

What drives Filipino firms to innovate

Jose Ramon G. Albert, Ramonette B. Serafica, Francis Mark A. Quimba, Jana Flor V. Vizmanos, and Jose Carlos Alexis C. Bairan

Innovation is recognized as an important driver of productivity, sustained economic growth, and development. It is also a key to finding enduring solutions to socioeconomic and environmental challenges. Moreover, it serves as the main driver behind the emergence of the Fourth Industrial Revolution that is transforming not only production but also consumption and livelihood (Schwab 2016). With this, the Philippine government devotes an entire chapter in its *Philippine Development Plan 2017–2022* to vigorously advance innovation in the country.

To gain insights on innovation, the Philippine Institute for Development Studies (PIDS) conducted the 2015 Survey of Innovation Activities (SIA). The said survey interviewed 891 firms representing nearly 29,536 establishments from four industries, namely, (1) food manufacturing, (2) other manufacturing, (3) information and communication technology (ICT), and (4) business process outsourcing. It generally followed the topics in the pilot 2009 SIA conducted by the Department of Science and Technology (DOST) in partnership with PIDS and the Philippine Statistics Authority (Albert et al. 2013). This *Policy Note*

presents the highlights of the 2015 SIA to put forward the policy issues attendant to mainstreaming and fostering innovation in the country.

Innovation at a glance

The Organisation for Economic Co-operation and Development (2005, p. 46) defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.” To be innovation active, firms should have done any of the following:

- Introduced new or significantly improved products in the market
- Used process innovations that introduced (1) new or significantly improved methods of manufacturing or producing goods or services, (2) new or significantly improved logistics, delivery, or distribution methods for your inputs, goods, and services, or (3) new or significantly improved supporting activities for their processes, such as maintenance systems or operations for purchasing, accounting, or computing

- Engaged in innovation projects that are either not yet complete or abandoned
- Spent on innovation activities

While rich countries typically develop product innovations, especially technological innovations, developing countries tend to be users of technology. A World Bank report discusses this prevailing innovation paradox: Developing economies invest far less than advanced economies despite the potential returns to innovation and possibilities for catch-up (Cirera and Maloney 2017). This happens because innovation requires a broad set of complementarities, such as physical and human capital both at the firm level and in government, that are often lacking, if not absent, in developing countries.

Characterization of 2015 SIA firms surveyed

Age, size, and market

Nearly 7 in every 10 (70.3%) firms surveyed were established in the past 20 years, half of which within

the last 10 years. Among micro firms, more than 4 out of 10 (43.5%) were established in the past decade, while a third (33.7%) of small firms and about 2 out of every 5 medium (38.6 %) and large (40.9%) firms were established within the past 20 years.

About 3 in every 5 firms have local markets, while a third have national markets. Firms in the National Capital Region (NCR) tend to have less local markets than those outside the region. Meanwhile, Mindanao firms cater less to international markets than those outside Mindanao. Overall, nearly 1 in every 20 firms has markets in countries within the Association of Southeast Asian Nations (ASEAN), while 3 in every 20 have markets outside ASEAN.

Innovation activity

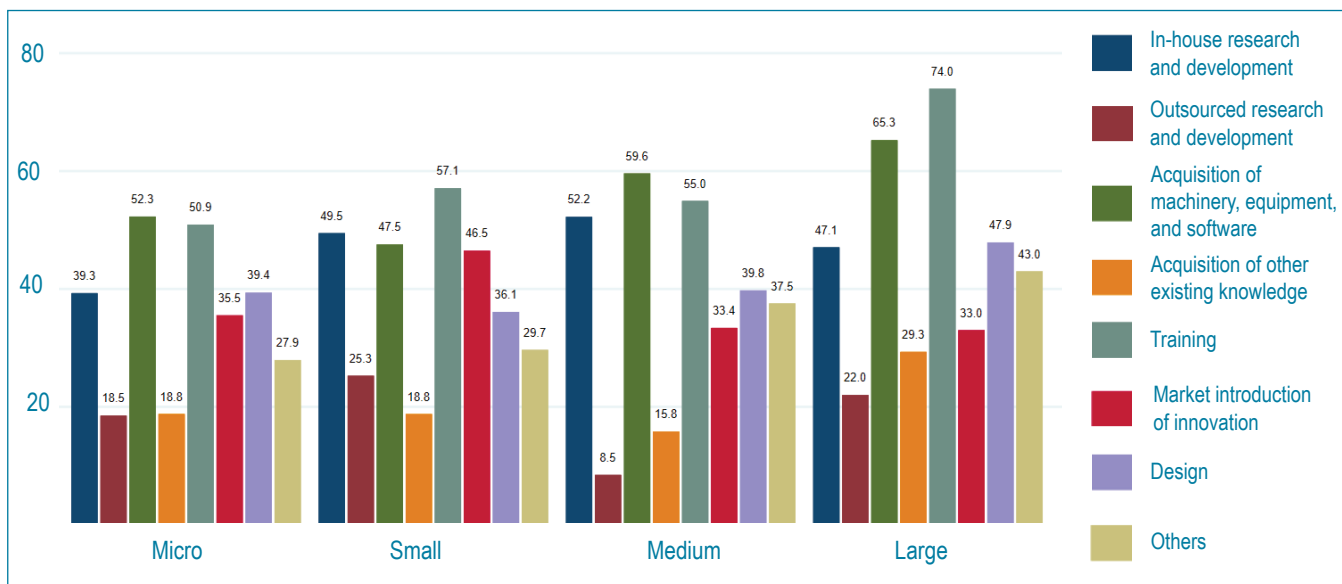
More than 2 in every 5 (42.9%) firms were innovation active in 2015 (Table 1). Large firms were more likely to conduct innovation, about two-thirds (63.0%) of them being innovation active compared to only half of small (49.6%) and medium (46.1%) firms and a third (33.9%) of micro firms.

Table 1. Key statistics on innovation activities by size of firms

Proportion (%) of Firms that Are/Have:	Micro	Small	Medium	Large	All Firms
Innovation active	33.9	49.6	46.1	63.0	42.9
Product innovators	26.8	33.7	30.0	39.3	30.7
Process innovations	22.9	36.5	35.7	46.8	30.6
Both product and process innovators	21.1	26.8	26.6	34.0	24.5
Either product or process innovator	28.6	43.4	39.0	52.1	36.8
Ongoing innovation activities	19.7	38.4	36.3	50.7	30.3
Abandoned innovation activities	8.4	9.8	5.3	15.5	9.2
Innovation-related expenditure	21.4	30.2	29.3	43.4	26.7
Public financial support for innovation	1.4	4.9	1.2	3.7	3.1
Innovation cooperation	11.8	23.1	20.4	20.1	17.6
Organizational innovations	33.5	39.6	41.4	53.1	37.5
Marketing innovators	37.2	38.7	36.3	43.3	38.1
With knowledge management practices	34.8	46.7	58.8	64.4	42.5
Aware of any government innovation policy or intervention	15.1	20.1	25.1	29.9	18.4

Source: Philippine Institute for Development Studies [PIDS] (2015)

Figure 1. Proportion (%) of firms spending on innovation-related activities, by activity and by size of firm



Source: PIDS (2015)

Only 1 in every 30 (3.1%) firms reported some public support for their innovations, with the rate higher among small and large than micro and medium ones. Moreover, only 2 in every 5 (18.4%) firms had some awareness of any government innovation policy or intervention.

For wider forms of innovation, a third (33.5%) of micro firms and more than half (53.1%) of large firms practiced organizational innovation. Similarly, a bigger share of large firms (43.3%) than micro firms (37.2%) conducted marketing innovation. Meanwhile, more than 2 in every 5 (42.5%) firms practiced knowledge management, especially the medium (58.8%) and large (64.4%) firms.

Spending on innovation

A quarter (26.7%) of firms had innovation-related expenditures. Their most common innovation activity is investment in training activities, followed by acquisition of machinery, equipment, and software. Both these activities were undertaken by more than half of the innovative firms (Figure 1).

More than two-fifths (43.4%) of large firms spent on innovation. Half (47.1%) of these firms undertook in-house research and development (R&D), while three quarters (74.0%) spent on training and two-thirds (65.3%) invested on either machinery, equipment, or software. Half (47.9%) of them also spent on in-house or subcontracted activities to design or alter the shape of the appearance of their goods or services.

Sources of innovation

Firms mostly used their own experience and information from customers and competitors in their innovation activities (Table 2). Moreover, their most important sources of information on innovation were internal sources (10.2%) and market sources, especially clients (14.3%) and competitors (8.7%). A third (32.3%) of large firms and a tenth (9.1%) of micro, small, and medium enterprises (MSMEs) relied on internal sources. Meanwhile, at most a fifth of firms, both large (19.8%) and MSMEs (14.1%), turned to their clients for information on innovation. Further, of all the possible sources of information,

Table 2. Proportion of micro, small, and medium enterprises (MSMEs) and large firms rating information sources as of ‘high’ importance, by size of firm (%)

	Information Source	MSMEs	Large Firms	All Firms
1. Internal sources	a. Within your firm or enterprise	9.1	32.3	10.2
2. Market sources	a. Suppliers of equipment, materials, components, or software	7.5	16.1	7.9
	b. Clients or customer	14.1	19.8	14.3
	c. Competitors or other enterprise in your sector	8.7	9.0	8.7
	d. Consultants, commercial laboratories, or private research and development institutes	3.5	6.7	3.6
3. Institutional sources	a. Universities or other higher education institutions	1.9	3.7	1.9
	b. Government or public research institutes	1.1	2.6	1.2
4. Other sources	a. Conferences, trade fairs, exhibitions	5.9	10.8	6.2
	b. Scientific journals and trade/technical publications	2.0	7.1	2.2
	c. Professional and industry associations	3.5	8.7	3.8

Source: PIDS (2015)

firms considered institutional sources, particularly the government (1.2%) or public research institutes (1.9%), as the least important source for information on innovation.

Barriers to innovation

For a quarter of firms, cost factors were deemed to be the most significant barriers to innovation. A fifth of MSMEs (18.7%) specifically mentioned the lack of funds within the firms as a barrier to innovation (Table 3).

About a fifth of firms also reported knowledge or market factors as barriers to innovation. In terms of knowledge factors, more than 1 in every 8 MSMEs cited the lack of qualified personnel (13.3%) and the difficulty in finding cooperation partners (12.2%) as significant barriers to innovation. Meanwhile, more than 10 percent of them mentioned uncertainties in demand for innovative goods or services as market-related barriers to innovation. A slightly bigger proportion (16.6%) reported that the market dominance of established enterprises hindered their innovation.

Determinants of innovation

Albert et al. (2017) provide a more detailed examination on the 2015 SIA results, such as results of a logistic regression, to examine a number of variables that can explain *ceteris paribus* how likely firms become product innovators, process innovators, and innovators. These variables included the gross sales, age of firm, share of employees with a postbaccalaureate degree, export orientation, foreign ownership, interaction of export orientation and foreign ownership, share of female employment, major industry, location, and engagement in knowledge management practices.

The study found that when a firm engages in knowledge management practices, it is likely to be a product innovator, a process innovator, and an innovator. Moreover, as was suggested by firms, skills of human resources matter. Firms with no employees with postbaccalaureate degrees were less likely to be innovators than those with at least a fifth of employees with postbaccalaureate degrees.

Gross sales also contributed to innovative behavior. Firms with higher gross sales were more likely to

innovate than those with lower gross sales. This factor also mattered for process, organizational, and marketing innovation but was insignificant for product innovation.

Firms in NCR and Balance Luzon were more likely to be product innovators than firms in Mindanao and Visayas. Aside from product innovation, however, Albert et al. (2017) found that location did not matter much in harnessing innovation.

Recommendations

While the government already provides various financial incentives, such as income tax holidays, tax deductions, duty-free importation, or value-added tax exemptions of raw materials, equipment and other capital inputs, to firms for fostering innovation, it has not yet fully mainstreamed innovation policies. Innovation is often viewed only within the context of science and technology and implemented without a whole-of-government approach.

Spending on R&D, both in public or private sectors, has also remained below 1 percent of the gross domestic product benchmark recommended by the United Nations Educational, Scientific, and Cultural Organization. Because of this, the country's infrastructure on science and technology, from physical facilities to ICT and knowledge assets, as well as the number of research scientists and engineers, have hardly kept up with production needs especially in the wake of the emerging fourth industrial revolution. Given these issues, this study recommends the following.

Veer away from linear innovation model

While a number of measures are in place for the generation of new ideas, such as tax incentives, intellectual property protection, and support for science and technology research, public policies should veer away from a linear innovation model, which assumes that technical change results in a linear fashion, from

Table 3. Percentage of micro, small, and medium enterprises (MSMEs) and large firms that regarded potential barriers to innovation as “high”

Factors Hampering Innovation Activities		MSMEs			Large Firms		
		Innovators	Noninnovators	All Firms	Innovators	Noninnovators	All Firms
1. Cost	a. Lack of funds within establishment or enterprise	17.3	19.7	18.7	19.4	5.6	14.3
	b. Lack of finances from sources outside enterprise	12.6	18.1	15.8	11.6	5.3	9.2
	c. Innovation costs too high	22.6	28.1	25.8	25.0	7.0	18.4
2. Knowledge	a. Lack of qualified personnel	14.6	12.4	13.3	9.6	2.8	7.1
	b. Lack of information on technology	7.3	14.1	11.3	6.8	3.0	5.4
	c. Lack of information on markets	7.5	6.4	6.9	5.7	0.8	3.9
	d. Difficulty in finding cooperation partners for innovation	13.5	11.2	12.2	3.9	1.6	3.1
3. Market	a. Market dominated by established enterprises	18.6	15.1	16.6	8.8	1.1	6.0
	b. Uncertain demand for innovative goods or services	10.2	12.0	11.2	10.9	4.4	8.5

Source: PIDS (2015)

invention to diffusion, and consequently focuses on scientific research over the role of innovation actors (Ancog and Aquino 2007). This linear model ignores the many feedbacks and loops that occur between the different stages of the innovation process. Instead, decisionmakers should view innovation in the context of an ecosystem with public policies and interventions thought out in consultation with all stakeholders.

Pursue a time-bound national innovation plan

Although the Department of Trade and Industry (DTI) has already developed an inclusive innovation industrial strategy, the government should still facilitate interactions among the players involved in the innovation ecosystem. These interactions must include those that support innovation in various sectors, such as universities, research laboratories, banks for venture capital, and government agencies, particularly DTI, DOST, the Department of ICT, the Department of Agriculture, and the Department of Health, to name a few. A time-bound national innovation plan should also consider sector-specific characteristics and needs of firms, complementary factors for innovation, from soft and hard infrastructure to bigger R&D investments, and the need to improve the capacities and drive of managers in both public and private sectors to innovate (Cirera and Maloney 2017).

Foster innovation with education and training

Human resources matter for innovation. However, while higher levels of human capital and skills are a foundation of improved innovation performance, the government should recognize that designing appropriate policies and programs for education and training to mainstream innovation is not straightforward but a multifaceted and complex undertaking (OECD 2011). As such, simple “more-is-better” policy prescriptions will not be effective. A better understanding of the linkages between skills

and innovation is needed for the government to develop the appropriate interventions to build human and institutional capacities for innovation.

Strengthen linkages between industry and academe

The 2015 SIA respondents noted a weak linkage between industry and academe. With this, the government must undertake an inventory and evaluation of existing mechanisms to identify effective programs it can scale up. The study of Vea (2014) on various forms of industry-academe collaboration provides useful insights on what has worked and what else needs to be done.

Moreover, most innovation-active firms do not identify research and public institutions as a source of cooperation and information for innovation. With this, the government must actively promote the free exchange of ideas and flow of knowledge from outside the companies. Higher educational institutions should also pursue R&D without being hindered by myopic internal policies (RTI International 2014).

Tailor assistance to MSMEs and large firms

While the government has already provided support to MSMEs, MSMEs do not still innovate as much as large firms (PIDS 2015). To encourage them to take risks and innovate, public interventions have to be adapted to their specific needs. This study noted that barriers and bottlenecks keeping MSMEs from innovating, especially constraints for accessing finance, knowledge, and skills, are not similar to those faced by large firms, thus the need to customize interventions.

Meanwhile, although large firms already have more financial and human resources, they will still need assistance in making a paradigm shift toward seeing the value of going beyond their knowledge and cooperation networks for innovation.



This study finds that micro, small, and medium enterprises do not innovate as much as large firms. To encourage them to take risks and innovate, the government must craft public interventions tailored to their needs, especially in accessing finance, knowledge, and skills. While large firms already have financial and human resources, the study argues they still need assistance in making a paradigm shift toward seeing the value of going beyond their knowledge and cooperation networks for innovation. (Photo by PIDS)

Recognize the role of regulations in the promotion of innovation

Having too few or too much regulation, as well as weak enforcement of existing regulation, can hinder innovation. Government should remove regulatory obstacles and improve the ease of doing business to encourage innovation among firms. Although not captured in the survey (i.e., highly regulated service industries are not included), the government should also recognize the impact of restrictive regulations on innovation. Government can try out adaptive regulatory frameworks, such as regulatory sandboxes, to allow new businesses to make use of emerging technologies on a small group of clients for which existing regulations may not be applicable (Productivity Commission 2016).

Pursue capacity-building efforts

Capacity building is required in both government and industry. The government should focus building capacities for implementing whole-of-government strategies, as well as develop and maintain policy coherence and consistency, to support innovation, not in piecemeal through sectors or MSMEs but through activities. In the industry, managerial and technological capability requires strengthening.

Monitor the extent of innovation activities

The government should also conduct regular monitoring of the extent of innovation activities being undertaken in industry. Given the pace of technological change, such monitoring can happen every three to five years.

A National Innovation Act is also being proposed in the legislature, calling for the establishment of a National Innovation Council. This study, however, argues that the work of such council may already be subsumed within the work programs of DTI or DOST, in cooperation with other agencies under a whole-of-government framework.

Other recommendations

Aside from these recommendations, the government should also work toward (1) providing not only increased but also meaningful and impactful support to innovators; (2) supporting investments in required technology, research infrastructure, and researchers; and (3) carrying out appropriate reforms in education, investment climate, and trade. It may also help to have a strong institutional champion that advocates promoting and harnessing innovation in the policy environment, especially as the country prepares for opportunities and risks in the use of emerging technologies and innovations across the world. 📖

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Contact us

Address: Research Information Department
Philippine Institute for Development Studies
18/F Three Cyberpod Centris - North Tower
EDSA corner Quezon Avenue, Quezon City

Telephone: (+63-2) 372-1291 to 92

Email: publications@mail.pids.gov.ph

Website: www.pids.gov.ph

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Jose Ramon Albert and Ramonette Serafica are senior research fellows, Francis Mark Quimba is research fellow, and Jana Flor Vizmanos and Jose Carlos Alexis Bairan are research analysts at the Philippine Institute for Development Studies (PIDS). The views expressed are those of the authors and do not necessarily reflect those of the PIDS or any of the study's sponsors.