TOWARD REALIZING INDUSTRIAL DEVELOPMENT IN CAMBODIA: AN ACADEMIC PERSPECTIVE

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FOREWORD

After the global financial crisis, there is a consensus that Cambodia needs to advance on industrial diversification, shifting from garment export-led growth to a more broad-based growth. It is well recognized by the Government and development partners that Cambodia faces challenges in the industrial sector if its success is to continue. These challenges include achieving greater diversification within manufacturing, and sustaining employment generation that can provide employment, increased wages and better conditions; all of this involves moving up the value chain in manufacturing.

The Toward Realizing Industrial Development in Cambodia recognizes that industrial policies are necessary, but must be designed to be effective, given the particular contracting failures that are most important and the institutions and enforcement capabilities of particular states. This implies, first, that the relevant contracting failures must be properly identified to determine the problems policies must address. Second, it must be recognized that there are many possible responses to any particular contracting problem, and not all of them may be equally enforceable in every context. The second step is therefore to select the response that is most likely to be effectively enforced in the local context. Finally, for policies to be successful, some governance capabilities may need to be developed in particular agencies, to monitor and enforce them.

The current study concludes that Cambodia potentially faces a number of quite different constraints to its industrial development, which industrial policy may have to address. However, not all of these problems are equally serious as immediate constraints; one of the tasks of policy design is to identify the most important problems, as implementation and fiscal capabilities of states are limited. Once the important problems have been identified, there are still many different policy instruments through which similar problems can be addressed. Here, an understanding of the political economy of the country is very important, as instruments that may be effectively implemented in one country may be very difficult to implement in another. The second task of policy design is therefore to tailor the policy so that it is likely to achieve the most desirable results. This may sometimes mean that more ambitious policy designs may need to be avoided, and policies designed to create appropriate incentives so that monitoring and enforcement requirements are reduced.

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ABBREVIATION

FDI	Foreign Direct Investment
IPR	Intellectual Property Rights
MNC	Multi-national Corporation
RGC	Royal Government of Cambodia
TRIPS	Trade Related Aspects of Intellectual Property Rights
WTO	World Trade Organization

EXECUTIVE SUMMARY

Cambodia has achieved significant success in recent years and has enjoyed the fastest growth in South-East Asia over 2001-2010. The garment sector dominates its manufacturing, but it has also achieved strong performance in agriculture, tourism and construction. Nevertheless, it is well recognized by the Government and development partners that Cambodia faces challenges in the industrial sector if its success is to continue. These challenges include achieving greater diversification within manufacturing, and sustaining employment generation that can provide employment, increased wages and better conditions; all of this involves moving up the value chain in manufacturing.

It is already widely understood both by the Government and development partners that Cambodia must improve its physical infrastructure and aspects of its governance, in particular the enforcement of property rights and the rule of law, both of which underpin market efficiency. Less frequently recognized are the implications of the as-yet limited participation of domestic Cambodian entrepreneurs in manufacturing. In the early stages, a manufacturing sector dominated by foreign investment and ownership can be a driver of growth, but in a middle-sized country like Cambodia, long-term sustainability of growth requires the development of a domestic entrepreneurial class. Foreign investors who specialize in particular manufacturing sectors may relocate if better opportunities for that sector emerge in other countries. The advantage of domestic entrepreneurs is that even if a particular sector declines, domestic entrepreneurs will look to develop new opportunities within the country, even if that is initially difficult.

In a relatively resource-rich country, land can provide easy sources of natural resource rents. In addition, in Cambodia around 80 percent of land is still publicly owned in a context where it is likely that greater moves toward forms of private ownership are likely in the coming years. This obviously creates strong incentives for 'investment' in capturing land and being first movers. It is not surprising that illegal land possession is recognized as a serious problem in Cambodia. This can have an unexpected indirect effect on industrial investment and the development of domestic entrepreneurs. The potentially high returns to investment to capture and control land implies that domestic elites are likely to be less interested in investing time, money and effort in becoming productive entrepreneurs. There is no easy answer to this, but policy-makers must attempt to level the playing field for domestic investors who focus on productive investments.

In an economy with low wages, private contracting (the market) can *in principle* organize the investment in capital equipment and in training workers to enable rapid industrialization. However, many reasons exist why private contracting of this type does not happen: a wide range of market failures exist. One response is to try to make markets more efficient so that private contracting can happen: this is the focus of *horizontal industrial policies*. This can include *governance reforms* (reform of property rights, rule of law) to reduce transaction costs, and *improvements in service delivery* to improve the business environment. This approach already informs many policies in Cambodia's 'rectangular strategy' and its *National Strategic Development Plan Update 2009-2013* (in particular Programmes 6 and 7, pp. 161-2).

Horizontal policies are important but they take time to implement and bear fruit. Few developing countries have made rapid progress on 'good governance' at early stages of their development, although some improvements, particularly in service delivery, are clearly possible. Horizontal industrial policies need to be *complemented* with other policies, as improvements in market efficiency through these measures will be relatively slow and significant market failures will remain. This is where *targeted* industrial policies can play a role in addressing **specific market failures** that need to be immediately addressed. But there are potentially many different types of market failures, each requiring different types of policies and governance capabilities to resolve. It is therefore important to identify the ones that are most critical for a particular country.

A large number of potential contracting failures can prevent private investors from solving the investment and coordination problems that constrain development. However, addressing each requires different policies and capabilities. It is important to understand the differences between the major types of market failures and the minimum policies and governance capabilities that are required to solve them. The introduction of policies without the capabilities to implement them can be worse than useless, as this can simply create new rent-seeking opportunities as a result of government failure. Finally, while there may be multiple market failures, some may be so basic that without at least a partial solution to these, attempts to solve other problems can appear to have little effect on outcomes. The types of important market failures identified in the academic and policy literature include:

1) Appropriability problems facing investment in skills. Appropriability means that investors are able to contract to capture the full benefits of their investment. If not, there is a contracting failure and private investors will not invest the appropriate amount. A common problem identified in the literature is the appropriability problem facing private investors in skills, as skilled workers can move to other firms or sectors, leaving the investor with private benefits lower than the social benefit of the investment. Here, the policy solution involves some form of partial public financing of training. This requires governance capabilities to identify the requisite missing skills and capabilities, and to monitor the quality of training to ensure that public resources are not wasted. While all developing countries suffer from serious skill shortages on the supply side, it is clear there is a parallel problem of inadequate demand for skills, the evidence for which is the 'brain drain' and 'skills drain' even from the poorest developing countries. This would be even more dramatic without immigration restrictions in more advanced countries. Solving the skills supply problem is therefore necessary, but by no means sufficient, and focusing only on this can create unemployed skilled workers and pressures for migration without necessarily solving the industrialization problem.

2) Appropriability problems facing innovators. This is more directly of concern in advanced countries where, without the protection of intellectual property rights (IPRs), high profits for innovators (Schumpeterian rents) are not assured. However, it indirectly affects developing countries, as when the latter have inadequate protection for IPRs, companies with technologies that are still generating Schumpeterian rents will be hesitant to bring their technologies to developing countries for fear of copying. The standard response to this is to urge developing countries to enforce IPRs, particularly as

enshrined in Trade Related Aspects of Intellectual Property Rights (TRIPS). The issues here are complex, because there are strong arguments (coming from Stiglitz and others) that the extent of IPR protection under TRIPS is detrimental for innovation and also makes it difficult for developing countries to copy and adapt technologies. The problems with TRIPS are not likely to immediately affect Cambodia, but may do in the future when Cambodia reaches mid-levels of middle-income status and is moving into relatively sophisticated technologies. Conversely, a focus on enforcing IPRs will have little immediate effect on Cambodia as it is unlikely to be significantly engaged in the production of high technology products that are still protected by IPRs.

3) Appropriability problems facing the Discovery of Comparative Advantage. Hausmann and Rodrik, Stiglitz and others have argued that 'first-mover' investors in developing countries who 'discover' areas where the country has comparative advantage also face an appropriability problem, as they cannot capture the full benefits of their discovery, but face all the costs in case of failure. The policy response here is to co-finance some of the costs of discovery, for instance by providing seed money for experimental start-ups in new sectors. This too requires governance capabilities to ensure that the assistance is short-lived and public resources are not wasted when discovery fails. In theory, this is a possible market failure, but in practice, most developing countries know what the next sectors in the value chain are until they reach the higher levels of middle-income status. Nevertheless, some element of support for start-ups in new sectors can accelerate the process of diversification, provided the governance capabilities exist to ensure that resources are not wasted.

4) Failures of Coordination. Targeting these problems lay behind early interest in industrial policy, with policy responses like indicative planning and five-year planning. The idea is that information and coordination failures in the market can prevent private investors from accurately predicting the demand and supply complementarities across sectors. In today's world, demand complementarities are less important (because of global trading opportunities) than supply complementarities, but coordinating investments to develop integrated clusters, for instance in electronics or auto parts, requires strong governance capabilities and effective relationships of exchanging information between entrepreneurs and state agencies. Again, this may be a future task for the Cambodian economy but the immediate priority may be to develop a diversified sector of more basic manufacturing and assembly, with few significant coordination issues.

5) Financing Learning with High Levels of Effort. This problem may be of much more immediate concern to an economy like Cambodia attempting to develop and diversify its manufacturing sector. Developing countries often find that even when they have workers with the appropriate formal skills, and the appropriate machinery is easily available, they are unable to engage in competitive production. A critical missing factor is the know-how of organizing production using modern production techniques. The low participation of domestic Cambodian entrepreneurs even in the garment industry suggests that this is an important problem in Cambodia. The absence of 'entrepreneurship' actually describes a broad range of missing organizational capabilities. Without these capabilities, firms are not competitive even *with cheap labour*, and there is limited demand for investment funds and skilled labour, as entrepreneurs will not make money by setting up an enterprise. This

is why the provision of investment funds and skilled labour is not sufficient for solving the industrialization problem. Achieving competitiveness requires learning and adapting efficient routines for production, inventory management, quality control, sales, marketing and the management of bottlenecks. The optimum factory layout, even for a simple garment factory, can vary from country to country, depending on patterns of working, optimal methods of quality control, specific infrastructural bottlenecks, and so on. Achieving these 'organizational capabilities' involves high levels of effort in experimentation, which in turn involves internal conflict management, with costs and risks for managers.

Without these organizational capabilities that raise productivity and product quality to achieve competitiveness, there is likely to be limited demand for investment funds and skilled labour. This brings us to the specific contracting problem. The 'knowledge' of organizational capabilities is not 'codified': it cannot be learnt in books or by attending courses. It is largely 'tacit', which refers to knowledge that can only be acquired through 'learning-by-doing'. The learning period involves an unknown period of low profits or even loss-making, and this too needs to be financed. But individual entrepreneurs are typically unwilling to take this risk by borrowing on their personal collateral, which is why private contracting does not solve this problem. As a result, private investment is slow in new sectors and entrepreneurs do not rapidly emerge. On the other hand, if support is too easily available to finance learning, this can paradoxically damage the compulsion to put in high levels of effort in learning. In the absence of compulsions for effort, entrepreneurs and managers receiving assistance for learning tacit knowledge can become *'satisficers'* (a term coined by Herbert Simon), putting in low levels of effort in learning and experimentation. This problem was widely observed in many early industrial policy experiments and the cross-country evidence suggests that while 'doing' is necessary, it is not sufficient for acquiring organizational and technological capabilities. Success requires financing instruments that are appropriate (given the governance structures in the agencies managing the instruments) for creating credible compulsions for high levels of 'effort' in learning-by-doing.

Developing countries face multiple market failures, and not all problems can be solved simultaneously. However, success requires that the most important problems are at least partially addressed. For Cambodia, an important challenge is likely to be to develop capabilities for domestic entrepreneurs in a diversified manufacturing sector. To some extent this may involve addressing the adverse incentives facing domestic elites who are attracted to investments in land and natural resource rents of different types. Policies to consider here will depend on political and administrative feasibility but could, for instance, include differential tax breaks or focusing attention on supporting less politically connected entrepreneurs to enter productive manufacturing activities. More importantly, the development of entrepreneurial and organizational capabilities (particularly for domestic entrepreneurs) will require developing financing instruments for supporting learning-by-doing. Broad 'infant industry' policies are unlikely to succeed in contexts of weak governance capabilities. But the capability development problem will not go away, and must be addressed. Policy-makers could consider targeted financing instruments, limited to a small number of sectors with well-specified outcomes, and with parallel programmes of developing the governance capabilities of specific agencies charged with the implementation and monitoring of these instruments.

I. INTRODUCTION

Cambodia has enjoyed significant success in recent years, achieving the fastest growth in South-East Asia over 2001-2010. Its garment sector dominates its manufacturing sector, but it has also achieved strong performances in agriculture, tourism and construction. Policy-makers recognize a number of challenges that face the country. This includes the challenge of achieving greater economic diversification, sustaining employment generation and moving up the value chain. The Royal Government of Cambodia (RGC) recognizes that Cambodia must improve its infrastructure and its governance, in particular its property rights regime and rule of law, which underpins market efficiency. Other problems are less-often recognized in formal policy design, although they are frequently pointed out in official documents. These include the relatively limited participation of domestic Cambodian entrepreneurs in modern productive activities, particularly in modern manufacturing. The long-term sustainability of growth requires the development of a domestic entrepreneurial class, and responses to this challenge must be incorporated in Cambodian industrial policy. A second problem that can indirectly affect industrial policy in a resource-rich country like Cambodia, where property rights are evolving, is that there can be much higher immediate returns in less-productive activities, compared to industrial production. Gaining control over land and natural resources can be very lucrative and can easily divert elite attention away from manufacturing and productive activities, as well as creating speculative crises and other problems. A holistic industrial policy strategy must also recognize these inter-relationships, and policy must aim to reduce the probability of negative outcomes.

In a developing country with relatively low wages, private market contracting could, in theory, organize investment in equipment and training to enable rapid industrialization simply by rapidly absorbing technologies of production from more advanced countries. However, private contracting usually fails to achieve this type of rapid development because of a wide range of contracting failures. Contracting failures refer to reasons why private contracting in markets can fail to achieve potentially beneficial resource allocations or activities. In general, contracting failures are caused by weaknesses in contract enforcement, which may in turn be due to a range of information, governance and political problems. A particular contracting failure describes a specific problem that constrains economic development, as stakeholders are unable to use voluntary contracting to solve specific problems affecting investment, technology absorption, learning, innovation, coordination or related issues. The result of these contracting failures is that investors or other stakeholders fail to invest or engage in productive activities because they fear that they will not be able to protect their interests through contracts.

There are two broad responses to the presence of significant contracting failures. One type of policy response is to try to make market contracting more efficient: this is the focus of *horizontal* industrial policies that seek to improve the 'investment climate'. These include governance reforms (reforms of property rights and strengthening the rule of law) to reduce transaction costs and make markets more efficient, and policies to improve public service delivery in areas such as infrastructure and utilities, to improve the

business environment. This approach informs policies like Cambodia's rectangular strategy and the National Strategic Development Plan Update 2009-2013 (Hun Sen, 2004, 2008; RGC, 2010). Horizontal policies are important, but can potentially take a very long time to implement sufficiently that they begin to have an effect on the actual ease of contracting in a developing country. This is because significant progress on 'good governance' reforms and infrastructure development requires correspondingly significant resources, and therefore historically, progress on good governance has proceeded in parallel with economic development, rather than preceding it (Khan, 2012b, 2012c, 2012d).

Horizontal industrial policies therefore need to be complemented with vertical or targeted industrial policies that target immediate and specific contracting failures. These types of policies are of vital importance as general improvements in market efficiency through horizontal measures are likely to be relatively slow. However, the design of targeted industrial policies is also challenging. The problem is that there are, in principle, many different types of contracting failures, each affecting very specific problems and each requiring specific policies and governance capabilities to resolve. It is therefore important to identify the contracting failures that create the most important constraints affecting industrial development in a particular country. Once the most important contracting failures have been identified, the challenge is to design policies that can address these problems. Policy design depends on an identification of the particular problems and constraints that are likely to be impeding development. The relevant constraints and contracting failures need to be carefully identified as, in principle; there may be very different constraints that are important in different countries, or in different sectors in the same country. The appropriate design of the policy also depends on the institutional and political conditions of the country, as all types of instruments may not be equally effective in different contexts, and success requires selecting instruments that are most likely to be effective in a particular context.

In the past, industrial policy design often ignored the importance of distinguishing between different contracting failures, and designing responses which could be enforced in the particular institutional and political context of that country. This is why the results of industrial policy have often been very variable, with very effective outcomes in some cases, but relatively poor outcomes in others. The design issues are particularly important as, while private contracting is subject to potentially serious contracting failures, developing country states also have weak enforcement and governance capabilities for effectively implementing many corrective policies. If policies are adopted that target the wrong problems, or that cannot be effectively enforced and implemented, the result can be poor economic outcomes. In turn, the poor results of industrial policy in many developing countries persuaded some economists and policy-makers to argue that developing countries should avoid industrial policies. This advice aimed to avoid the problem of government failure, but ignored the problem that the underlying contracting failures would continue to constrain development.

The 'new' approach to industrial policy recognizes that industrial policies are necessary, but they must be designed to be effective *given the particular contracting failures that are most important and the institutions and enforcement capabilities of particular states.* This

implies, first, that the relevant contracting failures must be properly identified to determine the problems policies must address. Second, it must be recognized that there are many possible responses to any particular contracting problem, and not all of them may be equally enforceable in every context. The second step is therefore to select the response that is most likely to be effectively enforced in the local context. Finally, for policies to be successful, some governance capabilities may also need to be developed in particular agencies, to monitor and enforce the relevant policies.

Understanding the interrelationships between these factors can help explain why some countries have done rather better with industrial policies than others, in contexts of weak governance. While all developing countries are far removed from textbook 'good governance' characteristics (strong enforcement of rule of law, government accountability and well-defined property rights), some have been better or luckier in adopting policies that were more effective in the context of their governance, and better at developing the governance capabilities of critical agencies that enabled these strategies to be effectively implemented. These insights are important for identifying the most important constraints affecting a particular country and designing the policy responses that are most likely to deliver improved outcomes. The policy solutions for addressing many technology-adoption problems can appear to be quite similar (for instance providing temporary subsidies to firms), but the detailed design of the policy and the governance conditions for ensuring their success can be quite different, depending on the underlying contractual problem that the policy aims to resolve.

As there are a number of different contracting problems affecting technology adoption and industrialization, it is also likely that a country can face more than one problem at any one time. Therefore, policy needs to ensure that the most general problems (the ones that affect all or most cases of technology acquisition) are addressed first. Unfortunately, the most general problem may not necessarily be the easiest to solve in terms of policy design and in developing the requisite governance capabilities. But if the problem or problems that are most general in their effect are not solved, solutions to other more specific problems may not be effective, as industrial development will continue to be constrained by the general problems. We will argue that the weak organizational and technological capabilities of domestic entrepreneurs are one of the general problems constraining industrial development in developing countries like Cambodia. It follows that industrial policies that do not address the contracting failures that constrain the development of organizationally and technologically capable domestic entrepreneurs are likely to fail, even if they address other important constraints, because all policies assume that potentially competitive domestic entrepreneurs exist who can benefit from policies addressing other constraints.

II. INDUSTRIAL POLICY CHALLENGES FOR CAMBODIA

Table 1 outlines a number of important contracting failures that can potentially affect technology acquisition and industrial development in developing countries. The first column in the table describes the contracting failure. The second column lists the policy responses likely to address the contracting failure, taking the stakeholders closer to the desired outcome. The final column is particularly important because it lists some of the governance capabilities required on the part of government agencies for implementing these policies effectively. A policy that is theoretically effective can be much less useful, or even useless, in practice if the agencies charged with its implementation are unable to identify and enforce the critical conditions that are required for its success. In fact, in some cases, badly designed and implemented policies can be worse than useless if the net effect of the policy is further resource misallocation and rent seeking (Krueger, 1990).

Table 1: Major Contracting Failures Affecting Technology Acquisition

Contracting Failures Affecting Investment	Likely Policy Instruments	Governance Capabilities required for Implementation
Appropriability problems facing investment in skills: Investors cannot capture full benefits of training	Public co-financing of labour training and investment in skills	Capabilities in relevant agencies to ensure financing for training is not misallocated or wasted
Appropriability problems facing innovators: Poor protection of innovation rents can discourage advanced technology investors	Protection of IPRs. But TRIPS may be too restrictive and MNCs may have weak incentives to transfer technologies	Enforcement capabilities for IPRs but also policies and strategies to encourage technology transfer by MNCs
Appropriability problems facing 'discovery': First movers do not capture full benefits of discovering comparative advantage	Subsidies for first mover start-up companies in new sectors	Capability to make subsidies time limited
Failures of coordination: Complementary supporting sectors do not develop, constraining investment	Indicative or incentivized strategies for coordinating investments	Significant governance capabilities required to coordinate and discipline investments across sectors
Problem of Contracting High Effort in Learning: Financing technological-organizational learning fails because of low effort	Public co-financing or sharing of risks of financing the learning of tacit technological and organizational capabilities	Financing instruments must be compatible with governance capabilities to ensure credible compulsions for high effort learning-by-doing

Source: Author

In general, therefore, solutions to contracting failures require properly designed corrective policies and governance capabilities appropriate for the monitoring, evaluation and enforcement requirements of specific policies. Developing countries typically have limited potential for improving their governance capabilities in every direction. It is therefore important to identify the precise contracting failures that are most important and to design policies that have the greatest chance of being implemented, given existing governance capabilities or with feasible improvements in these capabilities. The fit between problems, policies and capabilities can explain why some countries or sectors can do well even when overall governance capabilities are weak. In this section we briefly describe the different sources and effects of the contracting failures identified in Table 1, while the next section discusses the likely relative importance of these problems in Cambodia. This discussion will be useful for policy-makers as a guide to further thinking and discussion on Cambodian priorities, the critical contracting failures that are constraining industrial development, the feasible industrial policies that Cambodia should pursue and the appropriate governance capabilities that need to be developed.

1. Appropriability Problems Facing Investment in Skills

Appropriability problems refer to a general type of contracting failure that emerges when investment in a particular activity is potentially profitable, but investors fear they will not be able to capture or 'appropriate' enough of the returns on these investments, and as a result, investments do not take place. In the case of skills, the appropriability problem is that investing in the skills of the workforce may be potentially profitable for the employer, and workers may promise to work for the investor after their training is completed so that the investor gets enough benefit from that investment, but this promise may not be enforceable in a contract. Equally, if the training is specific for a sector or firm, workers may be reluctant to pay for the education unless the employer can guarantee employment later; this too may not be enforceable in a contract. The result can be low or no investment in the relevant productivity-enhancing education or in skills development. This is therefore essentially a problem of positive externalities (spillovers) associated with investment in education and skills, and given the contracting problem, investment in training will be constrained. The obvious policy response is for the state to share some of the costs of training or to provide the appropriate training through publicly funded training organizations. What is less often recognized is that getting the right outcomes through these policies is by no means simple and requires careful policy design and governance capabilities to ensure that the policies are effectively implemented. This includes governance capabilities to monitor the outcomes of skills training and withdrawing support from programmes that are making inadequate progress.

Subsidies for companies to invest in training may be wasted if firms provide poor quality or improper training as a result of the subsidy or its delivery being badly designed. Similarly, training institutions may provide sub-standard education, or training of a quality that is not of any commercial benefit to employers. In the former case, the governance requirement is to ensure that the employer is not using the assistance as a way of simply reducing the cost of current employment. Possible policy responses may involve designing firm-level support for learning so that government assistance for training is conditional

on wage or employment growth, or conditional on employment growth in high-skills sections of production where the training is being carried out. Similarly, public support for training institutes must have effective mechanisms for monitoring the quality of training. These monitoring, evaluation and governance capabilities cannot be presumed to exist in many developing countries. Providing high-quality training in publicly financed training institutes also requires a high level of coordination with the requirements of the private sector and effective quality monitoring and enforcement. These are difficult governance requirements even in advanced countries, and public money is often wasted in advanced countries, in poorly designed training support schemes. The appropriate mechanism for delivering public support for training therefore needs to be carefully considered in the context of their governance requirements and the likelihood that existing governance capabilities can be improved in the appropriate direction. Developing countries have many training schemes and institutes that end up wasting scarce resources without achieving significant improvements in training.

Workers in developing countries have important skills deficits but it is worth carefully considering what the primary source of the problem is in each country and sector. Part of the skills deficit can be due to insufficient formal training and education, which is the problem being discussed here. The acquisition of *formal* training involves going to a technical college of some variety and getting the appropriate training. However, in many sectors, the real constraint may *not* be the absence of formal training but is likely to be the absence of some critical tacit *knowledge* about efficient work practices and the organization of production that can only be acquired by learning-by-doing. This problem cannot be addressed by the mechanisms of formal training that we are discussing here. We will return to the problem of investing in the acquisition of tacit knowledge later, as this is often the most important contracting failure in Table 1. The problem of acquiring tacit knowledge is more fundamental for achieving competitiveness in most developing countries and refers to more general problems that affect firm productivity even when workers and managers appear to have the right level of formal skills. If so, creating a greater number of formally skilled workers will not solve the general problem of low productivity and competitiveness, and may simply result in the migration of skilled workers out of the country.

Financing the acquisition of tacit knowledge through learning-by-doing faces more formidable contracting problems and solving these requires more attention to policy design and governance requirements. The relevant point here is that the financing of formal skills and education may be neither necessary nor sufficient to improve productivity in the short to medium term. Most developing countries already have unemployed or under-employed workers and managers with the appropriate skills, and the problem is that they cannot be competitively employed given the organizational capabilities of firms in the country. Of course, once growth takes off, there may be formal skills shortages in particular sectors, and these problems must also be addressed. But addressing the second problem without addressing the first can simply result in greater levels of unemployment or under-employment. Once again, designing programmes without understanding and identifying the real constraints may result in resource wastage without solving the productivity and competitiveness problem. This is not to say that for *some* categories of formal skills (e.g. accountancy, computing skills or mechanical engineering) there may indeed be a genuine

shortage in the country even at the initial stages, given the types of industrial processes that are being attempted.

2. Appropriability Problems Facing Innovators

Another type of appropriability problem widely recognized in the literature derives from the difficulty of appropriating the full returns to investment in innovation. However, the implications for this contracting failure are different for innovators and those who imitate them. While advanced countries largely rely on innovation to drive their growth, a significant part of the growth in developing countries is based on imitation, adaptation and learning. From the perspective of innovators, there is extensive literature on the benefits of ensuring the temporary protection of Schumpeterian (or technology) rents, using intellectual property rights and other mechanisms (Dosi, 1988; Khan, 2000a). From the perspective of catching up in developing countries, the issues are different. There is some innovation happening in many developing countries and there is an issue of protecting the technology rents of these innovators, but most growth in developing countries comes from adopting and learning to be competitive in *known* technologies. The stellar growth of East Asian countries in the 1960s and 1970s was based on rapid technology transfer, but the emergence of TRIPS under the World Trade Organization (WTO) and other IPR protection agreements changed this process substantially. As a result of the changed international regime, it is often argued that to attract technology providers to developing countries, the latter must offer strong protection of intellectual property rights, without which companies from advanced countries which own critical technologies are likely to choose other destinations to set up their production centres.

This issue raises very important questions about the merits of the current system of global intellectual property rights, which will not be fully reviewed here. But there is a strong case that the way in which IPRs have been defined in international agreements, like the TRIPS agreement of 1994, are detrimental to the interests of developing countries, and may even be detrimental to innovation in advanced countries (Stiglitz, 2007: 103-32). Paradoxically, a complex and extensive set of protections for technology rents can also be harmful for the rate of innovation in advanced countries as it can slow the flow of knowledge to new innovators, and can slow down the innovation of new products that *may* infringe any of a vast array of patent rights (Stiglitz, 2007). The recent court cases between Samsung and Apple demonstrate this problem. For developing countries, the issues are more straightforward. The new IPR regime does constrain the pace of technology imitation and increases the costs, but at the moment, for an individual country like Cambodia, there are not many options but to work within the global rules. The strong protection of IPRs is therefore often recommended for middle-income developing countries as a way of attracting high technology foreign direct investment (FDI) (Hoekman, et al. 2004). However, here too important governance questions are at issue. It is not enough to provide blanket protection of all IPRs, but to be able to select the technologies that are particularly attractive for the country. Governments must have the negotiating skills and a knowledge of WTO rules to negotiate incentives and contracts with multinationals so that the most desirable technologies are transferred with the greatest spillovers for domestic firms and entrepreneurs.

3. Appropriability Problems Facing Discovery

An appropriability problem that has attracted considerable attention in recent years involves investments to discover activities that are profitable in particular developing countries (Hausmann and Rodrik, 2003). The idea is that countries may be potentially good at making some products, but this may not yet be known. Investors who put their money into different activities will sometimes lose their money, but occasionally discover things that can be made profitably. If other investors can easily imitate this discovery, the original investor may actually lose money (for instance if wages go up as a result and they cannot recover their initial investments in discovery) or at least the original investors may make less money than if their discovery could be 'protected'. However, discovery cannot be contractually protected as, unlike innovation, there are no patents for discovery. This contracting problem can result in under-investment in discovery, and public policy can attempt to address this with appropriate policies.

Although the proposition that countries have hidden comparative advantages that need to be discovered is not particularly convincing (Khan, 2009), the possibility that first movers may not be able to capture the full benefits of their investment can justify subsidizing first movers in new sectors. The initial proposition is not convincing because countries are unlikely to have 'hidden' comparative advantage that they are not aware of. It is more likely that they do not have competitiveness in *any* new sectors because of an absence of the tacit knowledge required to organize production competitively, a problem that we will discuss later. If that is the case, then without a solution to the problems of acquiring this organizational tacit knowledge, investment in new sectors will fail as there is no hidden comparative advantage to be discovered. However, to the extent that investment is not happening in new sectors because of a contracting failure to finance investments in discovery, the problem is essentially to address the positive spillovers of investments in new sectors. The appropriate public policy would be to subsidize investments in new sectors, and the governance capability required is to ensure that subsidies are only available to reduce some of the costs of the start-up phase. If subsidies are captured by the wrong firms (for instance firms that are not investing in new sectors) or if firms can continue to claim subsidies even when it is clear that the sector is not profitable, the public policy will fail. The important capabilities here are to identify what counts as a new sector and to police the time limits for subsidizing the very first investments in a new sector. In other words, if discovery was the primary problem, the monitoring and evaluation requirements for industrial policy solutions would be rather limited. Unfortunately, the contracting failures that are actually likely to be relevant in most developing countries require more complex solutions with more demanding governance requirements.

The modern sectors in developing countries are typically using technologies that are in use elsewhere. It is implausible that a country has a natural tendency to be good at producing, for example, hats rather than bed-sheets, simply in terms of skills and innate capabilities, when the technologies involved are relatively basic. In reality, the task of entrepreneurs in developing countries is generally not to *discover* the hidden comparative advantage of a country, but to *create* comparative advantage in basic technologies by building efficient organizations. If efficient organizations capable of using modern

technologies can be built, most developing countries can be competitive in most basic production lines, taking into account their factor endowments and formal skill levels. The development of effective productive organizations is therefore of great importance, and we discuss the relevant constraints later under the contractual failures affecting learning-by-doing.

4. Failures of Coordination

The problems of private contracting in conditions where coordinated investments are required have long been recognized as an important type of contracting failure by development economists (Rosenstein-Rodan, 1943; Nurkse, 1953; Scitovsky, 1954; Murphy et al., 1989). The 'lumpiness' of investments can create a number of related problems that can prevent the coordination of investments from achieving enhanced social benefits. Lumpiness refers to lumpy fixed costs that result in scale economies. In the presence of lumpiness, investments in one sector or firm can have more than a marginal effect on the profitability of other sectors by raising the demand for their products and/or cheapening the price of their inputs. The efficiency attributes of market prices as signals of social costs and benefits can break down in this context.

It is theoretically possible that an investment in a particular firm or sector can be unprofitable under these circumstances, but can become profitable when coordinated with investments in other sectors. In developing countries, this has been the justification for planning exercises and even for a state-coordinated *Big Push*. This could involve the coordination of investment across sectors potentially enjoying complementarities and external economies. But the governance requirements for a state trying to achieve *Big Push* industrialization are very significant indeed, and very few developing countries have the governance capabilities to identify and implement coordinated industrial policy of this type. First, government agencies must be able to identify the sectors to be included in the coordinated plan or *Big Push* without being influenced by rent-seeking or an incorrect reading of the data. Otherwise sectors may be included for promotion that cannot be justified on economic grounds. Furthermore, to effectively coordinate investments, the state's planning exercise must be aligned with the interests and capabilities of the private sector. Finally, the incentives and instruments supporting investments must be *effective* for achieving the desired resource allocations; otherwise the desired coordination will not be achieved. It is therefore also important to have the capacity to monitor and identify possible mistakes early on, so that policy can be changed or abandoned quickly.

Without all these implementation conditions, there is not much point in spending public resources constructing and publishing detailed plans that everyone ignores. Unfortunately, this happens quite frequently in developing countries, particularly because constructing detailed plans can employ large numbers of economists and officials in apparently useful activity. In reality, plans of this type are rarely implemented to any significant extent. Without very significant implementation capabilities, a broad indicative plan setting out the government's own plans for investment in infrastructure and the current policy framework may be all that is required. More important are specific strategies for addressing particular contracting failures, which we discuss separately.

Note that there is a separate requirement for governments to *coordinate* their own agencies to ensure that policy and service delivery tasks are adequately coordinated and financed. This is obviously essential if the government is to deliver services and policies effectively, but this is not what is referred to as the *Big Push* or development planning in the development literature. The latter refers to the coordination of sectoral investment by both the private and public sectors in a context where contracting failures can prevent coordination by private firms. Coordination within government is essential and should *always* be attempted. Government using industrial policy to solve coordination failures in the market has a different objective and requires governance and implementation capabilities that most developing countries lack. However, as countries progress from the lower to the higher levels of middle-income status, with increasingly complex industrial clustering, there is an increasing need for complementing market coordination with industrial policy coordination of different types. For instance, policy may attempt to coordinate sub-sectoral investments to promote viable production clusters in, for example, electronics and automobiles, where the presence of supply chains for a diverse bundle of components may be a precondition for sustaining success.

5. Problems of Financing Effective Learning-by-Doing

Very often, the most important constraint affecting the development of modern sectors, particularly in manufacturing, is that developing countries lack a broad spread of organizations (firms) with the *organizational and technological capabilities* to adopt, adapt and use *available* technologies profitably. Building competitive organizations is an extremely difficult task that is subject to significant contracting failures. But without effective organizations, industrial policy strategies will ultimately fail, as the success of any strategy requires a broad base of competitive firms with the basic organizational capabilities to benefit from the strategies. The absence of many potentially competitive firms reflects the absence of a particular kind of *tacit knowledge* embedded in firms. The development of organizational capabilities involves significant effort by management and other stakeholders in the acquisition of this type of knowledge. *Tacit knowledge* is a type of knowledge that cannot be acquired through formal processes of education and transmission, but through learning-by-doing. By definition, progress in acquiring tacit knowledge through learning-by-doing is difficult to monitor, evaluate and control.

Investors in firms in developing countries that initially lack competitiveness are effectively financing learning-by-doing as the firm strives to achieve competitiveness; during this period financiers are exposed to significant contracting risks. Their investment only pays off if the management and other stakeholders within the firm put in high levels of effort in learning-by-doing, so that competitiveness is rapidly achieved by acquiring the missing tacit knowledge. But if effort in learning is difficult to observe and monitor, a lower level of effort by the firm can make the investment unattractive for the investor and can result in non-investment. Equally, a subsidy by the government to an 'infant industry' to achieve competitiveness can result in a failure to achieve competitiveness for the same reason. Missing organizational and technological capabilities can explain the paradox that low-wage countries are unable to adopt and use freely available technologies which they should, in principle, be able to use competitively. Competitiveness depends not just

on wages but also on the productivities of labour, input use and capital equipment. The productivity of labour and of input use in turn depends not just on the formal technical knowledge of workers and managers. More significantly, the productivity of all factors depends on the *tacit knowledge* of the production team about how to organize the firm to use the technologies most productively.

Developing countries are generally not in the business of innovating entirely new products. Rather, most of their growth is based on the absorption of existing technologies to produce products of particular qualities that already have a global price set by the leading countries using these technologies. The machines and technologies for producing these products are likely to be well known, but there may be many types of organizations (firms) using them in the leading countries. These organizational variants reflect differences in local conditions, workforce habits, infrastructure constraints which must be dealt with and so on, but in every case, efficient organizations in more advanced countries define levels of quality and price that the catching-up country must match. Protecting domestic markets, granting export subsidies and other subsidies of different types can allow infant industries to engage in learning-by-doing, but unless competitiveness catches up, these strategies become unsustainable in terms of a growing subsidy cost. For a catching-up firm to graduate out of subsidies, it must achieve a globally competitive price-quality mix. Once this is achieved, subsidies are no longer required.

Competitiveness depends on achieving a minimum level of technological and organizational capabilities. The *technological capability* of workers and managers refers to their ability to use particular machines and technologies properly. These capabilities are partly based on formal education and training, but often they primarily depend on on-the-job learning-by-doing. This is often described as know-how. For example, classroom instruction on driving can be helpful, but does not provide the tacit knowledge that is required to drive a car. The ability to drive involves acquiring this tacit knowledge through learning-by-doing. Depending on how committed the learner is and how much effort they put in, learning to drive can take a longer or shorter time, given any level of formal skills. The same is true for operating many machines and production processes. In addition, the productivity of workers, inputs and capital equipment depends on the organization as a whole working effectively as a team.

Organizational capabilities refer to more general capabilities of organizing the production team and are possibly even more important for the overall productivity and competitiveness of the firm. The organization of a firm involves many processes of internal management, incentives, monitoring, quality control, interfacing with buyers and suppliers, reducing input wastage, effective inventory management, setting up machines and processes to maximize throughput, and so on, which are only fine-tuned through repeated practice and effort at continual productivity improvement. Organizational capabilities are embedded in the routines of the organization, and these organizational structures are a form of tacit knowledge that the organization acquires, again largely through learning-by-doing and experimentation. Without these technological and organizational capabilities, productivity levels are typically too low for the developing country to competitively engage in production, even if it acquires the appropriate machines and has workers and

managers with the formal knowledge required to use the technology. This is true even for relatively low technology production processes such as garment manufacturing, and even more so for more technically sophisticated processes. The acquisition of tacit knowledge through learning-by-doing is one of the most general problems affecting almost all areas of technology acquisition in developing countries and is subject to important contracting failures. In the absence of solutions to these problems, a new firm or an entire country can find its technology acquisition strategies blocked.

It is widely recognized that the acquisition of tacit knowledge requires learning-by-doing. However, the problem is that 'doing' without a large element of *effort* is not likely to generate much learning. Effort is obviously important in the learning-by-doing processes through which individual workers improve their productivity. But effort is particularly important in developing organizational capabilities, as the learning that is involved here involves the organization and reorganization of firms as complex organizations, so that they work more smoothly to produce competitive products. When infant industries fail to graduate into productive enterprises despite decades of 'doing', financed by different types of implicit subsidies, it is almost always because there was a failure of organizational learning. The continuous restructuring and fine-tuning of organizations to achieve high levels of productivity and competitiveness is a high effort activity that involves risks and costs for managers and other stakeholders, as change is painful and has distributive implications that are likely to be resisted. Given these costs, in the absence of pressure and even compulsion on firm managers, 'doing' can continue indefinitely without any organizational learning happening.

The obvious conclusion is that successful learning requires the exertion of a high level of effort *in the learning process,* particularly by management. The problem is that the appropriate incentives and compulsions for ensuring high levels of learning effort are difficult to enforce. It is not possible to directly observe effort; and to try to evaluate effort by looking at intermediate outcomes can sometimes give the wrong answers. This contracting failure can constrain private investments in learning-by-doing. But public financing is also likely to be largely wasted if it does not address the underlying problem with instruments of financing that can effectively ensure high levels of learning effort. The organizational capability and learning problem is likely to be the most general contracting problem affecting technology adoption. Missing tacit knowledge about *how to organize the relevant production processes* is usually at the heart of the problem of competitiveness. If the problems constraining the acquisition of technological and organizational capabilities are not solved, solutions to other aspects of the technology adoption problem are not likely to be effective.

Discussions about the governance conditions required for effective industrial policy used to be dominated by the experiences of East Asian countries, and particularly South Korea. In South Korea, the governance capabilities of its state ensured high levels of effort in learning in the decades after the 1960s in a range of targeted sectors that received significant direct and implicit subsidies. The South Korean industrial policy monitored performance using a number of intermediate outcome indicators, like exports. If management was slow in achieving targets, corrective action was rapidly taken by the

government; this could include re-allocating plants to alternative management. These strategies of monitoring and enforcement required bureaucratic capabilities to monitor performance and withdraw support from non-performers, as well as a business sector that could not make political alliances to protect their temporary 'learning rents' (Khan, 2000b). This combination of bureaucratic and political conditions (part of the 'political settlement' of a country) is typically lacking in most other developing countries (Khan, 2010, 2012c). If the South Korean instruments for financing the learning of competitive capabilities were the only ones available, we would have to conclude that industrial policies were inappropriate for most developing countries, as they typically lack the institutional and political capabilities to monitor and police South Korean types of industrial policies.

However, the experience of successful sectors in developing countries with weaker monitoring and enforcement capabilities shows that other types of financing can be effective in apparently adverse governance conditions. The critical requirement is that institutional and political conditions must be appropriate for creating credible incentives and compulsions for high levels of effort, given the specific financing instruments that are being used. This is supported by examples of successful learning-by-doing and technology adoption in particular sectors in India, Bangladesh and Thailand (Khan, 2009, 2011, 2012a, 2012c). The policy conclusion is that effective industrial policy for supporting learning and achieving competitiveness is possible in countries with weaker governance conditions, but only if the financing instruments are compatible for supporting high effort in these learning exercises, given the institutional and political conditions in the country.

The essential features of the catching-up problem can be described using a simple mark-up pricing model for products of a given quality. The current global price of a particular product of quality Q is set by its cost of production in the country that is currently the global production leader. The price can be arithmetically broken down into a unit labour cost component, plus unit input costs and the amortized unit capital costs representing the unit costs of machinery and buildings. This is shown in eq. [1]:

$$P_Q^{global} = \left[\frac{W_Q^{leader}}{\Pi_Q^{leader}} + \sum_i \frac{P_{Qi}}{\alpha_{Qi}^{leader}} + \sum_k \frac{P_{Qk}}{\beta_{Qk}^{leader}} \right] (1 + m_Q) \quad [1]$$

(unit labour cost) (unit input cost) (unit capital cost) (markup)

To simplify the notation, we do not denote products and simply refer to a particular quality indexed by Q, so Q+1 represents a higher quality product than Q. P_Q^{global} is the international price of a particular product of quality Q. W_Q^{leader} is the wage level in the leader country in the industry producing the product of quality Q. Π_Q^{leader} is the productivity of labour in this sector in the leader country, measured by the output per person in this activity. The first term on the right hand side is therefore the unit labour cost. The second term is the unit input cost. The production of the product requires i inputs as raw materials or semi-manufactured inputs. To simplify, we assume these inputs are globally traded, each with a global price of P_{Qi}. The efficiency with which inputs are used is measured by the productivity

of input use (output per unit input). In the leader country, the input productivities of each of the i inputs are represented by α_{Qi}^{leader} . Input productivity primarily measures wastage and input loss due to rejected final products. In many production processes, levels of input wastage are a critical determinant of competitiveness. The third term refers to the unit 'capital' cost attributable to the cost of machinery and buildings. There are k inputs of this type, and the most important elements are usually machines which have a globally traded price, although land and buildings can also be significant cost components in some cases. The unit cost of capital is determined by the fraction of each component of these capital costs attributed to the particular period of production, represented by P_{Qk} divided by the output-capital ratio for each type of capital (the productivity of capital) measured by β_{Qk}^{leader}. Given the fixed investment, the output-capital ratio will depend critically on capacity utilization and will be lower at higher scales of production. The mark-up is set at m_Q.

In the same way, the cost of production (in a common currency) in the developing country is the domestic cost for the product of quality Q, given by an exactly equivalent equation but with the appropriate domestic productivities and prices:

$$C_Q^{domestic} = \left[\frac{W_Q^{domestic}}{\Pi_Q^{domestic}} + \sum_i \frac{P_{Qi}}{\alpha_{Qi}^{domestic}} + \sum_k \frac{P_{Qk}}{\beta_{Qk}^{domestic}} \right] \left(1 + m_Q\right) \quad [2]$$

The follower country achieves competitiveness when its $C_Q^{domestic} \leq P_Q^{global}$. The problem of missing tacit knowledge is that, despite lower wages, the productivities of labour, inputs and capital are likely to be significantly lower in developing countries. Typically, this makes the domestic cost of production higher in the developing country compared to the world market price, even for relatively low technology products, and despite typically lower wages. It may appear that a low enough wage level could compensate for these productivity differentials, but in reality that wage may have to be much lower than is feasible. Indeed, in many cases, even zero wages may not be able to compensate for a lower efficiency of input and capital productivity. This is because inputs and capital equipment have global prices that must be paid. If $\alpha_{Qi}^{domestic} < \alpha_{Qi}^{leader}$ for expensive globally traded inputs, the greater wastage of inputs alone could result in a higher domestic cost of production even *if the domestic unit labour cost could be pushed to zero.* This is why efficiency in controlling the wastage of inputs and reducing product rejection is often a critical variable in achieving competitiveness. In addition, the productivity of capital equipment is also often lower, with $\beta_{Qk}^{domestic} < \beta_{Qk}^{leader}$ as a result of machinery not being properly set up, or the scale of production being too low. Indeed, a small disadvantage in these productivity variables across a number of inputs and types of capital could mean that even with hypothetically zero wages, the cost of production in the developing country may be higher. In fact, wages are typically a relatively small part of the cost of production even in labour-intensive manufacturing in developing countries. Competitiveness, even in low technology products, therefore depends more on the level and growth of productivity, rather than on wage cost advantages.

The productivity of all inputs, including labour, depends on a variety of economy-wide and firm-level factors that determine how effectively the firm-level production process is *organized*, and the *technological* capabilities of the team. The economy-wide determinants of a firm's productivities include the quality of public goods and utilities, including the quality of formal education, infrastructure and the reliability of utility supplies. Input productivities are also determined by firm-level variables, such as the capital equipment used, the skill and experience of the workforce, and management. The technological capabilities of workers are important determinants of firm-level productivity. These depend partly on their formal training and education, but also on their tacit knowledge of operating equipment effectively as a result of learning-by-doing. However, an even more important determinant of firm-level productivity is the organization of the firm: how teams are set up to ensure a smooth flow of production, how machinery is set up to reduce bottlenecks, how management systems are set up to reduce input wastage, maintain quality and so on. These *organizational* capabilities are also the result of effective learning-by-doing that results in the evolution of a work organization in ways that ensure high productivity.

Evidence tells us that crippling differences in productivity persist across countries *even when they use identical machinery* (Clark and Wolcott, 2002; Sutton, 2007). The importance of firm-level organizational capabilities as the critical determinant of competitiveness is supported by observers of technological capabilities who point out that the technological and organizational knowledge necessary for the success of firms is *tacit knowledge* embedded in routines (Nelson and Winter, 1982; Dosi, 1988; Pelikan, 1988; Perez and Soete, 1988). The process of developing these efficient routines inevitably involves practice and the adaptation of practice to local conditions, rather than reading off blueprints from a manual. The importance of these organizational capabilities becomes obvious when individual workers migrate from developing countries to more advanced ones. Their individual productivity jumps when they join a modern organization. In migrating to join an already efficient organization, an individual worker rapidly slots into existing routines and thereby rapidly improves his or her individual productivity; even in terms of the learning-by-doing that improves his or her individual technological capabilities. In contrast, if the whole team is experimenting with routines, the achievement of effective organizational routines can take a long time, and until then, the individual productivity of each worker remains low.

Literature on technological and organizational capability also points out that the relevant tacit knowledge is largely acquired through difficult processes of learning-by-doing (Lall, 1992, 2000a, 2000b, 2003). The type and difficulty of the learning-by-doing depends on the specific technologies that define the extent to which the tacit knowledge of individual workers matters, and the organizational requirements of using these technologies. However, the general implication is that for a firm to engage in learning-by-doing it must begin production *before* it achieves competitiveness. This implies that a start-up firm in a new sector in a developing country is likely to require some implicit or explicit form of loss-financing as the organization is not yet competitive *by definition*.

The loss-financing required to engage in learning-by-doing at quality Q depends on the gap between domestic cost of production and the global price at that quality. The loss-financing that would allow production (and learning-by-doing) to commence can be measured as a per unit 'subsidy', s_Q, which brings the initially higher domestic cost of production $C_Q^{domestic}$ into line with the global price P_Q^{global}. The 'subsidy' need not be a transfer from government and could be private loss-financing in the form of investors accepting a lower mark-up or putting in additional cash to cover a period of loss-making. When the loss-financing involves a public subsidy, this can also be delivered in a variety of ways, some explicit, others more subtle. The possibilities include export subsidies, import protection, subsidized interest rates, subsidized inputs or infrastructure, or a cash subsidy. Thus a variety of financing instruments are available to enable learning-by-doing to commence, and in general we can describe these instruments as ways of providing 'rents for learning' (Khan, 2000a).

An important consideration for industrial policy is the selection of the types of technologies that should be adopted, even within a particular sector. Under plausible assumptions $s_{Q+1} > s_Q$, meaning a higher subsidy is required if a firm wants to engage in producing higher quality products. The organization required to produce a more complex product is generally also more complex, which is why the production of more complex products yields higher mark-ups and higher value-added. The gap in initial tacit knowledge is therefore likely to be greater for higher quality products as they require more complex organization. Both the gap in labour productivity and gaps in input productivities are likely to be greater in higher quality products, as the latter typically require more sophisticated production routines and more sophisticated management of inputs, quality and design. In addition, capital productivity in higher qualities is likely to remain low for longer, as higher quality production often requires more expensive machinery and is likely to require a larger scale of production to become competitive. The greater gap in productivities, reflecting a bigger gap in organizational and technological knowledge for higher qualities, has a number of implications:

Proposition 1: *The loss-financing required to enter production is generally higher, the higher the quality of the product. Moreover, the subsidy will be required for longer as more complex organizational capabilities must be developed.*

Against this, the development of more complex organizational capabilities has a number of advantages.

Proposition 2: *The production of higher quality products is desirable as their production adds more value to the economy than lower quality products.*

Furthermore, competitive success in a high quality product is likely to make the future adoption of high-quality technologies easier, as the organizational capabilities are likely to be similar. This can explain why countries specialize in clusters of related qualities, possibly triggered by the random success of learning-by-doing in particular sectors. This is why it can be advantageous to acquire organizational capabilities in more advanced

technologies producing higher quality products. Innovation in advanced countries is more likely in higher quality products, such as electronics, than lower quality products, such as garments. A follower country with organizations capable of producing higher quality products is more likely to benefit from future productivity growth by adopting incremental improvements in these products as innovation happens in more advanced countries.

Proposition 3: *As future technical progress is likely to be faster in higher quality products, it is beneficial to develop more complex organizational capabilities.*

The trade-offs between these considerations affect the choice of quality to aim for. The problem for a developing country is: a) to enter globally competitive production for a variety of products at the highest feasible levels of quality; b) to ensure these capabilities can rapidly spread to create clusters of firms creating jobs across the working population; and c) to move up the quality ladder across product categories to achieve wage and productivity growth. While higher qualities are more desirable, the higher the targeted quality, the bigger the immediate subsidy required and the longer it must be managed. The governance requirements of monitoring and evaluation are therefore appropriately greater, and if the gap in initial productivities is too great, traversing the gap in a feasible timeframe may not be possible for the domestic firms that are participating in the programme. In that case, an ambitious strategy can totally fail in achieving the desired results and is less desirable than a less ambitious strategy.

In general, it is safer to be conservative by choosing somewhat simpler technologies and qualities at the early stages of industrial policy for two reasons. First, simpler technologies and qualities, where the learning periods are shorter, allow the design of implementable policies to be fine-tuned. Where the initial competitiveness gap is smaller, the results of successful learning are more rapidly observed and instruments that are not effective can be abandoned before the social loss of failed subsidization becomes too great. Once a successful sector emerges, the instruments that worked can be used to target more ambitious learning where the initial competitiveness gap is greater. Second, if the average organizational capabilities in a society are initially low, the imitation of the first few successful firms leading to clustering is easier if the technologies and organizational capabilities are closer to the average. This has a significant payoff in developing broad-based organizational and technological capabilities, so that when more ambitious technologies are attempted later, a base of firms and entrepreneurs already exists for adopting more advanced technologies. In general, the spread effects of industrial policy are very important and there is little point in creating one or two high quality firms that produce high quality products which other firms in that country are too far behind to feasibly imitate.

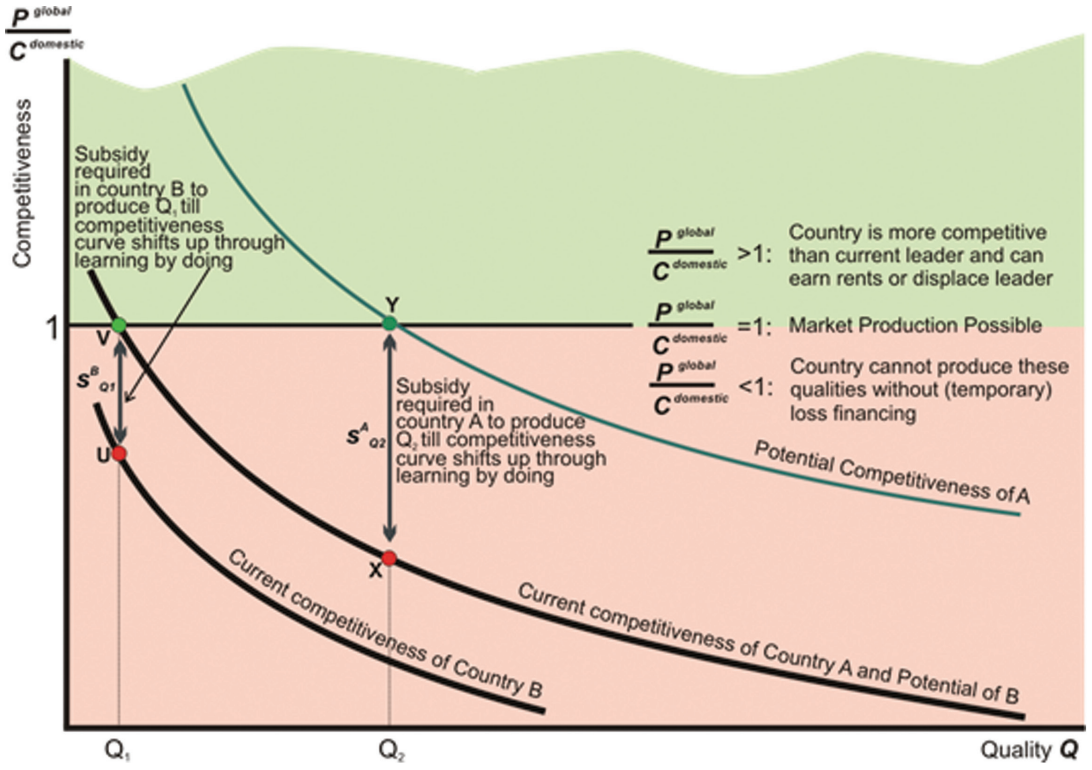

Figure 1: Loss-financing and learning-by-doing

Figure 1 summarizes some of the fundamental issues facing catching up and technology acquisition in developing countries. The competitiveness curve for a country summarizes its distance from global competitiveness across different qualities of the product. The x-axis measures the quality of the product, and the y-axis the follower's competitiveness in producing that quality. Competitiveness is measured by the ratio $\frac{P_Q^{global}}{C_Q^{domestic}}$. A higher ratio implies greater competitiveness of the country, relative to the prices set by the leader. When this ratio is 1 or higher, our country can sell a product of this quality in global markets, therefore, the horizontal line at 1 can be read as the global competitiveness frontier for the country. When the ratio is less than 1 for a particular quality, our country will either not be able to produce that quality or will require (temporary) loss-financing to allow production. The required rate of 'subsidy', s_Q, equals $1-\frac{P_Q^{global}}{C_Q^{domestic}}$ and is shown in Figure 1 as the gap between the global competitiveness frontier (the horizontal line at P/C=1) and current competitiveness at quality Q defined by the current competitiveness curve.

The competitiveness curve is downward sloping because, although world prices of higher quality products are higher (which is why they are more desirable to produce), the cost of production disadvantage in the follower country is even higher, giving it a greater disadvantage in higher quality products (Khan, 2009). The greater productivity gap in higher qualities forces market-reliant developing countries to specialize in low quality products. This may have nothing to do with the relative price of labour and capital, as in standard neoclassical theory. Consistent with Proposition 1, it is possible to imagine a developing country, like B in Figure 1, where current organizational capabilities are so low that it cannot even produce the lowest qualities of most products. In extreme cases, developing countries may struggle to produce competitive qualities of *any* product. The

competitiveness curve can be extended to apply to related products of different complexity. For instance, we could see different 'qualities' as components of a product in a vertically organized value chain. Low qualities could be low value-added parts of the value chain (like packing and assembling), medium qualities could be intermediate products involving assembly, and higher qualities could be design, product development and marketing.

Figure 1 suggests that a country like B will need loss-financing of s^{B}_{Q1} from the outset to begin production even of the lower-quality product Q_1 at point U. The success of a strategy of loss-financing would be measured by the *pace* at which productivity increased as a result of learning-by-doing. Successful learning-by-doing should result in the competitiveness curve rapidly moving up until the loss-financing was no longer required at V. For country A, which can produce Q_1 competitively, the imperative may be to move to a higher quality, not only to prepare for future competition from B, but also to enjoy faster productivity growth clustered around quality Q_2. Thus, for country A, there may be a policy justification to assist learning-by-doing around quality Q_2 by organizing temporary loss-financing of s^{A}_{Q2}. The challenge for A would be to go from point X to point Y to achieve competitiveness at this higher quality level. This would not only allow the country to raise its domestic value-added and living standards, it would ensure faster productivity growth in the future.

Proposition 1 tells us that, given existing capabilities, the higher the quality level that the country tries to achieve, the greater the financing cost measured by s_Q. Moreover, the greater the gap with leading countries, the longer the catching up is likely to take to reach break-even levels of competitiveness. As a result, trying to aim too high may involve excessively long periods of subsidization. Moreover, the competitiveness gap is only partially due to the absence of tacit knowledge. Some of the gap could also be due to levels of formal education and skills and the poor quality of economy-level public goods. If the initial gap is too big no amount of firm-level experience and learning-by-doing is likely to remove it entirely. Alternatively, it may be technically possible to climb the productivity gap at high qualities, but may take too long to be feasible. As there is a cost of financing the learning, there is a limit to how high up the quality ladder it is feasible to go.

The development of technological and organizational capabilities requires both time and effort. Time and effort are inversely related: the lower the effort, the longer the learning takes. The rate at which the competitiveness curve rises is critical, and depends on the degree of effort that is put into the learning process once loss-financing allows learning-by-doing to commence. Unfortunately, disciplining the learning process is a difficult problem to solve. Effort is difficult or impossible to directly observe and the intermediate levels of productivity growth are difficult to measure unless the firm is already close to competitiveness, in which case market tests like export growth can be used as proxies for effort. But if the firms being supported do not yet have significant exports, or if variations in the exchange rate create too much noise to assess underlying competitiveness fairly, or in contexts where new entrants into the global market or changing global market conditions change the goalposts for firms, looking at export performance or any single indicator may fail to give a fair idea of the effort that has been put into the learning process.

Even if proxies were available to measure how competitiveness was improving, a

credible contract for financing effort would also require incentives and compulsions for the production team to continue to put in high levels of effort. Without compulsions, a production team can keep repeating procedures without any improvement in its productivity. This would be the case if the firm could make a political case for continuing with the subsidy, or if proxies were not available for measuring competitiveness in the intermediate period before full competitiveness is achieved. The 'political' links of firms can make subsidy withdrawal too costly for many governments, and firms with such links are unlikely to put in high levels of effort in the learning process, even if performance could be measured. The characteristics of the firms, the market, and the institutional and political context can each define constraints on what can be done to measure and enforce high levels of effort in learning.

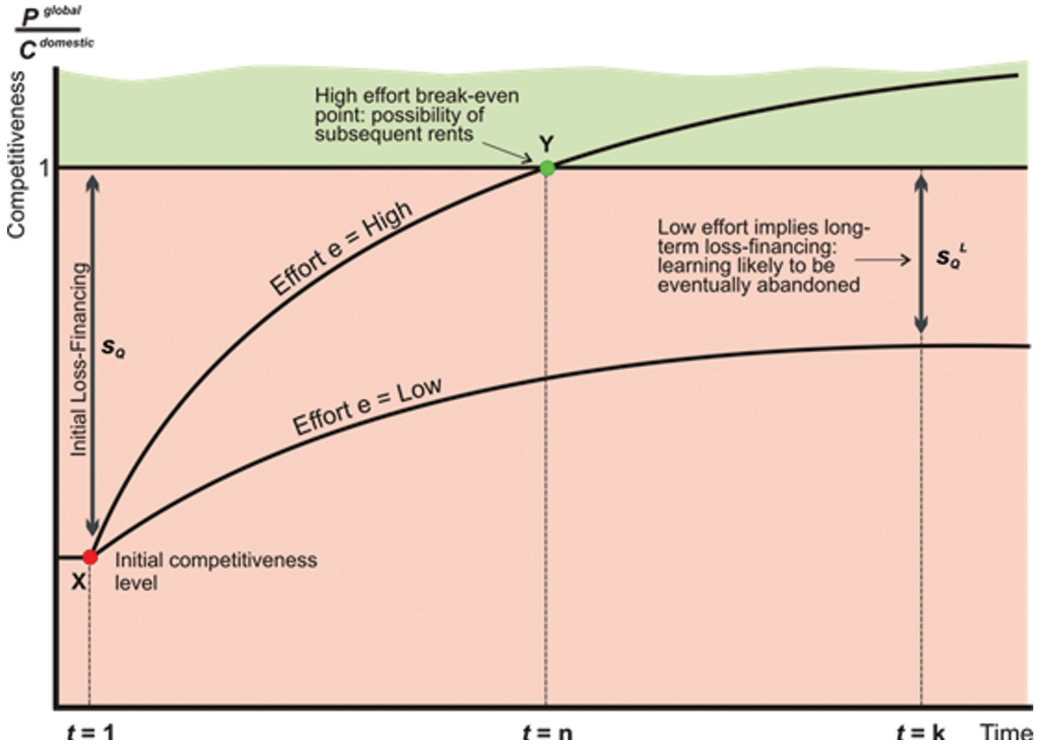

Figure 2: Effort levels and the viability of the learning process

Figure 2 shows what happens to competitiveness over time with different levels of effort in learning. Firms begin at point X where they require an initial loss-financing of s_Q to produce the product of quality Q. With high effort, the firm can increase its organizational and technological capabilities to become competitive at time t=n. But with low effort, its productivity growth is not high enough to catch up with the leaders (whose productivity is also growing) and in this case, production requires indefinite loss-financing. An important consideration that is often not recognized is that when governments provide the financing for learning, firms face adverse incentives when deciding on their effort levels in learning. The firm that puts in a high level of effort and achieves competitiveness is 'rewarded' by losing its financing. The successful firm effectively substitutes uncertain market profits based on maintaining its competitiveness for a subsidy that allowed it to operate with certainty.

The result is often a serious incentive compatibility problem that can induce *'satisficing'* behaviour on the part of management. The existing routines of production within the firm may be difficult to change and it may be easier to spend management effort in 'political activity' to protect the subsidy. Not surprisingly, managers are only likely to put a lot of effort into developing organizational capability and competitiveness when there are credible compulsions and pressures on them from outside the firm, from financing agencies or the state. Otherwise, satisficing strategies may emerge with low effort in learning and more effort in protecting the subsidy. Even if there is some productivity growth, if it is too low, competitiveness may never be achieved, as productivity is also increasing in the leader country. The infant industry will fail to grow up and eventually the catching-up strategies will have to be abandoned, but this may be many years later and managers and workers may not be too concerned about this right away.

Our understanding of industrial policy has been influenced by the experience of countries like South Korea, where centrally allocated learning rents achieved the rapid development of technological and organizational capabilities in the 1960s and 1970s. For a variety of historical reasons, East Asian states were untypical in having political settlements that allowed the enforcement of tough conditions on domestic firms receiving support (Khan, 2009; Khan and Blankenburg, 2009). The financing provided to the *chaebol* through low interest loans, protected domestic markets, and export subsidies, came with specific conditions for achieving export targets. Global market conditions at that time, and the ability of diversified South Korean *chaebol* to start exporting relatively quickly, meant that export performance was a good indicator of effort, and the political and institutional conditions in the country allowed corrective and sometimes punitive actions to be taken against recipients of subsidies if evidence suggested low levels of effort. These conditions ensured high levels of effort. The state could not only withdraw subsidies; it could re-allocate plants to different owners if they were more likely to enhance competitiveness. The required institutional and political conditions were missing in similar centralized industrial policy strategies in other developing countries, where the effort in learning was correspondingly low and, as a result, technological and organizational capabilities developed much more slowly and many sectors did not achieve competitiveness at all.

The indicators and conditions that the South Koreans used only make sense if the market conditions for a contemporary late developer allow a similar export-oriented manufacturing growth strategy, and if we believe that the political and institutional conditions allow a similar type of impartial monitoring and enforcement of conditions. Unfortunately, these conditions did not hold in many developing countries that attempted similar industrial policies in the 1960s and 1970s. But fortunately, the South Korean model of centralized subsidy allocation is not the only one available for addressing the contracting failures affecting learning (Khan, 2000a, 2000b). In contexts less conducive to centralized monitoring and enforcement, other types of financing have proven successful in driving capability development. The key condition of success was the design of the financing instruments. Effort was forthcoming if the instruments not only provided the resources to finance learning, but also created incentives for effort with lower requirements of centralized monitoring and enforcement of intermediate outcomes. The state still had to do some monitoring and enforcement but they were successful because these were

restricted to areas where the states involved had credible monitoring and enforcement capabilities.

For instance, the Indian automobile sector made a transition in the 1980s and 1990s from a protected and largely inefficient sector producing low-quality cars for a domestic market to one of the major global players in the automobile market by the 2000s. This transformation was based on a unique combination of industrial policy instruments that financed a spurt of high-effort learning in the 1980s in the Indian automobile sector, using a combination of public and private financing instruments (Khan, 2009, 2011). In contrast to the earlier strategies of centrally administered protection, where there was no compulsion on producers in the protected market to put in the effort to achieve competitiveness, the new strategies provided a promise of public rents with conditions attached that resulted in credible compulsions for high levels of effort in creating organizational capabilities in Indian producers. The public financing was provided in the form of access to a protected domestic market for automobiles that continued to offer significant rents. When the only producers were domestic Indian companies, the Indian state failed to impose effective conditions on them. The learning effort and therefore productivity growth was low, so that by the 1980s, Indian manufactures did produce cars, but they were not globally competitive.

The change that happened in the 1980s was to invite Suzuki to become a joint venture partner in a public-sector Indian automobile company, to set up Maruti-Suzuki. In contrast to previous strategies for financing learning, this time there were credible conditions that induced high effort. The foreign partner was given access to the significant rents in the protected domestic market, but had to achieve a 70 percent domestic content within five years. Since the domestic content requirements could be credibly enforced on the foreign company by denying it access to the domestic market if the condition was not achieved, this created strong compulsion for effort by Suzuki to transfer organizational and technological capabilities to domestic component suppliers. For countries that have already joined the WTO and have not negotiated exclusions on domestic content, this is not an instrument that can be used, but our point is only to show how the design of credible conditions can have a remarkable effect on effort.

To meet the domestic content requirements, Suzuki had to invest significant resources and effort in upgrading the organizational and technological capabilities not only of its own joint venture plant, but also along the entire Indian supply chain. Suzuki's incentive was the significant rent it could achieve *ex post* but it had to invest in learning and the transmission of organizational capabilities *ex ante*. The company therefore had no possibility of satisficing, as its *ex ante* investment in learning had to be effective if it was to collect future rents. It could only recover its investments by building the organizational capabilities of its Indian component suppliers, as this was a necessary and credible condition for making significant profits in the protected domestic market. The result was a combination of financing and incentives that produced credible incentives for high-effort learning. Suzuki's effort in transforming the organizational and technological capabilities of India's tier-one producers was spectacular. The capability development in the tier-one and two component producers later allowed Indian auto companies like Tata and Mahindra to

launch Indian branded cars in the 2000s. Other examples of successful learning from India, Thailand and Bangladesh show that learning can be successfully financed in contexts very different from that of South Korea (Khan, 2009). These strategies require combinations of public and private financing that, if appropriately sequenced, and with conditions that can be credibly enforced, given the enforcement capacities of the state, create incentives for high-effort learning and the successful achievement of competitiveness.

III. CAMBODIAN CONDITIONS AND INDUSTRIAL POLICY PRIORITIES

An examination of the relevant features of the Cambodian economy can help identify areas where contracting failures are likely to constrain economic and industrial growth. Effective industrial policy must identify the most important contracting failures and adopt policies that are most likely to result in better outcomes, given the institutional and enforcement capabilities of the Cambodian state.

1. Weakness of Domestic Entrepreneurs: Rents versus Capabilities

One fact that is immediately striking in Cambodia is that, despite its high growth rate of 8.1 percent per annum over 2001-2010 (ADB 2012: 3), the participation of domestic Cambodian entrepreneurs in export-oriented growth sectors has so far been very limited. For a number of reasons that we will discuss at greater length later, this is a matter of economic and political concern. In the garment sector that dominates manufacturing in Cambodia (around 65 percent of the manufacturing sector in 2011), only 26 factories out of 355 (7.3 percent) listed by the Garment Manufacturing Association of Cambodia were Cambodian-owned in 2008; in 2011 this declined further to only 19 factories out of 309 (6.1 percent) (JICA, 2012: 2-10, 5-16). In the footwear sector in 2011, Cambodian participation was four factories out of 37 (10.8 percent) (JICA, 2012: Table 4-4). We do not have figures for capital invested or employment, but even if we assume that the Cambodian-owned factories were of average size, Cambodian participation in the emerging industrial sectors is remarkably low. Looking across all sectors and types of establishments, the census figures for Cambodia show that 66.2 percent of establishments employing between 100 and 499 people were owned by Cambodians (out of a total of 545 establishments). For establishments employing between 500 and 999 people, the share of Cambodian-owned establishments falls to 46.3 percent (out of a total of 123) and to 35.3 percent for establishments employing more than 1000 people (out of a total of 119) (National Institute of Statistics, 2012: Table 1-2-2). Thus, while Cambodian entrepreneurial participation is generally low in larger-scale establishments across all sectors, the participation rates are particularly low in garments and textiles. This highlights the fact that foreign-owned firms are more heavily engaged in the critical export sectors where global competitiveness, and therefore the organizational and technological capabilities of the firm, are particularly important.

The development of national entrepreneurs is important for a number of reasons. First, the continuous evolution of domestic policies to support an expanding industrial sector is only guaranteed if enough local entrepreneurs emerge who can be a political constituency and pressure group for driving policy evolution. Second, profits constitute a significant part of value added in industry, and if profits are owned by foreign citizens, they can, in principle, be repatriated out of the country, with obvious implications for long-term growth. Third, foreign investors in any particular sector may withdraw their investment and leave the country if market conditions (such as wages or taxes relative to competitor countries) change. This can result in damaging effects for employment and

growth in the future as regional competitor countries emerge. In contrast, if domestic entrepreneurs emerge with high levels of organizational and technological capabilities, they are likely to seek and find alternative investment opportunities in their own country if market conditions change. Thus the smooth progression of a country up the value chain assumes that domestic entrepreneurs exist who can shift out of garments into, for example, electronics, if market conditions change.

This is not an argument against foreign investment. No country should seek to discourage foreign investment, and indeed there are many benefits of foreign investment in terms of accelerating investment and bringing in new technologies. However, as a country becomes more diversified in its manufacturing, its attractiveness even for foreign investors is likely to depend on the emergence of a diversified domestic productive sector that can supply components and provide markets for components produced by foreign investors. As countries move up the value chain, the presence or likely emergence of clusters of component manufactures with significant domestic participation is an important factor attracting or dissuading even foreign investors to the country. For all these reasons, the development of domestic entrepreneurial capabilities should be an important goal for industrial policy in a country like Cambodia, where these capabilities appear to be weak even in low-technology sectors like garments.

There may be several simultaneous factors at work that can explain the limited entry of Cambodian entrepreneurs into the industrial sector. If there are multiple causes and each of the causes is sufficient to constrain the development of domestic entrepreneurs, a joint approach is required for the success of policies promoting domestic participation. For example, domestic entrepreneurial participation may be low because the relative returns to investments of resources and effort in manufacturing may be low, relative to the returns available through investments in rent capture in other sectors. At the same time, domestic entrepreneurial participation may also be low because potential Cambodian entrepreneurs lack the organizational and technological capabilities to set up productive enterprises that can be globally competitive and profitable. The policy responses to each of these problems must be different, but if both factors are at work, policies that address one without addressing the other are likely to fail in their objective of increasing domestic participation.

Consider first the possibility that potential Cambodian entrepreneurs (individuals who have access to capital and are willing to take risks) are not attracted to invest in productive manufacturing activities because they can earn higher returns by investing their resources and effort to capture land and natural resource rents. If the returns in these less productive or entirely unproductive investments are higher than in productive sectors, no amount of policy efforts in solving contracting failures will succeed in attracting significant domestic investments in industrial development. The seriousness of the relative returns problem must be empirically assessed. The data on returns to investments in land capture, in using political connections to lease land for onward sub-leasing or for illegal logging and other similar activities are not publicly available. Studies on these issues therefore have been based on informed guesses and may have overestimated the problem, but even if partially true, they suggest a serious problem of relative returns between productive industrial

investments and investments in land and natural resource rent capture in contemporary Cambodia (Global Witness, 2007).

The low participation figure for Cambodian entrepreneurs, particularly in the significant export-oriented modern sectors, may also be due to the weak organizational and technological capabilities of the potential Cambodian entrepreneurial class. In that case, strategies of financing the acquisition of the relevant tacit knowledge through learning-by-doing are critical if industrial policies are to succeed in Cambodia. The transfer of the tacit knowledge required for developing technological and organizational capabilities is not a simple process, and without well-designed policies that can be effectively implemented, the development of these capabilities may fail. At the same time, policies for financing learning may not be effective in the presence of significant rents in rent-capture activities. This is because, even if successful, investors in manufacturing industries in a competitive global market would only earn 'normal' profits, whereas the profits from control over land and natural resources may be much higher if they include significant rents from natural resources. If that is the case, learning strategies alone will fail to attract entrepreneurs in productive manufacturing activities.

If both factors are operative, the solution must address both problems simultaneously. To the extent that the returns in manufacturing relative to investments in other sectors are part of the problem, industrial policies must be complemented with corrective policies that address the relevant incentive issues. Without corrective policies that constrain the easy rents in natural resources, entrepreneurs will not come forward even if potentially effective solutions for the learning problem are devised. And to the extent that there are missing organizational capabilities, policies of changing relative returns in industry will also fail on their own, because domestic entrepreneurs would simply not achieve profitability in industry, even if relative returns in unproductive activities became lower. Both sets of issues must be simultaneously addressed. The policies likely to be effective for addressing the macro-level disincentives for investment in the productive sector depend on political and administrative feasibility. Under some circumstances, the corrective policy could be differential taxes to change relative returns in the right direction. If fiscal correction of the appropriate magnitude is not possible, or if the rent capture activities are illegal or 'grey' (activities that cannot be effectively taxed or regulated), other possibilities must be considered. For instance, an alternative may be to focus industrial policy support on less politically-connected entrepreneurs who do not potentially have access to easy rents. Whatever the solution, once the macro-incentive problem has been addressed, effective learning strategies would be required to accelerate the emergence of competitive Cambodian entrepreneurs.

2. Where Do Entrepreneurs Come From?

The absence or weakness of entrepreneurial capabilities is one of the most important constraints faced by many developing countries. To some extent, entrepreneurial capabilities are inherited in the sense that they are not amenable to any policy or support. There is something in the common perception that entrepreneurs are born not made. Another way of saying this is that not everyone wants to or can become an entrepreneur.

However, every country has many potential entrepreneurs who have the drive, the risk-taking proclivities and potential management capabilities to become reasonably successful entrepreneurs in some areas suited to their skills and resources. Even within this pool, there will be successes and failures, and not every potential entrepreneur will eventually succeed in becoming one. Nevertheless, after accounting for all these contingencies, the emergence of competitive firms requires not just the selection of some individuals from the pool of potential entrepreneurs, but also a process of learning that converts potential entrepreneurs into managers with the organizational and technological capabilities to run competitive firms in a globalized world economy. The process of creating competitive firms can fail if industrial policies support individuals who have no capability of becoming entrepreneurs because they lack the basic qualities of becoming entrepreneurs. However, industrial policy can also fail even if potential entrepreneurs are indeed correctly selected but the policy provides support for learning-by-doing in ways that do not elicit the high levels of effort required to achieve competitiveness in a reasonable period of time.

It is a mistake to confuse the process of creating entrepreneurs who can run even small firms that are competitive in a global market context, with informal sector entrepreneurs who are very common in developing countries. Even a small garment firm is likely to require an investment in land, buildings and machinery that could easily add up to one million dollars, as well as technological and organizational capabilities on the part of owners and managers to deal with several hundred workers in disciplined modern production, a global production chain of suppliers and buyers, manage quality control and inventories to global standards, and so on. The typical informal sector entrepreneur who runs a food or service business is most unlikely to graduate to achieving these organizational and technological capabilities with the learning-by-doing that comes from their own entrepreneurial and business activities.

The developing-country 'middle class', which provides most of its 'entrepreneurs', is typically very poor in absolute terms, and these entrepreneurs are not typically the ones who graduate into globally competitive modern production. This has been empirically demonstrated in a cross-country study of thirteen developing countries including India, Pakistan, Indonesia, Timor Leste and others that are broadly representative of the developing world and not too dissimilar to Cambodia (Banerjee and Duflo, 2007). Using the Easterly definition of the 'middle class' as those lying between the 20th and 80th percentile on the consumption distribution, it turns out that the middle class in most developing countries is very poor, with a per capita expenditure in purchasing power parity (PPP) terms of between $2 and $4 per day. Many of these individuals do indeed run their own businesses, but a close examination of the types of business that middle-class individuals engage in demonstrates that they are not really 'entrepreneurs in waiting' of the type discussed earlier. Their businesses are small (food stalls, trading, small shops), not very profitable and, in many cases, hardly give a higher return than the opportunity cost of labour. The business does however give the middle-class owners a *more* steady income than the returns to pure labour, which is important in poor countries as it means that the children of the middle class are more likely to be better educated than those of the poor. But it is a mistake to see this pool of 'middle-class' businesses, mostly in

the informal sector, as providing a pool of potential entrepreneurs that could be targeted by industrial policy.

The potential entrepreneurs who may actually set up globally competitive firms are likely to come from the top 20th percentile, but it is important to remember that even this segment can include individuals who are quite poor in absolute terms, relative to the middle class in advanced countries. However, to set up even a relatively small globally competitive firm in garments, textiles, electronic component production and so on, requires a capital investment of at least several hundred thousand dollars, and very possibly one million dollars or more. Even when some of this financing is provided by banks or jointly contributed by several investors, the core entrepreneurs will have to have a personal worth beyond the reach of most people in a developing country. This does not mean that governments should not have strategies for promoting productive activity at all segments of the productivity ladder, but to the extent that we want to achieve the growth of a globally competitive industrial sector in a developing country, there is virtually no way that owners and managers of food stalls or small trading activities will graduate into these businesses. Rather, policy should see these segments of entrepreneurship and business as quite separate in most cases, although in exceptional cases of course, some entrepreneurs from the 'middle classes' in the Banerjee and Duflo sense may graduate into truly globally competitive entrepreneurs.

On the other hand, Cambodians with exposure to high salary modern sector service jobs, or engaged in significant trading activities that require considerable investment of their own funds, are more likely to understand the global competitiveness and quality requirements of modern productive activities, and have sufficient personal capital to put up the collateral required for other financiers to participate in the project. Individuals from these categories are therefore more likely to potentially graduate into globally competitive entrepreneurs, with adequate support programmes to support their learning of technological and organizational capabilities. It is this learning part of the industrial policy strategy that is particularly important for developing globally competitive entrepreneurs in countries like Cambodia.

3. Inward- and Outward-oriented Trade Policies

The relationship between trade policies and industrial policies in the industrial policy success cases of the 1960s to 1980s has been extensively discussed in the literature (Wade, 1988; Bradford Jr., 1990). Export success played an important role in all the successful industrial policy countries of that period. However, export success should not be confused with neutral trade policies. All successful industrial policy countries built up domestic competitiveness by supporting firms through a variety of implicit and explicit subsidies that financed their learning periods. Import substitution strategies were one mechanism of providing support, but so were export subsidies of different types. The critical condition for success was that in these countries, supported firms that failed to improve their competitiveness had no way of protecting their subsidies through political activity. This ensured that all firms had to take the opportunity provided by the implicit financing to raise their competitiveness, as the continuation of the subsidy was conditional on the

achievement of improvements in competitiveness. In countries where import protection or export subsidies were granted without credible conditions of subsidy withdrawal, the strategies resulted in weak effort in learning by domestic firms, and improvements in productivity and competitiveness were not achieved. In these cases, the policies eventually had to be abandoned. Thus, the critical condition for success was not the choice of import substitution or export promotion (all successful countries used both at different periods depending on the sectors and the size of their domestic market) but rather the conditions which were associated with the implicit financing.

One of the challenges facing countries like Cambodia in the new world order is that import substituting strategies and export subsidies that countries like South Korea and Taiwan used in the 1960s and 1970s are no longer easy to use. The WTO and, even more so, many bilateral trade agreements, enforce neutral trade policies on developing countries as a condition for access to the markets of advanced countries. The implication of this is primarily that it is no longer easy to finance learning by providing implicit subsidies through trade policies. The changes in the global trade regime (like the new global regime for the protection of intellectual property rights) are not necessarily to the advantage of developing countries, but for individual countries like Cambodia, the global regime is a given at any point in time. This simply means that other financing mechanisms must be found to enable firms to engage in learning-by-doing, through which they can achieve global competitiveness. The great advantage of using tariffs as a way of financing learning by domestic firms is that not only is there no fiscal cost to the government, the government in fact gains revenue by collecting tariffs. At the same time, tariffs on imports grant domestic firms an implicit temporary subsidy as they can sell their products in the domestic market even though their competitiveness is initially lower than that of their global competitors. If import substituting strategies are not allowed, the fiscal costs of funding support strategies are greater, but learning will not happen unless these learning strategies can be financed.

4. Formal Skills Shortages

It is widely recognized in industrial policy discussions in Cambodia that there are skills shortages constraining industrial development. The Supreme National Economic Council (SNEC) points out that the education system in Cambodia has a number of problems which must be addressed. As in many developing countries, a thrust to encourage higher education can fail to provide the necessary vocational skills to blue-collar and white-collar workers. Nor is there any guarantee that spending more on higher education will result in high-quality qualifications at these higher levels of education. The quality of higher education in developing countries is often low and it takes a long time to raise it. Moreover, the real irony is that individuals who do achieve some formal skills often do not find suitable employment in developing countries like Cambodia, and emigrate (SNEC 2011: 38-9).

This list of observations suggests several interdependent factors are at work. The policies that are providing public funding for formal training are not being used well because of failures in the system of determining the right areas in which formal skills are most required, and failures in the system of monitoring and evaluating the quality

of education. At the same time, it is clearly not entirely a supply-side problem as skilled labour at all levels of skill also emigrates from Cambodia, due to a lack of domestic demand. Cambodia shares this problem with most other developing countries, which demonstrates the importance of developing the organizational and technological capabilities of firms so that the available workforce with formal skills can be gainfully employed. If firms are unable to develop the tacit knowledge that gives them competitiveness, a workforce with formal skills will remain largely unemployed and many will be forced to leave the country in search of employment.

The problem of competitiveness cannot therefore be solved simply by increasing the supply of formally skilled workers if the tacit knowledge learning problem is not simultaneously addressed. Equally, learning strategies may run out of steam if the supply of formal skills is truly drying up in critical areas like accounting, store-keeping, marketing and so on. It is unlikely that at the early stages of development there will be a satisfactory supply of all necessary skills, but it is also unlikely that development is *primarily* being blocked by the absence of skills in the labour market. Once again, without a strategy for developing the tacit knowledge that enables firms to become competitive, a strategy that focuses on formal skills and training is likely to fail, and result primarily in an export of skilled labour to other countries.

To the extent that formal skills at different levels of the labour market are missing, and given the contracting problems that may prevent private investors funding the training, public policy to support skills development is important. However, this support must be delivered through effective policies that identify the skills shortages accurately, and then provide the support in ways that can be evaluated so that the quality of training is appropriate. Even in advanced countries, the public provision of training for meeting the needs of industry is subject to difficult issues of monitoring and evaluation, and resources are frequently wasted as a result of badly structured skills programmes that provide the wrong skills training or training at too low a level of quality to be useful.

Policy-makers need to coordinate with industry to identify the areas of skills shortages properly. However, the real problem is to then ensure that the skills that are provided in training institutes are of the right quality and content to be useful to the future employer. This is by no means easy to ensure, and there are many examples of training institutions in developing countries that receive some form of public support but whose output is not very useful for industry. These types of institutes can be damaging for workers and employees who participate in training if participants eventually discover that employers are unwilling to pay any premium to them in extra salaries because their additional training is not highly valued. Fortunately for developing countries, fine-tuning the provision of formal skills at the blue collar level is usually not the binding constraint, although there must be a supply of moderately skilled management, engineering and accountancy staff. Most manufacturing processes require fairly basic prior knowledge of the technology of production on the part of the workforce, and much of the knowledge that is required is tacit knowledge that can be transmitted on the job. This is what we observe for blue collar workers in the manufacturing growth stories in sectors like garments, textiles, basic electronics manufacturing and light engineering. Provided support is available for firms

to engage in learning-by-doing to develop the productivity of their workforce, the most binding training needs facing a developing country can be met, and the policy significance of the formal training is thereby reduced. Nevertheless, developing countries need to have proper secondary and tertiary educational establishments that can produce higher level formal training required at the management and supervisory levels (although even at these levels further absorption of tacit knowledge is also required, as discussed earlier).

5. Intellectual Property Rights and Innovation

The protection of IPRs as a way of attracting higher technology foreign investment raises both opportunities and challenges for developing countries. With WTO accession, developing countries cannot easily copy advanced technologies or even set domestic content requirements that induce foreign technology owners to transfer technological knowledge to local companies. At the same time, the importance of technology transfer to domestic companies is widely recognized (JICA, 2012: 2-30 - 2-31). The current international architecture of trade and IPRs can constrain the attempts of a developing country to accelerate the transfer of technological know-how to domestic firms, but this is not a problem that can be immediately addressed. Given Cambodia's current level of development, this is also not an immediate problem, as Cambodia is adopting technologies that are relatively simple and not protected by IPRs. However, as Cambodia becomes a higher middle-income country and is engaged in adopting sophisticated technologies, the protection of IPRs may constrain the types of industrial policies that are allowed. Developing countries may well have to renegotiate the terms of IPR agreements in the long run to ensure that growth through imitative technology adoption can continue in the way that allowed early industrial policy countries like South Korea and Taiwan to attain advanced-country status.

IV. THE DISCOVERY PROBLEM AND POSITIVE SPILLOVERS OF INVESTMENTS IN NEW SECTORS

We have argued that the discovery problem is unlikely to be the primary constraint in developing countries, but there may be other types of positive externalities associated with investment in new sectors. The first investors in a new sector may have to invest time and resources to correct government policies in appropriate ways and align bureaucratic systems in the government to enable the business to operate. These initial investments are likely to make investments by followers more profitable. If the rate of return that the first mover gets is insufficient to undertake investments from which future investors will benefit, then in addition to the learning problem, there may also be an externality problem that policy must address. This externality problem is different from the discovery problem, but it has a similar effect in that, by making the first investors less willing to invest, the emergence of new sectors can slow down. If investments in new sectors are judged to be constrained by positive externalities (whether due to the discovery issue or for any other reason) as opposed to or in addition to low competitiveness due to missing organizational capabilities, then additional public support for investments in new sectors is justified. The distinction between these problems is important. The policy responses for dealing with contracting failures due to positive externalities are very different from those that are appropriate for dealing with low competitiveness due to missing tacit knowledge. In particular, the problem of low competitiveness due to missing organizational capabilities can constrain industrial development even if there were no spillovers (positive externalities) at all.

The strategy required to address spillovers depends on the type of spillover that is at issue. If the problem is discovery, the first mover is unwilling to invest because the discovery process is risky. Once hidden comparative advantage has been discovered other investors rush in, and this can reduce the profits of the first mover. The contracting failure here is that the first mover is unable to contract with subsequent investors to get a share of their profits to compensate them for taking the risk to discover the sector. On the contrary, under some circumstances, followers can further reduce the profits of the first mover. We have argued that it is not very plausible to believe that a country has hidden comparative advantage that has to be discovered. However, if this *was* a problem, it is a relatively simple one to address using subsidies to investors to carry out trials in new sectors to discover if the country has a hidden comparative advantage. The agencies tasked with delivering these subsidies only need to have the capability to make sure that subsidies are provided for trials in new sectors and are withdrawn after a predetermined time, sufficient to discover the presence or absence of any hidden comparative advantage. For other spillovers, similar subsidies may be required, subject to the enforcement of conditions that ensure that the desired outcome is achieved. The significance of positive spillovers as a constraint on investment in Cambodia is an empirical question that is difficult to assess without further sector-level information. If policy-makers believe that there are hidden comparative advantages in

Cambodia, or if there are other positive externalities that deter the first investors in any sector, then subsidies for first movers may be justified. These subsidies must come with enforceable conditions that ensure the desired investments are achieved by the subsidy recipients. However, if the spillover problem is connected with a learning problem, the solution is more difficult and essentially requires a simultaneous solution to the problem of ensuring high levels of effort during learning-by-doing processes.

1. Coordination Problems

Industrial policy can be constrained by a variety of coordination problems and some of these may be quite difficult to address in a developing country, given the relatively limited capabilities of government agencies. At the simplest level, government agencies must ensure that policies are coordinated so that, for instance, high import taxes on inputs do not wipe out the incentives offered to producers of the final product. However, coordination refers to more than the coordination of policies; it refers to the government solving some of the coordination problems faced by the private sector. This is generally a much more difficult task. At the level of development of a country like Cambodia, it is unlikely that government agencies should set themselves the task of coordinating investments in different sectors, taking into account their demand and supply inter-dependencies. However, some coordination can be attempted at relatively low levels of development, for instance to encourage clustering of similar firms in a particular area so they can share infrastructure and benefit from positive externalities. These types of coordination policies can reduce the costs of firms, and therefore raise their competitiveness by encouraging clustering in industrial parks by providing infrastructure and fiscal incentives.

The risk of wasting public resources in these types of coordination activities is reduced if governments follow the demand coming from private investors rather than directing investors to locate in regions chosen by government. There have been many failed clusters and special economic zones in developing countries that have never taken off, and much successful clustering has happened by natural processes of private location without much government assistance. To ensure that public money is not wasted, coordination attempts should start off as small-scale trials, and even these may require significant capabilities on the part of government agencies. It is also important to remember that the private sector at early stages of development does not normally demand clustering or investment coordination across sectors, rather, basic public goods like relatively cheap electricity, good roads and transport connectivity. Public agencies would do well to focus on meeting these essential needs first. However, to the extent that primary infrastructure requirements have been met, trials with targeted infrastructure and incentive for clusters can be attempted with dedicated agencies being made responsible for their delivery. Competition between different regions, each with their own budget for setting up clusters, can also result in the evolution of effective outcomes, a path which has been well illustrated by the Chinese experience.

2. Public Policies for Assisting Organizational and Technological Development

The development of the organizational capabilities necessary for firms to become competitive is an essential and necessary component of successful industrial policies. Without this, a focus on other types of contracting failures is likely to fail, even if these policies are well-designed. In the Cambodian case, the organizational capability problem appears to be particularly acute for Cambodian-owned companies. We have argued that the long-term viability of the Cambodian growth path and its eventual diversification into new sectors requires as a precondition the development of a broad-based Cambodian entrepreneurial class. This then should be an essential component of the portfolio of industrial policies that Cambodia should attempt to develop. The slow development of Cambodian entrepreneurs makes Cambodia vulnerable to external market conditions that can cause shifts in the location preferences of foreign investors. Even in the relatively low-technology garment sector, foreign participation comprises more than 90 percent of the Cambodian garment sector. In contrast, in neighbouring Bangladesh, another successful garment producer, more than 90 percent of garment production is organized by *domestic* entrepreneurs. This has important implications for vulnerability. If world market conditions change and garment production shifts to a third country, Bangladesh will be better placed than Cambodia to respond, as Bangladeshi entrepreneurs will be forced to find alternative areas of growth while Cambodia may have to wait for a different group of foreign investors to appear. Policy-makers need to address this vulnerability in Cambodia as an urgent issue.

The experience of industrial policies across countries suggests that the development of capability through learning-by-doing, supported by top-down industrial policy of the type seen in South Korea, requires very strong monitoring and enforcement capabilities by government agencies. These enforcement capabilities are typically missing in most developing countries. Without these capabilities, top-down industrial policy is likely to finance learning-by-doing by firms without achieving high-effort learning. As a result, competitive firms may fail to emerge. The alternative is to look at the firm and sector-specific policies of learning that have worked in countries that did not have strong centralized enforcement capabilities. In these cases, the design of the financing instrument was critical for creating strong incentives and compulsions for effort. A common theme in many of these successful capability development stories was a combination of public and private financing that shared the costs and risks of the loss-financing required during the learning-by-doing process. Essentially, the challenge is to design the assistance for organizational capability development in such a way that the organization has no incentive to satisfice, and a low-effort strategy results in critical firm stakeholders losing money. If this can be achieved, the monitoring of performance and effort and the enforcement of subsidy withdrawal when performance is poor is less critical.

One way this has been achieved in countries like India and Bangladesh is by offering firms a reward *after* they achieve some result, such as achieving a specific domestic content or a sufficient quality to start exporting. Before they achieve the result, investors in the firm, particularly foreign technology providers, must invest in the learning effort *ex ante*. This ensures that if investors put in low effort in learning, they do not get the prize and may

not even recover their investment. This incentive structure reduces the need for external monitoring and withdrawal of subsidies from the firm in case of non-performance. The precise instruments and conditions that achieved these results differed across countries and sectors. We summarized the Indian automobile story earlier. A similar story operated in the development of the garment sector in Bangladesh (Khan, 2013). However, because of differences in technologies, governance conditions and the instruments that were available, there are no blueprints for a financing instrument that will work in every case. Cambodian industrial policy agencies should ask themselves, on the basis of a pragmatic understanding of incentives and motivations, how they should structure support for foreign technology providers to transfer organizational and technological capabilities to domestic firms in a way that satisfies two conditions. First, the incentive provided by the public policy should be big enough to pay for the risks and costs of the foreign partner to invest in a learning process that is likely to result in initial losses or low profits for a while, as their domestic partner initially lacks competitiveness. Second, incentives need to be provided conditional on achieving outcomes in such a way that investors cannot capture the incentives without achieving the outcomes.

Thus, the incentives and conditions must be designed in ways that are credible and enforceable, given the governance and political context of the country. General blueprints are unlikely to work, but pragmatic industrial policy officials can learn from the experience of other countries and should be able to ask how a particular financing instrument is likely to work in their own country. If the design of the incentives for building organizational capabilities passes the test of being credible in the Cambodian context, it may then be worthwhile to pass to a second stage of small trials which do not commit significant public resources. It may also be wise to try several experiments simultaneously, with different financing instruments and conditions in different sectors or regions, to see what is likely to work in the local context. Ultimately, it is this pragmatic strategy of 'crossing the river by feeling the stones' that has delivered results in the most successful countries. Follower countries must learn to devise their own strategies based on a proper understanding of the problems they are trying to solve.

V. CONCLUSIONS AND RECOMMENDATIONS

Cambodia potentially faces a number of quite different constraints to its industrial development that industrial policy may have to address. However, not all of these problems are equally serious as immediate constraints, and one of the tasks of policy design is to identify the most important problems, as implementation and fiscal capabilities of states are limited. Once the important problems have been identified, there are still many different policy instruments through which similar problems can be addressed. Here, an understanding of the political economy of the country is very important because instruments that may be effectively implemented in one country may be very difficult to implement in another. The second task of policy design is therefore to tailor the policy so that it is likely to achieve the most desirable results. This may sometimes mean that more ambitious policy designs may need to be avoided and policies designed to create appropriate incentives so that monitoring and enforcement requirements are reduced.

On the basis of a survey of the available secondary literature on Cambodia, it appears that one of the most important challenges for industrial policy in Cambodia is to develop a broad base of Cambodian firms in the competitive productive sector. This requires the development of organizational and technological capabilities within small to medium-sized Cambodian firms using appropriate strategies of financing learning. Small to medium size in this context refers to sizes of globally competitive firms, and even a small globally competitive firm is much larger than a small informal sector firm. Small and medium-sized enterprises (SMEs) in the context of global competitiveness, even in low-technology sectors like garments, refer to firms that employ several hundred employees and have a capital base of several hundred thousand to several million dollars. Operating these firms effectively to produce products of global quality, and at a globally competitive price, requires high levels of within-firm organizational and technological capabilities. These are largely based on tacit knowledge developed through learning-by-doing, and we have discussed the financing of this learning as a process facing significant contracting failures. Industrial policy must devise financing instruments for developing a broad-based firm sector. This is not simple, as financing can be wasted if the managers of firms engage in 'satisficing' behaviour, which they are likely to do if they believe that the subsidies can be renegotiated. Here, the financing models from strong industrial policy states like South Korea and Taiwan may be misleading, as they may not be enforceable in countries like Cambodia. However, there has been successful financing of learning in countries like India and Bangladesh, and Cambodia may have a lot to learn from these industrial policy experiences.

Supporting this core plank of industrial policy, a number of supplementary policies may also be necessary. A closely related problem in Cambodia is that natural resource rents may seriously distort the incentives of well-placed individuals who may otherwise have become potential entrepreneurs. These individuals may find that investments of effort and money in capturing land and natural resources offer higher returns. If a significant part of the politically connected elites with investible resources are not interested in the risky

business of developing their own capabilities in globally competitive activities, Cambodian industrial development will obviously be affected. There may be different responses to this problem. One response would be to use taxes and regulations to reduce the attractiveness of natural resource rents. However, such policies may be difficult to implement if powerful interests in the political system are dependent on these rents. An alternative strategy may be to deliberately target industrial policy so that it selects individuals as potential entrepreneurs who do not have access to natural resource rents. The elites who have the money and connections to capture natural resource rents are likely to be the richer individuals in society. So if industrial policy is designed for industries that require large investments, and if richer individuals are not interested in engaging in competitive production, industrial policy of this type will fail. In this case, industrial policy has to target more basic industries requiring smaller investments (but which are still potentially globally competitive) that may attract somewhat less advantaged elites who do not have access to easy natural resource rents. These judgements must be made by policy-makers who have a good understanding of the political feasibility of different options in the Cambodian context.

A second supportive plank of industrial policy may have to be supported for developing formal skills in a number of critical areas. In general, developing countries paradoxically do not face *formal* skill shortages at early stages of development. Rather, they typically suffer from brain drain, as their domestic firms are unable to generate enough demand even for the available skills. However, there may be critical shortages in some specific sectors like accountancy, legal services, computing and so on. Support for formal skills delivery is not easy, and it is possible to waste public resources in supporting skill delivery programmes that provide either the wrong skills or low-quality skills. In any case, at early stages of development, the most important constraints are missing *informal* or tacit knowledge skills. These skills cannot be provided by formal training institutions, but require learning-by-doing to be organized. For formal skills, it may be better to offer high salaries for skills in serious bottleneck areas like accountancy or computing, so that critical skills are attracted from, for example, neighbouring countries. Alternatively, some public investment in technical colleges and institutes may also be warranted, but the returns are likely to take time and policy-makers need to be aware that monitoring the quality of skills delivery is a difficult and challenging task, even in advanced countries with much stronger monitoring capabilities on the part of government.

On the scale of likely constraints, the possibility of positive externalities constraining investments by first movers also needs to be considered, but is likely to be a less serious problem in most cases. The problem of discovery has received a lot of attention in recent industrial policy discussions, but is unlikely to be a plausible constraint in reality. Countries are unlikely to have hidden comparative advantages that need to be discovered. However, first movers may face some specific risks and the failure to be compensated for these risks can constrain their investment. In these cases, time-bound subsidies for first mover investors, particularly in new sectors, may be justified. We have argued that subsidy strategies of these types are most unlikely to work on their own, because in general, developing countries fail to develop their industrial sectors for other reasons. In particular, subsidies for first movers will fail if the first movers themselves lack the organizational capabilities to set up globally

competitive firms, and if appropriate policies are missing that can help them engage in learning-by-doing with the right incentives and compulsions for high-effort learning.

Finally, coordination is the most demanding task for states and at early stages of industrial development, drawing up complex inter-sectoral plans for investment coordination may be unwarranted, given the implementation capabilities of states. At most, the coordination activity should focus on supporting the development of industrial clusters. Even this should be undertaken cautiously as it is easy to waste money setting up industrial parks and zones that then lie unused. A strategy of following investor demand by supplying infrastructure and incentives to clusters that are already setting up as a result of private investments may be the best approach.

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