Application for PhD by Publication

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Themes of Competitive Advantage: Small and Medium Size Enterprise Performance and

Inter-Regional Migration

Alan Mulhern. Submission for PhD by Publication. April 28 2015

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Academic Regulations Kingston University

A PhD by publication should have the following:

An introductory section demonstrating that the published works contain unifying themes and comprise a coherent body of academic work that meets the requirements for the award of PhD. The introductory section should:

• set the published work or creative output in the context of existing literature and evaluate the contribution that the research makes to the advancement of the chosen subject or professional area.

• stress the coherence of the publications, linking them to the methodology adopted.

• demonstrate the acquisition and utilisation of appropriate research skills equivalent to those of a traditional PhD student who has reached the end of the writing-up stage.

• include a section relating to the candidate's research methodology. This is particularly relevant if detail regarding methodology is not included in the publications. The PhD is about rigour of research process as well as the originality of the outcomes.

• in cases where the works are jointly authored by the applicant and other persons the introductory section should also describe the roles played by those joint authors, and contain percentage estimates of the applicant's input into each jointly authored work.

• be approximately 10,000 words in length.

Examination procedure is as follows:

* The regulations governing examination of PhD theses shall apply to the examination of the portfolio, except that the examiners' recommendations shall be limited to those in paragraph 11.

* Following the examination (including any oral examination), the examiners must make a joint recommendation of either:

i. that the award of the degree of PhD should be made

ii. that the candidate be allowed to resubmit the portfolio with a revised

introductory section; or

iii. that the material submitted in the portfolio falls short of the requirements, and

the degree should not be awarded.

*In the case of recommendation ii, the candidate must be provided with written guidelines on the additional material required and/or corrections to be. In the case of recommendation iii, the candidate will be informed that no further submission of this portfolio will be accepted for consideration for the award of PhD.

Introduction to Publication Series

and

Submitted Papers

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Submission of eight articles, one book chapter and one supporting article.

Themes of Competitive Advantage: Small and Medium Size Enterprise Performance and Inter-Regional Migration

Abstract

This series of papers is divided into three sub-themes under the general concept of competitive advantage. As well as extending our knowledge of this overall concept each makes a contribution to knowledge in their area. The three parts are as follows.

A. Small and medium size enterprise (SME) comparative performance was examined as the share of SME employment or output compared to that of large firms. This research was done with data of Venezuelan manufacturing industry 1961-1990. Apart from illustrating the long term relative and absolute decline of the SME stratum, eight variables were examined, all aspects of competitive advantage, that explained the decline in SME share. This was put into the context of the contemporary political and economic situation of this country.

B. SME comparative performance was explored in Poland:

Firstly with respect to the variables internal to the firm (competitive advantages) associated with faster growth of SMEs. This showed that SMEs with more developed organizational, behavioural, and non-price characteristics were likely to grow faster than SMEs with less developed characteristics.

Secondly, Polish regions with differing growth rates were examined and tested for differences in internal structure of SMEs in their regions. The faster growing region (with greater competitive advantage) was correlated with the more developed SME stratum.

C. Internal migration within two countries was examined as a response to differences in competitive advantage between regions. This work was carried out on Polish and Spanish regional and provincial data. An extended Harris-Todaro model, using wage and unemployment differentials as well as infrastructure, housing, and human capital variables, proved successful in explaining internal migration in both countries.

Overview

This submission consists of the following:

Part A

Section 1 sets out the unifying theme of the publication series. Section 2 describes how the two major sub-themes of SME performance and internal migration break down into three distinct parts which are briefly outlined. Section 3 sets out the research questions and methodology that structure the series. Section 4 names the core publications selected for this submission and the sharing arrangements with other authors.

Part B, C, and D describe in greater details each of the sub-themes, while Part E summarises the contribution to knowledge in each sub-field.

Part F is an appendix with a reference section, followed by two letters from my co-authors with respect to the share of input, a detailed list of the numbered publications that make up the submission, and electronic link to the papers.

There follows publishers' copies or photocopies of the 10 papers submitted for the PhD by publication.

Part A Main theme, Sub-themes, Methodology, Publications.

Part A Section 1. The unifying theme - Competitive Advantage

The unifying theme of the publication series is competitive advantage. The three sub-areas within this series, when closely considered, are all aspects of this overarching theme. Competitive advantage, a foundational economic concept, is often used with respect to firms and industries (Bain 1956, Porter 1985, Kay 1994) but can be widened to include regions, sectors, or countries. It consists in the ability to perform at a higher level than rivals as a result of advantages in areas such as internal organization, technology, labour power, location, or resources. We can observe the long term importance of this concept as it takes various guises throughout the history of economic thought. For example, as long ago as 1776 Adam Smith argued that the wealth of nations was determined by productivity advantages such as the division of labour and specialisation. One can think of these as competitive advantages of a country. This theme was taken up explicitly by Michael Porter over 200 years later (The Competitive Advantage of Nations, 1998) and has become part of the standard vocabulary of government economic strategy¹. Alfred Marshall (1879) argued that urban centres create external economies of scale that impact on firms' productivity and therefore create competitive advantages for all firms within the agglomeration. Urban competitiveness has become of major concern to contemporary government (Kitson et alia 2004). Penrose (1959), Petaraf (1993), and Barney (2001) argued that resources internal to the firm that are valuable, imperfectly imitable, rare, and non-substitutable can give it competitive advantage - the resource-based view. Kaldor (1970), Dixon and Thirlwall (1975), León-Ledesma (2002), and others showed how regions possess competitive advantages and explained the process of cumulative causation whereby small initial advantages (resource or location) could amplify in a virtuous circle of greater output and exports, producing increased productivity which leads to more growth. Michael Porter (1985) developed a model for understanding industry strategy and competitive advantages of firms within industries and regions. Acs and Audretsch (1989) with respect to industry stratum, showed how smaller firms may gain competitive advantage compared to large firms by increasing their efficiency and productivity measures. Harris and Todaro (1970) showed how migration flowed between sectors or regions reflecting their productivity (competitive) advantages, expressed in wage and unemployment differentials. Thus, we observe how this concept,

¹ The UK government department encouraging investment in the UK, for example, uses the concept of competitive advantage of the UK: <u>http://investinuk.net/competitive-advantage-uk</u>

widely applied to countries, regions, industries, stratum of industries, cities, as well as firms, is either directly or indirectly one of the most extensive, important, and long-lasting in economics.

The series of articles presented below explores aspects of competitive advantage in some of the above areas, namely, *industry stratum*, *firms*, and *regions*. For example, if the large firm stratum gains employment share while the small and medium size enterprise (SME) stratum, employing less than 250 persons², loses it, that is an expression of differing productivity, efficiency, and innovation levels between the two strata - i.e. their competitive advantages. If SMEs in one region have higher profits than another this is probably linked to the differing competitive advantages (productivity, infrastructure, and education levels for example) of the regions they are in. If migration moves from one region to another that also is a result of the differing competitive advantages (expressed in wage and unemployment differentials) of the regions which act as push-pull factors on the movement of labour around a country. Such theories can be tested especially with the regional and large data resources that have become available.

Part A Section 2. The sub-themes described

Although the sub-title of the publication series divides into two parts (SME performance and internal migration) the constituent papers are split into three sections to reflect more closely their research areas. Each paper and sub-theme is theoretically based upon one of the above mentioned theories of competitive advantage, namely, Acs & Audretsch's elaboration of industry stratum comparisons, the resource-based view (RBV), cumulative causation in regions, and the Harris-Todaro theory of migration. The methodology used throughout the three sections was to specifically test hypotheses concerning competitive advantage that would advance knowledge in the chosen sub-area. Each testing has some elements of uniqueness in the research (e.g. SME share in emerging economies) or uniqueness in the results (e.g. positive results for Spanish internal migration for the first time).

The three parts or themes of the publication series are as follows.

1. SME comparative performance, resulting from competitive advantage or disadvantage, is

² In the European Union small and medium size firms are defined as firms employing less than 250 employees. Within this category medium size employ between 50-249, small employ between 10-49, and micro employ less than 10. For credit, taxation, and other purposes turnover and balance sheet levels are important but for academic research it is the employee levels that count.

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examined as the share of SME employment or output compared to large firms. The determinants of this share were tested for on long term data from Venezuelan manufacturing industry. The theoretical understanding for this field was developed by Acs and Audretsch - henceforward A&A - (1989) with respect to the US and then applied to various other *developed* countries to examine *increasing* SME share (Birch 1981, A&A 1989, Ming-Wen Hu 1990, Segenberger et alia 1990, Mata 1993, Nugent 1994, Storey 1994, Thomadakis and Droucopoulos 1996, Spilling 1996, Doi and Cowling 1998, Trau 1997). Our papers were the first to apply a variation of the A&A model to a developing country and to use a reverse logic and demonstrate the determining variables (i.e. the competitive advantages or disadvantages) explaining *decreasing* SME share. The relevant key articles of the publication series are explained in more detail in section B below (pp15-20).

2. SME comparative performance in Poland. This was explored in two ways.

Firstly, with respect to the determinants (internal to the firm) of faster growing small firms – i.e. those with competitive advantage. The literature background is the general field of the resource-based view (Penrose 1959, Peteraf 1993, Wernerfelt 1995, Barney 2001) which points to the organizational, behavioural, and conduct features of firms influencing their performance. This was an original effort to examine this theme in the small firm stratum in Poland. The results were positive and indicated a range of internal organizational features correlated with small firm growth.

Secondly, with respect to differences in competitive advantage between regions. The background literature for this is in growth pole theory (Myrdal 1957, Hirschman 1958), cumulative causation theory (Kaldor 1970, Dixon and Thirlwall 1975), and its extended models (Amable 1993, De Benedictis 1998, León-Ledesma 2002). It implies that regions generate productivity advantages that impact on firm performance. To the best of our knowledge there was no prior literature testing this for small firms within regions. Our research used primary data from Polish regions and showed that the more developed region was correlated with more advanced organization of small firms - a contribution to the small firm and regional literature. The relevant key articles of the publication series on these two topics are explained in more detail in section C below (pp21-26).

3. Internal migration was examined as a response to the differences in competitive advantage between regions. The literature background to this starts with the Harris-Todaro (1970) model (henceforward H-T) using wage and employment differentials as the drivers of internal migration. There was nothing in the previous literature on Polish internal migration that had tested such a model (Deichmann and Henderson 1996, Fidrmuc 2003, Bornhorst and Commander 2004). Our

results showed for the first time that Polish internal migration, though weak, was explained by the variables of an extended H-T model.

The Spanish internal migration literature (Antolin and Bover 1997, Jimeno and Bentolila 1997, Bover and Velilla 2002, Maza and Villaverde 2004) had not found positive results in testing for migration determinants using the H-T model. However, our application of an extended H-T model proved successful and solved the long-standing enigma of Spanish internal migration The relevant key articles of the publication series are explained in more detail in section D below (pp27-34).

Section E below (pp35-36) summarises the contribution to knowledge made in each area.

Part A Section 3. Research Questions and Methodology

The questions posed concerning SME performance and internal migration include the following.

* What are the variables of competitive advantage that determine SME comparative performance with large firms?

* What are the long and short term forces determining the growth or decline of the SME stratum? Are regional differences correlated with SME quantitative and qualitative performance?

* Why have SMEs increased their employment and output share in some countries while in others they have experienced a declining share?

* Is it possible to model declining share of SMEs in a developing country?

* Which models can we use or construct to explain such phenomena?

* What are the determinants of migration from one region or province to another within a country over time?

* Can migration be modelled by wage and employment variables alone or is a wider spectrum of variables needed to explain it?

The publication series since 1996 examined these themes within selected countries. The key articles, published in peer-reviewed academic journals (except for the book chapter), provide theoretical and empirical explanations to these questions, model the dynamics, and use a variety of econometric methods to test the explanatory power of the determining variables. The data of three countries, Venezuela, Poland, and Spain, is used. The choice of these countries was partially determined by access to previously unavailable long term, robust, data series, and the variety and interest *per se* of these economies. Venezuela (an emerging economy) and Poland (ex-Soviet block)

had limited work on their SME stratum, while Spain was an inherent challenge because of the previous lack of success in explaining the internal migration in this developed economy. The combination of improved data availability, more complex modelling, and the use of econometric techniques, it was believed, would answer the above questions – which proved correct.

Methodology

The typical methodology of the papers was as follows:

- * Statement of the theoretical and empirical problem.
- * Formulation of a clear, testable hypothesis (or hypotheses).
- * The setting out of the theoretical background.
- * Placing the paper within a literature context.
- * Formulation of the dependent variable.
- * Construction of independent variables that are theoretically coherent, non-overlapping, and genuinely explanatory of the dependent variable.
- * Where data on these variables is unavailable the formulation of proxies is required. This is followed by the assessment of the adequacy of the proxy data.
- * Location or construction of a database as a foundation for the empirical work.
- * Selection of statistical and econometric methods adequate for testing the empirical validity of the hypothesised relationships.
- * Fine-tuning the methods and model; running the model; presenting results.
- * Placing these results within the literature background and theoretical context of the paper.
- * Suggestion of policy implications where appropriate.

This structured methodology was used throughout the series. Thus, the papers typically begin with an introduction that sets out the theoretical problem; then examine the background literature or previous attempts to resolve the problem; next the empirical specification section is presented where a model is proposed and justified; the dependent and independent variables are set out clearly and the econometric method to be used is introduced and explained; then the results of the testing of the model are presented and assessed; finally conclusions are drawn and where appropriate policy implications are suggested.

However, the actual method of carrying out the research, as opposed to presenting it, while covering the above points, might well have a different emphasis and order. Below is an example of how this method worked with respect to one sub-theme - Spanish internal migration (Mulhern and Watson Due to my work on Polish internal migration I was armed with a proven model and a robust theory of internal migration. I then became aware of similar attempts to explain internal migration in other countries. Among these was Spanish regional migration where there had been numerous attempts to explain and test for the determinants of internal migration using the H-T model. These had been unsuccessful and it was intriguing to know why. Here we have stage 1 – the formulation of the theoretical and empirical problem, namely: Spanish internal migration was not following theoretical expectation; numerous attempts to test for the migration dynamics had been unsuccessful. Why?

One explanation was that Spanish labour markets were rigid and unresponsive to normal economic forces – a recurring theme in the literature dominated by Spanish researchers. But it was also clear that all investigations had been using a core H-T model (mainly unemployment and wage differentials) and, for lack of data, had not expanded the explanatory variables to an extended model. The second stage of the research methodology is the formulation of a clear, testable hypothesis (or hypotheses). The primary hypotheses became the following: 1. Spanish internal migration is now explicable with an *extended* H-T model. Could this be tested for? Was the data available? The secondary hypothesis became: Spanish internal migration is now responding to basic economic forces (extended H-T model) as a result of labour reforms in the second half the 1990s. If the first hypothesis could be tested then our econometric testing could also split the decade of the 1990s in two and test if internal migration became more responsive to the explanatory variables in the second half of the decade (when labour reforms were implemented) compared to the first.

Following this we found the data for migration and a set of potential explanatory variables across a ten year period for Spanish regions. We then formulated the precise extended model with its explanatory variables and also determined their signs – positive or negative with respect to the explained variable. At times the intelligent use of proxies (usually with some precedence in the literature) was required.

Next the econometric method was decided. In the case of the Spanish regional paper this was the use of a SURE model that had already been used successfully with Polish migration data. Once the results were obtained then a judgement could be made as to hypothesis verification. Sometimes one would have to go back to the drawing board and start again. In this investigation, however, we found good results and were able to confirm our primary and secondary hypotheses.

Having found positive results for the Spanish regions and solved a long standing problem we found more disaggregated data at provincial level. There are 52 provinces as opposed to 17 regions. Clearly, our hypothesis that internal migration was now explicable would be even more decisively answered if we could prove it at the provincial level. However, we had a methodological problem. The choice of econometric method was now influenced by the latest developments in the field of the economics of spatial analysis and was linked to developments in geographic and urban analysis. The research field had advanced since our first paper on regions and indicated the desirability of a more complex model that allowed for spatial dependency in the data (not allowed for by OLS methods) and accordingly we moved to a *spatial error model*. The results were again successful with internal migration at this more disaggregated level being explained by the H-T extended model.

Each paper has its own individuality but they all fit within the general umbrella of points described above. The emphasis may change with one paper requiring intense theoretical effort, another the obtaining of primary data or the close examination of secondary data, or another the choosing of an adequate econometric method. All required creative theoretical interaction with the data. The higher the level of theoretical awareness the more one was able to look at data and use it - to see its significance. In some cases it was required that the theory should develop to make allowance for surprising results. Policy matters were typically discussed at the end of the papers. However, all papers had a balance of high level qualitative and quantitative methodology, and an interaction of theory and econometrics. No ethical problems arose to endanger the research. Neither was there any problem of shared ownership of the research since our teams developed a clear understanding of sharing arrangements, roles, and duties.

Part A Section 4. The selected publications and sharing with other authors.

The publications cover the later part of my academic career. I retired in 2013. The four parts of the research presented here represent the chronological order in which the research took place: firstly, on SMEs in Venezuela; secondly, SMEs in western Poland; thirdly, regional differences of SMEs in Poland; and fourthly, internal migration in both Poland and Spain.

Eight articles and one book chapter have been chosen as the core articles of the PhD by publication. In addition one article is background information. Please refer to the publications list in the appendix (p40) for full publication titles and details. Articles of shared authorship are often referred to here with the first letter of the surname: M = Mulhern; S = Stewart; W = Watson; G = Ghatak. Thus, Mulhern and Stewart are referred to as M&S, Mulhern and Watson as M&W, while Ghatak, Mulhern, and Watson become G&M&S.

The core articles and one background article, divided into the three sub-themes, are as follows: 1. M&S 2003a, Mulhern 2002 and M&S 1999 (articles 6, 8, and 9 [book chapter]) cover SME comparative performance with large firms. Mulhern 1996 (article 10) is background information to these.

2a. G&M&S 2003b (article 7) examines the determinants of fast growing small firms in Poland.2b. Mulhern 2009b, G&M&S 2005 (articles 3 and 5 cover Polish regional differences in SME performance).

3. M&W 2010, M&W 2009a, G&M&W 2008 (articles 1, 2, and 4) examine inter-regional migration in two countries, Spain and Poland.

The share of joint work

Professor Subrata Ghatak is deceased but Dr. Stewart and John Watson have written to confirm that we shared the articles in the following proportions. Of the four articles written with Dr. Stewart two were jointly authored (M&S 2003a and 1999, numbers 6 and 9) and two were tripled authored (G&M&S 2005 and 2003b, numbers 5 and 7). All of these four were equally shared between Dr Stewart and myself. For the two articles that were triple authored Professor Ghatak had a background, managerial role.

With respect to the three articles I shared with John Watson, two were jointly authored (M&W 2010 and 2009a, numbers 1 and 2) and one was triple authored (G&M&W 2008, number 4). Again Professor Ghatak had a managerial non-writing role on one article, while I led the articles with a division of 60% for my input and 40% for John Watson's

John Watson and Dr. Stewart were the econometricians. There are letters from them both in the appendix concerning this agreed share of input.

I leave it to the examiners to calculate a total from these shares. But the following exercise may

help. Let us suppose that single authored papers count for 1; joint authored with CS count for .5; joint authored with JW count for .6; triple authored with CS and SG count for .5 (with SG having a managerial role only); and triple authored with JW and SG counts for .6 (with SG having a managerial role only). Then, in order to help these calculations I offer the following possibility. Of the eight articles and one book chapter:

Two are sole authored (3 and 8)- suppose these count for 1 each	2
Two are joint authored with CS (6 and 9) - suppose these count for .5 each	1
Two are triple authored with CS and SG (5 and 7) - suppose these count for .5 each	1
Two are joint authored with JW (1 and 2) - suppose these count for .6 each	1.2
One is triple authored with JW and SG (4) - suppose this counts for .6	.6
Then my article contribution could be calculated at -	5.8

Of course a less generous view of the percentages may reduce the total somewhat. The inclusion of the background information article 10 (single authored and not included in the above calculations) might add a little. I hope this is helpful.

Themes of Competitive Advantage Part B The Share of Small and Medium Size Enterprises

Key articles 6,8,9. 10 is a background article.

- (6) Mulhern, A. and Stewart, C. 2003a. Long term decline of small and medium size enterprise share. *Small Business Economics* 21(3).
- (8) Mulhern, A. 2002. Venezuelan manufacturing, SME decline and failed transition, in H. Katrak and R. Strange (ed.) *Small-scale enterprises in developing and transitional economies*. Palgrave.
- (9) Mulhern, A. and Stewart, C. 1999. Long and short run determinants of small and medium size enterprise share: the case of Venezuelan manufacturing. *Economics of Planning* 32(3).

(10) Mulhern, A. 1996. Venezuelan small businesses and the economic crisis: reflections from Europe. *International Journal of Entrepreneurial Behaviour & Research* 2(2).

The three papers (6,8,9) explore how competitive advantage affects the relative position of the SME compared to the large firm stratum. They examine long term data of manufacturing industry for a particular developing country, Venezuela, where there has been a loss of competitive position of the SME stratum in terms of output, employment, and the number of firms. The long term decline of this stratum is, at root, a loss of competitive advantage within a hostile business environment.

No other studies of SME *share* in developing countries were known to the authors. These articles present and examine evidence that SME share in Venezuelan manufacturing experienced serious decline from 1961 to 1990 in contrast to the trend in some developed countries of a revival in SME share for a period since the 1970s. Firstly, the long term absolute and relative decline of SMEs in the manufacturing sector of Venezuela was demonstrated for the first time; and secondly, a model explaining this decline, using as explanatory variables a series of structural, efficiency, and innovation measures, was tested and proved successful (M&S 1999 and 2003a). The variables explaining this absolute and relative decline are aspects of competitive advantage including those of productivity differences between large firms and SMEs. This was the first time such investigation

had been done in any developing country. The data series was unusually long (1961-1990) and therefore gave this study increased significance.

Absolute decline refers to the numbers of firms and their employment and output levels. Relative decline refers to the percentage share of employment and output of SMEs compared to large firms. These absolute and relative measures can move in different directions. In Venezuela's case they both were in long term decline indicating a serious crisis in the SME stratum. Put simply, there had been declining long term share of SMEs in the manufacturing sector of this country due to poorer relative performance of SMEs – they had lost competitive advantage. Eight variables representing aspects of competitive advantage were identified, measured, and then fed into two regression models and published in two separate papers (M&S 1999 and 2003a) which were successful in explaining the decline of SMEs in this country over a thirty year period. A book chapter and an earlier paper (Mulhern 2002 and Mulhern 1996) also explained the institutional and political-economic factors that underlay the decline in competitive advantage of the SME stratum.

The Venezuelan manufacturing sector, by any of the standard three measures of employment, output (manufacturing value added – MVA), and number of enterprises, was small and inefficient. Examining the period 1961–1990, there was marked expansion of MVA up to 1979, accounted for by the very low base from which the country was starting. From 1979 to 1990 real MVA suffered stagnation though with some volatility around a depressed trend. This picture is repeated if we look at employment in manufacturing and the number of firms in this sector. There is a structural break around 1979 with significant growth before this period and decline after it.

The participation of SMEs in manufacturing activity over this period declined in the three indicators of MVA, employment, and the number of firms. Although there is a general and serious decline throughout the whole period, the loss of percentage share was greater in periods of expansion and less in contraction for reasons that are explained below. Below the employment share is shown.





While Mulhern (1996 and 2002) emphasised the Venezuelan political and economic environment the two articles M&S (1999 and 2003a) used time series data available for Venezuelan manufacturing (1961-1990) which allowed testing for explanatory variables of declining SME share using firstly the Engle and Granger error correction methodology (M&S 1999), and secondly an autoregressive distributed lag model (M&S 2003a). The theoretical model was derived from A&A (1989), who, using U.S. cross section data, found that industry-wide structural variables (e.g. entry barriers such as industry capital intensity, market size, advertising, and concentration ratios) have negative impacts on SME share, while strategic responses by SMEs (innovation and efficiency efforts especially by the larger of the SMEs) were found to compensate for these disadvantages and positively influence SME share.

These empirical findings for SMEs in the US have a theoretical base. Structural variables are factors having a deterrent effect on SMEs' formation and growth. It is well known that economies of scale, for example, favour larger firms since they offer reductions in average cost. Barriers to entry such as intensive advertising and high capital intensity are associated with large firm domination. Structural barriers such as these can either be measured directly by various variables or suitable proxies can be used.

The dependent variable for M&S (1999) was the change of SME share in manufacturing value added while for M&S (2003a) it was SME share in employment (ES). For the sake of simplicity the 2003a specification is used here to analyse SME employment share where:

 $\Delta ES_t = \delta + \Sigma \pi_i X_{it-1} + \Sigma \gamma_i \Delta X_{it} + \alpha ES_{t-1} + u_t \qquad (M\&S \ 2003a \ p220)$

Where the ith explanatory variable is entered both as a lagged level, X_{it-1} , and a difference term, ΔX_{it} . This autoregressive distributed lag (ADL) model may be interpreted as a partial adjustment specification, and the coefficient on lagged SME share is expected to take values between zero and minus one to ensure correct adjustment.

The explanatory variables, all aspects of competitive advantage, divide into three groups: structural, efficiency, and innovation variables. A country specific variable is also added. These explanatory variables and their expected signs are as follows.

Structural variables - refer to the industry (in this case the Venezuelan manufacturing sector) as a whole rather than to individual firms. The variables used were capital intensity, market size, and import penetration. These are industry features that are expected to confer on large firms competitive advantage over smaller rivals. *Capital intensity* (KL), captures barriers to entry discouraging small firm presence and therefore has an expected negative sign. *Market size* (LSZ) proxies for economies of scale and has an expected negative sign. *Import penetration* (IP) of the manufacturing sector was included. It was expected that the greater the level of these structural variables then the more smaller firms would experience competitive disadvantage.

Efficiency variables. SMEs may, nevertheless, increase their share by improving their relative performance vis-à-vis larger firms in efficiency or productivity variables. For example, improving their labour productivity relative to larger firms should lead, *ceteris paribus*, to an increase in their share of manufacturing output and employment. Three variables were used which measured such potential SME response. *Relative capital/labour mix of SMEs* (RKLS), *pure efficiency* after the capital/labour mix has been controlled for (VS), and *relative labour costs* (RWS). Positive signs were expected on RKLS and VS since an increase in these ratios (compared to large firms) constitute relative competitive advantage, while a negative sign was expected on RWS since a rise in this ratio would show labour costs rising faster in the SME compared to the large firm stratum. Of course, the opposite also applies. If the SME position deteriorates with respect to comparative efficiency then its competitive disadvantage increases and it loses share vis-a-vis large firms.

Innovation variables. Since data on patents and innovations was unavailable in Venezuela we used a proxy: relative investment intensity (INVS) of SMEs compared to industry as a whole. This is the relative ratio of value added to capital employed (capital productivity) with an expected positive

sign. Greater relative modernisation of the SME stratum, as indicated by a rising INVS, should lead to greater share in manufacturing production.

GDP as an exogenous independent variable was added as a proxy for the general business environment. It was argued that, in the case of Venezuela, the business environment was hostile to SME progress. The reasoning was as follows: in times of rising GDP Venezuelan SME share declines because large firms take greater advantage of favourable conditions. These include access to contracts, soft credit facilities, political connections, preferential interest rates and greater access to many areas, such as, export markets, commercial information and new technologies. Quite simply, access to these advantages is determined by political influence rather than by genuine competition. SMEs are outsiders in the economic/political game. With falling GDP, SME share may increase, not because SMEs are doing well (they may in fact be contracting) but because large firms contract production even more, thus narrowing the gap between them. This was especially noticeable in the recession of the early 1980s. Large firm share decreased reflecting the larger reductions in production in the large firm strata compared to the SME strata. This greater volatility of the large firm strata can be observed across a range of important variables such as employment figures as well as numbers of firms in each strata. It is not that SMEs are more stable in any positive sense. Rather they are unable in periods of GDP growth to take as great an advantage of economic opportunities as large firms, while in recession they have less to lose than the larger firms. In this respect Venezuelan SME experience resembles that of certain industrial countries (Spilling 1996, Trau 1997). We therefore expected a significant and negative sign, i.e. that rising GDP is accompanied by declining SME share in Venezuelan manufacturing production.

With respect to Venezuelan manufacturing over a thirty-year period our results found that key structural barriers (the capital/labour ratio and the size of market) were, as expected, negatively and significantly correlated with SME share, while efficiency and modernisation measures had the expected positive signs and were significant. SME relative labour costs, as anticipated, were significant and negatively related to SME share, while relative factor mix, relative efficiency and relative investment effort were positively and significantly correlated to SME share. Import penetration was found to be insignificant. The studies found a very strong negative correlation between the proxy variable GDP and SME manufacturing share, indicating, in the authors' opinion, evidence for a business environment hostile to SME interests. In short all our variables, with the exception of import penetration, proved significant and correctly signed.

The M&S (1999) paper showed similar results and distinguished between long and short term determinants of share. The Mulhern (2002a) book chapter gave more detail of the political and economic background as well as the prejudicial business environment. The Mulhern (1996) paper was background information examining the evolving macro-crisis in the Venezuelan economy and comparing in broad terms the EU and the Venezuelan SME stratum.

Overall our analysis demonstrated that SME share in Venezuela over a long period was negatively related to the existence of structural barriers, positively related to the extent to which small firms relied on a strategy of innovation, and negatively related to the efficiency differential between small and large enterprises. These are all types of competitive advantage between different stratum of industry, in this case SMEs and large firms. This was the first time this had been demonstrated for a developing country. Part E below points to the implications of this knowledge in a wider context.

Themes of Competitive Advantage Part C Small and Medium Size Enterprises:

Internal Organization, Competitive Advantage, and Regions

Part C examines SMEs in Poland. It divides into two related areas of research. The first is centred on a survey of SMEs in the Pomorskie region in 1999 and, following the RBV model, we test the hypothesis that faster growing firms are characterised by more developed internal organization and conduct features. The second extends the above survey to include SMEs in Lubelskie, eastern Poland which is a less developed region. Thus, we had available primary data on the internal organization of SMEs in both a developed and less developed region of a country. Using the theoretical model of cumulative causation and the RBV model we hypothesised that the faster growing region would have SMEs with more developed organizational characteristics beyond (but obviously including) those of output and price.

A. SME internal organization and competitive advantage

Key article 7.

(7) Ghatak, S. Mulhern, A. and Stewart, C. 2003b. Determinants of intended expansion of Polish small firms. *Journal of Policy Modeling* 25(3).

G&M&S 2003b examined SMEs in the Polish economy demonstrating that competitive advantage can stem from internal organisation. It examined the hypothesis that the performance of SMEs is correlated with the efficiency of their internal organisation following the implications of the RBV perspective which sees the competitive advantage of a firm based on a set of internal resources (Penrose 1959; Peteraf 1993; Wernerfelt 1995; Barney 2001). The paper was based on primary data of a survey in 1999 (School of Economics, Kingston University) of SMEs in Pomorski, the Gdansk region of Poland. A structure-conduct-performance and RBV logic suggested that under competitive conditions, the better organised (conduct features) SMEs in a region would have superior results (performance features). The proxy for performance was 'intention to expand' since profit figures were unavailable. The ordinary least squares (OLS) method was applied and suggested the use of a non-linear functional form. The general specification of the estimated non-linear model was:

$$Y_i = \Sigma_i \beta_i X_i + \Sigma_i \delta_i X_i^2 + u_i$$

where u_i is a stochastic error. Our non-linear model specifies some squared explanatory variables – not possible for other dichotomous variables that only take either the value zero or one.

Results showed that firm's intention to expand was correlated with seven significant conduct variables, namely: the existence of export and franchising activity, a recent increase in fixed assets, the difficulty in obtaining a bank loan, the level of human capital, the technological level of the firm's products, and the estimated proportionate change in income in recent years.

Our results showed that the more efficient firms and those with proven competitive advantage intended to expand within the two years following the survey. These were firms that had already proved themselves with higher growth of turnover and investment, higher levels of technology in their products, superior levels of human capital, proven international presence and had overcome the difficulties of high cost bank loans - probably by sourcing growth from profits. Our results indicated that it was not just the larger of the small firms that were expected to grow but those experiencing recent growth, for example in investment and turnover. It was the faster growing of the small firms that were expected to continue to do well. The non-linearity of the variable "technological level of the firm's products" pointed in the same direction. By implication strong catch-up gains were possible for the smaller but faster growing firms.

B. Regional location and SME internal organization

Key articles 5 and 3.

(5) Ghatak, S. Mulhern, A. and Stewart, C. 2005. Regional development of small firms in Poland. *Economic Change and Restructuring* 38(2).

(3) Mulhern, A. 2009b. Small firms and diverging regions: the case of Poland. *The International Journal of Economics Issues* 2(2).

These two papers examine SMEs in the Polish economy demonstrating that competitive advantage is associated with the development of the region in which they are located. Faster growing and more developed regions have more advanced firms, not only quantitatively in terms of output and employment but also qualitatively in the way the firms are organized.

Polish regions and the theory of cumulative causation.

To examine regional differences in SMEs, Pomorski and Lubelskie were chosen as representative of the more developed and less developed parts of Poland. Although of similar population size, by the year 2000 Pomorskie compared to Lubelskie had the following advantages: 46% higher per capita GDP; 45% higher urbanization rate; 120% larger industrial output; 40% greater industrial productivity; 20% higher wage levels. The GDP differences had been widening through the 1990s and these two regions were representative of a similar widening gap between faster and slower growing regions in Poland.

Cumulative growth theory gives a theoretical framework for understanding regional growth variations indicating that more developed regions, initially propelled by resource, historical, or geographic advantages, evolve greater competitive advantage in a positive cycle. As a result of the greater levels of demand for their products and services greater output is generated thus creating higher levels of urbanization and industrialization. Agglomeration advantages and greater productivity result in these regions. Regional output growth, especially in the form of exports, causes cumulative growth and regional polarities through its effect on labour productivity (Kaldor 1970, Dixon and Thirlwall 1975). The Verdoorn Law, indicating the correlation between productivity growth and output of the previous period, covers a variety of processes, such as specialization of labour and technical advances, by which output growth in a region triggers subsequent productivity growth which in turn triggers greater output growth. Such a view also has its roots in growth pole theorists (Myrdal 1957, Hirschman 1958) who stressed not only internal economies of scale but also external economies as underlying productivity advances and growth. In this scenario external economies (urbanization and localization economies) generate greater productivity advances in those regions possessing them. This in turn leads to greater growth, higher levels of urbanization and industrialization which subsequently generate higher productivity growth. Price competitiveness is linked with increased productivity, increased output, and aggregate demand in a circular process. Later models (e.g. Amable 1993, De Benedictis 1998, León-Ledesma 2002) introduced non-price competitive behaviour which was shown to influence productivity and aggregate demand of the region. Regional analysis showing divergence or convergence is not new. What is novel, however, is to show how this is linked to small firm structure, conduct, and performance.

Primary data was used from an interview survey of SMEs in both the Pomorski and Lubelskie regions together with a theoretical model based on cumulative causation and systemic

competitiveness, hypothesising that the more developed region would be associated with the more developed conduct and performance features of its firms. The SMEs, for example, in the more developed Pomorskie region were expected to not only be more numerous but also more productive as well as better organised, resourced, and connected. This would be reflected in higher performance features which in turn, would be related to general regional advantages (external economies of scale, banking facilities, educational provision etc.). Essentially these articles (G&M&S 2005 and Mulhern 2009b) test if SME development is region specific in Poland. This development covers a range of non-price variables that influence the competitiveness of SMEs. These include *structural* features of the firm, e.g. its legal structure, and ownership of other companies in Poland or abroad; *behavioural* or *conduct* features of the firm, e.g. subcontracting, exporting, and franchising; and *performance* features of the firm, e.g. technological and organizational advance, investment, wages, human capital improvement, intention to expand output, profit levels, and the like.

The basic assumption is that more developed firms "choose" the more dynamic region to locate in. This not only applies to incoming firms but to newly emerging and existing firms within a region. They all have "choice" in where to locate or continue locating their operations influenced by their pursuit of either profit maximisation, profit targets, market share, sales revenue maximisation or growth of the size of the firm. Firms, be they large or small, are more likely, on average, to achieve these aims as they qualitatively improve their performance and their organization (Penrose 1959, Barney 2001). From this perspective a firm, for example, with greater productivity than the average, with more highly developed networking or subcontracting experience, with higher technological functioning, higher productivity and past profits, and with greater intention to expand is more likely to achieve the above aims (be they of profit, sales or growth) and inclined to "choose" the more dynamic region.

Prior econometric and statistical analysis of structural, behavioral, and performance features of SMEs in a transitional economy and their correlation with regional location was unknown to the authors. G&M&S 2005, using a probit model, revealed the following five variables to be correlated with region:

The legal status of Pomorskie's SMEs differed from those of Lubelskie's with more firms at the higher end of the free market development spectrum (e.g. more limited companies), indicating structural differences between firms in the two regions. Firms that were legally structured as

limited companies, for example, are more likely to survive, to raise finance, to be larger in size, to be more specialised and technologically more advanced than sole traders. The legal structure of a company is indicative of a raft of structural differences between small firms. The more dynamic region in our study showed, as expected, the more developed legal form.

Subcontracting proved a significant difference between SMEs in the two regions indicating differing regional behavior of firms in response to competitive dynamics. Pomorskie engaged in seven times more subcontracting than Lubelskie. The subcontracting compared to non-subcontracting firm is more networked and knowledgeable of rules of engagement with larger firms (some foreign); more advanced in information technology, quality working practices, contracts, teamwork and working in clusters (Schmitz 1992); more flexible and responsive to change and has greater access to credit (since it is more "known" and has references for bank credit). Such connectivity and transparency is not available to the more isolated firm which will have limited and expensive credit. Since credit is a general constraint on small firm development in Poland (as well as many other countries) then sub-contracting is indicative of ways of overcoming this problem (Petersen and Rajan 1997).

Intention to expand turnover was greater in Pomorski indicating the existence of higher profit levels and pointing, once again, to the productivity differential between the two regions.

The technological level of the products of the firm was higher in the Pomorski region indicating greater productivity advances and an expected correlation between SME growth and new product development (Solem and Steiner 1989, Wo et alia 1989).

A higher average wage of the Pomorskie SMEs was theoretically expected to be correlated with a higher marginal productivity of labour.

Many, though not all, of the above mentioned variables have also occurred in other studies of SME growth. However our study differs in that it was of regional differences in SMEs. It might be argued that such correlations are to be expected in regions of different development – the more dynamic region possessing a more developed smaller firm sector, and, as it were, being "chosen" by firms for their location. Indeed, this was our expectation. However, the purpose of this paper was to test this relationship on sound evidence rather than expectation and inference.

A second and simpler test (Difference in Proportions) was employed by Mulhern (2009) in order to include a wider range of variables. More rigorous econometric methods (e.g. probit and logit models) proved very costly in terms of information loss thus reducing the sample population considerably. The Difference in Proportions Test offered a solution to this by not excluding an observation (i.e. a firm) simply because it failed to answer one question of the total questionnaire unlike the probit analysis which did. Thus the probit model, despite its rigour, was "exclusionary" while the Difference in Proportions Test, though less rigorous, proved more inclusive of information and therefore gave a broader picture of the population characteristics. By this method Mulhern (2009b) found that smaller firms in the more developed region had a greater degree of development in a total of eighteen variables, indicating a considerable range of organisational, behavioural, and performance differences. The five variables found relevant in G&M&S (2005) were again significant in this test. In addition other significant variables were now included. The Pomorskie region had a higher level of firms' legal status; a greater presence of foreign capital; more international orientation; greater network arrangements and formal collaboration with other Polish firms; higher levels of R&D and innovation (including improved technologies with respect to new products and services); higher levels of human capital; a greater degree of external financial help and grants; greater experience of restructuring arrangements; greater intention to increase output and higher levels of investment. By contrast, SMEs in the less developed area of Lubelskie were smaller, overwhelmingly of sole proprietorship structure with a low technology level. They had very little networking and no developed form of financing, for example leasing. Their levels of education and training were below firms in the developed regions and export activity was lower.

Conclusion

Non-price variables contribute to creating competitive advantage as shown in G&M&S (2003b). A range of performance variables as well as structural features of SMEs create the conditions for growth. While it has been known for some decades, certainly since Penrose (1959), that large multinationals pay great attention to their internal organization and non-price factors in order to create competitive advantage, it has not been clear that a similar process occurs in smaller firms also. The evidence of this paper favours looking at SMEs as a heterogeneous stratum. G&M&S (2005) and Mulhern (2009b) show that non-price variables are strongly correlated with regional location. This work can be placed within a theoretical setting of cumulative causation. This is the first time, to the authors' knowledge, that this has been empirically demonstrated in a transitional or developing economy

Themes of Competitive Advantage

Part D

Internal Migration:

The Competitive Struggle of Regions and Provinces

Key articles 1,2,4.

(1) Mulhern, A. and Watson, J. 2010. Spanish inter-regional migration: an enigma resolved. *Applied Economic Letters* 17(14).

(2) Mulhern, A. and Watson, J. 2009a. Spanish internal migration: is there anything new to say? *Spatial Economic Analysis* 4(1).

(4) Ghatak, S., Mulhern, A. and Watson, J. 2008. Inter-regional migration in transition economies: the case of Poland. *Review of Development Economics* 12(1).

The three articles concerning internal migration in publication order deal with: 1. The Polish regions (1995-2001). 2. The Spanish provinces (1999-2006). 3. The Spanish regions (1990-2000). Their unifying methodology is the use of an extended Harris-Todaro (H-T) model. Seemingly Unrelated Regression Equations (SURE) were used for the Polish and Spanish Regions while a spatial error model was used for the Spanish provinces.

Migration generally follows the push and pull of economic incentives which are expressions of the competitive advantages of different countries or regions and has traditionally been explained by the differences in wages and unemployment that exist between them. These are the core economic explanatory factors and constitute the H-T model (1970). Additional variables are expected to also influence internal migration, for example the educational level of the migrant, differentials in housing prices, regional infrastructure, and select others. These are non-core variables and constitute, together with the core, an extended H-T model. This extended model, intuitively plausible, was difficult to test empirically up to around 2005 since regional data was generally difficult of access and often incomplete even with respect to core variables. However, the availability of large regional data sets within countries made it possible for researchers to test models that had previously been confined to theory - such as the extended H-T model. Previous work on regional analysis of Polish SMEs (G&M&S 2005, Mulhern 2009b) led to related matters of regional migration. Once this work proved successful it became possible to apply the extended

H-T model to another country. In particular, Spanish internal migration was of interest since it had proved resistant to traditional economic explanation and empirical testing.

Polish Internal Migration

Similar to other transition economies, Poland exhibited a polarisation of its economy with growing gaps between regions as well as increasing rates of unemployment. Traditional migration models predicted that internal mobility would reduce such gaps with migrants moving from depressed areas to more advanced regions. However, Poland showed very low rates of internal migration (Fidrmuc 2003, Bornhorst and Commander 2004) especially in the first half of the 1990s which only faintly reflected regional polarisation. Clearly, the lack of labour mobility from lower to higher productivity regions adversely affected efficiency in output and employment (Deichmann and Henderson 1996). The understanding of the regional migration dynamics of Poland was the object of this paper.

Firstly, we wished to test the extent to which inter-regional migration flows were correlated with:

A) *Relative economic opportunity* measured by regional differences in wage rates and unemployment - the H-T (1970) hypothesis. In the case of Poland there was a lack of regional data on wages for the time period studied and therefore they were proxied by regional GDP per capita in the model.

B) *Regional facilities* (particularly publicly provided facilities) - the Tiebout (1956) hypothesis. In our model we tested for road infrastructure, health, and housing facilities. In the faster growing regions these act as agglomeration economies thus increasing regional productivity, raising wage rates, and attracting inward migration.

C) The relative distance migrants have to travel - the Hatton-Williams (1998) hypothesis. This proxied for the cost of migration.

D) The impact of human capital on migration patterns (Dustmann 1995).

The theory behind these views of migration, the choice of our model and variables for testing were built on previous research into the determinants of inter-regional migration (the extended H-T model). None of the previous research on Poland had used econometric testing. Other studies of transitional economies noted similar trends of low migration and differing regional growth rates (Fidrmuc 2003). By testing for the explanatory variables of inter-regional migration and with the availability of new data we were able to examine more deeply the causes of migration within Poland and obtain results based on robust econometrics.

We expected that Polish regional migration, weak though it was, would still be correlated positively with differentials of GDP per capita (our proxy for wages) and negatively with unemployment in the faster growing regions which therefore pull in workers from the slower growing regions. We expected that general infrastructure facilities in the faster growing regions would act as a magnet for migration, constituting agglomerations economies. Distance to be travelled by the migrant, as proxy for the cost of migration, was assumed to be negatively signed. Human capital was expected to be positively correlated with migration - the more educated are more likely to migrate.

All data was drawn from the recently available web site of the Polish Central Statistical Office (Glowny Urzad Statystyczny, GUS: www.stat.gov.pl). It comprised regional data on migration, unemployment, GDP per capita, housing, secondary school education, infant mortality, road provision and population numbers.

For empirical estimation we used the following model:

$$M_{ijt} = \delta_i + \gamma_j + \beta X_{ijt} + \varepsilon_{ijt} \text{ with } i, j = 1 \dots 16 \ i \neq j \tag{G\&M\&W 2008 P216}$$

where M_{ijt} is the natural logarithm of migration from province *i* to province *j*; δ_i and γ_j are fixed effects for donor and destination provinces respectively, used to catch spatial heterogeneity; X is a vector of explanatory variables which are as follows:

 Y_{jt} (Y_{it}): natural logarithm of GDP per capita (proxy for wages) in destination province (donor province).

U_{it} (U_{it}): natural logarithm of unemployment in destination province (donor province).

DW_t: natural logarithm of the number of dwellings per thousand population in destination region.

HC_t: is the natural logarithm of the number of students enrolled in secondary schools including vocational, basic and especial schools per thousand population in donor province.

D: is the road distance in kilometres between the capitals of provinces i to j, which we proxy for migration costs.

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 RD_{jt} (RD_{it}): natural logarithm of density of road length in destination province (donor province). IM_{it} (IM_{it}): rate of infant mortality in destination province (donor province).

The last two variables were used to test the incidence of publicly provided goods. RD was a proxy for infrastructure and IM for health care. Three different models were estimated. The first did not take into account publicly provided goods, the second only infrastructure, while the third used all variables. Seemingly Unrelated Regression Equations (SURE) were used for testing purposes.

In explaining migration decisions in Poland the results showed Y_i , U_j , and D were highly significant. Y_j and U_i also proved significant though somewhat less so. Therefore, GDP and unemployment differentials were significant. Distance was an important explanatory variable for migration thus lending support to gravity type models. Housing facilities in the destination region (DW) and the educational background of the migrant (HC) were both highly significant with both SURE estimators. Road provision (RD) was significant for destinations regions in our preferred Table 2. Health, proxied by infant mortality in our model (IM), was not significant - thus indicating, as suspected, that workers were moving for narrower economic motives. Polish regional migration was low by international standards, a feature noted in other transitional economies, but our results generally confirm the theory that internal migration followed the incentives and disincentives of wage and unemployment differentials, relative regional opportunity and facilities, and the cost of migration.

It followed from these findings that in order to encourage greater labour mobility for reaping efficiency gains an important policy decision for the Polish government was to provide more practical housing for key workers in those regions with growth potential. Regional facilities can also be improved thus providing the infrastructure necessary for increased employment. Finally greater educational provision helps migration. The better educated migrant is more equipped to find work, long term employment and a higher wage.

Spanish Internal Migration

After the initial success in analysing migration flows across the Polish regions attention was turned to Spain. Data became more available in this period. The extended H-T model had proved its value in Poland. However, the Spanish economy was characterised by very rigid labour markets and this impeded internal migration. Spanish internal migration had been characterized as low by international standards and as unresponsive to traditional explanatory variables such as wages and unemployment. Previous econometric investigation into the explanatory factors causing internal migration in Spain found variables wrongly signed, unexpectedly insignificant, or with low elasticity. For example, Bover and Velilla (2002) claimed that high regional unemployment did not trigger migrations to more prosperous regions and ... "since the mid-1980s we are witnessing in Spain what may seem a migration puzzle: despite persistent unemployment differentials, high unemployment regions are not any more net out-migration regions while rich and low unemployment ones are no longer net immigration regions." Maza and Villaverde (2004) concluded "This appears to indicate that along with the traditional economic factors there are other determining factors of migration that are non-economic in nature and whose influence is difficult to quantify." Antolin and Bover (1997), found traditional economic explanatory variables, such as unemployment and wages, to be problematic and sometimes wrongly signed.

In brief, the literature revealed a problematic research field. Our purpose was to examine if Spanish internal migration was still unresponsive to traditional economic explanation – the H-T model. Had the partial reforms of the labour market made it now responsive? Would the new regional data available make it possible to apply the extended H-T model? In other words, there was an long-standing problem of unresponsive internal migration that might now be resolvable with the new tools (extended H-T model) and data available.

M&W (2009a) analysed and tested *inter-provincial* migration (more disaggregated than regional) and 47 provinces were investigated. M&W (2010) analysed and tested migration across the regions (17 of them). The M&W (2010) paper is discussed first since it was written before but published after M&W (2009a) which used a spatial error model plus a much larger (and more difficult to obtain) data set for the provinces.

M&W (2010) used the data of Spanish regions and, like the Polish model, extended the traditional model of migration to include human capital, housing prices and regional infrastructure in order to analyse the determinants of migration in the Spanish regions during 1998-2006. Seemingly Unrelated Regression Equations (SURE) model were used once again.

The empirical section of this paper used the following model:

$$m_{hty} = c + x_1 W_{hy} + x_2 W_{ty} + x_3 U_{hy} + x_4 U_{ty} + x_5 P H_{hy} + x_6 P H_{ty} + x_7 \text{Infra}_{hy} + x_8 \text{Infra}_{ty} + x_9 D_y + \varepsilon_{hty}$$
(M&W 2010 P1356)

Here m_{hty} is the flow of migrants from region h to region t at year y, divided by population in region h; where W is real wages, U is the rate of unemployment compared to the active population, PH is the price of housing, infra is infrastructure of a region compared to its area; D is distance, a proxy for migration costs; and finally hty is a random error. Subscripts h and t refer to home and target regions. All variables are transformed to logarithms.

We tested the elasticity of migration with respect to its explanatory variables which are denoted as parameters x. Given the emergence of labour reforms and increase in regional migration in the second half of the decade we anticipated increased responsiveness of regional migration to these variables and therefore, after testing for a structural break, we divided the data series in two. Three SURE tests were performed for the following periods:

1. 1990-2000, the whole period, where our expectations were confirmed with a high R^2 and all variables being correctly signed and significant (except for *PH* in target region).

2. 1990-1995 (pre-labour market reform), where as expected we had weaker results. The R^2 was high; all variables except infrastructure and wages in target regions were significant and all were right signed except infrastructure (home and target regions). Such partial results were expected in the early period before the increased level of labour market reforms.

3. 1996-2000 (labour market reform period), where we expected stronger results reflecting the labour reforms and increased inner migration. All variables were significant except two, house prices in target region and infrastructure (home region), both with low significance. All variables were right signed and the R^2 continued consistently high. The improved results, compared to the 1990-1995 period, were clear, however, in the change of elasticities of migration with respect to wages in the second period compared to the first: the coefficient (demonstrating the elasticity) in front of wages in the target region leaped from 0.57 to 7.84 (an increase of 14 times), while wages in home region increased from 1.97 to 3.36. These large increases in wage elasticity were found in all experiments with the model. With unemployment there was also an increased responsiveness of migration in the target region.

We were pleased to report: "This is the first time that Spanish inter-regional migration follows the

expectations of economic theory".

The subject of the M&W (2009) paper, written later than the paper above, was internal migration across the *provinces* of Spain in the years 1998-2006. In the course of the research of the previous article we came across newly available data at provincial level and felt that our model should still work at this more disaggregated level. The model investigated was as follows:

$$m = \alpha + \beta x_t + \beta x_h + D + u$$
$$u = (\rho_1 Wh + \rho_2 Wt)\varepsilon + e$$

(M&W 2009 p111)

This is a spatial error specification that takes into account geographical interaction of errors through the error term. Migration across provinces was denoted by m; X_t denotes explanatory variables for destination provinces and Xh explanatory variables for origin provinces. These consisted of wage and unemployment gaps as well as housing price and infrastructure differentials between provinces. D denoted distance. For provincial partition we used 47 Spanish provinces. We had 13,246 observations. Results of the regressions were largely as anticipated.

Housing prices, wages, unemployment and distance showed the expected signs and were significant. Infrastructure had the expected sign, but was not significant. The R^2 , 0.62, had an acceptable value. The coefficients showed strong elasticity of inter-provincial migration in response to wage and housing price differentials. Differentials in housing prices, along with wage and unemployment gaps, are key to understanding internal migration. Unemployment differentials between provinces were significant although the elasticity was low. The results show that core variables explained internal migration flows in Spain and that inter-provincial migration now followed the traditional economic reasoning of the Harris-Todaro variety with respect to gaps in wages and unemployment. It was also very responsive to housing price differentials as well as distance factors.

Spanish internal migration had been resistant to economic analysis for many decades. The econometric results of the two papers above showed that both regional and provincial migration responded to the H-T model. This was positive encouragement for the reforms in the labour markets that show migration responding to wage and unemployment gaps between provinces.

General conclusions for the migration papers

The three migration papers applied an extended H-T model to two countries, Poland and Spain, at a regional level, as well as more rigorous testing at the provincial level in Spain. The results confirmed the usefulness of this model. In Poland such econometric work had not been done before and in Spain there was a history of bewildering results that went against theoretical expectation. The results for the Polish regions showed that migration, although weak, did conform to theoretical expectation (from the extended H-T model). In Spain the core explanatory variables as well as a range of non-core variables were confirmed thus ending a long-lasting puzzle for research on internal migration in this country.

Themes of Competitive Advantage

Part E

Contribution to knowledge

In the publication series four contributions to the literature stand out.

The first is the understanding of changes over time in the SME stratum compared to large firms. This was explored and tested with reference to Venezuela. The long term absolute and relative decline of SMEs in the manufacturing sector of this country was demonstrated for the first time (M&S 1999, Mulhern 1996). Secondly, more importantly, a complex model explaining this decline, using a number of structural, efficiency, and innovation explanatory variables, was tested and proved successful (M&S 1999, 2003a). These variables constitute competitive advantages including, but not limited to, productivity differences between large firms and SMEs. Put simply, SMEs had lost competitive advantage and lost share. However, this decline was now explained by a plausible model and econometric testing. This was the first time that such a model was applied to a developing country and moreover it was the first time it had explained a declining share. By implication such a model explaining the determinants of SME share of output or employment could now be incorporated into the theory of SMEs and even firm theory in general. An answer to the question of what are the driving forces determining changes in size structure in an industry had been given and this knowledge could be used as an understanding of SME share generally. Our research was a link in the chain making this possible.

The second contribution, G&M&S (2003b), showed that competitive advantages can stem from the manner in which firms are organised with particular reference to non-price features. This was the first time that such a model and testing had been applied to SMEs in a transitional or developing economy. This added weight to the RBV position.

The third contribution concerned the understanding of regional differences in SME performance. Using primary data from Polish regions and together with a theoretical model based on cumulative causation it was shown that more developed regions were correlated with more advanced organization of small firms (G&M&S 2005, Mulhern 2009b). This was a contribution to the small firm field and, to the best of my knowledge, the regional literature.

The fourth contribution was the theoretical and empirical understanding of inter-regional migration. An extended Harris-Todaro (H-T) model for understanding internal population movements was used. The explanatory variables of this model constitute regional competitive advantages which, in the theory of cumulative causation, have positive feedback loops and create self-reinforcing cycles. The expanded model exploited newly available data allowing the successful explanation of interregional migration in Poland - not attempted before for this country (G&M&W 2008). A similar project was undertaken with respect to Spanish internal migration for which there had been, in the prior literature, a number of attempts at explanation thwarted by the lack of data required for an extended H-T model. Tackling at first inter-regional and then inter-provincial migration, a standard and then more advanced econometric method were employed which, together with the extended H-T model provided an explanation, for the first time, of the inter-regional migration dynamics in Spain (Mulhern and Watson 2010, 2009a). Again, understanding regional competitive advantages was at the heart of this research. Besides the contributions to empirical knowledge (internal migration in Poland and Spain) the contribution to theoretical knowledge was that our papers gave clear evidence that when the H-T core model is not effective in explaining internal migration then the extended model incorporating regional variables should be used, namely, that internal migration is best explained by using a set of regional variables beyond those of wage and unemployment differences.

These contributions are all aspects of competitive advantage: either a comparison of one *industry stratum* to another; better growth from *firms* with more developed organisational and conduct characteristics compared to those with less; more developed firms belonging to the more advanced *regions* of a country rather than the less; *migration* moving to regions with greater productivity and regional facilities rather than less. The application of the concept of competitive advantage continues to be flexible and of great importance across a wide range of economics. This series of publications has explored sub-themes of competitive advantage that have contributed to empirical and theoretical knowledge.

Themes of Competitive Advantage

Part F

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Part G

Appendix: Publications List, Electronic Links

Publications list. Numbered key references to Mulhern - either single or shared.
1. Mulhern, A. and Watson, J. 2010. Spanish inter-regional migration: an enigma resolved. *Applied Economic Letters* 17(14).

2. Mulhern, A. and Watson, J. 2009a. Spanish internal migration: is there anything new to say? *Spatial Economic Analysis* 4(1).

3. Mulhern, A. 2009b. Small firms and diverging regions: the case of Poland. *The International Journal of Economics Issues* 1(2).

4. Ghatak, S., Mulhern, A. and Watson, J. 2008. Inter-regional migration in transition economies: the case of Poland. *Review of Development Economics* 12(1).

5. Ghatak, S., Mulhern, A. and Stewart, C. 2005. Regional Development of Small Firms in Poland'. *Economic Change and Restructuring* 38(2).

6. Mulhern, A. and Stewart, C. 2003a. Long term Decline of Small and Medium Size Enterprise Share. *Small Business Economics* 21(3).

7. Ghatak, S., Mulhern, A. and Stewart, C. 2003b. Determinants of intended expansion of Polish small firms. *Journal of Policy Modeling* 25(3).

8. Mulhern, A. 2002. Venezuelan Manufacturing, SME Decline and Failed Transition, in H. Katrak and R. Strange (ed.) *Small-Scale Enterprises in Developing and Transitional Economies*. Palgrave.

9. Mulhern, A. and Stewart, C. 1999. Long and short run determinants of small and medium size enterprise share: the case of Venezuelan manufacturing. *Economics of Planning* 32(3).

10. Mulhern, A. 1996. Venezuelan small businesses and the economic crisis: reflections from Europe. International Journal of Entrepreneurial Behaviour & Research 2(2).

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Electronic versions of published articles

 Mulhern, A. and Watson, J. (2010) 'Spanish inter-regional migration: an enigma resolved'. *Applied Economic Letters*, 17(14), pp. 1355-1359. ISSN (print) 1350-4851. DOI: 10.1080/13504850902967464 <u>http://www.tandfonline.com/doi/abs/10.1080/13504850902967464#.ufeszqyR7qI</u> Full article available at <u>http://eprints.kingston.ac.uk/6598/</u>

2. Mulhern, A. and Watson, J. (2009a) 'Spanish internal migration: is there anything new to say?' *Spatial Economic Analysis*, 4(1), pp. 103-120. ISSN (print) 1742-1772.
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4. Ghatak, S., Mulhern, A. and Watson, J. (2008) 'Inter-regional migration in transition economies: the case of Poland'. *Review of Development Economics*, 12(1), pp. 209-222. ISSN (print) 1363-6669.

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