Employment, MSMes and E-Commerce:
A framework for a Research Agenda

Antonio José J. Botelho
(PUC Rio, Brazil)
with Alex da Silva Alves
(Universitá Milano Bicocca, Italy

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Avenida Brasil 2655
CP 11300
Montevideo, Uruguay
Tel: (598-2) 709.0042 ext 231 Fax: (598-2) 708.6776

250 Albert Street / PO Box 8500
Ottawa, Ontario
Canada K1G 3H9
Tel: (613) 236.6163 ext 2354 Fax: (613) 567.7749

www.idrc.ca/lacro / www.idrc.ca

I. Introduction

Employment has become the major global challenge nowadays. For nearly three decades, developed countries at the technological frontier have been wrestling with it, generally with mixed poor results. During this period, as the pace of technological change led by Information and Communication Technologies (hereafter ICTs) developments quickened and the structure of developed economies, and of a few developing ones, migrated towards services; the previously quasi-automatic employment effects of economic growth were greatly damped and their transmission mechanisms became more complex. Globalization induced enhanced international competition and factor mobility further compounded the employment challenge for developing countries. Whereas growth in manufactured trade and in the national service economy has opened up new opportunities of growth for (formal) micro, small and medium enterprises (hereafter MSMEs), the poor which reside in rural areas, are mostly illiterate, self-employed and unskilled rural laborers or subsistence farmers and speak a minority languageT[1]; and informal MSMEs which constitute the majority of establishments in countries with significant poor population, have seen their income and their revenue growth prospects further impaired by these trends.

It is by now widely accepted that three driving forces have led the growth of the global economy from the early eighties. First, is the adoption of ICTs by firms and related increases in productivity. Second, is the renewed role of SMEs in employment creation and innovation generation through entrepreneurship. Third, at the turn of the century, e-commerce, is becoming the relay engine to sustain this growth into the twenty-first century.

We also know that to date there's has been no cut and dry positive linkage between ICT in general and a increase in trend growth in most countries[2]. In addition, as yet, there is also no clear cut way to explain penetration rates of component ICT technologies, for example mobile telecommunications, across a diverse range of countries, beyond changes in regulatory pregime as a triggering event[3]. Traditional socio-economic markers such as GDP growth rate, GDP per capita as well as other socio-economic and geographic factors usually fall short of accounting for different penetration rates of mobile telecom, although some exhibit a strong correlation, e.g. income per capita[4].

There seem to be, however, positive growth effects related to roll-out of discrete ICT technologies such as telecommunications, both fixed and mobile, with the latter exhibiting some convergence between countries and smaller differences within countries. Yet, as the mixed results of previous studies on the impact of fixed telecommunications on the poor show, it may still be too early to establish the social impact of mobile on poverty alleviation[5]. Studies found that the impact of telecom penetration rates is enhanced at near universal services, the critical mass effect, for developed countries and that the network effects may favor larger economies, suggesting the low overall impact of telecom diffusion for developing countries still far away from universal services[6].

If the effects of ICT diffusion on trends in economic growth are still hard to assess, their social role and impact on employment are even more tenuous to even grasp. We're just beginning to learn about the differential impact of some of ICT dimensions, e.g. cost effectiveness for direct poverty alleviation, on developed and less developed countries as well as on the differential growth impact of individual ICT technologies[7]. For example, a recent study found that

the diffusion of mobiles has a greater growth impact on developing countries (twice as large) than on developed ones due to a critical mass effect[8].

In the end, one part of the problematic lies in the fact that the diffusion of these driving forces has been uneven across regions, countries, firm size and economic sectors. Thus a challenge ahead for poverty alleviation to Latin American and Caribbean (hereafter LAC) economies is not only to to increase diffusion of ICTs to the point of pervasiveness (access), but also, at a first approximation, to learn which technologies to deploy, to which socio-economic strata and to which economic segments, and which timing and sequecing of implementation are the most cost effective. Moreover, there's virtually no systematic information and analytic knowledge on how the MSMEs, particularly the former which are in its quasi-entirety informal, identify, value, select, deploy, use, adapt, transform and migrate ICTs in developing countries, including in LAC.

However, an additional problem is that these factors have also been evolving since the beginning of this period, increasingly becoming fast moving targets. The key role of ICTs has been dramatically transformed by the spread of Internet and the quickening pace of convergence between information and communication technologies. Next, SMEs role in job creation and innovation generation has become even more important as large firms restructuring pushed more critical functions to them and the emerging knowledge economy has placed innovation at the center of the growth dynamic. Finally, in developed countries, the concept of e-commerce (buying and selling on-line) has morphed into e-business which encompasses the integration of ICT into the business processes of the firms.

In this transformative context, managerial innovation, which had already been perceived as a key to enhance the productivity gains of ICT adoption, and the entrepreneurial spirit, which is increasingly proving to be critical for both bringing technological innovation to the market and fulfilling the full potential of emerging flexible specialization production systems have acquired a new dimension comparable to technological breakthroughs.

E-commerce diffusion continues to increase in the LAC region. In the larger and more developed economies, according to recent surveys (CRITO, Câmara Brasileira de Comércio Eletrônico), one observes convergence with developed countries on the pattern of adoption of e-commerce (E-mail, website, intranet and extranet). However, here there are still significant gaps across sectors and firm sizes. More importantly, the region lags in the types of use of these new technologies and in the perception of the impact of adoption on the firm's competitiveness[9].

This brief explores these issues in the framework of formulating a research agenda aimed at advancing our understanding of the increasingly complex relationship between ICT adoption by SMEs and employment growth in the LAC region, particularly in regard to poverty reduction among the most vulnerable segments of the population.

II. ICT Promotion Scenario for MSMEs & Employment Generation

ICTs have pervasive effects on the society at large, transforming simultaneously supply (formal and informal MSMEs), demand (business and individual clients) and context (socio-economic and institutional environments).. Their effective application can reinforce or transform the existing structure of industries, alter patterns of competition, shift the geographical location of economic and social activities, as well as transform the organization and routines of firms and public-sector organizations. ICTs can play roles in both formal firm creation and growth.

II.1. Formal Firms - New formal firm creation often generates limited and fragile employment due to the naturally high mortality rates of new micro firms. It seems that the most cost effective employment generators, at least in developed countries and in the modern sectors of developing countries, are medium size enterprises[10]. Thus formal firm growth ought to be at the forefront of ICT policy for MSME promotion.

In the formal sector, the specific advantages of ICTs for firms in general can be confined to productivity gains given by their application in production (such as CAD/CAM, SCM and ERP solutions) or the reduction of co-ordination and transaction costs allowed, for instance, by LANs and EDIs. With the Internet boom of the 1990s it has been possible for firms not only to attain similar efficiency gains at lower costs, but also to enlarge the size of their potential markets and find new growth opportunities. This was the case with e-commerce and, more recently, with internet telephony (VoIP). These also apply to formal MSMEs, particularly in modern sectors, where ICTs can play a key role in development and sustainable growth.

By incorporating advanced ICTs[11], MSMEs are able to face at the same time flexible de-centralisation and purpose-driven (or focused) decision making, which, before the advance of such technologies, presented limitations on managing specific tasks beyond a certain size of a network or the production value-chain in which they are embedded, as well as on performing coordinated tasks. This would allow SMEs to participate in export-led production chains generating more stable jobs[12]; in larger and denser firm networks, leading sub-networks, with similar employment effects; and in higher value-added service and production arrangements with more skilled job requirements.

A main equalizing aspect brought about by ICTs to both micro and SMEs, particularly the former, regards innovation, a point much recognized in the literature. Though, particularly in the LAC context, SMEs are much less innovative than firms with larger dimensions, as they face obstacles related to limitations in their material conditions and in the nature of their reactive competitive strategies. The development of innovation is not encouraged by a competitive environment in which economic agents merely react to information on relative prices and act in isolation[13]. In this regard, ICT adoption can spur innovation in MSMEs by allowing them to overcome such limitations by establishing cooperative relations, generating economies of scale and scope[14], and, more importantly, design and embrace learning by monitoring strategies[15], allowing them to sustain cooperative learning for flexible growth. ICT adoption is also important for micro enterprises in overcoming the limitations of a reactive competitive strategy, by supporting the acquisition and organization of new information flows inside the firm, enabling sustained learning and innovation to occur.

In this regard the policy best practices comes from developed regions. For example, the European Union 6th Framework Program comprises a rich set of policy directives to promote the integration of the EU member states into the Information Society, with a strong emphasis in SMEs. Its main sub-areas dedicated to SMEs are named eTen and CRAFT[16]. The former aims at establishing collaborative actions for designing, developing and testing ICT-based platforms for promoting the competitiveness of European SMEs operating in any business sector of relevance (agrofood, tourism, advanced and traditional manufacturing etc.). The latter consist in the development of targeted projects, generally developed by a consulting firm together with one or a group of SMEs, working together with an university or research centre in the development of technology-based projects with high innovative potential, in which SMEs are the main beneficiary[17].

LAC MSMEs have differing productivity and output levels among countries in the region. Such differences are even more striking when compared to EU MSMEs operating in similar sectors. Yet, European policy development schemes for promoting ICT take up among SMEs appears to be the most suitable policy experience for the region (in terms of transfer of experiences and adaption), in particular for large countries with decentralized states or regions such as Brazil and Mexico, and to lesser extent smaller countries which have significant modern economic sectors such as Argentina, Chile, Colombia and Venezuela[18].

II.2. Informal Firms - Although informal firms constitute the majority of micro and small enterprises in the larger and more advanced economies of the region and the majority of the firms in the smaller and more backward economies, overall they represent the major source of employment in the region. Yet it is still far from clear that small is beautiful in terms of net employment (usually negative) and employment stability (high employee rotation), if the performance of micro formal firms can be taken as a proxy.

Most of these firms generate comparatively few jobs beyond self-employment or family lifestyle business model. Moreover it seems that the skill requirements of these firms, is relatively low, as they generally do business in traditional, technologically mature industrial sectors and in low entry barriers service segments. Of course in some smaller countries and in those with high levels of poverty, the majority of these firms are in the agricultural sector, requiring very low levels of qualifications.

In general, the market and institutional environment in which these firms operate does not generate incentives for them to take up ICTs. If and when they do, it is likely that they will make sub-optimal use of them; refuse to see their full competitive value and thus neglect to make needed organizational changes for full appropriation; and fail to adapt and adopt them to enhance internal business processes, strategic learning and cooperation capacities.

An emerging anecdotal literature hints that access to ICT enhances the acquisition of 'useful information for the poor' and improves the flow of (market related) information thus reducing price dispersion[19]. However, in a likely scenario, as ICT diffusion advances in a given informal business population and their similar usage pattern stagnates, due to a lack of incentives for the most dynamic businesses to migrate upward in ICT usage complexity trajectory, a sub-optimal equilibrium will set in, in terms of firm growth, employment creation and income generation.

On the other hand, results of a survey on the economic impact of mobiles on rural small business in South Africa, Tanzania and Egypt found that the majority reported increased sales and profits, saved time and acquired greater efficiency[20].

ICTs can contribute to firms move into formality, or informal MSME upgrading. First, ICTs can be employed to improve government agencies and SME promotion institutions to assist informal business to move into formality. In this regard, ICTs role is to enhance institutional capacity to identify, characterize and monitor the early stage growth of informal business across sectors and regions. Second, these will in turn generate knowledge subsidies to design selective and flexible policies to assist the ICT for growth needs of the most dynamic firms and strengthen emerging cooperative firms networks with the most effective employment and income generation potential.

Nevertheless, there are also potential risks which need to be addressed to prevent ICTs take up by SMEs from falling into the political rhetoric of policy-makers and politicians[21]. As Mansell warns us: "The successful use of ICT applications requires improved awareness in the public and business sectors,

better education and improved literacy rates, user involvement in designing and implementing new services and applications, policies for improved public access to networks, and a readiness on the part of governments and other stakeholders to assume responsibility for selecting and giving priority to a wide range of policy and practical initiatives."[22] Sections III and IV of this brief present some indications and possible future itineraries of research that might be more specifically addressed to promoting targeted ICT take up among SMEs in Latin America and Caribbean, taking into consideration the differences among countries, regions and, more particular, business sectors and characteristics of firms.

III. ICT, Employment and Poverty Reduction

In 2004, the LAC economy experienced renewed growth performance and a rise in per capita income. This pattern is expected to continue over the following two years. Despite growth, poverty fell only slightly and still one quarter of the region's population live in poverty, the same level of 1980.

ILO's World Employment Report 2004-2005 suggests that the benefits of productivity gains start at the enterprise level, with lower costs of production and increased profits and competitiveness; and can continue to benefit workers in the form of higher earnings and reduced working time. In addition, because productivity gains can often lead to the downsizing of some sectors, with employment increases coming elsewhere and at later growth stages, the report points out the need for institutions to provide workers with security and training to better prepare them for the changing labor market. The increased and enhanced use of ICTs in MSMEs can be an effective tool here.

The report aptly concludes that "A focus on where people really work is as important as a focus on emerging, dynamic sectors", highlighting the importance of the expanding service sector, which has shown both productivity and employment gains and may provide opportunities for both high and low skilled workers. In this regard, it suggests that upgrading the informal economy where most people work in many developing countries is vital. We note, however, that a uniform upgrade of firms in the informal economy would be inefficient in both social and economic terms as it would mortgage future employment generation by holding back more dynamic firms intomoving up the growth ladder. With this caveat, here again is an area where ICT can critically contribute to informal MSME upgrading with a direct impact on increasing the rate of (formal) firm creation, which in turn increases the possibilities of indirectly: 1- generating more, better and more stable employment down the growth (meaning up) line; 2-establishing wider, longer, stronger and richer in social capital MSMEs` networks which may reach deeper into hitherto untapped market of the (urban) poor; and 3- ICT can assist funding agencies to monitor and select the firms poised to growth and accelerate them into formality.

In Latin America, according to the Inter-American Development Bank, SMEs respond to 20% to 40% of jobs created. In the 14 largest economies in the region, in 2001, there were about 8.4 million firms operating in the formal economy, of which 93% were micro-enterprises (up to 5 or 10 employees, according to each country's definition of SME); 6.8% were small and medium enterprises (between 5-10 or 100-200 employees); and only 0.2% were large enterprises, most of them multinational firms (more than 200 employees). Micro, small and medium firms accounted for 60% to 80% of employment in most countries in the region. In the 1990's, micro-enterprises and SMEs have created, respectively, 6 out of 10 and 3 out of 10 new jobs. Their share in total production, in most LA countries, lies between 30% to 60%.

Although fundamental engines for job creation and economic growth in he LAC region, MSMEs – particularly micro-enterprises – have not yet caught up the same benefits of experiences brought about by mobile telephony in India and a few African countries. Even though mobile telephony usage has significantly increased in the region, its impact in enterprise development and growth, and in job creation has not yet considerably changed the social and productive fabric of micro-enterprises in the region, in many cases due to high costs of phone calls and low supply of associated solutions (software for mobile telephony and targeted services by operators) and related micro credit. The main reasons behind this phenomenon in the region have not yet been sufficiently explored so that more research is needed to identify and understand the barriers blocking an effective translation of mobile telephony usage into business opportunities, particularly by young and adult micro-entrepreneurs.

The importance of informal SMEs to job creation is not a new phenomenon in the literature. The argument took life in the 1970's when the industrial district phenomena began to raise interest. Nevertheless, there is no consensus yet about the main causes of informality in both employment and entrepreneurship. Given the hazardous consequences to quality job creation -- notwithstanding its social consequences -- the informal economy is a benign plague in the region's socio-economic fabric. In Brazil, according to SEBRAE, there are 10 million informal enterprises employing 13 million people. In Chile, according to CORFO, almost half the country's SMEs are informal. This picture is not much different in other countries, and even more skewed in the smaller and poorer ones. The main causes, although varying from one country to another, can be derived by macroeconomic aspects (more particularly high interest rates and its impacts to credit provision and investment), inadequate incentive system for growth and opportunity-drive in entrepreneurship, low educational levels of entrepreneurs, high levels of bureaucracy in public administration, corruption and lack of trust in public authorities.

The role of ICTs can be important in this segment, indirectly as discussed in the previous section by assisting informal firm upgrades. Though, it seems to have a more direct and cost effective impact in upgrading local development agencies and support organizations MSMEs monitoring and learning capabilities, both in formal and informal economies. For example, in Brazil, the Technological Incubator for Popular Cooperatives – ITCP of the Federal University of Rio de Janeiro is developing an integrated Internet-based information system to generate a structured system of indicators to monitor the main needs of marginalized communities as they move into the formal economy, from the incubation process to the management of cooperatives[23]. The system will integrate all 16 Brazilian cooperative incubators also providing a critical learning function.

Modern ICTs in a case like this tend to have more practical effects to support organizations, given its capillarity and multiplication effects among micro enterprises, rather than the direct provision of ICT solutions to micro entrepreneurs themselves, particularly due to their very low educational levels and given the fact that most live on the edge of poverty lines.

IV. Recent Experiences: Analytic Shortcomings and Research Gaps

It is not easy to establish the ICT-specificity of policy instruments. A general trend, derived from market regulation and competition policy in Europe, seems to be oriented towards more generic or technology-neutral instruments[24]. Nevertheless, the speed and nature of ICT development often disrupt the existing policies. On the one hand, the growth of the information society is

leading to increasing complexities and interdependencies in the economy and society, giving rise to the need for new policy concepts and agenda. On the other, the pace of ICT diffusion – or whatever the transformations led by new ICTs are taking us[25]– varies from country to country, across and within geographic areas in a country, across socio-economic spaces (urban/rural) and across economic sectors.

Many ICTs and related innovation policies involve market stimulation by encouraging ICT take-up in the economy as a whole, thereby focusing on the development of domestic markets[26]. In Latin America, middle-income countries like Chile, Argentina and Uruguay are pursuing similar policy strategies[27]. Other countries adopt a mix of policies both to stimulate the domestic growth of ICT goods and service production, developing relevant domestic and export markets, as seems to be the case in France, Italy, Spain and northern European countries. In Latin America, the only countries with such a similar policy approach are Brazil and, up to a certain extent, Mexico. Other LA countries, due to poor industrialization track-records and low levels of capillarity among their institutions, present loose and unstable policy mixes regarding ICT infrastructure development and SMEs promotion.

IV.1. Infrastructure - In advanced economies, policies aimed at enhancing ICT industries have been mainly addressed throughout the 1980's and 90', thus launching the basis for better ICT deployment for citizens, government and firms. In Latin America., poor ICT infrastructure and services remain a considerable bottleneck, thus imposing higher costs and low quality targeted ICT service and products availability to SMEs in the region, with just a few exceptions[28]. Results of a recent survey states that the most significant barriers for attending Information and Communication Infrastructure–ICI needs regard excessive regulation and low competition, which increase prices and hamper private investment in the sector[29]. The same study points out that in developing countries with private, competitive provision of services, enterprises rarely see poor telecom as a constraint to doing business. Brazil, Mexico, Argentina, Chile and Uruguay are considered the most attractive countries for ICT investment in the region for that same reason. On the other hand, countries with monopolized or highly regulated telecom and infrastructure sectors like Honduras and Ecuador lack significant ICT infrastructure for firms, thus carrying out significant consequences to these country's economic activities, of which reduced entrepreneurship and job creation are among the more remarkable ones.

IV.2. Innovation - Next, the acquisition of technological capabilities is strictly related to the quality of the provision of high value-added goods and services by SMEs[30]. Thus, a country's national innovation system and its science and technology (S&T) policies need to equally – and systemically – promote regional economic growth and competitiveness of small and medium-sized enterprises[31]. The problem of ICT adoption in Latin American SMEs is very complex and will require long term commitments and a very structured and inter-twinned policy effort regarding industrial, regional, educational and legal policies. Many studies carried out in the region acknowledge that SMEs regard innovation as a way to differentiate products and gain new clients[32]. Although these firms consider innovation important, their innovative activities are not regular and are undertaken more to survive in existing markets than to conquer new ones. Hence, this is not sufficient to generate competitive advantages, because innovative activities are not incorporated in firms learning and innovation processes, an area where ICT rake up can stimulate.

IV.3. Institutions -The only countries in the LAC region with mature and capillary institutions specifically targeted to supporting SMEs are Brazil and Chile, due to their strong existing institutional apparatus and the active role of the

State in building institutions for supporting development goals over the last decades, such as FINEP and SEBRAE in Brazil, and SERCOTEC, CORFO and FUNDES in Chile[33].

In Ecuador, although without mature and long-standing institutions focusing MSMEs, a private organization named Insotec provides MSMEs with managerial and coaching programs for entrepreneurs, with funding from multilateral and international institutions. In other countries, the role of NGOs to fill this policy gap in terms of stable support to SMEs is becoming increasingly important. As an example, the initiative, carried out by a German organization GTZ (Deutsche Gesellschaft fuer Technische Zusammenarbeit, GmbH), consists of a web portal – www.infomipyme.com - dedicated to five Central American countries: El Salvador, Guatemala, Honduras, Nicaragua and Dominican Republic[34]. This portal represents a powerful educational tool, being used directly by SMEs, but also by local development agencies. For example, the Science and Technology Honduran Council uses the information gathered through the portal for designing its educational programs and development projects, promoting it in the telecenters and using it for its consultancy activities.

Thus, apart from Brazil and Chile, the operations of most SMEs-oriented institutions tend to address SMEs fundamental needs (managerial capacity building, legal aspects, youth entrepreneurship etc.), without a focus on ICT diffusion. Nevertheless, their role seems to be in line with each country's main barriers hampering SMEs' growth, but it is also fundamental to complement such actions with more technology capacity building (particularly for small and medium enterprises) and learning programs (particularly for micro and small enterprises) aimed at associating the benefits of ICT to the competitive strategies of firms.

IV.4. E-commerce – According to Ueki and Tsuji (2005), the main barriers to e-commerce usage by MSMES in LAC today are: 1- a serious lack of confidence in e-commerce among potential users, leading firms to make complementary usage of video conference and other communication methods such as telephone, e-mail, and face-to-face communications; 2- reduced availability of appropriate IT managerial systems coupled to the unfamiliarity with the technology make firms hesitant to employ e-commerce and SCM and wholeheartedly embrace the informatization of managerial processes related to business transactions; 3- the high costs and fees to launch an e-commerce strategy by utilizing shared e-marketplaces, as MSMEs are generally incapable of developing their own IT systems, and 4- insufficient human resources and inadequate digital infrastructure.

IV.5. Trade -As Kumayama (2001) and Ueki (2003) point out, exports by Latin American SMEs are constrained by a combination of internal and external factors. The former includes: 1-barriers to credit, 2-information and 3-insufficient management skills. The latter encompasses: 1-trade barriers from industrialized countries, 2-bureaucracy, 3-loose marketing and distribution strategies, and 4-high transportation and telecommunication costs. SMEs also face substantial difficulties in: 1-getting information on their potential customers (including credit-worthiness), 2-suitable representation in the target markets, as well as 3-on generating relationships based on trust and 4-on overcoming language barriers among producers and overseas customers. ICTs, particularly e-commerce and other Internet solutions such as VoIP, might either lessen or intensify each of these constraints, depending on the nature – and quality – of polices designed and implemented.

In Chile, only 3% to 4% of MSMEs are exporting companies. Although aware of this, the Chilean government has not yet designed ICT based policies tailored for the export promotion of MSMEs, which are concentrated in agricultural sectors.

In Brazil, the situation is somewhat better than most of the other LAC countries as it is the leader in exports of manufactures to neighboring countries, in which SMEs play a significant role[35]. In Mexico, a few SMEs export, due to difficulties related to quality, delivery and service agreements, low capacity to respond to pressures for cost reduction and to increasing productive scale, as well as lack of credibility throughout the value-chain[36]. Finally, in Uruguay, for instance, the dependence of this country to Argentina and Brazil, which are more industrialized, pose significant barriers to Uruguayan SMEs, which lack entrepreneurial culture and technological capacity to support their competitive efforts of adding value to its exports. In most of the other countries in the region, SMEs tend to be in the downstream value-chain of a given industry, being in most cases commodities suppliers of large enterprises, most of which branches of large transnational companies.

In this sense, ICTs have an enormous potential for developing direct exports capabilities in SMEs, more particularly e-Business solutions. The problem, though, lies in the low level of Internet penetration in these firms, more particularly for those operating outside the urban perimeters of larger cities. Additionally, most LAC countries do not have a sufficient telecom infrastructure, lack adequate selective ICT take up policies and their entrepreneurs have low motivation and skills to fully embrace and make use of ICTs due to their lower educational backgrounds.

Latin American SMEs lag behind their East Asian competitors. As Ueki (2003) points out, East Asian firms (particularly from China, Taiwan, Singapore and Korea) export up to 60% of their outputs, with a high percentage of such exports concentrated on high value-added manufacturing goods[37]. In LA, average exports originated by SMEs do not surpass 4.5%. Countries like China and Korea increasingly control the European and American markets with, on one hand, low-priced traditional manufacturing products and, on the other, with very competitive (in quality and price) advanced manufactures – cars, micro-electronics products, advanced materials etc. In this sense, another barrier imposed to the development of MSMEs in many LAC countries is the growing barrier to catch up. Production of semiconductors and hardware equipments is almost prohibitive in most of these countries, for most of them cannot face the higher barriers of entry in these industries due to lack of specialized human capital and long term investments needed, as well as to their limited past records of R&D and university-industry relations. More importantly, they lack large firms to take the lead in setting up, with government assistance, long, high value-added and innovation-driven export production chains[38].

IV.6. Policy Locus - The most evident aspect that can be underlined so far is that SMEs in the region cannot face such challenges on their own. The role of government, in the national and local spheres, becomes fundamental in this process. Their interventions can play a very effective role in enhancing the evolution of geographical concentration of productive activities in the LAC region, which is recognized as one of the most resilient sources of economies of scale and transaction costs reduction to firms, particularly those with smaller dimensions.

It is by means of an effective cooperation – be it vertical or horizontal, depending on their nature and productive sectors considered – that Marshallian external economies and collective action lead to technological capacity building and collective learning. This may lead to a more efficient ICT incorporation, and due to ICTs role in making communication and trade more effectively among firms throughout the same value-chain, may in turn reinforce the pattern of collective learning. In this sense, governments should employ ICT to: a) support local actors understanding of the potential benefits arising out of cooperation and joint

learning and b) using local public and private support organizations to work towards the creation of communication channels capable of strengthening the dialogue, exchange of ideas and experiences among entrepreneurs, policy makers, consultants and other organizations.

These aspects have been increasingly underlined for quite a long time and, today, most of them seem obvious[39]. Nevertheless, a substantial amount of policy initiatives in LAC are not yet taking into account the importance of such factors for enhancing technological, monitoring and learning capacity building – and hence better and more comprehensive ICT use and diffusion – and competitiveness of MSMEs operating in geographical clusters and productive agglomerations. The most resilient aspects, so far, indicate that the prevailing characteristics of related policies are still bound to clientelistic politics.

Another issue regards the importance of financial resources to public bodies, in order to increase the duration and extension of ICT take up policy – for which the role of multilateral institutions is fundamental – together with the provision of technical capacity building in the local public administration to support Latin American policy makers on interpreting and translating entrepreneurs' demands into effective and competitive production systems. ICTs are not only important to SMEs, but also to local public administrations which lack sufficient means to catalogue, collect and interpreting information on SMEs ICT take up and impacts in a given spatial locus.

Along this line, one can extend a policy prescription based on criteria developed by Stumpo & Dini (2005) case studies realized in four LA countries. They suggest, contrary to other views which stress that cluster and industrial districts cannot be created from scratch[40]– cluster formation can be successfully induced by the State in LAC. We add that intense and innovative ICT deployment can substitute for some of the community-based institutional learning and monitoring mechanisms, underpinnings the flexible functioning of traditional clusters. We should add the caveat that this is neither an automatic nor a given process, thus requiring close monitoring and fine tuning. This means that the nature of institutional complexity and articulation of the productive fabric in each country will influence policy orientation. In more complex countries (like Brazil and Mexico, for example), it is easier to enhance a policy strategy aimed at existing groups of SMEs spontaneously formed around a given territory, whereas in others the scarcity (or absence) of spontaneous productive systems experiences shall support policy intervention aimed at the formation of clusters or agglomerations of firms from the very beginning.

They suggest that Latin American policy makers should be more proactively in fostering the clustering of firms, given the very polarized nature of LA production structure, for it can produce sustainable externalities that, in turn, can facilitate credit acquisition, skilled job creation, internationalization and more effective ICT implementation. Latin American ICT policies tend to be less sophisticated in terms of incorporating clusters of SMEs in their agenda. This has to do with the contsraints in the environment surrounding firms and public institutions in LA, that in some instances, forces policy makers to focus on firms in a higher value adding chain for they can lower the risk of policy failure (they are the ones with greatest capacity to benefit from such policies) or, alternatively, designing blanket policies, often also geographically dispersed., which do not take into account individual firm motivation. Both can penalize dynamically motivated MSMEs in their ICT migration trajectory towards growth pursuit, generating an illusory short term policy effectiveness and long term inefficiencies.

Our view is that such policy orientation can be effectively adopted in the region, although more research is needed to understand the meaning and value assigned to cooperation and learning through ICT by MSMEs in the region.

Complementary, there is a need to gain an understanding of how these perceptual evaluations by firms are affected by the interplay of policies. Industrial policy for development challenges (infra-structure provision, education, quality of life and health), concentrated on variables that hamper firms' competitiveness; regional policy which emphasizes the territory and its main socio-economic aspects, creating local conditions for factor production (and reproduction) in line with industrial policy goals; and ICT take up policy, more particularly in deprived and peripheral regions of a country. The reason for this is the strong territorial dependency of local factors embedded in SMEs' development processes.

Latin American SMEs as a whole are not technologically advanced, with a few niche exceptions. An overall view of LA specialists state that SMEs tend to face difficulties to receive demand-side policies. On the other hand, supply-side policies tend to be more efficient, according to experts. In the latter case, governments – as a customer – can favor the development of alliances and cooperation, quality of products and services delivered, thus coordinating the networking process of firms for reaching specific aims. In this case, ICTs can be an effective instrument for promoting cooperation. Clusters of firms tend to arise throughout the interplay between quality information and business needs, which tends to favor cooperation among firms. An example of such strategy is being undertaken by CORFO, a Chilean development agency, which is establishing efficient policies for the promotion of networking among SMEs in the country. Chile has taken the lead here, with the establishment of the *Chile Compras* project – *Sistema de Información de Compras Públicas*. Similar actions are also being carried out by Brazil and Uruguay.

IV.7. Institutional Articulation - The interplay between education, e-commerce and the modernization of the State ought to be strengthened if SMEs are to take full advantage of the transformations led by the information society. In this case, the articulation with multilateral institutions – given their experience and resources is critical. Additionally, it should be noted that further research is needed to strengthen our understanding of how the articulation of such policies can best contribute to the development of MSMEs. These three aspects' main ICT take up-related characteristics provide us with some analytic clues in this direction.

Education is one of the most important forces for creating an entrepreneurial and technological awareness in small firms. It can also assist individuals in becoming more active members in a community (by means of social capital investment). The perception that the change effected by the adoption of ICT is needed must come from the individual entrepreneur. Here, education and ICT form the basis, for they provide entrepreneurs with more quality information (and preferably interactive access to it) to make better and more rational decisions.

E-commerce policies ought to be strengthened with the intense use of diverse ICTs (for instance, m-commerce may be more relevant and suitable to informal micro enterprises) to insure that e-commerce permeates the whole economy, in particular – but not exclusively – in the public administration, exporting firms and informal MSMEs.

Effective policies need to be designed to strengthen and streamline the MSMEs public policy chain, particularly the judicial system. Most LA specialists concur that the institutional apparatus of most LAC governments – the Judicial system – is often not efficient for the economy's potential development, reflecting difficulties to fairly and responsively arbitrage of contractual conflicts, to protect to minor shareholders, and to reduce bureaucratic barriers for allowing SMEs to be eligible to public bids for acquisition of goods and services.

IV.8. Competitiveness - Regarding SMEs and their struggle for competitiveness we emphasize that their evolution towards strategic networks will not come about spontaneously and progressively, as it did, for example, with Marshallian industrial districts in the past. SMEs will need strategic support on selecting and applying ICTs into their business processes, as well as on understanding the nature of the changing environment (domestic for informal and formal micro enterprises, both domestic and international for all formal SMEs) brought about by globalization. Such a context, requires a continued commitment in the form systemic support mechanisms involving the adoption of ICTs, local economic development policies, network development and SME-oriented programs together with entrepreneurship educational programs, enacted with a clear innovation bias which can only be comparable in size and scope to the industrial development programs carried out in some Latin American countries – Brazil, Mexico, Argentina and Chile – in the past.

Chapter V – Conclusions and Recommendations

Latin American and Caribbean MSMEs are, beyond the formal/informal divide, very heterogeneous. Also, their demand make-up, market constraints, pattern of competition and institutional environment are quite diverse within and across countries in the region.

The EU policy approach to ICT take up by SMEs described above, given its capillarity, built-in policy fine tuning mechanisms, capacity to cater to diverse national institutional regimes and innovative arrangement to bring together different actors (researchers, consultants, policy-makers and entrepreneurs) for collaboratively work towards reaching specific common goals; can be a useful blueprint for policy formation in the area for LAC countries. As such policy agenda ought to embed a flexible, effective institutional apparatus capable of taking advantage of the strengths of ICT's quick development pace and unobservable and unanticipated effects, for accelerating MSME evolution towards greater employment generation.

The above quick and dirty review of the state of practice and knowledge in this broad and intertwined theme reveals a fundamental tension. Piecemeal policy efforts to deal with the ICT and SME issue continue to proliferate in the region, often without clear and justified goals and orientations.

In a schematic and necessarily fragmented synthesis one can say that a first line of practice has been oriented toward mitigating the ICT deficit of poor populations. The rationale for intervention here is that there's an expanding digital divide which the market is not capable of correcting. A policy variant defends the need to provide greater access to ICTs to poor and isolated communities, a micro approach. There's still considerable debate in this camp regarding the right ICT, the best form of deployment, the level of access to be offered and the cost cut-off point, among others. The underlying implicit rationale is that ICTs provide these communities with access to needed information, and more recently thanks to the capabilities of more advanced ICTs, to the provision of basic services like health, security, education and training. ICTs here are perceived as capable of expanding reach of traditional policies for the poor at a lower cost and with greater ease than previous technologies. The impact on mostly informal MSMEs is generally indirect.

A second line of policy practice seeks to lower the costs of factors identified as critical for reducing the digital divide such as computer hardware, internet access, public telephony universalization and others, a macro approach. There's still considerable debate in this camp regarding the top priority factor, given the

high cost involved, and the right institutional locus and arrangement for policy formulation and implementation, causing timely delays. The underlying implicit rationale is that a massive interest neutral policy that put the technology in the hands of the user provides them with an 'empowerment' access to ICTs, and thus has a larger impact. The impact on MSMEs is more direct and is a function of the entrepreneurial motivation.

Neither ICT policy practice explicitly recognizes the importance of MSMEs for the economy and employment generation. In the emerging national and international competitive environment -- where ICTs appear to equalize foreign market access, but also domestic one, and the production capability of firms – new firm creation and particularly rapid growth are key drivers for rising and sustainable employment generation. Entrepreneurial capacity building, identification of emerging growth niche markets and innovation to act upon the opportunities provided in them are main components of the policy repertoire available to LAC countries to develop these drivers. Both in the informal and formal MSMEs segments, these three factors at different levels and combinations are critical to firm growth. Entrepreneurial capacity intensifies new firm creation and thus enhances capacity to identify growing niche markets. Niche markets call for experimentation of different business models and thus incite cooperation, as no single small firm is likely to have all the necessary resources to fully exploit them. Innovation raises the barriers to entry and thus lowers the risks to the firm's growth and incites learning, as innovation is increasingly cumulative. At every step in this growth path, ICTs can facilitate and accelerate the firm capacity for learning to learn. A cumulative effect of conscious firm learning is enhanced growth stability and thus better and more employment generation.

It is equally important to stress the importance of another set of factors which can increase the chances of success of ICT policies aimed at supporting SMEs in Latin America: a) promotion of sound regulatory and institutional frameworks (regarding clientelism, corruption, legal and tax systems, rule of law etc.); b) promotion of access to and the functioning of supply markets (regarding financing, qualified workforce, technology, enterprise development services and infrastructure); c) promotion of access to and the functioning of goods and services final markets (distribution channels and marketing); d) promotion of capacity building and cooperation (entrepreneurship development services, cooperation promotion and clustering policies). Most EU countries have targeted such issues during the 80's and 90's with different levels of success, thereby developing comprehensive and functional policy schemes for harmonizing and setting up a sound competitive market for firms in all member States. ICT development policies for SMEs in Europe came up when most of such issues had been, if not completely, at least partially addressed.

Finally, one must be aware, that ICT adoption in SMEs represents the result of cumulative learning processes and that the innovative character of the business activity is a determining factor in ICT adoption. For instance, SMEs in the software sector present more intense and diversified patterns of ICT adoption than enterprises from other sectors. The fact that SMES in the tourism business use more ICT than, say, firms in the clothing sector suggests that the sector technological level and national pattern of competition influence the assigned importance of information to the activity as a determining factor on the firm's decisions on ICT adoption. The same applies for ICT training, which is higher in companies that are more information intensive and therefore require higher expertise. As training affects the learning processes of firms and this is essential for ICT take-up, information-intensive SMEs have more chances to developing and sustaining innovations that will support their competitive advantages. However, as competition depends on the specific sector conditions, the results of ICT adoption on competitiveness are not predetermined. Since ICTs provide the

infrastructure of the information society, many policy-makers act as if the diffusion of ICT will be sufficient to improve the competitiveness of firms. This can be indicative that it is fundamental to concentrate research efforts on sustaining (and proving) that ICT policy efforts must be included in more general innovation, industrial and regional policies, dealing not only with conditions of infrastructure but also on learning, education, organization of information within firms and the creation of clusters that support cooperation and collective learning among firms.

In light of the above discussion, we make the following research recommendation.

- There's a need for comparable longitudinal base line studies of (formal) firm mortality and employment contribution across firm size categories and sectors.
- Theres a need to map out sectoral distribution of informal firms, their patterns of emplyment generation and business networks.
- There's need to distinguish different dynamic patterns of ICT adoption among informal firms.
- There's a pressing need to assess the impact of geographic focused (clusters) ICT take up policies, as they quickly multiply in the region. Here one needs to be able to identify the good and the bad practices in order to refine policy and promote cost effective policy learning. At the lower analytic level, there's a need to understand differences in the nature and motivation of ICT uses, ownership and valuation by MSMEs.
- In a similar vein, the analytic focus has to move firmly into the changing role of ICT take up in the firm creation and evolution. There's a need to understand
- Cross-country sector specific and firm size controlled rigorous comparative analysis of ICT take up and impact might help us get a more refined picture.
- Comparative longitudinal analysis of ICT take up aspects between formal and informal micro enterprises might assist us in devising targeted and more effective policies.
- In light of the importance of medium enterprises for net employment creation, there's a need for a study of ICT take up factors and impact components of a group of adopting medium enterprises and a control group of non adopting ones.
- Complementary, a longitudinal analysis of the differential performance impact of early and late adopters in this firm category as well as in formal and informal enterprises might bring useful knowledge towards the development of new MSME ICT policy concepts and content.
- An interesting experimental study would be to make a comparative policy analysis of the cost structure, skill demands, usage pattern, economic performance, employment creation and business organization evolution of a group of formal and informal (separately) micro firms a) which receive direct assistance for ICT take up (self-organizing digital take up, for example a voucher program for firms to buy equipment, software and consultancy) and a group that receives shared ICT take up assistance (ICT access through telecenter or similar dedicated shared ICT facility).
- One way MSME portals, even when they provide useful information and relevant training programs do not exercise the critical monitoring and learning functions. The design, deployment and assessment of n experimental pilot project along these lines aimed at enhancing the interactive online monitoring

an learning capabilities of SME promotion agencies, and those of participating firms among themselves could then be assessed against the more traditional and static portals in terms of policy cost-benefit effectiveness and development of ICT usage and valuation patterns between the to groups of benefited MSMEs.

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[1] Kenny 2002.
[2] OECD 2003.
[3] Gebreab 2002.
[4] ITU 2003.
[5] It has been shown for past historical periods shown that growth in fixed line telephone density is correlated with faster increase in poor income but event quicker progression in the incomes of the rich, thus generating growing inequality. Coyle 2005: 5.
[6] Coyle 2005. Roeller and Waverman 2001 for the critical mass effect and Qiang et al for network effects.
[7] Kenny 2002.
[8] Waverman, Meschi and Fuss 2005.
[9] Bjorn-Andersen 2005. For further details see www.crito.uci.edu. For example, in Brazil a survey conducted by the *Cämara Brasileira de Comércio Eletrönico* in three modern states pointed out that overall firms that sell over the internet showed an average revenue increase of 20-60% and that almost half of MSMEs does some sort of e-commerce: 76% have a website, 60% make purchases over the internet, 47% sell over the internet and 41% have more than 10 computers.
[10] A recent study of overall formal firm employment generation over a 20 year period (1980-2000) in Chile found a small negative net result (-0.2%). Medium enterprises had the second largest net employment creation index next to large enterprises (0.7% versus 0.8%), the only positive index among MSMEs. Whereas in the period 1986-1997 both large and medium firms showed a net creation of employment (4.5% and 4.3%), in the more recent one (1998-2000) no firms categories had a net positive index. This could be a sign of the cyclical nature of employment generation in MSMEs as jobs are created in the initial ICT take up stages. The author also concluded for the overall period that MSMES have a lower probability of survival, with medium enterprises posting the highest probabilities among MSMEs in every discrete period. On the other hand, he found that size, productivity and K/L ratio positively affect production unit survival, perhaps signaling an indirect role for ICT adoption. Vergara 2005.

[11] The European Commission and the European Information Technology Observatory (cf. EITO, 2000) have concluded that Europe will only become a center of e-business if European SMEs are fully committed to using the Internet as a leading-edge business tool. Thus, the e-Europe Action Plan launched in 2000 includes a specific program to help European SMEs to 'Go-Digital, to be implemented from 2001 to 2005. One of the objectives of this program is to develop a comprehensive scoreboard for measuring the take-up of ICTs and e-business by SMEs in EU Member States and across business sectors.

[12] In some countries in the region partly due to government policy efforts the number of exporting MSMEs and their exported value went up, but generally gains were not sustainable, exchange rate fluctuations aside. Participation in export chains led by large multinational firms may generally increase employment stability in MSMEs.
[13] Kuzul-Wright 1995.
[14] This is corroborated by the policy agenda of the European Union, in which the diffusion of ICTs has recently received the highest priority (see EC 2002) with particular emphasis on the adoption of e-business practices and digital technologies among SMEs. EC 2001.
[15] Sabel 1998.

[16] European SMEs are among the most competitive in the world, thus making important contributions to EU exports, particularly in countries like Italy, Spain, Germany, Finland and Denmark.

[17] The EU policy governance system, the definition of priority areas based on solid resource allocation criteria, and institutional cooperation requirements for eligibility to projects approval, together with specific regional action plans which respect autonomy of member States to pursue target programs based on each country's priorities, are hallmarks in terms of policy development.

18 Although some problems still persist in Europe – over regulated labor system, high taxes and international competition - thus directly affecting SMEs competitiveness.
[19] Harris 2004 and Coyle 2005.

[20] Goodman 2005.
[21] May 2002.
[22] Mansell 1999.
23 ICTP talks marginalized entrepreneurs into joining cooperatives, thus acquiring legal status and some tax relief. ITCP offers training, managerial and basic technological capacity building and work with local tele-centers to facilitate internet access to micro-entrepreneurs and cooperatives. A problem is that the incubators are not self-sustainable and require a sophisticated technological apparatus for supporting informal entrepreneurs, at the risk of becoming obsolete.
[24] Navarro 2003; EC 2002.
[25] May 2002; Webster 2002.
[26] This is the case of Portugal, Greece and newcomers in the European Union from Eastern Europe.
[27] Hilbert, Bustos y Ferraz 2003.
[28] Botelho 2005.
[29] World Bank 2005.
[30] Caniëls & Romijn 2003.
31 The association of S&T policy with economic development is not a new concept for Latin America. The core S&T policy-making bodies in Brazil and Mexico were founded early in the 1950s, followed by Argentina later in the decade. By the early 1970s, a significant number of countries—also including the members of the Andean Pact (Bolivia, Colombia, Ecuador, Peru, Venezuela, and Chile) and Cuba—had established some sorts of systematic policy thinking on S&T policy matters. The results obtained have not been particularly successful, with the exception of relatively few countries. Research and development (R&D) expenditures remain low by international standards—ranging from approximately 1% of GDP for Brazil, to 0.75% for Chile, 0.5% for Mexico, and 0.3% for Argentina—and their distribution biased towards governments and universities and against the private sector . Vonortas, 2002; De Nigri & Salerno, 2005.
[32] For example, Stumpo & Dini, 2004 and La Rovere 2003.
[33] The latter institution, FUNDES, is a Swiss NGO with headquarters in Santiago and operations in other LA countries without mature institutions targeting SMEs main problems (Mexico, Guatemala, El Salvador, Costa Rica, Panama, Venezuela, Colombia, Bolivia and Argentina).
[34] The web portal offers detailed information and training material on enterprise management, accounting, business law and marketing. Specific sections are dedicated to each country, structured as followed: step-by-step procedures to follow how to open a new company; how to develop a business plan; how to commercialize firm's own products; how to engage in e-commerce and e-business initiatives; market information; support organizations and institutions; legal aspects; educational information.
[35] A recent study carried out by SEBRAE, a Brazilian SME development agency, analyzing Brazilian exports from 1997 to 2004, presented some interesting results regarding the export efforts by manufacturing and commercial SMEs, in which more than half of such firms are exporting ones. Although, as expected, the vast majority of exports consisted in low to middle technological content products, most of them low value-added commodities and semi-manufactured products labor and natural resources intensive. In order to revert the situation, the Ministry of Science and Technology jointly with the Ministry of Industry, Commerce and Development have been developing systemic directives for integrating industrial, S&T, innovation and foreign trade policies so that to promoting SMEs geographical agglomeration, exports, and innovation efforts. So far, few actions have been implemented. Some important actions and lines of intervention in place are still awaiting for approval in the Congress. Botelho 2005.
[36] The major dependence to the United States represents another constraint, for most of the industrial fabric of Mexico which is largely based in the 'maquiladoras' production system, with medium to large firms engaged in assembling industrial components from neighboring United States.
[37] In a summary of the topic based on recent country surveys of exporting SMEs, Ueki and Tsujin conclude: "Latin American SMEs do not participate in international markets as much as Asian firms. These countries pointed out the main barriers to export as: (1) weakness in their firms' quality management, information management, marketing strategy, customer management, and so on; (2) lack of human capital and access to credit; (3) small production capacity insufficient to achieve economies of scale; (4) lack of access to information relating to markets, regulations, technical norms, and so forth in foreign countries; (5) high freight costs and complexity and slowness of trade-related procedures.
[38] Amsden and Chu 2003.
[39] Pyke & Sengenberger 1992; Butera 1999; Becattini et al. 2003; Caniëls & Romijn 2003 and Ács & Varga 2005.
[40] See for example Becattini et al. 2003.

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