests that entrepreneurial income accumulation accrues disproportionately to wealthier economic agents, and that this accumulation effect is stronger than the redistributive effects of increased resource utilization and demand generated by the newly created firms. It is possible that this result arises from one limitation of our dataset: the basket of economies analyzed excludes the poorest economies in the world. The lowest income nation in our analysis sample is Indonesia with GDP per capita of USD 3,000 in 2005. In contrast, many less developed economies, especially in Africa, had income levels of below USD 1,000 per capita and are not included in the dataset. As such, we cannot generalize the findings here to all economies in the world. The positive association between entrepreneurship and inequality applies to mid to high income economies, and the discussion in this section will be confined to that context.

The second key finding from our results is that higher levels of new firm entry widen the income gap more so in developing economies compared to high-income advanced economies. This finding is consistent with the view that opportunity-driven entrepreneurs create a temporary monopoly and the profits generated accrue temporarily to the innovator-entrepreneur. While these
new innovative enterprises create jobs, the required skills sets may be scarce, hence driving up wages for a small segment of the labor market and further concentrating income and wealth. Employees in incumbent firms and industries that are displaced by new entrants also face the threat of income reduction or loss. In advanced economies, there are mechanisms for knowledge and skills upgrading to equip the labor force with the capabilities to capitalize on the new opportunities created by new firm entry. At the same time, the innovation systems in advanced economies also facilitate knowledge transfer to a greater extent, allowing other entrepreneurs to initially imitate, and thereafter improve upon, the innovative ideas of the original new entrant. This creates a virtuous cycle of new firm entry that partially counters the wealth concentration arising from the initial temporary monopoly. On the other hand, systems and structures for supporting knowledge transfer and skills upgrading are less well-established in mid-income developing economies. New entrants are able to engage in monopolistic rent-seeking for longer periods and the scarcity of skills is more pronounced, leading to greater inequality compared to the advanced economies.

The above findings from our study suggest a number of policy implications for mid to high-income economies with respect to entrepreneurship development and promotion. In recent years, many governments around the world have increasingly embraced the notion that entrepreneurship should be actively promoted through public policy as it contributes to economic growth and employment creation. While it has been shown in recent years that higher entrepreneurial propensity is indeed associated with higher average GDP growth (Wong et al., 2005; Van Stel et al., 2005), the empirical evidence for the relationship between entrepreneurship and income inequality has not been examined so far. While some scholars have argued for the beneficial effect of entrepreneurship on income distribution (Saemundsson and Davidsson, 2002; Spencer et al., 2008), our empirical findings in this paper suggest otherwise. Higher new firm formation rates appear to be associated with higher income disparity, at least in the short-run.
Hence, contrary to the unbridled optimism about the role of entrepreneurship in economic development among many government officials, a major implication from this study is that public policy makers need to recognize that a pure pursuit of entrepreneurship may not be optimal, as it may lead to potential adverse effects on social equity. As with many other areas of policy making, entrepreneurship policy making must weigh the trade-off between its growth and equity effects. A related policy implication is that, if and when a government does decide to embark on a public policy push to promote entrepreneurship, it should also incorporate policies to mitigate the potential adverse consequences of increasing income inequality arising from that promotion policy.

While it is beyond the scope of this paper to propose concrete mitigation policies that should be introduced given the aggregate nature of our empirical findings, we can nonetheless suggest a number of considerations based on the Schumpeterian view of entrepreneurship that underpins our analysis framework. Firstly, to the extent that it is opportunity creating, innovation-driven new firms that contribute to higher income inequality through their new wealth creation effect, public policies could facilitate a broader distribution of the new wealth generated by removing local supply-side bottlenecks such as skill development and local resource upgrading to meet the input demands of these new firms. Such policies will facilitate a faster spillover of the new value created among the local population, instead of it being captured by a small number of highly-paid employees, or of it leaking out to overseas suppliers. Secondly, to the extent that the higher income inequality is caused by the rent-capturing effect of the new firms to the detriment of previous incumbents, public policies could mitigate the adverse effects of such rent-capturing by facilitating the mobility of resources out of the negatively impacted industries or sectors. For example, subsidies could be provided to re-train the affected workers so that they can acquire the new skills required in other growing sectors of the economy.

In summary, this paper represents a first attempt at understanding the empirical relationship between entrepreneurship and income distribution in a cross-country context, using available
independent data from the World Bank and UNU/WIDER. The findings show that this issue warrants further research with better data, specifically in more clearly understanding the influence of the stage of economic development on the relationship between entrepreneurship and income inequality, and the trade-off between income growth and income inequality. In particular, collection of compatible entrepreneurial propensity data covering a larger sample that includes low-income developing economies would be of priority, as it would enable an investigation into whether the findings of this study can be generalized to a wider range of economic development levels. Secondly, panel data and longitudinal analysis, rather than cross-sectional data and analysis, are needed to better understand the temporal dynamics of the entrepreneurship-inequality relationship. A larger panel dataset would also overcome another limitation of this study, which does not take into account the endogenous relationship between entrepreneurship and growth found in prior studies using cross-economy data (Wong et al., 2005; Van Stel et al., 2005). The endogenous relationships between entrepreneurship, growth and income inequality should ideally be specified in a system of simultaneous equations and analyzed with a larger panel dataset. We have been unable to construct an adequate time series dataset due to gaps in the UNU/WIDER dataset, and a relatively small sample of economies for which there are consistently reported figures on new firm registrations in the WBES dataset.


ENTREPRENEURIAL PROPENSITY AND INCOME INEQUALITY


---

1 Our analysis is focused on mid-income developing and high-income advanced economies and as such, the measure of new firm entry may not cover the micro-entrepreneurship in informal sectors that is more prevalent in less developed economies.

2 The Schumpeterian and Kirnerian perspectives address the role of entrepreneurs in an economic system, as distinct from the motivations for individuals to engage in entrepreneurship activities. As such, the motivation-based typology of opportunity versus necessity entrepreneurs (Reynolds, Bygrave, Autio, Cox
and Hay, 2002) does not correspond directly to this framework. However, it may be conjectured from the nature of necessity-driven entrepreneurship that much, although not all, of such activity would have the characteristics of Kirzner’s imitative entries.

3 For completeness, the analysis was also conducted with New Firm Entry rate measured in 2005, contemporaneous with the dependent variable. The resulting estimated coefficient was statistically insignificant.

4 Both time-series and cross-country panel approaches have been used in empirical work on the Kuznets curve. Findings using time-series data tend to reject the Kuznets curve hypothesis, as summarized by Adams (2004). In cross-country analysis, simple tabulations and regressions affirm the inverted U pattern but the Kuznets curve effect was found to disappear with the inclusion of fixed effects (Fields, 2011). While Kuznet’s original hypothesis was derived from cross-sectional data, Bruno, Ravallion and Squire (1998) argue that it is an error to rely on cross-country data to draw conclusions on the existence of a Kuznets curve.

5 Sensitivity tests were also conducted using different ranges of years. Altering the range did not significantly change the results.
<table>
<thead>
<tr>
<th>Kirznerian Entrepreneur</th>
<th>Schumpeterian Entrepreneur</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Imitative Entrepreneur Effect</strong></td>
<td><strong>Novel Opportunity-Seeking Effect</strong></td>
</tr>
<tr>
<td><strong>Creative Destruction (New Wealth Creation) Effect</strong></td>
<td><strong>Dominant Rent-Capturing Effect</strong></td>
</tr>
</tbody>
</table>

Decreases Income Inequality Increases Income Inequality

**Figure 1:** Opposing Income Distribution Effects of Schumpeterian and Kirznerian New Firm Entry
Figure 2: Income Inequality and Rate of New Firm Entry
Table 1: Regression Analysis for Determinants of Income Inequality

<table>
<thead>
<tr>
<th>Dependent = Log Gini Coeff 2005 N = 32</th>
<th>Control variables</th>
<th>New Firm Entry 2003 (Lagged 2 Years)</th>
<th>New Firm Entry 2004 (Lagged 1 Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted R²</td>
<td>0.448</td>
<td>0.526 0.63</td>
<td>0.485 0.569</td>
</tr>
<tr>
<td>F</td>
<td>7.281***</td>
<td>7.885*** 9.804***</td>
<td>6.847*** 7.818***</td>
</tr>
<tr>
<td>Significance of change in F</td>
<td></td>
<td>0.027** 0.008**</td>
<td>0.096* 0.021**</td>
</tr>
<tr>
<td>Constant</td>
<td>5.594*** (0.751)</td>
<td>6.050*** (0.722) 6.954*** (0.711)</td>
<td>6.032*** (0.768) 6.748*** (0.761)</td>
</tr>
<tr>
<td>Income Level - Log GDP Per Capita 2005 (USD PPP)</td>
<td>-0.099 (0.074)</td>
<td>-0.135 -0.106</td>
<td>-0.127 -0.129*</td>
</tr>
<tr>
<td>Income Level squared</td>
<td>-0.122** (0.058)</td>
<td>-0.108* 0.020</td>
<td>-0.095 0.045</td>
</tr>
<tr>
<td>Economic Growth – Average Annual RGDP Growth 2001-05</td>
<td>-0.011** (0.017)</td>
<td>-0.016 -0.031**</td>
<td>-0.015 -0.033*</td>
</tr>
<tr>
<td>Taxation - Log Total Taxes collected/GDP 2005</td>
<td>-0.578 (0.207)</td>
<td>-0.580** -0.821***</td>
<td>-0.608** -0.822***</td>
</tr>
<tr>
<td>New Firm Entry – Log Entry Rate</td>
<td>0.172** (0.073)</td>
<td>0.179** (0.065)</td>
<td>0.131* (0.076) 0.099 (0.071)</td>
</tr>
<tr>
<td>New Firm Entry * Income Level</td>
<td></td>
<td>-0.367** (0.127)</td>
<td>-0.272** (0.111)</td>
</tr>
</tbody>
</table>

(Standard errors in parentheses)

*** significant at 1%, ** significant at 5%, * significant at 10%
### Annex Table 1: List of Economies Included in Analysis

<table>
<thead>
<tr>
<th>Country</th>
<th>Gini Coefficient 2005</th>
<th>Entry Rate 2003 (%)</th>
<th>Entry Rate 2004 (%)</th>
<th>GDP per capita 2005 (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Argentia</td>
<td>50.1</td>
<td>8.71</td>
<td>9.34</td>
<td>10,872</td>
</tr>
<tr>
<td>2 Austria</td>
<td>26.0</td>
<td>4.66</td>
<td>4.85</td>
<td>33,597</td>
</tr>
<tr>
<td>3 Belgium</td>
<td>28.0</td>
<td>6.95</td>
<td>7.65</td>
<td>32,097</td>
</tr>
<tr>
<td>4 Brazil</td>
<td>56.4</td>
<td>9.11</td>
<td>8.58</td>
<td>8,793</td>
</tr>
<tr>
<td>5 Bulgaria</td>
<td>33.8</td>
<td>10.35</td>
<td>11.83</td>
<td>9,430</td>
</tr>
<tr>
<td>6 Croatia</td>
<td>29.0</td>
<td>3.89</td>
<td>4.12</td>
<td>15,124</td>
</tr>
<tr>
<td>7 Czech Republic</td>
<td>26.0</td>
<td>5.29</td>
<td>6.61</td>
<td>20,221</td>
</tr>
<tr>
<td>8 Denmark</td>
<td>24.0</td>
<td>10.62</td>
<td>12.08</td>
<td>33,193</td>
</tr>
<tr>
<td>9 Finland</td>
<td>26.0</td>
<td>7.08</td>
<td>7.56</td>
<td>30,701</td>
</tr>
<tr>
<td>10 France</td>
<td>28.0</td>
<td>9.32</td>
<td>10.58</td>
<td>30,390</td>
</tr>
<tr>
<td>11 Germany</td>
<td>26.0</td>
<td>15.35</td>
<td>14.98</td>
<td>31,126</td>
</tr>
<tr>
<td>12 Greece</td>
<td>33.0</td>
<td>5.81</td>
<td>5.36</td>
<td>24,180</td>
</tr>
<tr>
<td>13 Hungary</td>
<td>28.0</td>
<td>9.47</td>
<td>10.75</td>
<td>16,952</td>
</tr>
<tr>
<td>14 Iceland</td>
<td>25.0</td>
<td>11.85</td>
<td>11.41</td>
<td>35,264</td>
</tr>
<tr>
<td>15 Indonesia</td>
<td>39.4</td>
<td>3.02</td>
<td>1.72</td>
<td>3,081</td>
</tr>
<tr>
<td>16 Ireland</td>
<td>32.0</td>
<td>9.67</td>
<td>9.9</td>
<td>38,805</td>
</tr>
<tr>
<td>17 Italy</td>
<td>33.0</td>
<td>12.75</td>
<td>12.74</td>
<td>28,262</td>
</tr>
<tr>
<td>18 Kazakhstan</td>
<td>42.0</td>
<td>9.7</td>
<td>9</td>
<td>8,660</td>
</tr>
<tr>
<td>19 Lithuania</td>
<td>36.0</td>
<td>7.38</td>
<td>7.06</td>
<td>14,043</td>
</tr>
<tr>
<td>20 Luxembourg</td>
<td>26.0</td>
<td>11.13</td>
<td>10.73</td>
<td>68,660</td>
</tr>
<tr>
<td>21 Netherlands</td>
<td>27.0</td>
<td>9.21</td>
<td>10.34</td>
<td>35,153</td>
</tr>
<tr>
<td>22 Norway</td>
<td>28.0</td>
<td>7.47</td>
<td>8.76</td>
<td>47,452</td>
</tr>
<tr>
<td>23 Poland</td>
<td>36.0</td>
<td>4.89</td>
<td>4.75</td>
<td>13,573</td>
</tr>
<tr>
<td>24 Portugal</td>
<td>38.0</td>
<td>6.04</td>
<td>6.82</td>
<td>21,410</td>
</tr>
<tr>
<td>25 Romania</td>
<td>36.1</td>
<td>11.04</td>
<td>11.98</td>
<td>9,376</td>
</tr>
<tr>
<td>26 Russian Federation</td>
<td>44.5</td>
<td>12.74</td>
<td>11.92</td>
<td>11,861</td>
</tr>
<tr>
<td>27 Slovak Republic</td>
<td>26.0</td>
<td>6.09</td>
<td>10.3</td>
<td>15,867</td>
</tr>
<tr>
<td>28 Slovenia</td>
<td>24.0</td>
<td>6.72</td>
<td>7.69</td>
<td>23,351</td>
</tr>
<tr>
<td>29 Spain</td>
<td>32.0</td>
<td>6.68</td>
<td>6.66</td>
<td>26,951</td>
</tr>
<tr>
<td>30 Sweden</td>
<td>23.0</td>
<td>5.35</td>
<td>6.53</td>
<td>32,622</td>
</tr>
<tr>
<td>31 Ukraine</td>
<td>28.2</td>
<td>6.48</td>
<td>5.92</td>
<td>5,580</td>
</tr>
<tr>
<td>32 United Kingdom</td>
<td>34.0</td>
<td>18.06</td>
<td>19.35</td>
<td>32,952</td>
</tr>
</tbody>
</table>
Annex Table 2: Descriptive statistics and correlation coefficients

\( n = 32 \)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std Dev</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Log Gini Coefficient</td>
<td>3.44</td>
<td>3.44</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2) Log GDP per capita 2005</td>
<td>9.90</td>
<td>9.90</td>
<td>-0.603 ***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3) Growth in Real GDP 01-05</td>
<td>3.80</td>
<td>3.80</td>
<td>0.312 *</td>
<td>-0.599 ***</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Log Tax/GDP</td>
<td>3.54</td>
<td>3.54</td>
<td>-0.631 ***</td>
<td>0.756 ***</td>
<td>-0.472 ***</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5) Log Entry Rate 2003</td>
<td>-2.54</td>
<td>-2.54</td>
<td>0.086</td>
<td>0.314 *</td>
<td>-0.096</td>
<td>0.274</td>
<td>1</td>
</tr>
<tr>
<td>6) Log Entry Rate 2004</td>
<td>-2.49</td>
<td>-2.49</td>
<td>-0.077</td>
<td>0.434 **</td>
<td>-0.161</td>
<td>0.465 ***</td>
<td>0.93</td>
</tr>
</tbody>
</table>

*** significant at 1%, ** significant at 5%, * significant at 1%; all significance levels are for one-sided tests.