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Editor’s Note

The Winter 2015 issue of Perspectives is a collection of a wide range of topics in contemporary business and economics contributed by young and seasoned researchers coming from the Philippines. The six articles in this issue profoundly contribute to the continuing discourse on poverty, taxation, employment, and conduct of business. All of which employed emerging research methodologies both qualitative and quantitative – mixed methods.

In this issue, we showcase a case method approach in doing research. Andrea Santiago (Understanding entitlement mentality as a source of conflict in Philippine business families) discussed the topic of entitlement mentality on family business, which has been the subject of a growing number of researches. Drawing from the interviews of seven business families, Santiago explored the link between the concept of fairness and entitlement mentality. Family members exhibited excessive entitlement when they perceived that there was lack of fairness. There was persistent and escalating conflict when there was no similarity in the way family members defined.

We also have a study that analyzes the impact of feed-on tariffs (FIT) on the investment decision of industry players, written by Martina Dampf and Fernando Martin Y. Roxas (Feed-In Tariffs as an incentive to power investments in the Philippines). The study concluded that FIT could not address all the issues that face potential investors; however, it may be a good place to start as any. Hence, the authors also identified areas for improving program design and implementation; viable alternatives such as auction systems, public bidding or Renewable Portfolio Standards (RPS); and possible improvements in scope such as the inclusion of brownfield projects and off-grid areas into the current set of regulations.

An empirical article also includes our issue. Cynthia P. Cudia (Factors affecting state of poverty in the Philippines) examined the relationship between demographic, social, and economic factors with the state of poverty in the Philippines. Results reveal that the factors mentioned significantly affect the state of poverty of Filipino households. These factors make poverty alleviation challenging; while economic factors such as entrepreneurship and government support are also seen as interventions. It was recommended that government should create more programs supporting entrepreneurship to equip poor Filipino households while expanding government assistance schemes to aid them move out of poverty.

In relation to poverty, taxation also has a crucial role in redistributing income across the population. The study of Enrico V. Gloria, Ronald U. Mendoza, and Ser Percival K. Peña-Reyes (An analysis of Philippine income tax reforms) zoomed in on ensuring a progressive tax structure while observing economic growth objectives. A progressive tax structure would mean that those with the lower ability to pay would face a relatively lower tax burden, imposing much higher tax rates to those with a higher ability to pay. Using data from the Bureau of Internal Revenue and the 2012 Family Income and Expenditure Survey (FIES), the study focused on the possible implications of the three income tax reform proposals on progressivity and economic growth through revenue generation. The
study stopped short of providing suggestions on what could be an optimal tax structure for the Philippines. It also provided some of the key policy issues relevant to tax progressivity and how this could affect inclusive growth and development.

We also cover the issue of job satisfaction and work values. Fredelita E. de Mesa (Employees job satisfaction and commitment: Work values of an organization) conducted a study the effect of demographics and work experiences on job satisfaction and organizational commitment among 117 middle-management officers of a retail bank. Results revealed that marital status significantly affects job satisfaction while age and work near residence significantly affect organizational commitment.

Finally, the study of Jim Ericson B. Kung, Jill Irish Ramirez, Jeneva Marielle Apolinar, and Winona Rebadomia (Developing a fraud prediction model: Application of artificial intelligence methods using firm-specific data and locational factors) posited that corporate fraud, just like any irregularity, can start insignificant; but when blown out of proportion, may cause devastating effects beyond anyone’s expectations. Their study emphasized the need for early detection, thus aiding in keeping fraud occurrence to a minimum. They sought to develop a forecasting model that could predict the occurrence of fraud in companies based on publicly available financial and locational information, specifically: current ratio (CR), total asset turnover (TATO), return on assets (ROA), debt to asset ratio (DAR), current asset to total asset ratio (CATA), corruption perception index (CPI) and gross domestic product (GDP). Results demonstrated that the model is effectively in predicting fraudulent financial statements, proving that the model could be of assistance in mitigating the widespread effects of fraud.

The authors of the articles in this issue of Perspectives touched on current issues in the Philippines and laid emphasis on certain developments in the fields of business, economics, taxation, finance, and development. The challenge now is for economic agents to see the changing signs of the times and adapt to these changes to see the business and economic environment in a dynamic perspective. In behalf of the Advisory Editorial Board, I would like to express gratitude to all the contributors for making Perspectives their journal of choice in publishing their research articles.

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Understanding entitlement mentality as a source of conflict in Philippine business families

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ABSTRACT

The topic of entitlement has been subject of a growing number of researches, although these have been limited to the disciplines of psychology and law with sporadic articles in academic and business settings. Discussions on the effect of the entitlement mentality on family businesses are found mostly in non-academic literature. Drawing from the interviews of seven business families, this research explored the link between the concept of fairness and entitlement mentality. It would appear that family members exhibited excessive entitlement when they perceived that there was lack of fairness. There was persistent and escalating conflict when there was no similarity in the way family members defined. Based on the responses of the interviewees, a self-reported instrument was designed to capture a family member’s perceptions of fairness. The similarity or divergence of the results should help family members understand the source of their conflict. They can then work towards convergence.

Keywords: family business, entitlement, conflict, fairness

INTRODUCTION

When entrepreneurs start businesses that turn a profit, there is an implicit expectation that the profits generated would be shared by family members and that the business operations will eventually be turned over to the next generation. This expectation makes family members believe that they are entitled to the business and, inevitably, the family wealth by virtue of their family name, regardless of whether they contributed to the growth of the business or not. If there is more than one family member who shares the view that the family wealth should be distributed, then there is also the expectation that the distribution of family wealth and power that accompanies entitlement will be done so in a fair manner. But what is fair and do family members share the same definition of fairness?

A cursory review of publicized squabbles among family members reveals that the underlying cause of conflict is the inability of family members to agree on what is a fair allocation of the family wealth and business power that they feel they are entitled to. For instance, siblings Grimalda, Aldo, Rodolfo, and Vasco Gucci were battling for what each believed was a fair share of the family business wealth when their father, Guccio Gucci passed away in 1953. The feud passed on to their children that eventually led to the sale of large portion of the business to an outsider (Barmash, 1988). In Canada, brothers Harrison
and Wallace co-founders of McCain Foods, struggled to ward each other’s children from dominating the family business, when their other brother Robert, who had led the family business, died in 1977 (Gordon & Nicholson, 2008). Wallace eventually lost a legal battle against his brother and started his own food business (Shufelt, 2011). The Ambani brothers of India fought over the control of their father’s Reliance Empire. One brother was resentful of the flamboyant life style of the other (Bundhun, 2014).

In 2015, Bianca Rinehart won her battle against her mother Gina, who had changed the terms of the Hope Margaret Hancock Trust, preventing Bianca from enjoying the trust fund that she was entitled to when she turned 25 (Robb, 2015). The children of Stanley Ho from one wife also sued their father for what they perceived to be their share in the business wealth. It was understood that Stanley’s estate would be equally divided among his 16 children from three wives (Mao, 2011).

In the Philippines, there are many families that have battled it out in public. During the last decade, the noted stories are from the families of Ilusorio and Co. The Ilusorios brought to court, counter suits against each other, wanting a greater share in the wealth left by their deceased father in 2001. One camp accused the other of hastening the death of Ponciano Ilusorio and attempting to change the will (Garcia, 2015). In the case of Green Cross, Gonzalo Co It, eldest of four children, claims that he established the family business with his own resources and thus it was unjust for his siblings to buy him out using the company funds. However, his siblings counter that Gonzalo was only a conduit, and that their father was the actual founder of the business. Consequently, as legitimate heirs, they claim they are entitled to the business wealth (Jimenez-David, 2014).

Gordon and Nicholson (2008) opine that the persistent cause of conflict is the perception that one is cheated of something one deserves. If one pursues the logic, it would mean that if individuals do not feel they are entitled to something, then there is nothing to argue about. Further, if there is perceived fairness in the manner by which entitlements are distributed, there too is no basis for argument. Consequently, this research forwards that entitlement mentality explains persistent, unproductive conflict in family business. Escalating, non-productive conflict hinders the long-term sustainability of the family business.

**LITERATURE REVIEW**

Conflict surfaces when there are at least two divergent and opposing views. Since divergent views are inevitable, then conflict is to be expected. Dane, Leichtentritt, Metz, and Huddleston-Casas (2000) opine that it is the way that conflicting parties respond to conflict that defines their quality of the life. If families are unable to address their conflict, it can lead to not only to emotional consequences, but to financial strains as well. They continue that the conflict tends to intensify the more family members use aggression, withdrawal, and submission as their conflict resolution styles (p. 266).

Identifying the underlying cause of conflict helps families address issues frontally, though not aggressively, rather than in a circuitous manner brought about by withdrawal and submission. When conflict addressed, this allows families to focus on business issues rather than family issues. If it remains unaddressed, the growth of family businesses is stymied, leading to business slow down or closure. Layman (2012) cited unresolved conflict as one reason that can contribute to failed succession. Levinson (1971) echoed this when he described how tense father-son relationships discourage the son from taking over the leadership. Without a successor, business survival is at risk. Finch (2005) agrees that
the failure to reach an accord leads to business mortality. This has serious repercussions especially for stakeholders whose lives depend on the business. When the businesses close down, employees would need to compete with the rest of jobseekers in finding employment, suppliers would need to look for other business partners, and the economy of the community where the business is located may be negatively affected.

There should be no doubt that family business owners desire to do things right. However, what is right however is relative. Thus, family business owners can adopt practices that may be counter-intuitive for others but still feel right for them. For instance, it is typical to treat children equally even when circumstances differ, such as when children belong to different age groups. Some will agree that equality is the right thing to do so to avoid being accused of favoritism; others will argue that it is not right. There will be those who will claim that children should get what they need or what they deserve.

For many families, it is normal for children to enjoy the benefits of family wealth, even if the children do nothing to deserve it. Brown and Jaffe (2011) point that entrepreneurs generate the family wealth while their children are surrounded with wealth. More often than not, the next generation moves around in circles with other wealthy families. Without a notion of where the wealth is coming from, there is a tendency for children of wealth entrepreneurs to take their family wealth for granted. Thus, it leads to a sense of entitlement.

Hughes (2008) reminds that the term “entitlement” used to have a good connotation, subsequently marred when it became associated with the attitude of citizens who expected government to provide for all their needs despite being non-productive. Such attitudes were previously observed in people who grew up in wealth (Piff, 2014). Nowadays, some have gone so far to say that an entire generation is growing up to be entitled and narcissistic (Alexander & Sysko, 2012; Amble, 2005; Karofsky & Karofsky, 2002; Rourke, 2011). Torres (2008) questions this view. He believes that Generation Y are miscasted and that their attitude is born out of the socio-economic environment they have been exposed to since birth.

Regardless, when individuals feel cheated, there is a natural tendency to react in a negative manner rather than in a manner, that fosters alliances. Thus family members who feel entitled, but do not get the proportionate wealth and power they feel they deserve, may exhibit dysfunctional behavior. Consequently, family members should dig deeper and explore their interpretation of fairness. In the process, they will discover how entitlement mentality influences their concept of fairness.

**RESEARCH DESIGN**

This research brought together two fields of study – conflict management and family business. It drew from the literature on conflict management that leads to research on fairness. It considered Adam’s equity theory that has given rise to the equity sensitivity theory and justice theory (as cited in Huseman, Hatfield, & Miles, 1987). It is the a priori assumption that perception of fairness is the precursor of entitlement mentality. The research will contextualize this by situating these phenomena in the realm of family business. The research logic is schematically presented in Figure 1.
Recurring Family Business Conflict Themes: ownership continuity or change, executive leadership continuity or change, power and asset distribution, management vision (Davis & Harveston, 2001)

Type of Conflict: task, process, relationship (Kellermanns & Eddleston, 2004)

Issues of Fairness: equality of opportunity, equality of results, equity, anarchy (Feng et al., 2013; Taylor & Norris, 2000)

Entitlement Mentality: deserve more than one puts in, deserve as much as one puts in, deserve less than one puts in, does not deserve since one does not put it (Huseman, Hatfield, & Miles, 1987; Naumann, Minsky, and Sturman, 2002)

Entitlement Manifestations: tolerance, maintain/restore justice, instinctive aggression, reflective aggression (Fisk, 2010; Moeller, Crocker, & Bushman, 2009; Reidy, Zeichner, Foster, & Martinez, 2008)

**Figure 1.** Schematic Representation of the Research Logic

To operationalize the research logic, the researcher asked the questions listed in Table 1.

As of yet, there is no instrument to measure the sense of entitlement in family businesses. At best, Huseman, Hatfield, and Miles (1987) developed an instrument referred to as the Equity Sensitivity Instrument (ESI) applied to perceptions of employees on job equity. By distributing 10 points between two opposing statements, the five-item instrument determines whether an employee is benevolent or entitled. Using the input-output ratio following Adam’s equity theory, the score of an employee was plotted on a spectrum. Benevolents are employees willing to give more than they receive, as “benevolents” while “entitled” are employees those who wanted to receive more than what they bring in. Clark et al. (2010) modified this into a triadic measure where the 10 points were spread over three statements. On the other hand, Sauley and Bedeian (2000) believe that their 14-item Equity Preference Questionnaire is a better measurement of entitlement of equity sensitivity. Regardless, all instruments thus far have focused on entitlement mentality of employees. This was partly remedied by Campbell et al. (2004) in their Psychological Entitlement Scale that looked at entitlement apart from organizational setting.
Table 1. Interview Guide Questions

<table>
<thead>
<tr>
<th>Guide Question</th>
<th>Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>What type of discussions has the family had that led to differences in opinion? What was the outcome?</td>
<td>Prevailing Family Business Theme</td>
</tr>
<tr>
<td>Has there been discussion on a specific issue that keep coming back? Are there issues that the family refuses to discuss? Why do you think this is so?</td>
<td>Type of Conflict</td>
</tr>
<tr>
<td>Do you think family members should be treated fairly? What do you mean by fair?</td>
<td>View on Fairness</td>
</tr>
<tr>
<td>Should family members be treated differently than non-family members? Why or why not? (For instance, should certain positions be reserved for family members) Should some family members be treated differently than others? Why or why not? (For instance, should family members involved in the business be compensated differently than those who do not?)</td>
<td>Type/Degree of Entitlement</td>
</tr>
<tr>
<td>In the conflict situation that you raised earlier, how did you respond? How did the other family members respond?</td>
<td>Entitlement Manifestation</td>
</tr>
</tbody>
</table>

This paper tries to situate entitlement in family business by presenting a self-assessment tool that considers the most common issues raised by business families. However, it is not an instrument meant to be scored since conflict in family business is not so much that family members feel entitled or not. Conflict arises because there is a difference in perceptions. Thus, the self-assessment encourages family members to reflect on their beliefs and perceptions; then, they can discuss similarities and differences among each other. By communicating, they are able to move one step up to finding resolutions that will help save the business and the family.

RESEARCH METHODOLOGY

The case method was used to study the phenomenon of entitlement. Using an embedded multi-case design, the units of analyses for this research were business families and its family members. The family businesses were at least in its second generation or if not, were transitioning into the second generation.

The snowball technique was used in identifying family business participants that experienced conflicts. After each interview, the respondents were asked to suggest families they knew who experienced visible conflict, whether resolved or not, and who may be open to discuss their experience with a researcher. The focus on families with resolved or unresolved conflict allowed the researcher to assess how the conflict affected family and business outcomes. Excluded from the study were family businesses where family members appeared to have healthy relationships since the focus of the study was on the relationship of unresolved conflict to family business development. Also excluded were families that were not open to be interviewed or to admit they had conflict. Based on prior experience of the researcher, it is difficult to get whole families to speak about conflict to complete strangers. The referral of previous interviewees served as an entry point for the interviews.

The researcher interviewed case participants individually, and as a family whenever circumstances permitted. The opportunity to interview the participants as a
family allowed the observation of family dynamics that strengthened data reliability. A semi-structured approach was used for the interview. For all cases, it was evident that the root of repeated conflict was the inability to receive what family members perceived to be due them. Thus, there was no need to utilize probing techniques to elicit perception of fairness and entitlement.

The objective of this phase of the research was to develop a self-assessment tool to help family members discover possible sources of conflict, whether this results from a sense of entitlement and/or perceptions about what is fair. To accomplish this task, the researcher noted commonalities in the stories of family members on conflict issues. These commonalities became the basis for the 22 statements in the “What is Fair in the Family Business” instrument.

**DISCUSSION OF RESULTS**

Altogether, the researcher interviewed seven business families composed of about 30 family members. Table 2 shows the profile of the business families. Of the seven cases, four are still operating, two no longer exist in its original form, and one has changed its business to leasing. Despite differences in circumstance, the stories became all too familiar.

The interviews revealed that family members had strong feelings about fairness. The problem was there were different interpretations of fairness. Moreover, in conflicted families, the family members did not share the same interpretation. Fairness could mean that everyone received exactly the same benefits and privileges as everyone else. Fairness could mean that the individual, who deserved it more due to circumstances, would receive more than others would. Fairness could also mean that the individual who needed something more, would get more.

**Table 2. Profile of Case Participants**

<table>
<thead>
<tr>
<th>Case</th>
<th>Business</th>
<th>Current Generation</th>
<th>No. of branches</th>
<th>Manila-based?</th>
<th>Ethnic Origin</th>
<th>Business Outcome</th>
<th>Family Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hospital, college</td>
<td>2nd</td>
<td>6</td>
<td>Yes</td>
<td>Filipino</td>
<td>Ongoing</td>
<td>Strained</td>
</tr>
<tr>
<td>2</td>
<td>Department store</td>
<td>3rd</td>
<td>6</td>
<td>No</td>
<td>Filipino</td>
<td>Reduced to property rental</td>
<td>Vocal dissent</td>
</tr>
<tr>
<td>3</td>
<td>Mall</td>
<td>2nd</td>
<td>6</td>
<td>No</td>
<td>Chinese</td>
<td>Ongoing</td>
<td>Quiet dissent</td>
</tr>
<tr>
<td>4</td>
<td>Jewelry retail</td>
<td>2nd</td>
<td>5</td>
<td>Yes</td>
<td>Filipino</td>
<td>Ongoing</td>
<td>Polite</td>
</tr>
<tr>
<td>5</td>
<td>Restaurant</td>
<td>3rd</td>
<td>12</td>
<td>Yes</td>
<td>Filipino</td>
<td>Disbanded</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>6</td>
<td>Real estate</td>
<td>2nd</td>
<td>5</td>
<td>Yes</td>
<td>Filipino</td>
<td>Disbanded</td>
<td>Antagonistic</td>
</tr>
<tr>
<td>7</td>
<td>Leather retail</td>
<td>1st</td>
<td>4</td>
<td>Yes</td>
<td>Filipino</td>
<td>Ongoing</td>
<td>Tentative</td>
</tr>
</tbody>
</table>

**Source:** “Entitlement Mentality: Undertones in Unproductive Conflict in Family Businesses”, Angelo King Institute Selected Essays on Entrepreneurship and Trade, Volume II (in press)

There was also the matter of timing. If fairness meant equality, did a family look at being given equal opportunities at the start or did it mean being given equal opportunities at the present time? According to Ooghe, Schokkaert, and Van de Gaer (2007), equality of opportunity means that everyone is given the same benefits and privileges at the start (for instance, comparative education and travel opportunities) and it is up to the individual to make the most of it. On the other hand, opportunity of results means that, at the present time, everyone should have the same benefits and privileges. In family business, this can mean similar compensation even if one started working in the
business longer or one has a higher position. These differences in perception were highlighted during the interviews. It explained why in some instances, family members felt cheated.

At the surface, family members argued about fairness. When entitlement mentality entered the picture, rational interpretations of fairness were ignored. Instead, highly entitled individuals were satisfied, only if they received equal or more than others even if others legitimately earned the right to receive something more than them. This is where the interviews became quite interesting. In all seven cases, there was at least one family member who felt more entitled than the rest or others perceived that at least one family member was getting more than what he or she truly deserved. The latter statement implies that sometimes a family member does not know or acknowledge that he or she is treated specially.

The interviews also revealed that business families did not differentiate family wealth from business wealth. After all, the business was established for the family. Consequently, if family wealth was distributed equally, then business wealth should also be distributed equally. This became a bone of contention in some cases. Family members who held responsible positions in the family business believed, and perhaps rightfully so, that they deserved to get more from the business than others do. Yet, family members who did not even work in the business or who had no expertise or interest in the business, expected that they should be given the same rights and privileges by virtue of their family name. The conflict can be resolved if family wealth is treated differently from business wealth. If done so, this will allow business owners to give some family members comparable assets and remove them from the business.

Finally, a common thread among the cases was a dominant parent, usually a strong matriarch, who was able to control the behavior of siblings even if there were perceptions of unfair practices. However, when the dominant parent passed away, the suppressed feelings of unfairness erupted. It is at this time when varying interpretations of fairness surfaced. There was always one party who insisted on maintaining the status quo because that is how the dominant parent would have wanted it; and there was at least one opposing party who insisted that fairness as defined by the parent (usually equality) was inappropriate given changing circumstances.

**INSTRUMENT DESIGN**

From these findings, an instrument was developed to capture a family member’s perceptions of fairness (see Appendix). As mentioned, the instrument is not meant to be scored. Rather, it is meant to help family members recognize the similarities or differences of their interpretation of fairness. In most instances, there would be differences and this could explain the source of conflict. If indeed, the source of conflict lies in the differences, then family members can work towards more convergence. Communication is the starting point.

**Expectations from the business**

The decisions regarding the granting of positions, compensation, benefits and allocation of wealth were questioned in family businesses with conflict. When the founders were alive, family members did not openly contest the circumstance of their employment. However, when the next generation family members took over the business, there was a tendency for some members to challenge the wisdom of the founders. This
usually started from family members who felt they were entitled to more, since they put in more hours in the business than their siblings have. Since changes on how positions and compensation is determined can be unsettling, there will be family members who will resist discussions and prefer the status quo. In the cases where there were no changes, those who felt entitled grew resentful while those who supported the status quo also felt hurt and disappointed. In the cases where there were discussions, these became heated as family members contested the basis for entitlement.

In a classic example, a Cruz sibling (case 3) questioned why the company was financing the education of all his nieces and nephews. To him, this meant his siblings were receiving more than he was since he did not benefit from the privilege, having no children. His sibling countered that he is actually enjoying more from his monthly salary since all siblings receive the same amount even if they have more children to feed. He retorted that compensation should be tied to the position and that family circumstance should not determine how much an individual receives. Thus, the education benefit that his nieces and nephews enjoyed should not be taken from company funds. The conversation then becomes emotional with one party asserting the intentions of the deceased founder that the business is for the family.

From the typical conversation, it appears that family members may have differing views about how they should be compensated. There are those who will believe that family members in the same generation should receive the same amount regardless of their contribution, while others may assert that compensation is dependent on position title. Still there are others who will argue that compensation is gender-specific since males are the heads of the family while females have spouses who should take care of the financial needs of the family. Then there are those who will trust in the wisdom of the parent (Q1 in instrument, see Appendix).

The above scenario presumes that all family members are involved in the family business. There are circumstances however where only some family members are active participants and thus expect more from the business than their siblings who are not involved in business operations. A third-generation family member belonging to the Reyes clan (case 2) could not understand why her father would not give her any salary even if she worked in the business. Her father reasoned that anyway, she partly owned the business. Yet at the end of the year, all of the children received the same amount of year-end bonus. Thus, she concluded that she did not need to work hard since her siblings enjoyed the same benefits as her even if they did not work in the family business.

From this conversation, it became evident that family members may have realistic or unrealistic expectations of what they believe the business “owes” them. Question 2 in the instrument probes into this expectation. There will be those who expect a position with monthly salary, personal and monthly allowances, benefits that extend to their family branch as well as shares of stock usually received when the older generation passes away. There will be others who will expect much less. This however, may be dependent on what the others receive. After all, a family member within the same generation should reasonably expect that they have entitlements similar to their siblings.

The literature has shown that what an individual expects to receive is relative to what others receive. If this were the case, then family wealth should be distributed equally at all times (Q3). However, there will those who will contend that some siblings deserve more due to personal circumstances or because they have contributed more than others did. Thus, justice would dictate that they receive more.
Then and Now
The interviews revealed that the feeling of injustice is not one that somebody suddenly wakes up to. It is one, which gnaws into the core until there is a trigger that causes it to emerge. The Hizons (case 5) were very envious of a middle sibling who appeared to be the favorite of their mother. Even as a young lad, he would accompany their mother to the restaurant and he thus learned the business thoroughly. His siblings had their respective responsibilities and some probably spent longer hours in the restaurant than he did. Yet, his mother treated him specially. He realized the extent of the resentment towards him when their mother passed away.

Question 4 to 7 probe into a family member’s perception of whether he or she received a fair share of the family business wealth as well as his or her reaction to it. The set of questions provide insights on whether feelings of entitlement and resentment were rooted in past or present events. It also provides insight on how a family member views a sibling’s level of contentment or discontentment. When matched with the results of another sibling, it should provide more information on a possible “problem” family member.

Questions 8 and 9 present the perception of family member’s on the family relations before there was conflict and at the present time. It alerts family members to the perceived changes of how family members relate with each other in and out of the family business.

Roots of entitlement attitude
Research shows that entitlement is a learned behavior. This means that if parents raise their children to enjoy the family wealth without a fair exchange of input, then children will grow up believing the world owes them. The Lim’s (case 6) who previously managed a real estate development business as a family were provided shares of stock in the firm and given positions even when they did not know how to manage the business. The matriarch insisted that each sibling have an equal share of the business that she funded. However, only one family member, the only female who raised the idea of the business, possessed the entrepreneurial spirit. The business grew under her stewardship and her siblings lived luxurious lives because of it. When the economic environment collapsed and business profits suffered, the siblings continued to draw from business, expecting to maintain their lifestyles. It did not take long for the business to declare bankruptcy. The story does not stop there.

The only female started her own real estate development business from scratch funded by proceeds of the inheritance of her husband. Her siblings resented her for not investing the funds in the floundering family business. Without any source of income, her siblings decided to sabotage her operations by destroying her credibility as a property developer.

The case of the Lim family shows that the matriarch encouraged her children to be dependent on her and the family business. Questions 10 through 15 are meant to draw out how family members were raised. It will give indications of whether parents were enablers of entitlement behavior or not and whether this was consistent among the children. For instance in Q12, a parent may over parent by making decisions for children and being always present to solve problems. This encourages dependency behavior that feed into feelings of entitlement.
Paying forward

Sometimes, it is easy to claim one thing, then do another. For instance, there are family members who may insist that merit should be the basis of wealth distribution. This means that a person who contributes more to the business must receive more. Yet when they have their own families, there is a tendency to share resources equally.

The eldest Abad sibling (case 1) was responsible for the establishment of hospitals in and outside Manila. While he solely owns operates three hospitals and a nursing school in the province, he insists that he is entitled to a share in the profits of the family business where he sits as chairman. The president of the hospital and college is the youngest, who has for a very long time, been receiving the same compensation as his five siblings. It was under his leadership that the family businesses began to make respectable profits. Understandably, he feels he deserves more. Meanwhile, he raises his four children to expect that each of them will receive the same benefits and privileges, and no one receiving more.

Questions 16 and 17 ask family members how they intend to behave if wealth is to be distributed among their children. The questions temporarily change the state of mind of the family member from being a recipient of benefits to being a donor.

Laying it out

The Garcias (case 4) and Perezes (case 7) have family businesses where some family members are not involved. The eldest Garcia sibling wonders why her sister has to live in the ancestral home even if she is the current president of their business. She is actually more upset is her brother-in-law who has not shown that he can independently support his family since he is relying on his wife’s wealth. She would like the house sold and the proceeds divided equally among the five siblings. Then, her sister can choose to do what she wants with her share of the proceeds. For the Perezes, the natural-born siblings question their parents’ decision to treat all siblings equally, including the adopted sibling who was then too young to work in the family business. The elder Perez siblings are married and have different number of children. The third sibling who is actively involved in the business believes that he deserves a little more since he has three children. The eldest, who is being groomed to take over but who shows little interest, does not agree since this means he would be getting less because he is unmarried.

Questions 18 to 22 are questions where family members indicate the degree to which they agree or disagree with the statements. Sometimes, what an individual perceives is different from what an individual believes. The five statements are concrete examples of how fairness is applied. Rather than ask conceptual questions about how they view fairness, the statements draw this out. Like the questions before, the answers of family members should be compared against each other. The disparities, if any, can then be discussed.

CONCLUSION AND FUTURE RESEARCH

Conflict is inevitable in family business. There is nothing wrong with it. The problem is when conflict is persistent and escalates to a point that business operations are adversely affected. As evidenced by the cases, unresolved conflict destroys businesses and upsets family harmony.
Interviews with family members revealed that conflict arose due to feelings of entitlement and the differing perceptions of fairness. Some family members felt they deserved rights, benefits, and privileges because these were legitimately earned. Other members felt they deserved the same because they carried the family name. When these family members held the belief in the extreme, they tended to exhibit dysfunctional behavior.

In many instances, family members do not realize the source of their conflict. The “What is Fair in the Family Business” instrument helps family members understand their own perceptions and that of other family members. By openly comparing the results of the self-administered instrument, family members may appreciate the source of their conflict. This appreciation and understanding will help them in finding the appropriate resolution to their conflict. With open, honest, and constant communications, families may eventually learn to live harmoniously with one another. Ideally, the family business will benefit in the process.

For business families that are not yet conflicted, it helps that family members also gain that awareness of how each views fairness and entitlement. In this way, they are able to address early on, potential sources of conflict. If indeed parents enable the entitlement mentality, then early realization may help them correct dysfunctional practices. Not all families need to go through unwanted experience of family disharmony.

The study of the effect of entitlement mentality in the family business is important to understand because it can result in escalating conflict that in turn affects business longevity. This paper looked only at developing an instrument to help family members understand perceptions of fairness and entitlement. It did so by interviewing business families who have suffered from unresolved conflict. It may benefit if researchers can explore the usefulness of the instrument and to add other facets of conflict, fairness, and entitlement that may have been missed out. After all, the instrument took into account the experiences of only seven business families. Moreover, it would be interesting to see how other cultures respond to the same issues.

Finally, this paper contributes to the body of literature by bridging the social sciences with management and merges theories on conflict management with family business. While the area of entitlement has been subject of a growing number of researches, these are limited to the disciplines of psychology and law with sporadic articles in academic and business settings. Discussions on the effect of the entitlement mentality on family businesses are found mostly in non-academic literature. This research took a more structure approach to establish a linkage between entitlement mentality and unproductive family business conflict. It brought in a new perspective that offers a practical insight that would hopefully spur further research on its effect on family business longevity.

ACKNOWLEDGMENT
This output is one paper generated from the research on entitlement mentality that was wholly funded by the DLSU-Angelo King Institute as part of the Entrepreneurship and Family Business program. The original and complete work entitled “Entitlement Mentality: Undertones in Unproductive Conflict in Family Businesses” is expected to be published in Angelo King Institute Selected Essays on Entrepreneurship and Trade, Volume II. Both the table and the appendix are part of the original work.
REFERENCES


APPENDIX
What is Fair in Family Business?

1. Family members who work in the family business should be compensated as follows:
   a. Equally among the members of the same generation
   b. Depending on position, the higher the position the higher the compensation
   c. Males should be given higher salaries than females
   d. Depends on the parent

2. Since we have a family business, I expect to be given
   a. A position with salary, personal benefits and monthly allowances, benefits that extend to my family, shares of stock
   b. A position with salary, personal benefits and monthly allowances, benefits that extend to my family
   c. A position with salary, personal benefits and monthly allowances, shares of stock
   d. Personal benefits and monthly allowances, benefits that extend to my family, shares of stock

3. Family wealth should be distributed as follows:
   a. Equally for all siblings
   b. Equitably depending on the need of each sibling
   c. Proportionately depending on the contribution of each sibling to the family
   d. Depending on how the parent likes

4. So far I believe that
   a. I have gotten a fair share of the family business wealth
   b. I may have received a little more than the rest and I have no complaints
   c. I may have received a little less than the rest and I have no complaints
   d. I have not gotten my fair share and I feel cheated

5. If there is injustice, I will
   a. accept it as the will of the elders
   b. complain about it
   c. fight for it but will stop if it will mean destroying family harmony
   d. fight for it even if it means destroying family harmony

6. In the present situation, I feel
   a. My siblings and I are content with how the family business wealth has been distributed
   b. My siblings are not content with the distribution and are resentful
   c. I am not content with the distribution and I am resentful
   d. My siblings and I are not content with how the family business wealth has been distributed and we are all resentful

7. In the present situation, I feel
   a. There is no struggle to change how family business wealth is shared
   b. There is a silent struggle to equalize perceived inequities in wealth distribution
   c. There is a vocal struggle to equalize
   d. It is a hopeless case
8. Currently,
   a. The family is as close as when my parents were around
   b. The family is close but not as close
   c. There are family factions
   d. The family has drifted apart
9. I can describe family meetings as
   a. Relaxed and fun
   b. Cautious and uncomfortable
   c. Very tense and controlled
   d. Adversarial
10. When we were growing up, my parents emphasized that
    a. All of us had to work in the family business, regardless of qualification
    b. Anyone of us could work for the family business
    c. We had to be qualified to work in the family business
    d. Only selected family members could work in the family business
11. I grew up in an environment where
    a. My parents were like friends
    b. My parents more lenient but strict
    c. More strict but lenient
    d. My parents were very strict and controlling
12. While growing up, if I was in trouble my parents would normally
    a. Solve the problem for me
    b. Help me solve the problem
    c. Listen to me and allows me to solve it on my own
    d. Leave me alone
13. When my siblings and I were growing up,
    a. Each of us received the same allowance
    b. Each of us received allowances depending on our age
    c. Each of us had to do family chores to earn our allowance
    d. We received no allowance
14. When I was growing up, my parents would
    a. Applaud me for a task because I was good at it
    b. Applaud me for a task even if I was not good at it
    c. Not applaud me even if I was good at it
    d. Not applaud me because I was bad at it
15. I believe
    a. I was the favorite child
    b. I was one of the favorite children
    c. My sibling was the favorite child
    d. I was the black sheep
16. I want my children to
    a. Work in the family business
    b. Work elsewhere and then the family business
    c. Work in my business
    d. Do what they want
17. When I am at the point that I have to distribute my wealth, I will do so
   a. Equally
   b. Equitably
   c. Proportionally
   d. Whatever way I want

How strongly do you agree or disagree with the following statements?
5 – very strongly agree, 1- very strongly disagree

18. A sibling who works in the family business should get more than a sibling who
does not work in the business.
19. A sibling who is the President/General Manager of the family business should
receive a higher salary than a sibling holding a different position.
20. A sibling who is mentally or physically incapacitated should be given the same
amount as a sibling who is not incapacitated.
21. A sibling who takes care of a parent should get more than a sibling who does not
take care of a parent.
22. A sibling with more children should get more than a sibling who is single or has no
children.
Feed-in tariffs as an incentive to power investments in the Philippines

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ABSTRACT
Globally, the most widely used approach for promoting the use of Renewable Energy is the Feed-in-Tariff, also called “FIT”. The Philippines’ Renewable Energy (RE) Law of 2008 aims to achieve the following objectives: (a) accelerate the exploration and development of RE resources to achieve energy self-reliance; (b) increase the utilization RE by providing fiscal and non-fiscal incentives; (c) encourage the development and utilization of RE to prevent or reduce harmful emissions and balance the goals of economic growth with the protection of health and the environment. This article analyzes the impact of FIT on the investment decision of industry players to expand the RE portfolio of the Philippines. The authors conclude that FIT, which is a “pricing” tool, cannot address all the issues that face potential investors. However, it may be a good place to start as any. The authors also identified areas for improving program design and implementation; viable alternatives such as auction systems, public bidding or Renewable Portfolio Standards (RPS); and possible improvements in scope such as the inclusion of brownfield projects and off-grid areas into the current set of regulations.

Keywords: feed-in tariffs, power, renewable energy

INTRODUCTION
Many countries have foreseen the need to move towards more environmentally benign technologies and have implemented regimes and measures to promote renewable energy. The most widely used approach is the Feed-in-Tariff, also called “FIT”. The FIT mechanism is one of the primary instrument prescribed by the Philippines’ Renewable Energy (RE) Law of 2008, to achieve the following objectives: (a) accelerate the exploration and development of RE resources to achieve energy self-reliance; (b) increase the utilization RE by providing fiscal and non-fiscal incentives; (c) encourage the development and utilization of RE to prevent or reduce harmful emissions and balance the goals of economic growth with the protection of health and the environment.

However, as many jurisdictions log more experience, the hidden costs and shortcomings of FIT become more and more apparent. Some countries, notably Spain and Germany, are back peddling trying to find solutions for a subsidy mechanism that is about to become, or has already become, largely unsustainable. Yet other countries, such as the Philippines, are newly implementing and promoting FIT.
OBJECTIVES

This article aims to analyze FIT from the viewpoint of investor friendliness, and from that vantage point, identify:

1. Areas for improving approach and implementation,
2. Viable alternatives such as an auction systems, public bidding or Renewable Portfolio Standards (RPS) and,
3. Possible improvements in scope such as the inclusion of brownfield projects and off-grid areas into the current set of regulations.

The authors recognize that the FIT tariffs may just be one of the things that potential proponents look at when they decide to invest or not in the Philippine power sector. There are many other equally important factors that would determine whether they sink their dollars on assets in the Philippines or in some other country needing power sector investments.

Issues on the Use of FIT in the Philippines

With the enactment of Republic Act 9513 on July 28, 2008, the Renewable Energy Act of 2008, and its Implementing Rules and Regulations on May 25, 2009, the Philippines paved the way for FIT in the country. The final FIT rules were adopted on July 12, 2010. On July 27, 2012 the Energy Regulatory Commission (ERC) approved the following rates:

<table>
<thead>
<tr>
<th>Technology</th>
<th>Rates (PhP/kWh)</th>
<th>Degression rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>8.53</td>
<td>0.5 percent after year 2 from effectivity</td>
</tr>
<tr>
<td>Biomass</td>
<td>6.63</td>
<td>0.5 percent after year 2 from effectivity</td>
</tr>
<tr>
<td>Solar</td>
<td>9.68</td>
<td>6 percent after year 1 from effectivity</td>
</tr>
<tr>
<td>Hydro</td>
<td>5.90</td>
<td>0.5 percent after year 2 from effectivity</td>
</tr>
</tbody>
</table>

Source: ERC (2012)

Degression Rates

Degression, as used in this context, aims to account for reductions in the costs of the respective technology and to avoid overcompensation, as well as to provide incentives for technology improvements. The downside of a fixed degression mechanism for extended time periods, is the lack of flexibility to take outside factors such as steel prices or the prices of other installation materials into consideration. Admittedly, substantially greater price reductions in steel and other construction materials are improbable. At the same time, it is difficult to assess the rate of technology improvements and associated cost reductions. To expect that technology improvements will continue to bring down prices, particularly for wind and solar energy, cannot be taken for granted and historical developments are of limited use to develop forecasts for future improvements.

A solution that has been used in the UK is a contingent degression mechanism wherein the level of deployment of a certain technology determines the rate of degression. A default degression rate is set and if the technology deployment remains within a certain pre-defined corridor, the degression rate remains the default rate. If it is below or above the corridor, different degression rates apply (Feed-in Tariffs Ltd., 2014). It remains to be seen if the Philippine approach to FIT adjustments after 3 years, or when installation targets have been met, is sufficient to adjust for technology improvements in a timely fashion. The
provisions pertaining to FIT adjustment is silent on the degression rates. However, it is fair to assume that the overall FIT, including degression rates, is subject to review by the Energy Regulatory Commission rather than the rates on a stand-alone basis without degression.

**FIT Installation Limits**

In the Philippine FIT regime, installation limits were put in place to prevent oversubscription such as happened in Spain (Butler, 2011). There are disadvantages to the use of installation limits. Firstly, any non-performing or underperforming project which has been awarded still counts in full towards the installation limit, thus on paper the installation limit is reached when in fact the actual production is below the limit or even non-existent. This opens doors for speculative subscriptions which distort the overall supply picture.

Unfortunately, speculative offers prevent credible market players from realizing projects. Credible market players have a reputation to protect and internal procedures to adhere to which may include complicated internal approval processes before they can tender an offer in contrast with speculative subscribers who likely do not need to follow approval processes and are therefore in a position to act quickly. In the case of foreign market entrants, subscription alone might require lengthy due diligence and a board approval, which typically requires some lead-time.

**The DOE’s “First Come, First Serve” Policy for FIT Eligibility**

Rather than impose termination provisions for projects that are covered under the installation limits but are delayed or not commercially operational beyond a certain timeframe, the solution that was proposed in the Philippines is a “first come first serve” basis (Department of Energy, 2013). This policy required that a project show substantial completion equivalent to 80 percent of its electro-mechanical requirements before it can even apply for FIT certification.

This principle is not particularly palatable to investors as it increases, among others, the costs of finance. Financing, especially project financing, requires relative certainty that debt can be serviced as scheduled and considering that a project might or might not be eligible for FIT after it has been 80 percent completed will lead lenders to ask for expensive warranties in case the project turns out to be ineligible.

Such safeguards will, if it is a small project, be guarantees, which are costly to maintain. For major projects, the safeguards will likely be parent company guarantees which shall be carried on the respective parent’s balance sheet and thus impact its credit rating and overall borrowing terms and conditions. In the unlikely event that a lender would not ask for safeguards, the conditions of financing would simply be such that the risk premium, and correspondingly the borrowing rate, would be too high. In other instances, the “first come, first serve” situation might lead to situations wherein quality and safety is sacrificed for the sake of timely, if not early, completion of a project.

**THREE MAJOR OBSTACLES TO RENEWABLE ENERGY INVESTMENTS IN THE PHILIPPINES**

**Foreign Ownership Restriction**

It is and was expected that FIT would attract foreign investors and renewable energy projects would materialize (Department of Energy, 2014). What was not taken into
consideration is that FIT alone – even if price levels are appealing to investors, would not be sufficiently attractive if other investment criteria are not met. To the extent that FIT was driven by such deliberations, three major obstacles were not addressed, two of which could have been taken up in the bundling of regulations surrounding FIT.

The most fundamental barrier is the infamous “60/40 rule” enshrined in the Philippines’ constitution. The rule restricts foreign ownership of “public utilities” to 40 percent. This provision is part of the 1987 constitution of the Republic of the Philippines but was also embedded in the constitutions of 1935 and 1973. The “Electric Power Industry Reform Act” in 2001, commonly known as EPIRA (Republic Act No. 9136), stipulates in Section 6: “power generation shall not be considered a public utility operation”.

However, the Securities and Exchange Commission (SEC), which is the government agency tasked to enforce this constitutional ownership constraint, applied the ownership restrictions in an opinion regarding a wind farm, disregarding Section 6 of EPIRA (SEC, 2011). Section 6 of EPIRA further skirts the question of the power plant as a public utility because reference is only made to the operation. Investors are not satisfied. The former British Ambassador referred to it as “unhelpful” in the context of investments in the renewable energy sector (Lowe, 2013) and the president of the German-Philippine Chamber of Commerce and Industry “very much regret[s], […] that we are restricted” (GMA Network, 2013).

The SEC tended to use a liberal approach to the aforementioned ownership restrictions. Using layers of companies and Holding Companies to circumvent the 60/40 rule was an acceptable solution to circumvent ownership restrictions for many years. However, in 2010 the General Counsel of the SEC returned from the general “control test” to the application of the so-called Grandfather Rule (SEC, 2010). Under the “control test”, a 60 percent Filipino owned corporation is treated as a fully Filipino owned corporation, wherein under the Grandfather Rule the ultimate and beneficial ownership has to be taken into consideration, taking different layers in a corporate setting into account. At the same time the SEC accepted inclusion of non-voting, preferred shares in its definition of “capital” which provided another solution to circumvent the 60/40 rule.

Two decisions of the Supreme Court, namely on June 28, 2011 (Gamboa vs. Teves, G.R. No. 176579) and on October 9, 2012 (Heirs of Gamboa vs. Teves, G.R. No. 176579) seemed to change the picture in a way that circumvention by either layering or using different classes of shares would no longer be an option. However, on October 9, 2012 the Supreme Court clarified as follows:

“Since a specific class of shares may have rights and privileges or restrictions different from the rest of the shares in a corporation, the 60-40 ownership requirement in favor of Filipino citizens in Section 11, Article XII of the Constitution must apply not only to shares with voting rights but also to shares without voting rights. Preferred shares, denied the right to vote in the election of directors, are anyway still entitled to vote on […] eight specific corporate matters mentioned [...]. Thus, if a corporation, engaged in a partially nationalized industry, issues a mixture of common and preferred non-voting shares, at least 60 percent of the common shares and at least 60 percent of the preferred non-voting shares must be owned by Filipinos. Of course, if a corporation issues only a single class of shares, at
least 60 percent of such shares must necessarily be owned by Filipinos. In short, the 60-40 ownership requirement in favor of Filipino citizens must apply separately to each class of shares, whether common, preferred non-voting, preferred voting or any other class of shares.” (Supreme Court, 2012)

Since the aforementioned decisions of the Supreme Court, other ways to circumvent the 60/40 rule have been found and tolerated by the SEC and the Supreme Court has so far not taken any action. The process as such is not investor friendly; the change of heart of the SEC is unsettling for investors at best, and the disregard of the Supreme Court decisions by the SEC increases doubts. Investors can, unless they want to await further development, control a company only via tight management control contracts. These are poor substitutes for exercising control in a company by way of majority ownership.

Open Ended Approval Time Tables & Pre-Eligibility Completion Targets

The Department of Energy in its Department Circular Order DC 2013 – 05 – 0009 (“Guidelines for process of Renewable energy projects under the Feed-in Tariff system and the award of certificate for Feed-in Tariff eligibility”) has stipulated three (3) main steps with various sub-conditions which eventually lead, on a first come, first serve basis, to FIT eligibility. (1) Initially, any project requires a declaration of commerciality which has to be confirmed by the Department of Energy within 30 days; (2) after electromechanical completion, which is deemed attained after 80 percent of the EPC (Engineering, Procurement and Construction) Contract has been completed, the Department of Energy will validate such completion within 15 days and within another 15 days confirm or deny the validation. If the validation is confirmed, the DOE has to nominate the eligibility to the Energy Regulatory Commission for processing of the certificate of compliance; no timeframe is given for this step in the approval process. (3) After successful commissioning of the project, which has to be duly validated by the Department of Energy (no timeframe is given for such validation either) a certificate of endorsement has to be issued within 15 days on a first come, first serve basis.

This approval process is complicated and the lack of timeframe for two sub conditions in a country struggling to contain corruption is not comforting. Moreover, the fact that 80 percent of the EPC contract has to be completed in order to even apply for FIT eligibility is difficult to satisfy. These conditions are quite challenging for on-balance sheet financing but would be nearly impossible for off-balance sheet financing, especially for capital intensive projects such as larger hydropower or commercial scale biomass projects.

Lenders and equity investors in project financed assets need to have a high degree of cash flow certainty whether or not their respective projects will be eligible for FIT. For those planning to qualify for FIT, only refinancing on a project finance basis is an option, once the eligibility has been established. This policy adjustment regarding FIT eligibility will benefit mostly established corporations with sufficiently large balance sheets to bear development costs until commercial operation commences.

Process Predictability

Obviously, the FIT pricing level has to be such that RE projects are bankable. It has to be assumed that proper due diligence was undertaken although tariffs were lower than
generally anticipated by the private sector renewable energy proponents. However, lenders might be amenable to lower cost of debt in exchange for other safeguards or additional incentives. Leaving aside the 60/40 regulation and pricing issues, early clarity on eligibility and a less complicated qualification process would improve the entire situation from a financing perspective. Given the installation limits in place, the Philippine government needs some leeway for non-performing or underperforming projects, which count towards the limit. Rather than the current uncertainty surrounding the 80 percent completion requirement and “first come, first serve”, termination provisions for time overruns, cost overruns or similar unfortunate circumstances would have been a better solution.

Performance bonds or completion guarantees, which are not foreseen under the current regime, can easily prevent speculative subscriptions. A credible investor with serious implementation plans will be willing and able to provide a reasonable performance bond refundable upon construction completion or upon commercial operation of the project. Subscription fees similar to commitment fees until construction completion or commercial operation are another way to limit speculative subscription although performance bonds are likely more acceptable to investors as they are returned to the project sponsors upon completion or commercial operation.

**Oversubscribed Installation Limits – Where is this coming from?**

By 31 December 2013, forty-one (41) renewable energy projects had been certified commercially viable with another 44 projects pending certification of commercial viability (Department of Energy, 2014). With the exception of Biomass, which is undersubscribed, all categories are significantly oversubscribed - most notably wind with an installation limit of 220 MW and a subscription level of 650.50 MW. This leaves the valid question whether or not the FIT tariff has been assessed correctly. Increasing the installation limits for wind and solar are being considered.

The FIT rate is subject to adjustment after three (3) years or if the installation targets have been met. The Technical Committee of the National Renewable Energy Board has proposed to the Energy Regulatory Commission (ERC) the amendment of the currently approved FIT as follows:

<table>
<thead>
<tr>
<th>Technology</th>
<th>ERC approved</th>
<th>Indicative FIT new</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td>6.63</td>
<td>6.56</td>
</tr>
<tr>
<td>Hydro</td>
<td>5.89</td>
<td>6.17</td>
</tr>
<tr>
<td>Solar</td>
<td>9.69</td>
<td>8.70</td>
</tr>
<tr>
<td>Wind</td>
<td>8.53</td>
<td>8.37</td>
</tr>
</tbody>
</table>

**Source:** NREB Technical Committee (2014)

Except for hydropower projects, all prices are recommended for reduction by the NREB. The rates for solar energy will undergo a significant drop if the ERC follows the recommendation of NREB’s Technical Committee. At the same time, it is noteworthy that the originally proposed FIT rates by developers of renewable energy were substantially higher. Inflation and improvement of technology between June 2010 when the original rates were proposed and July 2012 when the final rates were approved by the ERC may not fully account for such a significant difference.
### Table 3. Original NREB Recommended FIT vs ERC Approved FIT

<table>
<thead>
<tr>
<th>Technology</th>
<th>Initially proposed FIT April 2011</th>
<th>ERC approved FIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td>6.95</td>
<td>6.63</td>
</tr>
<tr>
<td>Hydro</td>
<td>6.15</td>
<td>5.89</td>
</tr>
<tr>
<td>Solar</td>
<td>17.95</td>
<td>9.69</td>
</tr>
<tr>
<td>Wind</td>
<td>10.37</td>
<td>8.53</td>
</tr>
</tbody>
</table>

Source: NREB revised targeted FIT (ERC Case No. 2011-006 RM., 2012)

In essence, the following three (3) reasons for the oversubscription are the most plausible: (1) the ERC approved prices were too high despite the expectations of private investors of even higher tariffs; (2) lack of termination procedures, penalties and warranties; and (3) investors subscribed on a speculative basis, counting on delays and future cost decreases in the respective technology.

The reduction for solar FIT as suggested by the Technical Committee of the NREB from 9.69 to 8.70 PHP per kWh highlights the first reason mentioned above, albeit not necessarily excluding other reasons. At the same time, the aforementioned lack of termination provisions, completion guarantees or similar warranties that have been subscribed to provide ample room for speculation. In turn, reputable and serious developers as well as credible investors might stay away from projects in light of the oversubscription. In a worst-case scenario, little to no production output will follow a high volume of “paper” projects.

### Problems of Conventional Energy Providers

Meanwhile, conventional energy providers will, in the long run, be hard pressed to remain competitive, particularly in light of the priority access to the grid given to providers of renewable energy. Wind and solar energy are created irrespective of demand and supply whilst conventional providers are subject to market prices and corresponding fluctuations.

As long as storage of electricity from intermittent production is not commercially viable and other non-intermittent producers are insufficient in number and capacity to replace fossil and nuclear energy producers, RE alone cannot satisfy energy demand. An incident in Germany, which occurred in May 2014, provides a showcase for the dilemma. During a day of extensive wind and sunshine, electricity spot prices dropped below zero for a short while (Gell, 2014). In this situation the seller pays the buyer to take the generated electricity. Prices below zero can occur in the wholesale spot market if conventional providers do not reduce their base load. In some instances this might be due to technical reasons, in other instances environmental compliance such as controlled water flow to maintain and protect fish population might even prevent a reduction of the base load although the latter mostly affects hydro power plants (US Energy Information Administration, 2012). Intermittent producers are given priority access to the grid and conventional providers are left to find solutions for the oversupply that they might not even be able to avoid.

### Cost Pass-Through to Customers and its Impact on End-User Tariffs

In Germany – as is the case in the Philippines – costs for the high and distorted electricity prices caused by FIT will be passed on to end-users, a fact that is particularly relevant for industries which, by nature, consume high volumes of electricity. Their
competitiveness on the international market decreases with increases in power prices and relocation to a country with cheaper electricity. Philippines electricity tariffs are among the highest in Asia.

In 2012, Meralco’s prices ranked 9th in the world (Anonuevo, 2012), which does not make the country particularly attractive to investors. It has to be noted that, as oppose to other countries in South-East Asia, electricity in the Philippines is not subsidized. The fact that electricity prices are high is not solely attributable to costs of generation and transmission. Prices are, however, heavily taxed which accounts in part for the high rates.

The cost pass through of an increase in electricity prices is felt immediately and on an individual basis. On the other hand, consumer benefits associated with such reforms are mostly non-monetary in nature and do not facilitate social marketing objectives. Arguments that renewable energy is comparable to a “hedging” of fuel price increases (Swanson, 2013) are equally dismissed merely by the fact that the proportion of renewable energy versus conventionally produced energy is small and will remain small in comparison for many years to come.

Ironically, electricity supply via renewable energy in off-grid areas – where such arguments might hold – is not considered by any of the regulations surrounding the Philippine FIT regime. Many off-grid areas in the Philippines only have diesel generators as their common source of power, a source known to be expensive and volatile. It seems worthwhile to consider subsidizing renewable energy in those areas, particularly if extension of the major national grid is difficult or too costly.

In reality, the increase caused by the FIT regime initially amounts to little more than 4 centavos/kWh per individual household if the Energy Regulatory Commission approves the rate case of TransCo, the authority tasked with administering FIT. This 4-centavos/kWh increase is by no means excessive when compared to general hikes of electricity rates over the previous years. However, this amount could escalate should the Department of Energy increase the installation limits and if projects do come on stream. In August 2014 alone, the Manila Electric Company increased electricity prices by 3.1 centavos (Cayabyab, 2014). In December 2013 the price spike reached PHP 4.15 (415 centavos) although this has been disputed and the case is currently resting with the Supreme Court of the Philippines.

In many countries, FIT is, and has been promoted as a “risk hedging” strategy against dependence on the internal politics of other countries, against long-term environmental pollution and against similar inherently valid reasons (Pembina, 2014). However, such long-term considerations are not tangible enough to convince end users of the necessity to increase, in principle, electricity prices. The same argument applies to businesses, which have to remain competitive. It is only in off-grid areas which are dependent on diesel generators might those arguments be more tangible and have more merit.

**Auction Systems and Public Bidding as Alternatives to FIT**

An alternative way to derive the right pricing structure can be provided by an auction system where the proponents conclude contracts at the lowest prices acceptable to them. Initially, the following decisions have to be made: (1) will there be segregation between off-grid and on-grid areas and (2) will the bid be for a specific technology, e.g. solar vs. solar, biomass vs. biomass and, (3) will the bid be based on energy output or the capacity to feed into a power grid.
Off-grid locations are areas, which are not connected to any one of the three (Luzon, Visayas, or Mindanao) main grids although they are sometimes connected within a community via mini-grids or local grids. Canada with its vast areas provides a good example for off-grid communities. Many of its off-grid areas are supplied by hydropower with back-up diesel generators in place (Aboriginal Affairs and Northern Development Canada, 2012). Theoretically, feeding into those local grids should suffice to qualify for FIT eligibility and there is no obvious reason not to include off-grid areas. However, in the UK where FIT is theoretically possible for off-grid areas, other FIT related issues, such as meter reading in remote areas, effectively prevent FIT participation in off-grid sites (Centre for Alternative Technology, 2014). For ease of implementation it seems therefore preferable to maintain the current segregation of on-grid and off-grid areas for the time being.

In terms of any particular renewable energy technology, it is more beneficial to auction according to electricity output without specifying the technology to be used. If a certain base load is required, hydropower and biomass can supply the base load while solar and wind can be utilized by way of a hybrid system. Peak demand can be satisfied by solar or wind energy. This simplifies implementation and regulation since it allows the market to choose between technologies given current advances, natural endowments and prices. There is also no need to specify degression rates for each technology.

Such a scheme would also allow existing fossil plants to participate by increasing production via the use of renewable energy technology. Where a hybrid plant using fossil fuel fired production and renewable energy production co-exist, all existing infrastructure of the fossil plant (switchyard, right of way, associated transmission lines etc.) can be used by the renewable energy component. This would make the respective bidder very competitive which in turn is advantageous to the government as well as end users because it decreases the required subsidy.

Likewise, if the bid is based on energy output rather than the capacity to feed into the grid, project sites which are less than ideal because of the system losses they incur due to their remote location are equally eligible for FIT as projects which do not face such issues. An auction system based on feed-in capacity would exclude such projects and thus reduce the undue burden to the public resulting from less than ideal project sites. However, this aspect could also be appropriately taken into consideration simply by specifying acceptable ranges for system loss when establishing FIT eligibility.

However, an auction system would bring back a public bidding process, which FIT intended to eliminate when it was initially introduced by forerunners in Europe. Public bidding, at the same time, brings back all procurement law issues as well as delays typically encountered. Traditionally, bidding processes are lengthy, often marred, often contested; sometimes quality suffers but in essence it is a means to derive the right pricing structure. It can be argued that the almost obligatory delays whenever public bidding and procurement is involved might make FIT the preferable option. However, if assessed objectively, the delays in implementing FIT in the Philippines have been such that a difference would hardly have been noticeable.

Competitive bidding does have some pitfalls. One of the greatest problems that occur whenever competitive bidding is involved is the singular focus on price. If price is the overriding criteria, quality will suffer. What is more unfortunate is that projects might not even be implemented because the cheapest bidder is often not capable of delivering the desired outcomes, be it financially or technically.
Obviously every bidder has to adhere to the same technical specifications but within those specifications, the respective bidder should be free to locate savings or find improvements. If too many opportunities for savings are discovered or, maybe worse, prices are unknown to a bidder and the bid is based only on rough estimates, chances are that something that looked good on paper may turn into the proverbial white elephant. In those cases, which are unfortunately not uncommon – everybody loses, including the public agency which is left to deal with the problem and the requirements of a new tender.

On the other hand, if too much emphasis is placed on technical criteria as oppose to price, the winning bid is easier to challenge. Price is undisputable but technical criteria and specifications are open to further scrutiny by a competitor. In recent years, a mixture of technical criteria and price has been used in tenders. Under current benchmarks, it is common to give technical criteria 40 percent and price 60 percent of the valuation. Although time consuming, a relatively stringent pre-bid process can eliminate some shortcomings by requiring bidders to provide references of completed projects similar in scale and nature or requiring specific expertise of core personnel. The barriers to entry that are created this way can be mitigated by allowing a consortium of bidders to submit a joint bid wherein the consortium but not the individual member has to fulfill the criteria. It is reasonable to assume that an experienced and reputable party will not take the risk of partnering with a company that is not credible.

Bid bonds are often used to prevent bidders who are not serious from participating in a bid. If the amount of the bid bond is sufficiently high, segregation can take place on this basis. To the extent this constitutes a barrier to entry or an unfair advantage, allowing a consortium of bidders to participate mitigates the barrier for the same reasons outlined above. Often low implementation rates are cited as a disadvantage of public bidding. In this context, to what extent is it the fault of the winning bidder that the project stalled or is not implemented at all. If permits are missing, construction is hindered or prevented by late expropriation of land or similar reasons, which are beyond the control of the winning bidder, then it is the implementing agency that is at fault.

Besides transparency issues, the biggest disadvantage of public bidding – and the biggest barrier to entry – is the costs associated with submitting a responsive bid. Particularly for large infrastructure projects, these costs easily reach millions of dollars. Even if a consortium shares costs on a pro rata basis, smaller participants might not be able to cover even a relatively small portion. Some countries have, in recent years, successfully used a competitive tender process rather than FIT. Interestingly, most of those countries are developing countries and not countries, which have long standing, experience with successful public bidding (International Renewable energy Agency, 2014).

An alternative to public bidding that might be considered, though probably even more contentious as far as the Philippine experience goes, are unsolicited proposals. Unsolicited proposals originate from private sector proponents that have the necessary means, knowledge and experience to prepare, and in the long run implement, projects in areas where governments do not have funds, know-how or manpower to solicit such proposals or simply fail to request for proposals. However, unsolicited proposals have had undesirable outcomes in the Philippines. In the case of NAIA Terminal 3, an unsolicited proposal where construction started in 1997, the contract was declared null and void in 2004 and legal proceedings between the consortium PIATCO and the Philippine
Government are still ongoing whilst a semi-constructed much needed terminal has been left idle for years (Rappler, 2015).

Before FIT was adopted by all countries in the European Union, it was a practice in some member states to provide subsidies to plants with the lowest generation costs as determined by a bidding process (Economic and Social Research Institute, 2005). Although this also involves public procurement, it might be worthwhile considering as a viable alternative to FIT in the Philippines. This can take the form of bidding for the lowest subsidy required to generate a certain capacity or bidding for a certain amount of capacity on cost basis with guaranteed Minimum Energy Off-Take for a pre-defined period of years. Particularly in off-grid areas, which are diesel powered, this might be a valuable approach to promote renewable energy and achieve the goal of significantly increasing renewables production in the country.

The Use of Renewable Portfolio Standards

Another approach to promote renewable energy are Renewable Portfolio Standards (RPS) wherein a certain amount of energy has to be sourced from renewable energy generation. This can happen via a supplier’s own generation or purchases from third parties, the latter leading to highly competitive prices. In the United States, more than half of its member states have such guidelines in place although, in the absence of national legislation, the policies vary (Solar Energy Industries Association, 2014). It seems worthwhile considering a combination of RPS with other incentives or initiatives. However, in light of the many problems and uncertainties surrounding FIT in the Philippines, it might be overly ambitious to aim for a combination at this point in time. RPS follow a different set of rules and regulations which would add an additional layer of complexity and complication to a process that is currently already unnecessarily complicated and complex in its own right.

The Use of FIT in Other Countries

Interestingly, the European Commission in its new guidelines on State aid for environmental protection and energy 2014 to 2020 which became effective in July 2014, orders the member states to adopt a market based approach and public bidding instead of FIT, thus essentially abolishing FIT by 2017 (European Commission, 2014). The situation in the European Union is not comparable to the Philippines inasmuch as the European Union has to take heed of the so called “Single Market” wherein goods, people, services and capital are guaranteed free movement within the 28 member countries of the Union. A Single Market entails certain conditions; among others the obligation of the individual member states not to grant subsidies outside the rules and regulations provided for in the framework of the European Union as it distorts the market and its competitiveness.

Taking leads from the guidelines of the European Commission is of no relevance to the Philippines. The EU members have had long standing experience with FIT while the Philippines is just starting out its FIT regime. If ever a public bidding process is intended to replace FIT, the guidelines can help form a basis of how to move from FIT to a competitive bidding structure. At the same time, they can provide guidelines for useful exemptions as well as deviations for public bidding. The regulations of other developing countries might also be used as models, e.g. Brazil, Peru or South Africa.
How Brownfield Projects can Leverage FIT Implementation

What is entirely missing in the Philippine FIT approach is the promotion of renewable energy in brownfield projects. Brownfields are power plants already in service as opposed to ‘greenfields’ or those yet to be constructed. A possible reason for the neglect of brownfield projects might be administrative difficulties. Other than that, there is no apparent reason why brownfield projects are being left out. Without question, it is easier to apply FIT to greenfield projects but including brownfield projects might be more in line with the overall interest of promoting renewable energy in the country. The Department of Energy on its web page http://www.doe.gov.ph/renewable-energy-res states the following:

“…the government is formulating programs and projects to stimulate greater private-led investments in the sector, promote RE technologies as competitive energy options and maximize the use of RE potentials.”

If the potential of renewable energy is to be maximized, brownfield projects cannot be disregarded. Since the financial crisis in 2008, banks have become more careful and have shown a preference for brownfield projects over Greenfield projects, particularly for capital-intensive projects on a large scale. Obviously, an already performing power plant – be it renewable energy or fossil energy – with a steady revenue stream is significantly less risky than a Greenfield project where, as the term implies, does not exists yet.

Typically, investors are more amenable to provide finance if historical data is available because such information provides insights on revenue projections over the lifetime of the asset which makes brownfield projects particularly attractive. Further, if production can be continued, future revenues can be used as collateral or pre-payment of receivables, possibly obtaining preferential VAT treatment at the same time. If a fossil brownfield plant, which does not enjoy preferential VAT treatment, is converted into a hybrid plant, access to the preferred treatment could be introduced as an investment incentive.

DOE Resolution No. 16, Series of 2010, the Resolution Adopting Feed-in Tariff Rules, mentions brownfield projects in the following context:

*Section 1.4 on eligibility of RE plants : “…existing facilities which have been substantially modified or expanded as described in Section 3.”*

*Section 3: “Additional or incremental capacities above an established generation baseline of existing facilities using the technologies listed above that undergo re-powering, modernization and/or expansion shall also be eligible for FIT.”*

Technical criteria have so far not been provided to the public. It is unclear what criteria fulfill the term “substantially modified” or what constitutes merely an “upgrade” as oppose to an “expansion”. Hybrid plants are one example where FIT eligibility is unclear: it can be argued that, e.g., adding a solar power system to a fossil plant which is already operational, and which can utilize all the infrastructure of the fossil plant and thus be highly efficient and cost effective, is an expansion.
A situation like the one above might help obtain bridge financing required to complete 80 percent of the plant, which is required for FIT eligibility. The future revenues of the existing plant might be sufficient collateral for lenders if FIT is sought for an expansion – be the original plant a renewable energy plant or a conventional one. After commercial operation of the expansion, the project can be refinanced on a project finance basis. Although someone might argue that the main plant is still a fossil plant and even the incremental capacity does not qualify it eligible for FIT.

One of the most critical permits in any power plant project – be it conventional or renewable energy, is the Environmental Compliance Certificate, conventionally called “ECC”. The ECC has to be obtained from the Department of Environment and Natural Resources, following a complicated application procedure (DENR, 2015). Oftentimes significant delays are encountered in obtaining an ECC. The costs of such delays have to be borne by the project developer and will eventually increase overall project costs. With an ECC for an existing project in place, construction commencement can happen within a predictable time frame, development costs can be budgeted accordingly and cost overruns as well as completion on time can be achieved easily. Brownfield projects have ECCs in place and only some amendments or adjustments might be required.

**Current Impact of FIT on the Philippine Generation Mix**

The current impact of FiT in the Philippines is too low to be of any significance. Investors still prefer bilateral off-take agreements even if they are below FiT rates because they are deemed less risky in light of the many uncertainties surrounding FiT (Navarro, 2014). In addition to the issues outlined before, it is yet unclear how and when payment to RE providers will occur. FiT is a uniform charge which will show as an individual line item on consumers’ electricity bills. TransCo has filed the amount of PHP 0.04057 for such line item in July 2014 and is seeking provisional authority pending final decision but is, at the same time, still consulting with the Bureau of Internal Revenue (BIR) on the tax treatment of FiT (Velasco, 2014). In light of the fact that the FiT rules were adopted in July 12, 2010, it is not comforting for investors to know that more than four years later, the disbursing agency is still seeking provisional authority and the tax treatment has not yet been clarified.

**CONCLUSIONS**

Despite all the shortcomings of FiT in the Philippines, it has to be noted that action still needs to be taken on the promotion and advancement of renewable energy. “Lessons learned” from other countries have been considered and lengthy consultations with industry sectors have already taken place. No rules or regulations will ever be satisfactory to all concerned parties. FiT might not be ideal but it has its merits and to change course and veer away from FiT would be premature at this point in time.

Rather than condemning FiT altogether because of its administrative difficulties in the Philippines and its many failures seen around the world, it seems worthwhile addressing the known concerns and existing issues such as eligibility, pricing and taxation in a timely fashion. If some of those issues are addressed and brownfield projects as well as off-grid areas are included into the FiT regulations, investors might already look at the Philippine FiT with a friendlier eye.

It is interesting and noteworthy that an industry specialist, Luis Miguel Aboitiz, Senior VP of Aboitiz Power Marketing & Trading, President & CEO of Aboitiz Energy Solutions and First VP of Aboitiz Equity Ventures, believes that the barriers to entry against foreign investors...
are high due to the existing strong domestic players, most notably SMC, Lopez, Aboitiz, Alcantara, Ayala, Filinvest, Trans-Asia Energy, Meralco and DMCI despite a current production gap (Energy Boardroom, 2014).

If this is indeed the case, many of the issues surrounding FIT are not pressing and of rather secondary nature because most of the aforementioned industry players have strong enough balance sheets to finance projects themselves. This provides them with the option to refinance the project at a later stage on a project finance basis or leave it on their balance sheet; whichever is more practical from a strategic and financial viewpoint. Conversely, we can also say that the recent policy change by the Department of Energy is disadvantageous to upstarts and newcomers who may have good technologies but lack the financial muscle to provide on balance sheet finance.

In summary, FIT in the Philippines, which has been in the making since the Electric Power Industry Reform Act in 2001 has so far not had much effect other than indicating ceiling prices for bilateral offtake agreements. Hopefully this will change in the future when more eligible projects become operational and proponents as well as lenders gain confidence in the process. In the meantime, we hope that the Department of Energy will reconsider some of the difficulties new policy changes have created for investors and make renewable energy more attractive for the much-needed foreign direct investments.

**POST SCRIPT - IMPACT OF CURRENT LOW CRUDE OIL PRICES**

In light of the steep decline in international oil prices over the last few months, the question that comes to mind is the impact of such price levels on renewable energy. According to the concept of supply and demand, the thirst for oil should go up while demand for renewable energy, as a substitute for oil, should go down in this scenario. However, this concept is severely distorted if subsidies and policies are considered.

In many countries, petroleum products are heavily subsidized and renewable energy heavily policy driven; any change in subsidies and policies traditionally require time due to their legislative nature and political impact. It is therefore unlikely, if not to say premature, that any government will start changing its policies on renewable energy because oil prices have dropped over the last months (Shukman, 2015). Oil is, and has historically been, a volatile commodity. Predictions for future price developments are plentiful but in essence futile because the future cannot be predicted with surety.

The current drop in oil prices might even be used to argue in favor of renewable energy. Costs of renewable energy are stable and tend to decrease due to technical improvements and advancements, which make it more predictable than oil prices. Renewable energy thus provides independence from oil price volatility to the extent of its deployment. Phasing out oil subsidies during this period of low oil prices is worth considering (Economist, 2015). The effect on renewable energy can only be positive.

If indeed the drop in oil prices proves to be lasting and steps for policy amendments are considered, it can be argued that at the point in time such amendments become effective, prices for renewable energy will likely have decreased further due to technical improvements and thus, the overall situation is largely unchanged.
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Factors affecting state of poverty in the Philippines

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ABSTRACT
Poverty is a global problem characterized by a lack of resources. Causes of poverty boil down to status or any disadvantage that can be ascribed to demographic, social and economic factors. This study aims to examine the relationship between some of these factors and state of poverty in the Philippines. In particular, this study includes demographic factors such as age, family size, and education; economic factors such as entrepreneurship, wages, and government support; and a social factor linked to inequality of distribution of wealth between urban and rural centers. Using binary logistic regression, results reveal that the factors included in the study significantly affect state of poverty of Filipino households. These factors make poverty alleviation challenging; while economic factors such as entrepreneurship and government support are also seen as interventions. Hence, it is recommended that government should create more programs supporting entrepreneurship to equip poor Filipino households while expanding government assistance schemes to aid them move out of poverty.

Keywords: poverty, state of poverty, entrepreneurship, government support, logistic regression

INTRODUCTION
Poverty is a global problem characterized by a lack of resources. In economic terms, poverty is defined by a dollar-a-day subsistence or more specifically, the revised USD1.25 daily survival income.

According to Todaro and Smith (2011), despite the variations in physical, demographic, historical, cultural and structural characteristics, most developing nations face common set of problems that define their state of underdevelopment. The Philippines is one of the developing nations that share the phenomenal problem of poverty. While different administrations of the Philippine government took turns in prioritizing poverty alleviation with programs to combat it, the incidence of poverty in the Philippines is reported at 25.2 percent as of 2009 according to National Statistical Coordination Board.

Causes of poverty boil down to status or any disadvantage that can be ascribed to demographic, social and economic factors. This poses to the research problem statement of this study, “What factors affect state of poverty in the Philippines?” In particular, this study aims to examine the relationship between the state of poverty and demographic factors such as age, family size, and education; economic factors such as entrepreneurship, wages, and government support; and a social factor linked to inequality of distribution of wealth between urban and rural centers. These factors make poverty alleviation challenging; while economic factors such as entrepreneurship and government support are
also seen as interventions. Using APIS 2008 and 2011, this study constructs a model estimating the effect of these factors on state of poverty in the Philippines.

REVIEW OF RELATED LITERATURE

Poverty, defined and measured. Early studies of poverty used income as a measure of poverty. Rowntree (1902) divided poverty levels of families as primary and secondary. Families whose total earnings were insufficient for the maintenance of merely physical efficiency, which include food, rent, and household sundries (clothing, fuel and other needs) were classified as primary poverty. On the other hand, families whose earnings were enough for merely physical efficiency unless a portion of it were spent on other expenditures whether wasteful or not were categorized as secondary poverty.

Another perspective of poverty, according to Sen (2000), dealt with deprivation of capabilities or the freedom to choose to lead the kind of life that a person deems to be valuable. This approach focuses on deprivations and shows that the relation of income and incapability are variable and contingent on factors such as age and location, among other things.

Hulme (2009) stated that the United Nations (UN) declaration on poverty eradication has been hinged on a moral argument regarding poverty as a denial of basic human rights. Over the years in its major summits, UN has made a moral case for poverty which culminated in the Millennium Summit in 2000, in which 145 heads of states or government and 189 countries resolved to end poverty as key goal for the 21st century together with peace, human rights, and democracy, and encapsulated in the Millennium Declaration (Fukuda-Parr & Hulme, 2011). The road map by which the declaration could be monitored quantitatively was documented as annex to the Millennium Declaration as the Millennium Development Goals (MDGs). The first MDG focused on cutting in half the population living in extreme poverty (or less than $1.25-a-day) by 2015, based on a Millennium Declaration categorizing extreme, dehumanizing poverty as morally unacceptable (Fukuda-Parr & Hulme, 2011).

Across the world, measures of poverty have been based on economic indicators such as income and consumption (Arcilla, Co, & Ocampo, 2011; Estudillo, Sawada & Otsuka, 2008; Mitiku, 2014; Orbeta, 2003, 2005), and other dimensions such as capacity (Ataguba, Ichoku & Fonta, 2013).

In the Philippines, Riverra, Pizzaro, and Aliping (2013) noted that poverty is officially measured through per capita income and food threshold. For instance, Reyes, Tabuga, Mina, Asis, and Datu (2010) studied income poverty movement using data from the Annual Poverty Indicators Survey (APIS; 2004, 2007, and 2008), Family Income Expenditure Survey (FIES; 2003 and 2006), and combined APIS and FIES five-year panel data set. The authors used poverty status as dependent variable, and household head profile, income from agriculture, housing characteristics, ownership of assets, access to basic amenities or social services, and location as independent variables. They categorized poverty status as follows: (a) chronic poor, consistently income poor in each of the covered year; (b) transient poor, poor during a given period of time and non-poor for at least one year during the year under study; (c) previously poor, non-poor during a given point in time but poor for at least a year during the year under study; and (d) never poor, never been poor during the period of study.

In this study, poverty is measured in terms of per capita income based on the poverty threshold from National Statistical Coordination Board of PHP16,871.00 per year or
PHP46.86 per day or the equivalent of approximately one USD. Hence, households having per capita income at poverty line of PHP16,871.00 per year is considered poor as they are deprived of basic necessities such as food, clothing, and shelter (Boateng, Boateng & Bampoe, 2014; Todaro & Smith, 2011; Van den Berg, 2012).

**Factors affecting state of poverty.** Literature points to several reasons for poverty, ranging from unequal distribution of benefits of poverty alleviation initiatives (Sawada & Estudillo, 2012) to disjointed link among economic growth, employment and poverty reduction (Islam, Islam, & Abubakar, 2012). Dowling and Yap (2009) stated that the causes of poverty boils down to status or any disadvantage that can be ascribed to race, ethnicity, gender, religion, social class or age. Several factors have been studied to which poverty, deprivation, exclusion, and impoverishment can be attributed. In a study by Kim, Lee, and Lee (2010) of factors contributing to poverty in welfare states, they concluded that the poverty status of a household is dependent on the characteristics of the household head. They found that household heads characteristics being younger, female, having low levels of education, labor market participation, and not being married could lend the household poorer. At the country level, however, they found that government allocation from the gross domestic product for social service is the only factor significant in the level of poverty of a country.

**METHODOLOGY**

Empirical results generated in this study were based on the binary logistic regression technique developed by Cameron and Trivedi (2005) that was adapted by Conchada and Rivera (2012).

Basic research design was employed in order to address the objectives of the study regarding the relationship of demographic, economic and social factors on state of poverty of households in the Philippines. Data on household characteristics and demographics were sourced from the Annual Poverty Indicator Survey (APIS), which is a poverty and policy-impact monitoring system using database of household information at the local level for planning, program implementation, and facilitation.

Using data of households from APIS 2008 covering 190,171 households and APIS 2011 with 42,063 households to capture the entire Philippine behavior, we measure the effect of the demographic, economic and social factors on the state of poverty in the Philippines. The method of maximum likelihood estimation (MLE) is an alternative approach that utilizes out of sample information and provides more efficient estimates (Greene, 2013, as cited in Conchada & Rivera, 2013). Since the dependent variable, state of poverty, is a dummy variable, it is modeled as a standard logit probability model. For a binary outcome data, it is modeled as a standard logit probability model. Hence, a logistic model was employed with the following specification:

\[
\ln \left( \frac{p_i}{1 - p_i} \right) = x' \beta + \epsilon
\]

where \( p_i/(1 - p_i) \) measures the probability that \( y = 1 \) relative to the probability that \( y = 0 \), which is called the odds ratio or relative risk (Gujarati & Porter, 2009). For the logistic regression model, the log-odds ratio is linear in the regressors (Cameron & Trivedi, 2005).

To trace the influence of the independent variables (i.e., demographic, economic and social factors) on the probability that a household will be poor or non-poor, the logistic specification is given by
\[
\ln \left( \frac{p_i}{1 - p_i} \right) = f(FSIZE_i, AGE_i, AGE SQ_i, EDUC_i, WAGE_i, URBAN_i, ENTREP_i, GOVS_i) + \epsilon_i
\]

where:

- \( p_i \) is the probability that a household is considered poor while \((1 - p_i) \) is the probability that a household is non-poor.

- \( FSIZE_i \) (family size), is the number of family members in the household, such that the greater the number, the smaller becomes the income distribution and thus the dwindling of purchasing power to access basic necessities such as food, clothing, shelter, sanitation, or to invest on human capital such as health and education. Also, with increase of number of children comes with diminishing household income because mothers would have to stop working to care for the child and fathers do not find it necessary to seek other income-generating activities even with this change in cash inflow.

- \( AGE_i \) indicates the age of the household head, reported in terms of the number of years completed, that is, his/her age as of last birthday. This demographic factor is expected to produce the opposite effect of poverty status of being poor.

- \( AGE SQ_i \) indicates the age-squared of the household head, which is generating a quadratic curve. Positive effect of age and a negative of age squared would mean that as household gets older, the effect of age is lessened. Furthermore, positive effect of age and a positive effect of age squared would mean that as the household head gets older the effect of age is lessened.

- \( EDUC_i \) (education), is defined as the highest grade completed by the household head in any educational institution, public or private, for formal academic education at the elementary, high school, college or university level. The lack of this human capital limits job opportunities. Low educational attainment limits job options to unskilled job openings with lower pay; and the higher chance of being unemployed. Hence, it is expected that the higher the level of education, the lower the possibility of the household of having per capita income at poverty line or below.

- \( WAGE_i \) refers to the gross basic salary or wage earned by the household head from all his/her jobs, including any allowance for family living, transportation and representation, cost of living, clothing, housing, overtime pay, tips, bonuses, longevity pay, productivity pay, commissions, medical benefits, etc. received in cash. Wages also include deductions made for retirement, insurance premiums, social security, union dues, PAG-IBIG fund, Philhealth, salary loans and other deductions reflected in the payroll. Hence, it expected that a household that receives wages from employment would get the lower chance of earning per capita income at poverty line or below.

- \( URBAN_i \) (urbanity) is a dummy variable assigning the value of 1 if the household is residing in urban area and 0 in rural area. Urban-rural duality spells the difference in household income. Hence, holding other factors constant, it is expected that household per capita income would be higher for a household in urban area than one in rural area.

- \( ENTREP_i \) (entrepreneurship) indicates whether or not the household is engaged in entrepreneurship. Entrepreneurial activities include:
  - crop farming and gardening,
  - livestock and poultry raising,
  - fishing,
  - livestock forestry and hunting,
• wholesale and retail,
• manufacturing,
• community, social services,
• transportation, storage services,
• mining and quarrying,
• construction, and
• entrepreneurial activities not elsewhere classified.

GOVS (government support) indicates whether the household received government support under Kalahi-CIDSS program, poverty reduction project implemented at the barangay level, with community members working closely with local government units in planning and implementing projects consistent with their development needs (Asian Development Bank, 2012).

\( \epsilon_i \) is the error term that captures all other variables that are not included in the equation.

**RESULTS AND DISCUSSION**

The following table shows the results of the logistic regression analysis to describe the relationship between the dichotomous characteristics of the dependent variable poverty status whether poor or non-poor; and a set of independent variables in the study that determines the outcome.

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<thead>
<tr>
<th>Table 1. Marginal effects after logit</th>
<th>2008</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y= poor: Probability</td>
<td>.7416693</td>
<td>.51060522</td>
</tr>
<tr>
<td>Exogenous Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Size</td>
<td>.1105319</td>
<td>.1599913</td>
</tr>
<tr>
<td>Age</td>
<td>-.0070555</td>
<td>-.0070898</td>
</tr>
<tr>
<td>Age Sq</td>
<td>.0000259</td>
<td>.0000248</td>
</tr>
<tr>
<td>Wages</td>
<td>-6.76e-06</td>
<td>-8.69e-06</td>
</tr>
<tr>
<td>No Grade Completed</td>
<td>.1966439</td>
<td>.302918</td>
</tr>
<tr>
<td>Elementary Graduate</td>
<td>.0987187</td>
<td>.1157421</td>
</tr>
<tr>
<td>High School Graduate</td>
<td>-.030664</td>
<td>-.0694932</td>
</tr>
<tr>
<td>Post-Secondary Grad</td>
<td>-.1522777</td>
<td>-.2765478</td>
</tr>
<tr>
<td>College Graduate</td>
<td>-.3701875</td>
<td>-.3605692</td>
</tr>
<tr>
<td>Urbanity</td>
<td>.221244</td>
<td>.2911865</td>
</tr>
<tr>
<td>Government Support</td>
<td>-.0143485</td>
<td>.1755928</td>
</tr>
<tr>
<td>Entrepreneurship</td>
<td>-.1596564</td>
<td>-.1967397</td>
</tr>
</tbody>
</table>

As shown in Table 1, poverty incidence in 2008 of 74 percent decreased to 51 percent in 2011. Poverty gap lowered because of all the significant factors, as discussed below.

**Family Size.** Results of marginal effects after the logistic regression analysis show that independent variable family size significantly increases the probability of the household of being poor for both 2008 and 2011. The results indicate that family size increases the 74 percent probability of the households of being poor in 2008 by 11 percent; while it increases the 51 percent probability in 2011 by 16 percent. This result is in
congruence with the studies of Orbeta (2003, 2005), Reyes et al. (2010), Arcilla et al. (2011), and Son (2003) that identified household size as a determinant for households being poor.

**Age.** Age of the household head is statistically significant that decreases the probability of household of becoming poor for both 2008 and 2011 by 0.7 percent. Household head age decreases the probability of the household of becoming poor of 74 percent and 51 percent, for 2008 and 2011, respectively. This validates the study of Reyes et al. (2010) who found that prime-aged household heads increased the probability of household being non-poor. At that stage, I would surmise that these household heads are at their optimum to take on work that could significantly contribute to income.

**Education.** The results suggest some kind of threshold, i.e., educational attainment of the household head below high school (secondary education) increases the probability of being poor for both 2008 and 2011. A more interesting result is that the marginal negative effect increases for higher educational attainment, i.e., higher levels of education past the threshold (secondary education) reduces the probability of being poor for both 2008 and 2011 at an increasing rate. This would mean increasing ‘returns’ to higher educational attainment, with returns measured as “reduced probability of being poor”, most likely due to greater capacity for earning but also lower deprivation in other aspects including education, obviously, but also in terms of health care, civic engagement, etc.

The study of Reyes et al. (2010) reaffirmed my own findings about the education qualification of the household as contributing to a household being poor on non-poor. Education increases the quality of human capital and opportunities for a higher paying job (Reyes et al., 2010) as jobs in the agriculture sector still contributed to households being poor (Reyes et al, 2010, 2012). It also contributes to adult literacy (Chatterjee, 2005; Hala & Ali, 2013; Kim & Terada-Hagiwara, 2013), a facet of quality human capital. In general, the proportion of poor decreases as educational level increases. Specifically, we note the results of the logistic regression pertaining to education, which refers to the highest educational attainment of the household head, as follows:

**Elementary graduate.** Independent variable education, specifically elementary graduate, significantly increases the probability of the household of being poor for both 2008 and 2011. The results indicate that 73.75 percent probability of the households being poor will increase by 9.02 percent for 2008 while 50.75 percent probability in 2011 will increase by 9.93 percent.

**Secondary Graduate.** Under the independent variable education, secondary graduate significantly decreases the probability of the household of being poor for both 2008 and 2011. The results indicate that 73.75 percent probability of the households being poor will decrease by 3.95 percent for 2008 while 50.75 percent probability in 2011 will decrease by 8.11 percent.

**Post-secondary graduate.** Independent variable education, specifically post-secondary graduate, significantly decreases the probability of the household of being poor for both 2008 and 2011. The results indicate that 73.75 percent probability of the households being poor will decrease by 16.3 percent for 2008 while 50.75 percent probability in 2011 will decrease by 28.4 percent.

**College graduate or higher.** College graduate or higher under the independent variable education significantly decreases the probability of the household of being poor for both 2008 and 2011. The results indicate that 73.75 percent probability of
the households being poor will decrease by 38.3 percent for 2008 while 50.75 percent probability in 2011 will decrease by 36.9 percent.

**Wages.** In my study as shown in Table 1, results of the marginal effects based on logistic regression analysis show that wages of the household head decreases the probability of the household of being poor for both 2008 and 2011. The results indicate that the 74 percent probability of the households being poor in 2008 decreases by 0.0007 percent; while 51 percent probability in 2011 decreases by 0.0008 percent. We note however that although the probabilities are statistically significant, they exhibit minimal effect on poverty status. This finding is validated by the study of Reyes et al. (2012), which revealed that the probability of household being poor is higher when the head of the household receives wages from agricultural work, or if the household head has no job or business. Rowntree (1902) also showed the same trend, that low wages contribute to poverty.

**Urbanity.** Results of the logistic regression analysis resonated previous studies as they showed that the independent variable urbanity significantly increases the probability of the household of being poor for both 2008 and 2011. This means that if the household is living in urban area, the results indicate that 74 percent probability of the households of being poor in 2008 increases by 22 percent; while 51 percent probability in 2011 increases by 29 percent. Reyes et al. (2012, 2010b) has classified poverty as a rural and agriculture issue. In Reyes et al. (2010b) showed that the probability of being poor becomes higher when one lives in the rural area. Research by Islam et al. (2012), Koveos and Zhang (2012), Kraay and McKenzie (2014), and Sawada and Estudillo (2012) all revealed that poverty is more obvious in the rural areas for a number of reasons such as low productivity and agriculture as main source of livelihood.

**Entrepreneurship.** Results of marginal effects based on logistic regression analysis show that entrepreneurship decreases the probability of the household of being poor for both 2008 and 2011. This means that if the household is engaged in entrepreneurial activities, the results indicate that 74 percent probability of the households being poor in 2008 decreases by 16 percent; while 51 percent probability in 2011 decreases by 20 percent. This suggests that the more Filipinos are involved in entrepreneurial activities, the lesser their chances of being poor.

We can observe from Table 1 that next to higher educational attainment among the significant factors included in the study, entrepreneurship plays a big role in decreasing poverty incidence in the Philippines. Entrepreneurship enabled by microfinance was shown in literature to have helped in the poverty situation of those who asked for credit (Aslanbeigui, Milgram, 2001; Oakes & Uddin, 2010; Shetty, 2010; Sigalla & Carney, 2012). The micro-entrepreneurs were able to increase their household income, improved their living conditions, and most importantly, gained the credibility to elevate themselves avail of commercial banking services (Moreno, 2011). Naudé (2009) stated that while entrepreneurship in the developing countries could not contribute to economic growth, it helps in alleviating the entrepreneurs’ poverty.

**Government Support.** As shown in Table 1, the results of the logistic regression analysis show that government support to the households significantly decreases the 74 percent probability of the household of being poor by 15.8 percent in 2008 while 51 percent probability in 2011 increases by 18 percent as shown in Table 6.2. The volatility of results implies that the government support received by households for 2008 and 2011 cannot predict reliably the effect on their poverty status. Attempts should be made to
reevaluate this statement as another set of data in the future becomes available. This validates the study done by Sulistyowati (2013), which mentioned that an increase in investment by government on expenditures such as health, education, and infrastructure increases GDP, all sector workforce employment, including in the agricultural sector where poverty occurs, and reduced poverty.

CONCLUSION AND RECOMMENDATIONS
The different administrations of the Philippine government took turns in prioritizing poverty alleviation with programs to combat it. While we observed some progress in reducing poverty, poverty rate is still high and remains to be a great concern of the economy. Consequently, poverty studies continue to focus on factors for why someone becomes or is poor.

This study estimates the effect of some demographic, economic and social factors on the state of poverty of Filipino households. Demographic factor family size significantly increases the probability of the household of being poor. Bigger households with more dependents shrink the income distribution, and dwindles purchasing power to afford basic services such as education, sanitation and health. This finding validates the studies of Orbeta (2003, 2005), Reyes et al. (2010), Arcilla et al. (2011), and Son (2003) that identified household size as a determinant for households being poor. In addition, Orbeta (2005) argues that for poor families, increase in number of children comes with diminishing household income because mothers would have to stop working without income-generating activities to compensate for the change in cash inflow.

Another demographic factor, age of the household head, is found statistically significant that decreases the probability of household of becoming poor. Advancement in age helps increase their income as a result of quality human capital. This validates the study of Reyes et al. (2010) who found that prime-aged household heads increased the probability of household being non-poor. In contrast, if the household heads are younger or older, the probability of the household being poor increases as well. This finding is associated with dependency burden according to Todaro and Smith, (2011) and the dependency ratio, which implies that the higher the burden it places on the working members of the household, the higher the probability of poverty.

Education seemingly is a major route out of poverty. Regression results suggest that higher educational attainment of household heads decreases the likelihood of becoming poor. In particular, completing secondary school and higher decreases the probability of the household of becoming poor. On the contrary, household heads who are elementary graduates increases the likelihood of becoming poor. This implies that low educational attainment limits job options to unskilled job opportunities with relatively lower pay offers. This finding supports the study of Reyes et al. (2010) about the education qualification of the household as contributing to a household being poor on non-poor.

It has been found in my study that urbanity significantly decreases the probability of the household of being poor. This means that if the household is living in urban area, the results indicate that probability of the households being poor will decrease. This validates the study by Reyes et al. (2012) that showed the probability of being poor getting higher when one lives in the rural area. Hence, my study supports the policy suggested by Reyes et al. (2012) that increasing rural incomes by improving non-farm income opportunities is a key to reducing poverty in the rural areas; and provision of safety nets like health and crop insurance will help the poor from falling deeper into the poverty trap and the non-poor
into becoming poor in times of crises. Moreover, research by Islam et al. (2012), Koveos and Zhang (2012), Kraay and McKenzie (2014), and Sawada and Estudillo (2012) all revealed that poverty is more obvious in the rural areas due to low productivity and agriculture as main source of livelihood.

Economic factor wages significantly decreases the probability of the household of being poor. This finding conforms with the study of Reyes et al. (2012), which revealed that the probability of household being poor is higher when the head of the household has no job. Corollary to this finding, Rowntree (1902) showed that low wages contribute to poverty. Hence, it is recommended that the government must ensure effective policies on minimum wage in line with its objective of reducing poverty gap and employer control of wages. Consequently, legislators must determine the minimum income that should be guaranteed to each household. This is essentially linked to inequality of income by progressive income taxes levied on employee taxpayers. Over-rated compensation tax has been a dilemma of Filipino employees, whose wages are substantially sliced-down before their take home pay. Furthermore, some sort of incentives must be given to private employers in offering competitive wages to their employees. Lastly, strategies to boost employment and job creation to enhance human capital are recommended.

Results of the logistic regression analysis show that entrepreneurship decreases the probability of the household of being poor. This implies that the more Filipinos are involved in entrepreneurial activities, the lesser their chances of being poor. These finding supports Naudé (2009) stated that while entrepreneurship in the developing countries could not contribute to economic growth, it helps in alleviating the entrepreneurs’ poverty. Thus, it is recommended that the government provide programs to help them initiate and support income-generating activities such as entrepreneurship. Entrepreneurship as an economic factor is found to be an important poverty intervention through valuable additional strategy, i.e. to create jobs and improve livelihoods and economic independence of entrepreneurs. Furthermore, it is recommended that the government be aggressive in its effort to disseminate information about the world of business and opportunities to create their own businesses. Providing these poor households with insight into entrepreneurship and enterprise would help them consider the options of starting and managing a business. Consequently, the government has to be flexible in creating ways to motivate potential and existing entrepreneurs to explore and target productivity of their ventures.

Factoring in government support has significant dramatic effect on state of poverty of Filipino households. This economic factor significantly decreases the probability of being poor for 190,171 households included in APIS 2008. This validates the study done by Sulistyowati (2013), which mentioned that an increase in investment by government on expenditures such as health, education, and infrastructure increases GDP, all sector workforce employment, including in the agricultural sector where poverty occurs, and reduced poverty. However, results show that government support significantly increases the probability of becoming poor for 42,063 households in APIS 2011. This counter-effect could be attributable to lower assistance by the government in 2011 (2.2 percent) than in 2008 (11.5 percent). Although the reasons behind the decline are difficult to pinpoint, this finding suggests that households do not get assistance they need and may be facing greater hardship. It implies that change in government support shows a disturbing trend affecting the poverty level of the households. Hence, it is recommended that government
should release long-term assistance to poor households; and extend programs that encourage and provide schemes to earn stable income toward self-sufficiency.

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Moreno, F. (2011). Governance of microcredit as a strategy for poverty reduction in the Philippines. doi: dx.doi.org/10/2139/ssrn.1991494


An analysis of Philippine income tax reforms

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ABSTRACT

Ensuring a progressive tax structure while observing economic growth objectives has been one of the significant challenges in taxation policy. A progressive tax structure would mean that those with the lower ability to pay will face a relatively lower tax burden, imposing much higher tax rates to those with a higher ability to pay. But this could have the effect of discouraging work for the relatively more productive taxpayers hence a trade-off between increased revenues and a more equitable tax system. Various income tax reform proposals has recently been filed in the Philippine legislature, all with the aim of updating the 1997 income tax structure, and ensuring a more progressive income tax system while still mindful of growth objectives. This paper analyzes the three income tax reform proposals filed by Senator Juan Edgardo M. Angara (Senate Bill 2149), Senator Paolo Benigno A. Aquino IV (Senate Bill 1942), and Senator Ralph G. Recto (Senate Bill 716). Using data from the Bureau of Internal Revenue and the 2012 Family Income and Expenditure Survey (FIES), this paper focuses on the possible implications of the three income tax reform proposals on progressivity and economic growth through revenue generation. This paper will stop short of providing suggestions on what could be an optimal tax structure for the Philippines. It will also provide some of the key policy issues relevant to tax progressivity and how this could affect inclusive growth and development.

Keywords: income tax, progressivity, optimal taxation, economic growth, inclusive growth

INTRODUCTION

The progressivity of tax regimes and their possible implications on policy objectives such as societal welfare and economic growth are among the most widely studied aspects of public finance policy. Essentially, progressive taxation reduces the tax incidence of people with a lower ability to pay, and instead shifts this to those with a higher ability to pay. Hence,
there is a possible tradeoff between increased equity (by applying higher marginal tax rates for higher-income individuals) and economic growth (by discouraging work and encouraging a stronger labor-leisure substitution for individuals who may prefer to work less). Nevertheless, more recent empirical work also acknowledges that for much higher levels of inequality, this tradeoff could disappear, and inequality itself could be a factor behind stunted growth.¹ In this case, until that threshold for much higher levels of inequality is passed, redistribution could have a pro-growth effect. Balancing the objectives of equity and efficiency are among the key goals of reform efforts in this area.

With the higher savings rates of relatively wealthier individuals, consumption taxes are often thought to be regressive. On the other hand, income taxes could be designed with stronger progressivity by allowing for more aggressively higher marginal tax rates for individuals with higher incomes. The overall progressivity of the entire tax regime is often examined based on a combination of these different tax instruments and their incidence on different individuals or households.²

This paper examines possible reforms in the income tax regime of the Philippines, highlighting income tax reform proposals recently discussed in the Philippine legislature. Because it will focus only on income taxes, it will stop short of assessing what might be considered an optimal tax structure. The analysis herein will illustrate some of the policy issues germane to tax progressivity and its contribution to inclusive growth and development in the Philippines.

**IMPETUS FOR TAX REFORM**

Recent income tax reform proposals in the Philippines have been partly motivated by the need to adjust the tax brackets in order to better reflect changes in incomes that have taken place since 1997, when the present system was introduced. According to the tax literature, most income tax systems in the world are not automatically inflation-adjusted. Over time, and if left uncorrected, this has the likely result that rising nominal incomes may push a growing number of income taxpayers into much higher tax brackets, even as their real incomes have not increased. In turn, this “bracket creep” could contribute to “fiscal drag”—a weakening of aggregate demand due to excess taxation of a growing number of taxpayers. In addition, and perhaps more important for the present case, the progressivity of the income tax regime could be diminished over time, as more individual taxpayers—notably on the higher end of the income spectrum—are pushed to the same bracket as the richest taxpayers in the country.

Indeed, there are signs of possible “bracket creep” based on a casual review of recent labor statistics. Data from the International Labour Organization (ILO) show that average nominal wages in the Philippines have been increasing from 2001 to 2011, but average real wages have been declining over the same span of time.

² The interested reader may wish to consult Slemrod (1996) and more recent work by Kakinaka and Pereira (2006). Earlier seminal work in this area could be traced back to Musgrave and Thin (1948), Kakwani (1977), and Suits (1977), among others.
Meanwhile, our analysis of data from the Bureau of Labor and Employment Statistics (BLES) reveal another interesting trend. In a sample of 362 occupations spanning 41 industries, we compare average gross annual wages for 2008 and 2012. The comparison also takes note of the change in the applicable marginal tax rate for each occupation. Of the 362 occupations, 299 (83 percent) show higher gross annual incomes (in nominal terms). 101 occupations (28 percent) show higher applicable marginal tax rates in 2012, implying that more taxpayers may have shifted to higher income tax brackets since 2008.\(^3\)

It should be noted that in 2012, 361 of the 362 occupations included in the sample belong to the middle-income class as defined by Virola et al. (2013). In order to be considered part of the middle-income class, one’s annual gross income should range from P64,317.00 to P787,572.00. In the sample, the occupation with the lowest annual gross income for 2012 (P72,202.11) is that of “Wood Processing Plant Operator” (under the industry group “Manufacture of Wood, Wood Products Except Furniture”). Clearly, its gross annual income falls within the middle-income class range. On the other hand, the occupation with the highest annual gross income for 2012 (P899,872.73) is “Aircraft Pilot, Navigator and Flight Engineer” (under the industry group “Air Transport”). In fact, its gross annual income is the only one in the sample that belongs to the high-income class. What

\(^3\)The interested reader may wish to read the annex providing details of these 101 occupations whose incomes and marginal tax rates have increased from 2008 to 2012.
this analysis implies is that “bracket creep” is already becoming evident among many occupations in the middle-income class (as identified by Virola and colleagues).

### Table 1. Changes in Annual Nominal Gross Incomes and Marginal Tax Rates, 2008-2012

<table>
<thead>
<tr>
<th>Status</th>
<th>Number of Occupations</th>
<th>Share in Total Number of Occupations (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Nominal Gross Incomes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Increase</td>
<td>299</td>
<td>83</td>
</tr>
<tr>
<td>Decrease</td>
<td>63</td>
<td>17</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>362</td>
<td>100</td>
</tr>
<tr>
<td><strong>Marginal Tax Rates</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td>244</td>
<td>67</td>
</tr>
<tr>
<td>Increase</td>
<td>101</td>
<td>28</td>
</tr>
<tr>
<td>Decrease</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>362</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.

### Table 2. Occupations Whose Marginal Tax Rates Have Increased to the Highest Rate

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (Philippine peso)</th>
<th>2012 Gross Annual Income (Philippine peso)</th>
<th>2012 Real Gross Annual Income (Philippine peso)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate for 2012 Real Income (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Directors</td>
<td>Animated Films and Cartoons Production</td>
<td>410,532.00</td>
<td>557,502.60</td>
<td>477,369.64</td>
<td>30</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>Electronics and Telecommunications Engineers Systems Analysts and Designers</td>
<td>Computer and Related Activities</td>
<td>321,456.00</td>
<td>663,172.87</td>
<td>567,851.33</td>
<td>30</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Systems Analysts and Designers</td>
<td>Computer and Related Activities</td>
<td>272,004.00</td>
<td>600,324.52</td>
<td>514,036.52</td>
<td>30</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Actuaries</td>
<td>Insurance and Pension Funding Except Compulsory Social Security</td>
<td>427,500.00</td>
<td>574,515.11</td>
<td>491,936.84</td>
<td>30</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>Manufacture of Plastic Products</td>
<td>158,520.00</td>
<td>521,757.48</td>
<td>446,762.36</td>
<td>25</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>Mining Engineers and Metallurgists</td>
<td>Metallic Ore Mining</td>
<td>287,580.00</td>
<td>540,060.88</td>
<td>462,434.91</td>
<td>30</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>Geologists</td>
<td>Non-Metallic Mining and Quarrying</td>
<td>240,000.00</td>
<td>570,936.55</td>
<td>488,872.65</td>
<td>25</td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>

Note: Real Incomes were computed using CPI (2006=100)
Source: AIM Policy Center Calculations using data from the BLES.
There are seven occupations whose marginal tax rates have increased to 32 percent, which is the highest applicable rate right now, as a result of an increase in their nominal incomes. They are featured in Table 2. (The rest of the information for other occupations is reported in Annex Tables 1-8, for the interested reader.) Interestingly, adjusting for real incomes in 2012 would indicate that most of these occupations should have not been assigned to the highest rate. Only Electronics and Telecommunications Engineers, and Systems Analysts and Designers would have been assigned the highest tax rate, based on the changes in their real incomes.

**REFORM PROPOSALS BY ANGARA, AQUINO AND RECTO**

In response to the issues of “bracket creep”, “fiscal drag”, and declining tax progressivity, tax reform proposals have been put forward by Senator Juan Edgardo M. Angara (Senate Bill 2149), Senator Paolo Benigno A. Aquino IV (Senate Bill 1942), and Senator Ralph G. Recto (Senate Bill 716). In order to analyze these, copies of the pertinent bills have been obtained from the official website of the Senate of the Philippines (http://www.senate.gov.ph), and the following datasets have been obtained from the Bureau of Internal Revenue (BIR): 1) number of taxpayers per income bracket for 2012\(^4\), 2) Data on Compensation Income and Tax Filers by Gross Taxable Income for CY 2012, 3) Distribution of Individuals Engaged in Business, Professionals and Self-Employed Income Tax Filers by Gross Income Bracket and by Status and no. of Dependents for CY 2012, and 4) top 500 taxpayers of 2012. It should be noted that Sen. Angara’s proposal is designed to unfold over a three-year period (i.e., 2015 to 2017); thus, there are three tax columns under his plan, with the last representing the permanent adjusted tax plan. Tables 3 to 6 summarize the details of the tax proposals from the three senators.

### Table 3. Existing Tax Regime

<table>
<thead>
<tr>
<th>Taxable Income (in Philippine peso)</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 10,000.00</td>
<td>5%</td>
</tr>
<tr>
<td>10,000.01 to 30,000.00</td>
<td>P500.00 + 10% of the excess over 10,000.00</td>
</tr>
<tr>
<td>30,000.01 to 70,000.00</td>
<td>P2,500.00 + 15% of the excess over 30,000.00</td>
</tr>
<tr>
<td>70,000.01 to 140,000.00</td>
<td>P8,500.00 + 20% of the excess over 70,000.00</td>
</tr>
<tr>
<td>140,000.01 to 250,000.00</td>
<td>P22,500.00 + 25% of the excess over 140,000.00</td>
</tr>
<tr>
<td>250,000.01 to 500,000.00</td>
<td>P50,000.00 + 30% of the excess over 250,000.00</td>
</tr>
<tr>
<td>500,000.01 and above</td>
<td>P125,000.00 + 32% of the excess over 500,000.00</td>
</tr>
</tbody>
</table>

Source: BIR website.

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\(^4\) The first BIR dataset covers BIR Form Nos. 1700 and 1701 filers. It comes from the Information Systems Development and Operations Service, BIR-ISG. As of 29 August 2014, two new datasets were obtained from the BIR and these were included in our analyses to improve on the paper. The results arising from the analyses of these three datasets are all presented in this paper. The two new datasets were also obtained from the Information Systems Development and Operations Service, BIR-ISG. All BIR datasets are included in the Annex of this paper.
Table 4. Sen. Angara’s Tax Proposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20,000.00</td>
<td>TAX EXEMPTED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20,000.01 to 70,000.00</td>
<td>15%</td>
<td>13%</td>
<td>10%</td>
</tr>
<tr>
<td>70,000.01 to 200,000.00</td>
<td>P10,500.00 + 20% of the excess over P70,000.00</td>
<td>P9,100.00 + 18% of the excess over P70,000.00</td>
<td>P7,000.00 + 15% of the excess over P70,000.00</td>
</tr>
<tr>
<td>200,000.01 to 500,000.00</td>
<td>P36,500.00 + 25% of the excess over P200,000.00</td>
<td>P32,500.00 + 23% of the excess over P200,000.00</td>
<td>P26,500.00 + 20% of the excess over P200,000.00</td>
</tr>
<tr>
<td>500,000.01 to 1,000,000.00</td>
<td>P111,500.00 + 30% of the excess over P500,000.00</td>
<td>P101,500.00 + 25% of the excess over P500,000.00</td>
<td>P86,500.00 + 22% of the excess over P500,000.00</td>
</tr>
<tr>
<td>1,000,001 and above</td>
<td>P261,500.00 + 32% of the excess over P1,000,000.00</td>
<td>P226,500.00 + 28% of the excess over P1,000,000.00</td>
<td>P196,500.00 + 25% of the excess over P1,000,000.00</td>
</tr>
</tbody>
</table>

Source: Senate of the Philippines website.

Table 5. Sen. Aquino’s Tax Proposal

<table>
<thead>
<tr>
<th>Taxable Income (in Philippine peso)</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 60,000.00</td>
<td>TAX EXEMPTED</td>
</tr>
<tr>
<td>60,000.01 to 140,000.00</td>
<td>P5,000.00 + 15% of the excess over P60,000.00</td>
</tr>
<tr>
<td>140,001 to 250,000.00</td>
<td>P17,000.00 + 20% of the excess over P140,000.00</td>
</tr>
<tr>
<td>250,000.01 to 500,000.00</td>
<td>P45,000.00 + 25% of the excess over P250,000.00</td>
</tr>
<tr>
<td>500,001 to 1,000,000.00</td>
<td>P100,000.00 + 30% of the excess over P500,000.00</td>
</tr>
<tr>
<td>1,000,001 to 12,000,000.00</td>
<td>P250,000.00 + 32% of the excess over P1,000,000.00</td>
</tr>
<tr>
<td>12,000,001 and above</td>
<td>P4,000,000.00 + 35% of the excess over P12,000,000.00</td>
</tr>
</tbody>
</table>

Source: Senate of the Philippines website.

Table 6. Sen. Recto’s Tax Proposal

<table>
<thead>
<tr>
<th>Taxable Income (in Philippine peso)</th>
<th>Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20,000.00</td>
<td>5%</td>
</tr>
<tr>
<td>20,001 to 60,000.00</td>
<td>P1,000.00 + 10% of the excess over P20,000.00</td>
</tr>
<tr>
<td>60,000.01 to 140,000.00</td>
<td>P5,000.00 + 15% of the excess over P60,000.00</td>
</tr>
<tr>
<td>140,001 to 280,000.00</td>
<td>P17,000.00 + 20% of the excess over P140,000.00</td>
</tr>
<tr>
<td>280,001 to 500,000.00</td>
<td>P45,000.00 + 25% of the excess over P280,000.00</td>
</tr>
<tr>
<td>500,001 to 1,000,000.00</td>
<td>P100,000.00 + 30% of the excess over P500,000.00</td>
</tr>
<tr>
<td>1,000,001 and above</td>
<td>P250,000.00 + 32% of the excess over P1,000,000.00</td>
</tr>
</tbody>
</table>

Source: Senate of the Philippines website.

The objective of the analysis here is to illustrate the possible impact on tax revenues if the tax brackets are adjusted according to the three separate proposals. The new brackets will simply be applied to the three different grouped datasets obtained from...
the BIR while assuming a static condition for all the income taxpayers. Employing different datasets obtained from the BIR will further validate the results of our analysis. While a more sophisticated analysis incorporating possible behavioral responses should probably follow this study, the first pass estimate on tax revenues and disposable incomes should serve as a useful barometer of the different proposals.

Possible Revenue Implications

Three BIR grouped datasets were obtained from the BIR. The first BIR dataset obtained considerably differ from the two other datasets in terms of its dimensions.

The first BIR dataset simply illustrates the number of taxpayers per income bracket, filing under BIR forms 1700 and 1701. It consists of two columns and 106 rows (with the first row containing the headings “Income Bracket” and “Number of Taxpayers”). The lowest income bracket has a lower class limit of 0, and the lower class limits of the succeeding brackets increase by an increment of P10,000.00. This continues up to P1,000,000.00 (the lower class limit of the 101st income bracket). The lower class limits from the 102nd income bracket to the 105th (last) income bracket are P5,000,000.00, P10,000,000.00, P15,000,000.00, and P20,000,000.00, respectively. The total number of taxpayers is 314,101.

The second and third BIR datasets on the other hand consists of five columns and 19 rows. They are similar in dimensions but different in terms of the type of tax filers enlisted. The second BIR dataset groups 5,336,390 compensation income tax filers while the third groups 364,855 self-employed individuals and professionals. These datasets are combined to represent the total number of tax filers in the country for 2012. The total number of tax filers for this combined dataset is 5,701,245. The rows of gross income brackets are classified in terms of the taxpayer’s status as either Single or Married, which are further disaggregated based on the number of dependents. And since gross income brackets were used in grouping the tax filers, exemptions and monthly contributions were included in the analysis to reflect taxable incomes. Classifications were also made for those having zero exemptions and undefined exemptions. The lowest income bracket has a lower class limit of zero. Succeeding brackets increase by an increment of P60,000 until the last income bracket.

The last income brackets for the BIR datasets appears to be treated as an “open class” (i.e., one that is not broken down into smaller income brackets, so there is no maximum value identified in the dataset shared by the BIR). The difficulty lies in finding the average value of these income brackets, since, unlike the other (lower) brackets, there are outliers in the last brackets of the BIR datasets. Since mean values will be used to calculate the estimated taxes paid per income bracket (as will be explained later), there is a need to derive the mean value for the last brackets. To do this, and purely for purposes of illustration, the list of top 500 taxpayers for 2012 is invoked in order to estimate the income of the top income taxpayer in 2012.

Let $T =$ amount of tax paid, $F =$ fixed amount of tax, $R =$ tax rate, $E =$ reference amount in excess of which the tax rate is applied, and $I =$ income. The formula is as follows:

$$T = F + R(I - E)$$

Nevertheless, this will need to be verified with BIR as the total number seems small. Undefined exemptions are those who have blank exemption type codes. Since the type of exemption to be imputed cannot be defined for this group, tax filers under this category were not included in the analysis.
Income can be algebraically derived as follows:

\[ I = \frac{T - F}{R} + E \]

The highest amount of tax paid in 2012 was PHP131,434,036.34. From Table 3 above, the following values can be obtained: \( F = 125,000.00 \), \( R = 0.32 \), and \( E = 500,000.00 \). The computation for the highest income is as follows:

\[ I = \frac{T - F}{R} + E = \frac{131,434,036.34 - 125,000.00}{0.32} + 500,000.00 = 410,840,738.56 \approx 411,000,000.00 \]

The upper bound for the last income brackets of the BIR datasets is estimated to be about PHP411,000,000.00.\(^7\) Thus, it becomes possible to compute for the mean of each income bracket, which could then be used to estimate the total income and tax revenue per bracket.\(^8\) The objective is to assess the possible change in revenue for each of the proposals, by comparing this to the baseline 2012 revenues (i.e., the existing tax brackets applied to the 2012 income tax data). Tables 7.1 and 7.2 summarize the tax revenues under the existing tax regime (i.e., the baseline) and the senators’ proposals. For purposes of comparison, the relative change from the baseline revenue is also reported for each of the proposals.

**Table 7.1. Estimated Tax Revenues from Existing Tax Regime and Tax Proposals (Using the first BIR dataset showing the number of taxpayers per income bracket)**

<table>
<thead>
<tr>
<th>Tax Regime</th>
<th>Estimated Total Revenue</th>
<th>Estimated Revenue Loss (Compared to the Baseline Revenue)</th>
<th>Estimated Revenue Loss as % of Estimated Total Revenue Under Existing Tax Regime (Baseline 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Tax Regime (Baseline 2012)</td>
<td>35,446,924,895.91</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Sen. Angara’s Proposal (2015)</td>
<td>34,539,425,850.18</td>
<td>907,499,045.73</td>
<td>3</td>
</tr>
<tr>
<td>Sen. Angara’s</td>
<td>26,432,913,989.35</td>
<td>9,014,010,906.56</td>
<td>25</td>
</tr>
</tbody>
</table>

\(^7\) This was estimated based on the top taxpayers for 2012 by BIR. It was simply assumed that the reported taxes paid are likely to be about 32% of the total taxable income for the top taxpayer.

\(^8\) Some discrepancies between the frequency table of the first BIR dataset and the list of top 500 taxpayers are noted. For the income bracket 15,000,000.00 to 19,999,999.99, there are supposedly 139 taxpayers, but only 75 names appear in the top 500 list. For the income bracket 20,000,000.00 and above, there are supposedly 236 taxpayers, but 425 names appear in the top 500 list.
Table 7.2. Estimated Tax Revenues from Existing Tax Regime and Tax Proposals (Using the combined dataset of Compensation Income Earners, Self-Employed, and Professionals)

<table>
<thead>
<tr>
<th>Tax Regime</th>
<th>Estimated Total Revenue</th>
<th>Estimated Revenue Loss (Compared to the Baseline Revenue)</th>
<th>Estimated Revenue Loss as % of Estimated Total Revenue Under Existing Tax Regime (Baseline 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Tax Regime (Baseline 2012)</td>
<td>740,892,777,500.00</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Sen. Angara’s Proposal (2015)</td>
<td>738,659,050,500.00</td>
<td>2,233,727,000.00</td>
<td>0.3</td>
</tr>
<tr>
<td>Sen. Angara’s Proposal (2016)</td>
<td>646,538,338,250.00</td>
<td>94,354,439,250.00</td>
<td>13</td>
</tr>
<tr>
<td>Sen. Angara’s Proposal (2017)</td>
<td>575,397,218,750.00</td>
<td>165,495,558,750.00</td>
<td>22</td>
</tr>
<tr>
<td>Sen. Aquino’s Proposal</td>
<td>792,870,608,750.00</td>
<td>-51,977,831,250.00</td>
<td>-7</td>
</tr>
<tr>
<td>Sen. Recto’s Proposal</td>
<td>732,809,024,000.00</td>
<td>8,083,753,500.00</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.

Despite using two different BIR datasets in the analysis, the rankings of proposals in terms of their respective revenue losses are fairly similar. The difference lies in the changes in the amount of revenues per proposal once estimated total revenues are compared to existing revenues. Drawing on these calculations, Sen. Aquino’s proposal could have the lowest revenue loss as reflected in the analysis of the different BIR datasets (1 percent loss of the estimated total for the first BIR dataset, and a 7 percent revenue gain for the combined dataset). This is followed by Sen. Recto’s proposal (at 5 percent of the total revenue under the existing tax regime for the first BIR dataset, and at 1 percent for the combined dataset). Initially, Sen. Angara’s proposal could decrease total revenue by only 3 percent for the first dataset or 0.3% for the combined dataset. In 2016, the decrease could rise to about 15 percent or 13 percent for the combined dataset. In 2017 (and onwards, once the new regime is made permanent), the decrease in revenues compared to...
the baseline (2012) revenues, could increase to 25 percent or 22 percent for the combined dataset. Once again, all these figures are based on comparative static calculations that do not accommodate behavioral responses or adjustments by taxpayers. They are merely illustrative, given the information on income taxpayers that are currently publicly accessible.

Illustrations of Possible Impact on Progressivity

While the existing literature on tax progressivity suggests that there is no generally accepted method of showing how progressive a tax structure is, the bulk of the work in this area is underpinned by seminal contributions by Musgrave and Thin (1948) and Kakwani (1977). Musgrave and Thin (1948) developed the tax progressivity index, which is a function of the equality coefficients before and after tax. The so-called Effective Progression (EP) coefficient shows the ratio of before-tax and after-tax Gini coefficients where, in this case, a coefficient equal to 1 would mean proportionality, a coefficient greater than 1 would mean progressivity, and a coefficient less than 1 would mean the opposite. The formula for the Gini coefficient is thus:

\[
G = 1 - \sum_{k=1}^{n} \left[ \left( X_k - X_{k-1} \right) \left( Y_k + Y_{k-1} \right) \right]
\]

Where, in this case, a coefficient equal to 1 would mean proportionality, a coefficient greater than 1 would mean progressivity, and a coefficient less than 1 would mean the opposite.

G is the Gini coefficient. \( X_k \) is the cumulative proportion of the population variable (i.e., the number of taxpayers) for \( k = 0, ..., n \). \( X_0 \) equals 0, and \( X_n \) equals 1. \( Y_k \) is the cumulative proportion of the income variable for \( k = 0, ..., n \). Likewise, \( Y_0 \) equals 0, and \( Y_n \) equals 1.

It should be noted that the Gini coefficients computed for the tax proposals consider information only on income taxpayers. Clearly, this is only a partial snapshot of the country’s equity issues, since income tax revenues only account for about 16.4% of the total tax revenues of the government in any given year. Hence, these Gini coefficients DO NOT reflect the degree of income inequality in the entire country, and given the small share of income taxes in total tax revenues, the analysis herein is more illustrative rather than definitive of the country’s equity landscape. At any rate, the Gini coefficients will allow the calculation of the EP coefficient of each proposal. Table 8 summarizes the results.

Before taxes, the Gini coefficient implied by the 2012 BIR dataset and the combined dataset is 0.951 and 0.929 respectively. This already implies that in the absence of a progressive tax system, and when considering only gross incomes from wages, there is considerable income inequality in this sub-group of taxpayers. Once the existing tax regime is applied, the Gini coefficient experiences a very mild decrease to 0.943 for the first dataset, and 0.906 for the combined dataset. This suggests that the progressivity in the present income tax system may have been reduced for the reasons noted earlier in this study.

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9 The Gini coefficient is often used as a measure of income equality given the relationship between cumulative population and cumulative income. It is a number between 0 and 1, where a value of 0 means perfect equality, and a value of 1 means perfect inequality.
10 In 2012, the Gini coefficient of the Philippines was 0.4605, according to the Philippine Statistics Authority (http://www.census.gov.ph/content/filipino-families-poorest-decile-earns-six-thousand-pesos-monthly-average-2012-results-2012).
Table 8. Computed Gini Coefficients and Effective Progression Coefficients for Existing Tax Regime and Tax Proposals

<table>
<thead>
<tr>
<th>Scenario</th>
<th>First BIR dataset (number of taxpayers per income bracket)</th>
<th>Combined dataset (Compensation Income tax filers + self-employed individuals and professionals)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gini Coefficient</td>
<td>Effective Progression Index</td>
</tr>
<tr>
<td>Gross Income</td>
<td>0.951</td>
<td>1.000</td>
</tr>
<tr>
<td>Income After Taxes (Current Tax Regime)</td>
<td>0.943</td>
<td>1.008</td>
</tr>
<tr>
<td>Sen. Angara’s Tax Proposal (2015)</td>
<td>0.945</td>
<td>1.008</td>
</tr>
<tr>
<td>Sen. Angara’s Tax Proposal (2016)</td>
<td>0.945</td>
<td>1.006</td>
</tr>
<tr>
<td>Sen. Angara’s Tax Proposal (2017)</td>
<td>0.945</td>
<td>1.006</td>
</tr>
<tr>
<td>Sen. Aquino’s Tax Proposal</td>
<td>0.940</td>
<td>1.012</td>
</tr>
<tr>
<td>Sen. Recto’s Tax Proposal</td>
<td>0.942</td>
<td>1.010</td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.

While the EP coefficient seems to be appealing due to its simplicity, it has its fair share of criticism, which necessitates the development of other measures. Kakwani (1977) argues that tax progressivity should be measured based on the deviation of a given tax structure from proportionality. This essentially makes the measure of progressivity a function of not only income distribution but also applicable tax rates that cause a tax structure to deviate from proportionality. The formula for Kakwani’s progressivity index is computed as follows:

\[ P = \frac{(G - G^*)(1 - t)}{t} \]

G and G* are the before-tax and after-tax Gini coefficients, respectively; t is the average tax rate. A positive value of P implies a progressive tax structure. A negative value implies the opposite. Zero simply means proportionality. Tables 9.1 and 9.2 summarize the results after applying Kakwani’s formula.

Table 9.1. Kakwani Progressivity Coefficients for Existing Tax Regime and Tax Proposals

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Average Tax Rate</th>
<th>Gini Before Tax</th>
<th>Gini After Tax</th>
<th>Progressivity Index</th>
</tr>
</thead>
</table>

11 As explained in Kakwani (1977), the concept of tax progressivity is related to the concept of tax elasticity (elasticity of tax function T(x) with respect to income). Tax elasticity is always unity for a proportional tax structure, so proportionality depends on the magnitude of the difference of tax elasticity from 1.
Table 9.2. Kakwani Progressivity Coefficients for Existing Tax Regime and Tax Proposals

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Average Tax Rate</th>
<th>Gini Before Tax</th>
<th>Gini After Tax</th>
<th>Progressivity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing System</td>
<td>0.29</td>
<td>0.929</td>
<td>0.906</td>
<td>0.057</td>
</tr>
<tr>
<td>Angara (2015)</td>
<td>0.29</td>
<td>0.929</td>
<td>0.906</td>
<td>0.057</td>
</tr>
<tr>
<td>Angara (2016)</td>
<td>0.25</td>
<td>0.929</td>
<td>0.910</td>
<td>0.056</td>
</tr>
<tr>
<td>Angara (2017)</td>
<td>0.22</td>
<td>0.929</td>
<td>0.913</td>
<td>0.055</td>
</tr>
<tr>
<td>Aquino</td>
<td>0.31</td>
<td>0.929</td>
<td>0.902</td>
<td>0.060</td>
</tr>
<tr>
<td>Recto</td>
<td>0.29</td>
<td>0.929</td>
<td>0.903</td>
<td>0.065</td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.

For now, it suffices to say that the three income tax reform proposals could have different consequences on inequality. But these all appear quite marginal.

Compared with the existing tax regime, Sen. Angara’s tax proposal implies a slightly larger Gini coefficient, yet it indicates little if any impact on inequality. Part of the reason for this is because Sen. Angara envisions a reduction in the marginal tax rate of the top income bracket of the country. Partly, this is possibly motivated by an attempt to reduce fiscal drag, by increasing the disposable income of the “middle class”. Nevertheless, the range of the “middle class” is quite large, as noted earlier. And it appears that the Angara proposal provides relief to both middle- and higher-income taxpayers.

There are, to be sure, many conceptions of the middle class. For illustrative purposes, we will turn to the estimates developed by Virola et al. (2013), who identified the middle-income class in the Philippines as those individuals with annual incomes between ₱64,317.00 and ₱787,572.00. The Angara proposal is designed to provide relief for this group; but it also does not distinguish this group from the top taxpayers in the country that earn significantly more than ₱787,572.00 annually. Under the proposal, the second top tax bracket (500,000.01-1,000,000.00) is given a reduction of 10 percentage points in their marginal tax, thus providing relief to: 1) part of the middle class, and 2) taxpayers with much higher annual incomes. Also, the top tax bracket of the proposal (1,000,000.01 and above) is given a reduction of 7 percentage points in their marginal tax, thus also providing some tax relief to high income earners. The motivations for providing this relief could be linked to the possible behavioral response of middle-income and high-income taxpayers.
income individuals who could choose to work more or invest, among other behavioral responses that could contribute to stronger economic growth. Such a response (while not calculated here in the analysis) could, in fact, result in higher revenues if the tax base expands with increasing economic activity.

In contrast, the tax proposals by Sen. Aquino and Sen. Recto imply smaller Gini coefficients when compared to the existing tax regime. Nevertheless, when compared to the existing tax regime, the change in the Gini coefficient is likely trivial.

Regrouping the data into deciles paves the way for a more visual examination of the potential results across different income groups. Annex 2 in this paper elaborates on the steps to arrive at this calculation. Tables 10.1 and 10.2 summarize the results and illustrates how the different tax proposals can be compared with the existing tax regime in terms of possible impact on different income groups.

When comparing senator Angara’s proposal with the existing tax regime (column highlighted in yellow) under the first BIR dataset, one can see that in 2015, the shares of the bottom classes, together with that of the top-most class, will increase further; and the shares of those in the middle will decrease further. The combined dataset, on the other hand, can only make conclusions based on the first, eighth, ninth, and tenth deciles, given that most observations would lump at these categories. In this dataset, one can see a constant increase in the share of the top most class while a constant decrease can be observed with those at the lowest and those at the upper middle (eighth and ninth deciles).

Taken together, this helps to explain why the impact of this proposal on tax progressivity is ambiguous.

Under Aquino’s proposal using the first BIR dataset, the shares of the middle classes will increase while the share of the top most class decreases. Except for the first bracket where they saw their shares rise as well, the upper middle and the top most class will also see a decrease in their shares under the combined dataset. Finally, comparing Sen. Recto’s tax proposal with the existing tax regime, one can see that it is only the highest class whose share will decrease further under the first BIR dataset. This is the opposite under the combined dataset where only those at the first decile will see their shares decrease.

In addition, Figure 2 shows the changes in disposable income per bracket (compared with the disposable income per bracket under the existing tax regime). Using the first BIR dataset, the average change in disposable income under Sen. Angara’s tax proposal compared with the existing tax regime is 5.43 percent, with those at the top bracket benefiting the most. Still under the same BIR dataset, Sen. Aquino’s tax proposal will increase disposable income per bracket by about 1.85 percent on average, which is the lowest among the three tax proposals. Moreover, Sen. Recto’s tax proposal will increase disposable income per bracket by about 5.44 percent on average, which is the largest among the three tax proposals.

Under the combined dataset, the changes in the average disposable incomes are marginal. Using Angara’s tax proposal would translate to an average 1% change in the disposable incomes of all classes. Sen. Aquino’s tax proposal on the other hand would not change disposable incomes on average while that of Sen. Recto’s would only increase it by 0.15%.
### Table 10.1. Shares in Total Income (Using the first BIR dataset showing the number of taxpayers per income bracket)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 2,579.01</td>
<td>121,767</td>
<td>39%</td>
<td>0.50%</td>
<td>0.67%</td>
<td>0.70%</td>
<td>0.66%</td>
<td>0.64%</td>
<td>0.66%</td>
</tr>
<tr>
<td>2,579.02 to 5,158.53</td>
<td>0</td>
<td>0%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>5,158.54 to 7,738.06</td>
<td>0</td>
<td>0%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>7,738.07 to 10,257.33</td>
<td>28,456</td>
<td>9%</td>
<td>0.35%</td>
<td>0.47%</td>
<td>0.49%</td>
<td>0.47%</td>
<td>0.47%</td>
<td>0.46%</td>
</tr>
<tr>
<td>10,257.34 to 20,400.05</td>
<td>20,224</td>
<td>6%</td>
<td>0.42%</td>
<td>0.54%</td>
<td>0.58%</td>
<td>0.55%</td>
<td>0.53%</td>
<td>0.54%</td>
</tr>
<tr>
<td>20,400.06 to 40,123.52</td>
<td>26,244</td>
<td>8%</td>
<td>0.84%</td>
<td>1.08%</td>
<td>1.00%</td>
<td>0.97%</td>
<td>0.97%</td>
<td>1.08%</td>
</tr>
<tr>
<td>40,123.53 to 80,072.9</td>
<td>26,952</td>
<td>10%</td>
<td>1.51%</td>
<td>1.87%</td>
<td>1.79%</td>
<td>1.75%</td>
<td>1.74%</td>
<td>1.90%</td>
</tr>
<tr>
<td>80,072.91 to 150,048.81</td>
<td>30,042</td>
<td>10%</td>
<td>6.05%</td>
<td>6.79%</td>
<td>6.79%</td>
<td>6.61%</td>
<td>6.60%</td>
<td>7.04%</td>
</tr>
<tr>
<td>150,048.82 to 360,013.94</td>
<td>29,349</td>
<td>9%</td>
<td>2.92%</td>
<td>3.48%</td>
<td>3.38%</td>
<td>3.29%</td>
<td>3.28%</td>
<td>3.56%</td>
</tr>
<tr>
<td>360,013.95 and above</td>
<td>31,067</td>
<td>10%</td>
<td>87.41%</td>
<td>85.10%</td>
<td>85.27%</td>
<td>85.70%</td>
<td>85.80%</td>
<td>84.77%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>314,101</td>
<td>100%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Note: Green means increase from baseline highlighted in yellow. Orange means decrease from baseline. No highlight means no change from baseline. Source: AIM Policy Center calculations using BIR data.
Figure 2.1. Changes in Disposable Income per Income Bracket: Sen. Angara (2017), Sen. Aquino, and Sen. Recto (Using the first BIR dataset showing the number of taxpayers per income bracket)

Figure 2.2. Changes in Disposable Income per Income Bracket: Sen. Angara (2017), Sen. Aquino, and Sen. Recto (Using the combined dataset of Compensation Income Earners, Self-Employed, and Professionals)

Note: The comparison focuses on Sen. Angara’s tax policy for 2017, for this is the permanent plan. The plans for 2015 and 2016 are merely transitional. However, they are featured in the annex to this report.
Source: AIM Policy Center calculations using BIR data
AREAS FOR FUTURE RESEARCH

The preceding analysis is illustrative and should not be considered as a final assessment of the three different income tax proposals being deliberated in the Philippine Senate. These proposals have helped to elevate the awareness of the public as to the need to revisit issues such as tax progressivity and equity for the country’s income tax regime. The evidence suggests that there are different tradeoffs being made between equity and efficiency, across the three proposals. Depending on the policy objectives and the relative contribution of the income tax regime (which is not large when compared to the total tax revenues, as noted earlier), one could begin to inform the policy discussions with further evidence on how these different options advance or retard the goals of equity and efficiency.

In further expanding the analysis herein, there are several areas one could consider. First, the calculations herein are based on a static analysis of the three different tax reform proposals. It is likely that applying these reforms will trigger a behavioral response among taxpayers, including, for instance: 1) boosting consumption and investments by some taxpayers that experience an increase in disposable income; 2) reducing labor by some taxpayers that might face higher marginal tax rates (e.g., the Aquino proposal); and 3) reallocating asset portfolios towards stock option plans that would reduce effective tax rates (in the case of the highest-income earners whose marginal tax rates might be increased). These changes could, on the net, either increase or decrease overall income tax revenues (and the total revenues of the public sector) depending on how large these effects are. In the literature, one way to consider these different aspects would be to use a general equilibrium approach in the analysis. This could be a fruitful avenue to explore in developing more sophisticated simulations of revenue and growth impacts of these reforms.

Second, it would be ideal to consider an analysis that is slightly more comprehensive so that other tax instruments are also part of the simulation. That could include, notably, the country’s value added tax (VAT) system which accounts for 15 percent of total government revenues. As noted earlier, income taxes account for 16.4 percent of the total tax revenues, suggesting that a more comprehensive tax reform effort could be much more effective if focused also on other tax policy levers. In fact, with the expected decline of tax progressivity in the country’s income tax regime (due in part to “bracket creep”), and given the introduction of the VAT in 1988 (as well as its growing share of the total tax revenues), it is more likely that the two have combined to weaken the impact of tax policy on the country’s equity objectives. It is time for this to be assessed through a rigorous empirical analysis, so as to map out possible policy adjustments to counter its unequalizing impact.

Third, it is also critical to assess the contribution of the expenditure side of public finance, when considering equity and efficiency objectives. The combined effects of public finance policies on the revenue and expenditure sides could provide a much more holistic basis for examining the government’s equity and efficiency objectives.

Lastly, one could also more closely examine where top income earners get their income. It is likely that in the Philippine context, most of them receive a considerable amount of their total incomes from family corporations. Thus, it becomes quite reasonable

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14 For a detailed elaboration of optimal tax modeling, see for example, Salanie (2011).
to assume that family members are currently receiving their funds not as salaries, but as dividends.

REFERENCES


### Annex 1. Tables and Figures

**Annex Table 1. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 1 of 8)**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art Directors</td>
<td>Animated Films and Cartoons Production</td>
<td>410,532.00</td>
<td>557,502.60</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Electronics and Telecommunications Engineers Systems Analysts and Designers Systems Analysts and Designers</td>
<td>Computer and Related Activities</td>
<td>321,456.00</td>
<td>663,172.87</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Actuaries</td>
<td>Insurance and Pension Funding Except Compulsory Social Security</td>
<td>427,500.00</td>
<td>574,515.11</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>Manufacture of Plastic Products</td>
<td>158,520.00</td>
<td>521,757.48</td>
<td>25</td>
<td>32</td>
</tr>
<tr>
<td>Mining Engineers and Metallurgists Geologists Mining Engineers and Metallurgists Geologists</td>
<td>Metallic Ore Mining</td>
<td>287,580.00</td>
<td>540,060.88</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Geologists</td>
<td>Non-Metallic Mining and Quarrying</td>
<td>240,000.00</td>
<td>570,936.55</td>
<td>25</td>
<td>32</td>
</tr>
<tr>
<td>Aircraft Engine Mechanics and Fitters Aircraft Engine Mechanics and Fitters Architects</td>
<td>Air Transport</td>
<td>205,056.00</td>
<td>342,528.03</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Architects</td>
<td>Architectural, Engineering and Related Technical Consultancy</td>
<td>170,136.00</td>
<td>301,539.34</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Draftsmen</td>
<td>Architectural, Engineering and Related Technical Consultancy</td>
<td>225,000.00</td>
<td>257,967.63</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Electrical Engineers</td>
<td>Architectural, Engineering and Related Technical Consultancy</td>
<td>232,884.00</td>
<td>417,060.00</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Computer Assistants</td>
<td>Call Center Activities</td>
<td>177,792.00</td>
<td>261,863.72</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Civil Engineers</td>
<td>Collection, Purification and Distribution of Water</td>
<td>235,896.00</td>
<td>331,973.45</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Production Supervisors and General Foremen</td>
<td>Collection, Purification and Distribution of Water</td>
<td>242,628.00</td>
<td>348,918.79</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Quality Inspectors</td>
<td>Collection, Purification and Distribution of Water</td>
<td>190,560.00</td>
<td>253,751.68</td>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
Annex Table 2. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 2 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Assistants</td>
<td>Computer and Related Activities</td>
<td>188,388.00</td>
<td>276,851.45</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Customer Service Representatives/Associates</td>
<td>Electricity, Gas, Steam and Hot Water Supply</td>
<td>179,904.00</td>
<td>253,685.18</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>(In Call Centers)</td>
<td>Electricity, Gas, Steam and Hot Water Supply</td>
<td>238,080.00</td>
<td>300,432.79</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Power-Production Plant Operators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appraisers and Valuers</td>
<td>Insurance and Pension Funding Except Compulsory</td>
<td>181,164.00</td>
<td>260,594.00</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Production Supervisors and General Foremen</td>
<td>Manufacture of Basic Metals</td>
<td>186,516.00</td>
<td>258,364.18</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Production Supervisors and General Foremen</td>
<td>Manufacture of Chemicals and Chemical Products</td>
<td>230,940.00</td>
<td>313,003.13</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>Manufacture of Paper and Paper Products</td>
<td>236,832.00</td>
<td>256,332.34</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Chemical Engineers</td>
<td>Manufacture of Plastic Products</td>
<td>149,184.00</td>
<td>251,781.62</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Chemical Engineers</td>
<td>Manufacture of Rubber Products</td>
<td>160,512.00</td>
<td>384,515.66</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Mechanical Engineers</td>
<td>Manufacture of Rubber Products</td>
<td>175,740.00</td>
<td>279,732.00</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Computer Assistants</td>
<td>Medical Transcription and Related Outsourcing</td>
<td>153,972.00</td>
<td>258,180.71</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Computer Engineers</td>
<td>Medical Transcription and Related Outsourcing</td>
<td>244,956.00</td>
<td>325,137.43</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Computer Programmers</td>
<td>Medical Transcription and Related Outsourcing</td>
<td>138,996.00</td>
<td>390,960.00</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Production Supervisors and General Foremen</td>
<td>Metallic Ore Mining</td>
<td>236,592.00</td>
<td>294,363.27</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Road Transport Service Supervisors</td>
<td>Other Land Transport Except Busline Operation;</td>
<td>174,144.00</td>
<td>295,406.78</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Transport Via Pipelines</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
### Annex Table 3. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 3 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Doctors</td>
<td>Private Medical, Dental and Other Health Activities</td>
<td>241,620.00</td>
<td>274,434.48</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Printing Engravers and Etchers</td>
<td>Publishing and Printing Except Reproduction of Recorded Media</td>
<td>147,744.00</td>
<td>316,896.00</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Production Supervisors and General Foremen</td>
<td>Publishing and Printing Except Reproduction of Recorded Media</td>
<td>208,836.00</td>
<td>277,794.43</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Accountants and Auditors</td>
<td>Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles</td>
<td>246,144.00</td>
<td>336,257.36</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Sales Supervisors</td>
<td>Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles</td>
<td>243,444.00</td>
<td>368,283.03</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Electrical Engineering Technicians</td>
<td>Architectural, Engineering and Related Technical Consultancy</td>
<td>122,424.00</td>
<td>166,296.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers Except Janitors, Messengers and Freight Handlers Accounting and Bookkeeping Clerks</td>
<td>Building and Repairing of Ships and Boats</td>
<td>95,472.00</td>
<td>157,119.67</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Marine Crafts Mechanics</td>
<td>Building and Repairing of Ships and Boats</td>
<td>111,624.00</td>
<td>188,424.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Production Clerks</td>
<td>Building and Repairing of Ships and Boats</td>
<td>101,964.00</td>
<td>206,116.93</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Road Transport Service Supervisors Plumbers, Pipe Fitters and Other Related Workers</td>
<td>Bus Line Operation Collection, Purification and Distribution of Water</td>
<td>123,636.00</td>
<td>159,973.57</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Computer Equipment Operators Accounting and Bookkeeping Clerks Building and Related Electricians</td>
<td>Computer and Related Activities Construction</td>
<td>95,748.00</td>
<td>149,915.51</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Construction</td>
<td>120,720.00</td>
<td>140,030.18</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
Annex Table 4. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 4 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy Equipment Mechanics</td>
<td>Construction</td>
<td>107,016.00</td>
<td>151,995.34</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Insulation Workers</td>
<td>Construction</td>
<td>118,524.00</td>
<td>147,324.53</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers</td>
<td>Electricity, Gas, Steam and Hot Water Supply</td>
<td>113,928.00</td>
<td>150,417.80</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Helpers and Cleaners</td>
<td>Hotels and Restaurants</td>
<td>101,928.00</td>
<td>147,624.35</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Production Clerks</td>
<td>Manufacture and Repair of Furniture</td>
<td>106,716.00</td>
<td>145,039.08</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Manufacture of Basic Metals</td>
<td>126,864.00</td>
<td>175,375.10</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Metal Drawers and Extruders</td>
<td>Manufacture of Basic Metals</td>
<td>108,240.00</td>
<td>156,154.38</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Metal Melters, Casters and Rolling-Mill Operators</td>
<td>Manufacture of Basic Metals</td>
<td>112,032.00</td>
<td>172,465.52</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Ore and Metal Furnace Operators</td>
<td>Manufacture of Basic Metals</td>
<td>117,708.00</td>
<td>182,616.97</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Chemical Heat-Treating Plant</td>
<td>Manufacture of Chemicals and Chemical Products</td>
<td>119,064.00</td>
<td>189,704.80</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Crushers, Grinding and Chemical-Mixing Machinery Operators</td>
<td>Manufacture of Chemicals and Chemical Products</td>
<td>138,024.00</td>
<td>187,085.93</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Manufacture of Fabricated Metal Products, Except Machinery Equipment</td>
<td>134,964.00</td>
<td>173,918.62</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Machine-Tool Setters and Setter-Operators</td>
<td>Manufacture of Fabricated Metal Products, Except Machinery Equipment</td>
<td>130,416.00</td>
<td>141,626.30</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Food and Related Products Machine Operators</td>
<td>Manufacture of Food Products and Beverages</td>
<td>121,140.00</td>
<td>145,012.28</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Production Clerks</td>
<td>Manufacture of Food Products and Beverages</td>
<td>121,272.00</td>
<td>152,895.37</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
## Annex Table 5. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 5 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Inspectors</td>
<td>Manufacture of Food Products and Beverages</td>
<td>137,088.00</td>
<td>152,637.77</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Agricultural or Industrial Machinery Mechanics and Fitters</td>
<td>Manufacture of Machinery and Equipment, N.E.C.</td>
<td>110,688.00</td>
<td>140,638.98</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Quality Inspectors</td>
<td>Manufacture of Machinery and Equipment, N.E.C.</td>
<td>131,160.00</td>
<td>143,874.72</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Motor Vehicle Mechanics and Related Trades Workers</td>
<td>Manufacture of Motor Vehicles, Trailers and Semi-Trailers</td>
<td>114,660.00</td>
<td>209,076.01</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Quality Inspectors</td>
<td>Manufacture of Motor Vehicles, Trailers and Semi-Trailers</td>
<td>134,112.00</td>
<td>194,423.30</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Sheet-Metal Workers</td>
<td>Manufacture of Motor Vehicles, Trailers and Semi-Trailers</td>
<td>109,524.00</td>
<td>151,946.80</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Cement and Other Mineral Products Machine Operators</td>
<td>Manufacture of Other Non-Metallic Mineral Products</td>
<td>131,256.00</td>
<td>238,160.19</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Glass, Ceramics and Related Plant Operators</td>
<td>Manufacture of Other Non-Metallic Mineral Products</td>
<td>110,940.00</td>
<td>154,857.30</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Manufacture of Paper and Paper Products</td>
<td>135,780.00</td>
<td>166,709.30</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Paper Pulp Plant Operators</td>
<td>Manufacture of Paper and Paper Products</td>
<td>113,676.00</td>
<td>156,151.77</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Papermaking Plant Operators</td>
<td>Manufacture of Paper and Paper Products</td>
<td>124,032.00</td>
<td>142,705.06</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers Except Janitors, Messengers and Freight Handlers</td>
<td>Manufacture of Paper and Paper Products</td>
<td>100,788.00</td>
<td>141,005.11</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Chemical Engineering Technicians</td>
<td>Manufacture of Plastic Products</td>
<td>129,828.00</td>
<td>152,490.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Manufacture of Rubber Products</td>
<td>130,236.00</td>
<td>166,562.86</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Weaving and Knitting Machine Operators</td>
<td>Manufacture of Textiles</td>
<td>107,712.00</td>
<td>148,742.55</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
Annex Table 6. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 6 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Manufacture of Wearing Apparel Medical Transcription and Related Outsourcing Activities</td>
<td>132,996.00</td>
<td>141,984.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Medical Transcriptionists</td>
<td></td>
<td>128,028.00</td>
<td>153,566.74</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Metallic Ore Mining</td>
<td>130,848.00</td>
<td>192,853.31</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Other Land Transport Except Busline Operation; Transport Via Pipelines</td>
<td>126,012.00</td>
<td>149,719.18</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Transport Clerks</td>
<td>Other Land Transport Except Busline Operation; Transport Via Pipelines</td>
<td>133,740.00</td>
<td>145,788.67</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers Except Janitors, Messengers and Freight Handlers</td>
<td>Other Land Transport Except Busline Operation; Transport Via Pipelines</td>
<td>113,940.00</td>
<td>145,550.11</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Medical Technologists</td>
<td>Private Medical, Dental and Other Health Activities</td>
<td>125,508.00</td>
<td>142,823.49</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Nutritionists-Dietitians</td>
<td>Private Medical, Dental and Other Health Activities</td>
<td>117,948.00</td>
<td>148,398.57</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Bookbinders and Related Workers</td>
<td>Publishing and Printing Except Reproduction of Recorded Media</td>
<td>127,788.00</td>
<td>160,871.19</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Compositors, Typesetters and Related Workers</td>
<td>Publishing and Printing Except Reproduction of Recorded Media</td>
<td>126,300.00</td>
<td>188,407.06</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Pressman Letterpress and Related Workers</td>
<td>Publishing and Printing Except Reproduction of Recorded Media</td>
<td>107,316.00</td>
<td>182,567.82</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
### Annex Table 7. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 7 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Retail Trade, Except of Motor Vehicles and Motorcycles and Repair of Personal and Household Goods</td>
<td>111,096.00</td>
<td>153,348.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Telemarketers</td>
<td>Retail Trade, Except of Motor Vehicles and Motorcycles and Repair of Personal and Household Goods</td>
<td>124,440.00</td>
<td>153,088.40</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Sale, Maintenance and Repair of Motor Vehicles and Motorcycles Except Retail Sale of Automotive Fuel</td>
<td>120,576.00</td>
<td>140,555.50</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Cashiers</td>
<td>Sale, Maintenance and Repair of Motor Vehicles and Motorcycles Except Retail Sale of Automotive Fuel</td>
<td>123,540.00</td>
<td>140,783.04</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Technical and Commercial Sales Representatives</td>
<td>Sale, Maintenance and Repair of Motor Vehicles and Motorcycles Except Retail Sale of Automotive Fuel</td>
<td>137,556.00</td>
<td>141,318.58</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers Except Janitors, Messengers and Freight Handlers</td>
<td>Supporting and Auxiliary Transport Activities; Activities of Travel Agencies</td>
<td>112,548.00</td>
<td>192,804.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Water Transport</td>
<td>135,024.00</td>
<td>176,844.39</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Freight Handlers</td>
<td>Water Transport</td>
<td>128,292.00</td>
<td>144,904.51</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Transport Clerks</td>
<td>Water Transport</td>
<td>130,476.00</td>
<td>175,223.23</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers Except Janitors, Messengers and Freight Handlers</td>
<td>Water Transport</td>
<td>115,932.00</td>
<td>150,723.07</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
### Annex Table 8. Details of the 101 Occupations Whose Incomes and Marginal Tax Rates Have Increased from 2008 to 2012 (part 8 of 8)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Industry Group</th>
<th>2008 Gross Annual Income (PHP)</th>
<th>2012 Gross Annual Income (PHP)</th>
<th>2008 Marginal Tax Rate (%)</th>
<th>2012 Marginal Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting and Bookkeeping Clerks</td>
<td>Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles</td>
<td>129,576.00</td>
<td>165,816.00</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Cashiers</td>
<td>Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles</td>
<td>129,420.00</td>
<td>166,935.27</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Shop Salespersons and Demonstrators</td>
<td>Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles</td>
<td>112,272.00</td>
<td>146,022.91</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Telemarketers</td>
<td>Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles</td>
<td>131,076.00</td>
<td>157,846.72</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Unskilled Workers Except Janitors, Messengers and Freight Handlers</td>
<td>Collection, Purification and Distribution of Water</td>
<td>67,044.00</td>
<td>111,769.78</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

Source: Asian Institute of Management (AIM) Policy Center calculations using data from the BLES.
Annex Figure 1.1. Changes in Disposable Income per Income Bracket: Sen. Angara (2015), Sen. Aquino, and Sen. Recto (Using the first BIR dataset showing the number of taxpayers per income bracket)

Source: AIM Policy Center calculations using BIR data.

Annex Figure 1.2. Changes in Disposable Income per Income Bracket: Sen. Angara (2015), Sen. Aquino, and Sen. Recto (Using the combined dataset of Compensation Income Earners, Self-Employed, and Professionals)

Source: AIM Policy Center calculations using BIR data.
Annex Figure 2.1. Changes in Disposable Income per Income Bracket: Sen. Angara (2016), Sen. Aquino, and Sen. Recto (Using the first BIR dataset showing the number of taxpayers per income bracket)

Source: AIM Policy Center calculations using BIR data.

Annex Figure 2.2. Changes in Disposable Income per Income Bracket: Sen. Angara (2016), Sen. Aquino, and Sen. Recto (Using the combined dataset of Compensation Income Earners, Self-Employed, and Professionals)

Source: AIM Policy Center calculations using BIR data.
Annex 2. Computing Income Deciles

From the BIR dataset on the number of taxpayers per income bracket for 2012, one can compute for the deciles by applying the following formula:

\[ D_i = L_i + c \left( \frac{i \cdot n - F_{i-1}}{f_i} \right) \]

where
- \( D_i \) = decile
- \( L_i \) = lower class boundary of the \( i^{th} \) decile interval
- \( c \) = class width or class interval
- \( n \) = number of observations (i.e., taxpayers) = 314,101
- \( F_{i-1} \) = cumulative frequency before decile class
- \( f_i \) = frequency of decile interval
- \( i \) = decile number.

Let \( A_p \) refer to the location of a desired percentile. The location formula is:

\[ A_p = (n + 1) \frac{P}{100} \]

Applying the location formula, one can determine the decile locations, as presented in Table 10. The computed decile values are presented in Table 11.
Annex Table 9.1. Decile Locations (For the first BIR dataset simply showing the number of taxpayers per income bracket)

<table>
<thead>
<tr>
<th>Decile</th>
<th>Location</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$A_{10} = \left(314,101 + 1\right) \frac{10}{100} = 31,410.2$</td>
<td>The first decile can be found between observation numbers 31,410 and 31,411 (observations arranged in ascending order of annual income).</td>
</tr>
<tr>
<td>2</td>
<td>$A_{20} = \left(314,101 + 1\right) \frac{20}{100} = 62,820.4$</td>
<td>The second decile can be found between observation numbers 62,820 and 62,821.</td>
</tr>
<tr>
<td>3</td>
<td>$A_{30} = \left(314,101 + 1\right) \frac{30}{100} = 94,230.6$</td>
<td>The third decile can be found between observation numbers 94,230 and 94,231.</td>
</tr>
<tr>
<td>4</td>
<td>$A_{40} = \left(314,101 + 1\right) \frac{40}{100} = 125,640.8$</td>
<td>The fourth decile can be found between observation numbers 125,640 and 125,641.</td>
</tr>
<tr>
<td>5</td>
<td>$A_{50} = \left(314,101 + 1\right) \frac{50}{100} = 157,051.0$</td>
<td>The fifth decile can be found at observation number 157,051.</td>
</tr>
<tr>
<td>6</td>
<td>$A_{60} = \left(314,101 + 1\right) \frac{60}{100} = 188,461.2$</td>
<td>The sixth decile can be found between observation numbers 188,461 and 188,462.</td>
</tr>
<tr>
<td>7</td>
<td>$A_{70} = \left(314,101 + 1\right) \frac{70}{100} = 219,871.4$</td>
<td>The seventh decile can be found between observation numbers 219,871 and 219,872.</td>
</tr>
<tr>
<td>8</td>
<td>$A_{80} = \left(314,101 + 1\right) \frac{80}{100} = 251,281.6$</td>
<td>The eighth decile can be found between observation numbers 251,281 and 251,282.</td>
</tr>
<tr>
<td>9</td>
<td>$A_{90} = \left(314,101 + 1\right) \frac{90}{100} = 282,691.8$</td>
<td>The ninth decile can be found between observation numbers 282,691 and 282,692.</td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.
Annex Table 9.2. Decile Locations (For the combined dataset of Compensation Income Earners, Self-Employed, and Professionals)

<table>
<thead>
<tr>
<th>Decile</th>
<th>Location</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$A_{10} = (\frac{5,090,597 + 1}{100}) \times 10$</td>
<td>The first decile can be found between observation numbers 509,059 and 509,060 (observations arranged in ascending order of annual income).</td>
</tr>
<tr>
<td></td>
<td>$= 509,059.8$</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$A_{20} = (\frac{5,090,597 + 1}{100}) \times 20$</td>
<td>The second decile can be found between observation numbers 1,018,119 and 1,018,120.</td>
</tr>
<tr>
<td></td>
<td>$= 1,018,119.6$</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>$A_{30} = (\frac{5,090,597 + 1}{100}) \times 30$</td>
<td>The third decile can be found between observation numbers 1,527,179 and 1,527,180</td>
</tr>
<tr>
<td></td>
<td>$= 1,527,179.4$</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>$A_{40} = (\frac{5,090,597 + 1}{100}) \times 40$</td>
<td>The fourth decile can be found between observation numbers 2,036,239 and 2,036,240.</td>
</tr>
<tr>
<td></td>
<td>$= 2,036,239.2$</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$A_{50} = (\frac{5,090,597 + 1}{100}) \times 50$</td>
<td>The fifth decile can be found at observation number 2,545,299 and 2,545,300</td>
</tr>
<tr>
<td></td>
<td>$= 2,545,299$</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$A_{60} = (\frac{5,090,597 + 1}{100}) \times 60$</td>
<td>The sixth decile can be found between observation numbers 3,054,358 and 3,054,359.</td>
</tr>
<tr>
<td></td>
<td>$= 3,054,358.8$</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>$A_{70} = (\frac{5,090,597 + 1}{100}) \times 70$</td>
<td>The seventh decile can be found between observation numbers 3,563,418 and 3,563,419.</td>
</tr>
<tr>
<td></td>
<td>$= 3,563,418.6$</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>$A_{80} = (\frac{5,090,597 + 1}{100}) \times 80$</td>
<td>The eighth decile can be found between observation numbers 4,072,478 and 4,072,479.</td>
</tr>
<tr>
<td></td>
<td>$= 4,072,478.4$</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>$A_{90} = (\frac{5,090,597 + 1}{100}) \times 90$</td>
<td>The ninth decile can be found between observation numbers 4,581,538 and 4,581,539.</td>
</tr>
<tr>
<td></td>
<td>$= 4,581,538.2$</td>
<td></td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.
**Annex Table 10.1.** Decile Values (For the first BIR dataset simply showing the number of taxpayers per income bracket)

<table>
<thead>
<tr>
<th>Decile</th>
<th>Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(D_1 = -0.50 + 9,999.99) (\frac{314,101}{1021,767} - 0) = 2,579.02</td>
<td>10 percent of the 2012 personal income tax filers earned less than P2,579.02 annual income.</td>
</tr>
<tr>
<td>2</td>
<td>(D_2 = -0.50 + 9,999.99) (\frac{314,101}{1021,767} - 0) = 5,158.54</td>
<td>20 percent of the 2012 personal income tax filers earned less than P5,158.54 annual income.</td>
</tr>
<tr>
<td>3</td>
<td>(D_3 = -0.50 + 9,999.99) (\frac{314,101}{1021,767} - 0) = 7,738.07</td>
<td>30 percent of the 2012 personal income tax filers earned less than P7,738.07 annual income.</td>
</tr>
<tr>
<td>4</td>
<td>(D_4 = 9,999.5 + 9,999.99) (\frac{314,101}{10150,223} - 121,767) = 10,257.34</td>
<td>40 percent of the 2012 personal income tax filers earned less than P10,257.34 annual income.</td>
</tr>
<tr>
<td>5</td>
<td>(D_5 = 19,999.5 + 9,999.99) (\frac{314,101}{10170,447} - 150,223) = 20,400.06</td>
<td>50 percent of the 2012 personal income tax filers earned less than P20,400.06 annual income.</td>
</tr>
<tr>
<td>6</td>
<td>(D_6 = 39,999.5 + 9,999.99) (\frac{314,101}{10196,691} - 186,021) = 40,123.53</td>
<td>60 percent of the 2012 personal income tax filers earned less than P40,123.53 annual income.</td>
</tr>
<tr>
<td>7</td>
<td>(D_7 = 79,999.5 + 9,999.99) (\frac{314,101}{10223,643} - 218,229) = 80,072.91</td>
<td>70 percent of the 2012 personal income tax filers earned less than P80,072.91 annual income.</td>
</tr>
<tr>
<td>8</td>
<td>(D_8 = 149,999.5 + 9,999.99) (\frac{314,101}{10252,992} - 250,033) = 150,048.82</td>
<td>80 percent of the 2012 personal income tax filers earned less than P150,048.82 annual income.</td>
</tr>
<tr>
<td>9</td>
<td>(D_9 = 359,999.5 + 9,999.99) (\frac{314,101}{10283,034} - 282,282) = 360,013.95</td>
<td>90 percent of the 2012 personal income tax filers earned less than P360,013.95 annual income.</td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.
### Annex Table 10.2. Decile Values (For the combined dataset of Compensation Income Earners, Self-Employed, and Professionals)

<table>
<thead>
<tr>
<th>Decile</th>
<th>Value</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$D_1 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>10 percent of the 2012 personal income tax filers earned less than ₱7,500.10 annual income.</td>
</tr>
<tr>
<td>2</td>
<td>$D_2 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>20 percent of the 2012 personal income tax filers earned less than ₱15,000.70 annual income.</td>
</tr>
<tr>
<td>3</td>
<td>$D_3 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>30 percent of the 2012 personal income tax filers earned less than ₱22,501.29 annual income.</td>
</tr>
<tr>
<td>4</td>
<td>$D_4 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>40 percent of the 2012 personal income tax filers earned less than ₱30,001.89 annual income.</td>
</tr>
<tr>
<td>5</td>
<td>$D_5 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>50 percent of the 2012 personal income tax filers earned less than ₱37,502.49 annual income.</td>
</tr>
<tr>
<td>6</td>
<td>$D_6 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>60 percent of the 2012 personal income tax filers earned less than ₱45,003.09 annual income.</td>
</tr>
<tr>
<td>7</td>
<td>$D_7 = -0.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>70 percent of the 2012 personal income tax filers earned less than ₱52,503.68 annual income.</td>
</tr>
<tr>
<td>8</td>
<td>$D_8 = 60,000.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>80 percent of the 2012 personal income tax filers earned less than ₱60,003.48 annual income.</td>
</tr>
<tr>
<td>9</td>
<td>$D_9 = 100,000.50 + 60,000 \left(\frac{5,090,597}{10} \right)_{4,072,153}$</td>
<td>90 percent of the 2012 personal income tax filers earned less than ₱102,387.39 annual income.</td>
</tr>
</tbody>
</table>

Source: AIM Policy Center calculations using BIR data.
Annex Dataset 1. Number of Taxpayers per Income Bracket (2008-2012)

### Data on Compensation Income Tax Filers by Gross Taxable Income for CY 2012

**Source:** DWH - 2012 1604CF Alphalist

**Rundate:** February 21, 2014

<table>
<thead>
<tr>
<th>Gross Income Bracket</th>
<th>ZERO EXEMPTION</th>
<th>SINGLE</th>
<th>MARRIED</th>
<th>UNDEFINED</th>
<th>Total No. of Taxfilers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not over 60,000</td>
<td>73,939</td>
<td>2,115,925</td>
<td>307,568</td>
<td>37,402</td>
<td>11,032</td>
</tr>
<tr>
<td>over 60,001 to 100,000</td>
<td>1,439</td>
<td>118,369</td>
<td>9,855</td>
<td>3,493</td>
<td>1,040</td>
</tr>
<tr>
<td>over 100,001 to 150,000</td>
<td>918</td>
<td>73,922</td>
<td>6,774</td>
<td>2,658</td>
<td>699</td>
</tr>
<tr>
<td>over 150,001 to 200,000</td>
<td>519</td>
<td>34,785</td>
<td>2,875</td>
<td>1,205</td>
<td>311</td>
</tr>
<tr>
<td>over 200,001 to 300,000</td>
<td>499</td>
<td>27,484</td>
<td>2,083</td>
<td>917</td>
<td>247</td>
</tr>
<tr>
<td>over 300,001 to 400,000</td>
<td>200</td>
<td>10,711</td>
<td>814</td>
<td>341</td>
<td>101</td>
</tr>
<tr>
<td>over 400,001 to 500,000</td>
<td>129</td>
<td>5,223</td>
<td>415</td>
<td>149</td>
<td>50</td>
</tr>
<tr>
<td>over 500,001 to 600,000</td>
<td>78</td>
<td>2,776</td>
<td>200</td>
<td>62</td>
<td>26</td>
</tr>
<tr>
<td>over 600,001 to 700,000</td>
<td>44</td>
<td>1,866</td>
<td>127</td>
<td>40</td>
<td>18</td>
</tr>
<tr>
<td>over 700,001 to 800,000</td>
<td>54</td>
<td>1,173</td>
<td>77</td>
<td>28</td>
<td>10</td>
</tr>
<tr>
<td>over 800,001 to 900,000</td>
<td>27</td>
<td>775</td>
<td>56</td>
<td>29</td>
<td>11</td>
</tr>
<tr>
<td>over 900,001 to 1,000,000</td>
<td>25</td>
<td>584</td>
<td>46</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>over 1,000,001 to 2,000,000</td>
<td>14</td>
<td>103</td>
<td>14</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>over 2,000,001 to 4,000,000</td>
<td>10</td>
<td>46</td>
<td>17</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>over 4,000,001 to 6,000,000</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>over 6,000,001 to 8,000,000</td>
<td>5</td>
<td>51</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>over 8,000,001 to 10,000,000</td>
<td>2</td>
<td>17</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>over 10,000,001 to 12,000,000</td>
<td>1</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>over 12,000,001</td>
<td>7</td>
<td>64</td>
<td>3</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

**TOTAL** | 78,049 | 2,415,891 | 130,861 | 46,454 | 13,586 | 5,928 | 636,947 | 511,334 | 450,320 | 276,646 | 162,903 | 564,294 | 6,336,390 |

**Note:**

a. additional columns for Zero & Undefined Exemptions are included in this report

b. Gross Income Bracket = Gross Taxable Income (GTI)

c. Gross Taxable Income is sum(13th Month & other Benefits + Salaries & Other Forms of Compensation)

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### Distribution of Individuals Engaged in Business, Professionals and Self-Employed Income Tax Filers by Gross Income Bracket and by Status and No. of Dependents for CY 2012

**Source:** RPS 2012

**Rundate:** February 21, 2014

<table>
<thead>
<tr>
<th>Gross Income Bracket</th>
<th>0 DPND</th>
<th>1 DPND</th>
<th>2 DPND</th>
<th>3 DPND</th>
<th>4 DPND</th>
<th>0 DPND</th>
<th>1 DPND</th>
<th>2 DPND</th>
<th>3 DPND</th>
<th>4 DPND</th>
<th>UNDEFINED</th>
<th>Total No. of Taxpayers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not over 60,000</td>
<td>20,026</td>
<td>1,439</td>
<td>499</td>
<td>78</td>
<td>44</td>
<td>54</td>
<td>27</td>
<td>2,776</td>
<td>200</td>
<td>129</td>
<td>7</td>
<td>78,049</td>
</tr>
<tr>
<td>over 60,001 to 100,000</td>
<td>2,415,891</td>
<td>130,861</td>
<td>46,454</td>
<td>13,586</td>
<td>5,928</td>
<td>636,947</td>
<td>511,334</td>
<td>450,320</td>
<td>276,646</td>
<td>162,903</td>
<td>564,294</td>
<td>6,336,390</td>
</tr>
<tr>
<td>over 100,001 to 150,000</td>
<td>46,434</td>
<td>19</td>
<td>735</td>
<td>2,415</td>
<td>293</td>
<td>46,434</td>
<td>19</td>
<td>735</td>
<td>2,415</td>
<td>293</td>
<td>46,434</td>
<td>19</td>
</tr>
</tbody>
</table>

**Note:**

a. an additional column for Undefined Exemptions is included in this report

b. These are taxpayers with blank Extype code and Num of Dependents or those having blank Extype code and non-blank Number of dependents

c. Gross Income Bracket (Total Gross Income is equal of Taxable and Other Taxable Income), where:

b.1 Taxable = sum_of_COMPINCOME_GROSS_SALES,SPS_COMPINCOME_GROSS_SALES

b.2 Non-taxable = sum_of_COMPINCOME_EXMTN,SPS_COMPINCOME_EXMTN

c.3 Other Taxable Income = sum_of_OTHR_TXBLE_INCL,OTHR_TXBLE_INCL2,SPS_OTHR_TXBLE_INCL,SPS_OTHR_TXBLE_INCL2

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83

5,701,245
Employees’ job satisfaction and commitment: Work values of an organization

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ABSTRACT
This paper reports a study on the effects of demographics and work experiences on job satisfaction and organizational commitment among 117 middle-management officers of a retail bank. Job Satisfaction portion of Job Diagnostic Survey (JDS) instrument developed by Hackman and Oldman (1977) was used for this study while the three-component model of commitment developed by Meyer and Allen (1997) was used to measure the organizational commitment. Demographics was operationalized on the basis of three categories: gender, age, and marital status while work experiences profile was operationalized on the basis of seven categories: years in service, number of years in current position, number of years’ experience with other companies, work near residence, experience with other companies, number of times promoted and number of times transferred from one branch to another. This study revealed that marital status significantly affects job satisfaction while age and work near residence significantly affect organizational commitment. Furthermore, it was also revealed that variables such as age, marital status, years in service, number of years in current position, work near residence and experience with other company significantly moderate the relationship between job satisfaction and organizational commitment.

Keywords: job satisfaction, organizational commitment, demographics and work experiences

INTRODUCTION
According to Maria and Raza (2013), the banking sector is one of the most demanding fields where employees are constantly under job overload and job stress due to the sensitive nature of their work. In addition, traditions are now being rapidly replaced by innovations. This rapid advancements and development have laid some impacts on banks and its stakeholders. Thus, making banking jobs more demanding than ever.

Bank employees from rank and file to managerial positions have to work harder than before. From entertaining valued clients in the best way possible while performing other internal/external job requirements, they, at the same time, have to face organizational politics.

Today, banking organizations are facing several challenges such as growth and sustainability. Considering the fact that different international and
well-reputable banks are now operating in the country. These challenges have
given rise to the current status of working in a bank. It is noteworthy to consider
that regardless of workloads, a satisfied employee continues to be committed to
the organization he works for.

In relation to this, determining the level of their job satisfaction and how
it affects their organizational commitment is deemed important, thus this study
will provide baseline data as banks work to improve their human resource
practices.

This study is limited to middle management bank employees of a retail
bank. The scope of the study is to determine if respondents’ demographics and
work experiences moderate the relationship between job satisfaction and
organizational commitment. Furthermore, the differences in work values
according to demographics and work experiences will also be evaluated.

Research Problem

To improve the exchange of relationship between organization and
employees, this study aims to determine how demographics and work
experiences affect employee’s job satisfaction and organizational commitment.
Specifically, it will answer the following research questions:

1. What satisfies a bank employee? Does it differ in terms of their
   personal and work-related profile?
2. What is the level of bank employee’s organizational commitment?
   Does it differ in terms of their demographics and work experiences?
3. Is the relationship between job satisfaction and organizational
   commitment moderated by their demographics and work
   experiences?

Research Objectives

1. To determine the factor/s that satisfy a bank employee.
2. To determine if level of satisfaction of an employee differ according
to their demographics and work experiences?
3. To determine if level of commitment of an employee differ according
to their demographics and work experiences.
4. To determine if the relationship between job satisfaction and
   organizational commitment is moderated by their demographics and
   work experiences.

Research Hypotheses

RH#1. Employees’ job satisfaction differs when grouped according to their
demographics and work experiences.
RH#2. Employees’ organizational commitment differs when grouped according to
their demographics and work experiences.
RH#3. Employees’ demographics and work experiences moderate the relationship
between job satisfaction and organizational commitment.
Significance of the Study

This study is deemed significant because satisfied employees build and participate in the success of an organization. In addition, this study will help managers in building the right relationship with their employees thus improving their performance. Lastly, the company needs to identify factors that can make employees work willingly for the benefit and success of the organization.

Furthermore, the level of organizational commitment is important to understand because having a committed workforce is seen as the key factor in achieving competitive performance. Advantaged of gaining employee commitment have been perceived to lower labor turnover, extra role behavior, better product and service quality and employee flexibility leading to the organizations competitive advantage. In addition, committed employees can be expected to exercise responsible autonomy or self-control, removing the need for supervisor and producing efficient gains. Therefore, commitment in the workforce moves away from the traditional psychological contract of a “fair days’ work for a fair days’ pay” and instead, to a contract which implies that employees will go the extra mile for the company.

RELATED LITERATURES AND STUDIES

Job Satisfaction

The concept of satisfaction originated from the humanistic school of thought, one of the branches of psychology. The precursor and a supporter of the school was A. Maslow, who believed that people seek to satisfy their needs in a proper hierarchical order. From the lowest level and moving upward, he ranks first physiological needs, then safety, love and belongingness, self-esteem and self-actualization. According to Maslow, only after feeling of satisfaction in meeting the needs of a lower level are there a desire to implement a need on a higher level (Sypniewska, 2014).

Job satisfaction is a state where an employee has an emotional perception of his situation and reacts with feelings of pleasure or pain. It is considered in different categories related to how each employee evaluates and thinks about his work. Job satisfaction is closely related to the performance and quality of work performance by an employee, and, consequently, translates into the success of an organization, because a satisfied employee builds and participates in the success of any organization (Sypniewska, 2014).

In the study of Belias, Koustelios, Sdrolias and Koutiva (2013), as well as the study of Belias, Koustelios, Koutiva et al. (2014), the aspects of job satisfaction were the organization as a whole and work itself. Employees get seriously involved and work their best to succeed on a job that they found to be valuable, satisfying and interesting.

The study of Belias et al. (2015) showed that, in general, bank employees seem to be quite satisfied with their work, especially with their immediate superior, working conditions and work itself, although they are less satisfied with the promotion opportunities offered by the institution. This finding confirms previous studies that have been conducted among bank employees in Greece, the
majority of which shows that the levels of employees’ job satisfaction are rather high nowadays.

Hira and Waqas (2012) found there was a positive relationship between job satisfaction and job performance in a survey of 335 respondents that work in middle level of banking sector. Iqbal et al. (2012) also found that job satisfaction has a positive impact on job performance in a survey of 251 respondents from various universities.

The previous studies have shown that job performance was influenced significantly by job satisfaction. A number of studies found that job satisfaction also had a significant impact on organizational commitment (Qureshi et al. 2015; Maleknia et al. 2011).

Organizational Commitment

Organizational commitment of employees in the organization became a buzzword for the manager’s different researchers were conducted in developing as well as developed nation to make their organization productive most of studies are conducted on organizational commitment in the USA. Organizational commitment is taken as the level to which an employee is faithful to their organization, and it is a condition in which an employee recognized himself/herself with a particular organization and its objectives, and wants to remain its participant (Khan and Jan, 2015; Carman-Tobin, 2011).

Committed employees are regarded as a vital source for the success of an organization. When organizational rules are observed by employees, there will be a suitable opportunity for increasing organizational commitment. On the other hand, personality characteristics and individualistic differences of people are among the most important factors which predict their organizational commitment and can help organizations reach the goals and productivity (Rafee, Bahrami, Entezarian 2014).

Numerous studies found organizational commitment has a positive significant relationship with variables such as job years (Yaghoubi et al. 2010, Maleknia et al. 2011, Mohabati et al. 2013, Farid et al. 2014), age (Yaghoubi et al. 2010, Maleknia et al. 2011, Noordin et al., 2011; Yucel 2012, Farid et al. 2014), gender (Farid et al. 2014), education (Nehrir et al. 2010, Maleknia et al. 2011, Mohabati et al. 2013, Nabizadeh 2014), and marital status (Farid et al. 2014).

Fu et al. (2013) reported that facets of job satisfaction (pay, co-worker, supervision, and work itself) had a significant impact on organizational commitment. Positive significant relationship also exists between job satisfaction and organizational commitment as revealed by the study of Dargahi H & SG (2014).

This study differs in the above-related studies because of its main objective, which is to find out if the demographics and work experiences moderate the relationship between job satisfaction and organizational commitment.

CONCEPTUAL FRAMEWORK

The study claimed that the level of job satisfaction and organizational commitment of the respondents differ according to their demographics and work
experiences. Furthermore, it also claimed that the relationship between job satisfaction and organizational commitment is moderated by demographics and work experiences.

**Figure 1. Hypothetical Model**

![Hypothetical Model](image)

Notice that the variables of the study are explicit in the paradigm presented in Figure 1. In the illustration, the variables are 1) job satisfaction (independent), 2) demographics and work experiences (moderating), and, 3) organizational commitment (dependent). The study of Dargahi et al (2014) and Fu et al (2013) revealed that facets of job satisfaction had positive, significant impact to organizational commitment.

Job satisfaction will be measured according to five categories – job security, pay, social, supervision and growth while organizational commitment will be measured according to four categories – affective commitment, continuance commitment, indebted obligation and moral imperative.

Demographics is operationalized on the basis of three categories: gender, age, and marital status while work experiences is operationalized on the basis of seven categories: years in service, number of years in current position, number of years’ experience with other companies, work near residence, experience with other companies, number of times promoted and number of times transferred from one branch to another.

**METHOD**

*Research Design*

The design of the study is descriptive-exploratory. Descriptive-exploratory research design seeks to provide an accurate description of observations of a phenomena and looking at the kind of relationship that exist between the measures understudy. It will describe the respondents’ demographics and work experiences, their level of job satisfaction and, extent of their organizational commitment. Furthermore, the study will explore if demographics and work experiences affects the direction of the relationship between employees’ job satisfaction and their organizational commitment.

*Samples and Procedures*

In the conduct of the research, the survey forms and interview methods were drafted in a very clear and concise manner to prevent conflicts among respondents. Proper communication and approval with the Region Head for the conduct of the survey was sought and granted. The researcher talked to the target respondents and, requested for their participation. Bank officers who agreed to participate were given the survey forms. They were given ample time to respond to the questions to avoid errors and inaccuracies in their answers. The
respondents were given a waiver regarding the confidentiality of their identity and the information that they did not wish to disclose. The respondents’ were assured that the data gathered from them would be treated with the strictest confidence, so that they would be more open. This was done with the hope that this would promote trust between the researcher and the respondents. A total of 117 officers participated in the study which comprises more than 70% of the total number. Data gathering was conducted during the month of October.

Measures

Job Satisfaction. Job Satisfaction portion of Job Diagnostic Survey (JDS) instrument developed by Hackman and Oldman (1977) was used for this study. General satisfaction measures of the degree to which the employee is satisfied and happy with job. Respondents respond to the query for each item, using a 6-point scale which ranges from “extremely dissatisfied” to “extremely satisfied”. The 14-items are divided to five sub-scales: job security (#1, #11), pay and other compensation (#2, #9), peers and co-worker (“social” satisfaction - #4, #7, #12), supervision (#5, #8, #14) and opportunities for personal growth and development on the job (“growth” satisfaction - #3, #6, #10, #13).

Organizational Commitment. The three-component model of commitment developed by Meyer and Allen (1997) was used. This model proposes that organizational commitment is experienced by the employee as three simultaneous mind sets encompassing affective, normative, and continuance organizational commitment. Affective Commitment reflects commitment based on emotional ties the employee develops with the organization primarily via positive work experiences. Normative Commitment reflects commitment based on perceived obligation towards the organization, for example rooted in the norms of reciprocity, it will divided into two dimensions – Indebted Obligation and Moral Imperative. Continuance Commitment reflects commitment based on the perceived costs, both economic and social of leaving the organization.

The questions are designed in 6-point Likert scale from 1 (strongly disagree) to 6 (strongly agree). In this questionnaire, 9 questions (4, 5, 6, 8, 9, 12, 18, 19, and 24) have a reverse code.

ANALYSIS

The data was analyzed using SPSS v21 software. To satisfy the research objectives and hypotheses posted, different statistical treatments were used. Mean and standard deviation will describe the level of job satisfaction and perceived organizational commitment. Pearson correlation coefficient will determine the strength and direction of relationship between job satisfaction and organizational commitment. To test the significant differences in their level of job satisfaction and organizational commitment when grouped according to their demographics and work experiences, t-test for two independent samples and one-way analysis of variance will be used. In addition, regression analysis will be used to determine if demographics and work experiences moderate the relationship between job satisfaction and organizational commitment.
Discussion of Findings

In this study, the purpose is to add more understanding of how job satisfaction and related demographics and work experiences contribute to organizational commitment in the demanding work environment of banking industry.

First of all, the reliability and validity of the job satisfaction and organizational commitment (affective commitment, continuance commitment, and normative commitment – indebted obligation and moral imperative) were assessed. Cronbach’s Alpha Coefficient was used in the reliability analysis of the scales in use in the research. Cronbach’s Alpha Coefficient of the job satisfaction categories – job security (0.818), pay (0.847), social (0.839), supervision (0.910), and growth (0.866) while Cronbach’s Alpha Coefficient of the affective commitment scale is 0.755, for continuance commitment scale is 0.736), and for normative commitment scale – indebted obligation (0.877) and moral imperative (0.875). Results of the validity analysis of the scales and all Cronbach’s Alpha Coefficient are given below in Tables 1.

An indication of the stability and consistency with which the instrument measures the concept and helps to assess the “goodness” of measure is reliability of measure. In this study, internal consistency reliability of the scales was assessed. To assess the reliability of a summated scale where several items are summed to form a total score, internal consistency reliability is used. A popular approach to determine internal consistency reliability is the Coefficient alpha or Cronbach’s alpha. This coefficient varies from 0 to 1, and a value of 0.6 or less indicates unsatisfactory internal reliability (Malhotra, 2010). Cronbach’s alpha coefficient is the most widely recommended measure of the reliability of a measurement scale with multipoint items. The higher the coefficients, the better the measuring instrument (Sekaran and Bougie, 2010). The results of job satisfaction, affective commitment, continuance commitment, normative commitment – indebted obligation and moral imperative scales reliability analysis were presented in Table 1.

<table>
<thead>
<tr>
<th>Table1. Reliability Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constructs</td>
</tr>
<tr>
<td>Job Satisfaction</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Organizational Commitment</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Employees’ Job Satisfaction differs according to their demographics and work experiences

Table 2 shows that among the demographics only marital status exhibits significant differences in satisfaction with regards to pay (\(F=7.790, p\text{-value}<0.01\)) and, in supervision (\(F=3.735, p\text{-value}<0.01\)). Therefore, the research hypothesis is not rejected for marital status in relation to pay and supervision.

Single employees are more satisfied than married and separated employees in terms of pay, while it is the married employees who are more satisfied than single employees in supervision. The results may be explained by their role in the family, especially if they are not sole or primary income earner (Saner and Eyüpoğlu, 2013). Single employees are most likely in the early stage of their work experience with the bank, and appreciate all attention given to them to perform well. Overall job satisfaction levels vary for different marital status. Different levels of job satisfaction may result in the need for the management to consider different motivational techniques in order to improve performance and organizational commitment. Furthermore, job satisfaction translates into a healthy and positive working environment (Saner and Eyüpoğlu, 2013).

Table 2. Difference in Job Satisfaction according to demographics and work experiences

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Demographic Profile</th>
<th>Work Profile</th>
<th>Gender</th>
<th>Age Group</th>
<th>Marital Status</th>
<th>Years in Service</th>
<th># of years in current position</th>
<th># of years experience with other companies</th>
<th>Work near residence</th>
<th>Experience with other companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay</td>
<td></td>
<td></td>
<td>1.025</td>
<td>1.887</td>
<td>7.790***</td>
<td>1.060</td>
<td>1.705</td>
<td>0.411</td>
<td>-1.175</td>
<td>0.656</td>
</tr>
<tr>
<td>Job Security</td>
<td>0.702</td>
<td></td>
<td>0.297</td>
<td>2.146</td>
<td>3.130</td>
<td>0.265</td>
<td>1.213</td>
<td>0.644</td>
<td>0.457</td>
<td>-0.459</td>
</tr>
<tr>
<td>Social</td>
<td>-0.189</td>
<td></td>
<td>0.907</td>
<td>0.32</td>
<td>0.927</td>
<td>1.002</td>
<td>1.402</td>
<td>0.373</td>
<td>-0.518</td>
<td>-0.927</td>
</tr>
<tr>
<td>Supervision</td>
<td>0.428</td>
<td></td>
<td>0.197</td>
<td>3.795**</td>
<td>2.147</td>
<td>0.265</td>
<td>2.072</td>
<td>0.316</td>
<td>-0.067</td>
<td>-0.79</td>
</tr>
<tr>
<td>Growth</td>
<td>0.306</td>
<td></td>
<td>0.254</td>
<td>2.748</td>
<td>0.373</td>
<td>0.473</td>
<td>0.704</td>
<td>0.414</td>
<td>0.063</td>
<td>-0.05</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>0.342</td>
<td></td>
<td>0.704</td>
<td>3.987***</td>
<td>0.866</td>
<td>1.419</td>
<td>0.273</td>
<td>-0.338</td>
<td>-0.367</td>
<td>-0.367</td>
</tr>
</tbody>
</table>

*** significant at 0.01, ** significant at 0.05, * significant at 0.10

Employees’ Organizational Commitment differs according to their demographics and work experiences

Table 3 shows that the organizational commitment differs significantly according to age group (\(F=2.922, p\text{-value}<0.05\)) specifically in indebted obligations (\(F=3.004, p\text{-value}<0.05\)).

In addition, the organizational commitment of employees also differs significantly in “work near residence” (\(t=2.456, p\text{-value}<0.05\)) specifically in continuance commitment (\(t=3.080, p\text{-value}<0.05\)) and in moral imperative (\(t=2.129, p\text{-value}<0.05\)).

The study also revealed that only age and working near residence affects organizational commitment. Age is limited to its indebted obligation component while working near residence is limited to continuance commitment and moral imperative components. Older employees perceived a higher need to meet others’ expectation compared to younger age groups.

The study found that working near their residence drive employees to continue their commitment with the organization. It would probably be the
benefits of not traveling far, which we all know that it consumes time and, the feeling of exhaustion even before we start the day in the office.

**Table 3.** Difference in Organizational Commitment according to demographic and work-related profiles

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Demographic Profile</th>
<th>Work Profile</th>
<th>Work near residence</th>
<th>Experience with other companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affective Commitment</td>
<td>Gender</td>
<td>Age Group</td>
<td>Marital Status</td>
<td>Years in Service</td>
</tr>
<tr>
<td></td>
<td>1.955</td>
<td>2.435</td>
<td>0.743</td>
<td>0.439</td>
</tr>
<tr>
<td>Continuance Commitment</td>
<td>-0.065</td>
<td>0.945</td>
<td>0.396</td>
<td>1.140</td>
</tr>
<tr>
<td>Indebted Obligation</td>
<td>-0.362</td>
<td>3.054**</td>
<td>0.952</td>
<td>0.520</td>
</tr>
<tr>
<td>Moral Imperative</td>
<td>-0.562</td>
<td>1.447</td>
<td>0.328</td>
<td>0.846</td>
</tr>
<tr>
<td>Organizational Commitment</td>
<td>0.612</td>
<td>2.922**</td>
<td>0.38</td>
<td>0.540</td>
</tr>
</tbody>
</table>

*** significant at alpha=0.01, ** significant at alpha=0.05, * significant at alpha=0.10

**Correlation between Organizational Commitment and Job Satisfaction**

Table 4 shows that the relationship between number of times promoted and number of times transferred is statistically significant (r=0.353, p-value<0.01) as well as the relationship between job satisfaction and organizational commitment (r=0.245, p-value<0.05). The relationship of number of times promoted and transferred was found to be not statistically significant with job satisfaction and organizational commitment.

**Table 4. Correlation between Frequency of Promotion and Transfer, Job Satisfaction and Organizational Commitment**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. # of times promoted</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. # of times transferred</td>
<td>0.353***</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>3. job satisfaction</td>
<td>-</td>
<td>0.005</td>
<td>-</td>
</tr>
<tr>
<td>4. organizational commitment</td>
<td>-</td>
<td>0.013</td>
<td>-</td>
</tr>
</tbody>
</table>

*** significant at alpha=0.01, ** significant at alpha=0.05, * significant at alpha=0.10

Table 5 shows that the effect of job satisfaction on organizational commitment is found to be significantly moderated by marital status (R² change=0.037, p-value<0.05), years in service (R² change=0.060, p-value<0.01).

It was revealed that variables such as marital status and years in service moderate the relationship between job satisfaction and organizational commitment. The percent of change in the variance of organizational commitment scores is significantly attributed to the interaction between these variables and job satisfaction.
Table 5. Relationship of the interaction of Job Satisfaction and Demographics and Work Experiences with Organizational Commitment

<table>
<thead>
<tr>
<th>Moderating Variables</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>R²</td>
</tr>
<tr>
<td>Gender</td>
<td>0.245**</td>
<td>0.060</td>
</tr>
<tr>
<td>Age</td>
<td>0.312***</td>
<td>0.098</td>
</tr>
<tr>
<td>Marital Status</td>
<td>0.258**</td>
<td>0.067</td>
</tr>
<tr>
<td>Years in Service</td>
<td>0.258**</td>
<td>0.067</td>
</tr>
<tr>
<td># of years in current position</td>
<td>0.245**</td>
<td>0.060</td>
</tr>
<tr>
<td># of years experience with other companies</td>
<td>0.251**</td>
<td>0.063</td>
</tr>
<tr>
<td>Work near residence</td>
<td>0.337***</td>
<td>0.113</td>
</tr>
<tr>
<td>Experience with other company</td>
<td>0.263**</td>
<td>0.069</td>
</tr>
<tr>
<td># of times promoted</td>
<td>0.245**</td>
<td>0.060</td>
</tr>
<tr>
<td># of times transferred from one branch to another</td>
<td>0.331***</td>
<td>0.110</td>
</tr>
</tbody>
</table>

Model 1: (Predictors) job satisfaction, demographic/work profile

Model 2: (Predictors) job satisfaction, demographic/work profile, interaction bet job satisfaction & demographic/work profile

Dependent variable for Model 1 & 2: Organizational Commitment

***Significant @ 0.01, ** significant @ 0.05, * significant @0.10

The findings of this study provided additional support to the findings of Farid et al. 2014, Saner and Eyüpoğlu, 2013, Yucel 2012, Qureshi et al. 2012, Maleknia et al., 2011; Noordin et al., 2011; Yaghoubi et al, 2010 to name a few on the relationship between job satisfaction, organizational commitment, demographics.

CONCLUSION AND RECOMMENDATION

To improve the exchange of relationship between organization and employees, this study aimed to determine the contribution of demographics and work experiences to employee’s job satisfaction and organizational commitment.

The study found that job satisfaction affects the organizational commitment of the employees. This implies that in order for the bank management to ensure organizational commitment, there is a need for them to constantly assess the level of motivation and the motivators of their workers as well, to make sure that their employees are on the right level of motivation. Further, the study revealed that factors like age, marital status, years in service, and work near residence are moderators between job satisfaction and organizational commitment. Hence, it implies that the level of motivation is not similar for all types of employees in the bank and varies depending on their profile. This implies that there is a need to consider these factors when the management, through HR is designing a motivation strategy for its workers.

Relationship is a two-way street, therefore it is recommended that this kind of study be continued covering the entire organization with the participation of the people from the top down to rank and file. In an organization, people come
and go and there will always be new rules to follow but at the end of the day organizations gain is also its peoples gain.

It is not always about satisfying one’s need but it is also about performance and commitment. In this regard, further studies may look into the possibility of adding employee’s performance self-evaluation and immediate superiors’ evaluation as predictors to organizational commitment. Bi-directional test is also recommended wherein job satisfaction, performance; commitment can be dependent or independent variables, and individual characteristics (demographics and work experiences).

Job satisfaction and organizational commitment will always be topic of major interest for many researchers, and, these are organizational variables that should be understood and constantly monitored for the well-being of an organization and its stakeholders.

REFERENCES


Developing a fraud prediction model: Application of artificial intelligence methods using firm-specific data and locational factors

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ABSTRACT
Corporate fraud, just like any irregularity, can start insignificant; but when blown out of proportion, may cause devastating effects beyond anyone’s expectations. After several financial crises and economic collapses, the cycle of corporate malpractice continues to plague the business world, with people still failing to grasp its significance. This study emphasizes the need for early detection, thus aiding in keeping fraud occurrence to a minimum. This research sought to develop a forecasting model that could predict the occurrence of fraud in companies based on publicly available financial and locational information, specifically: current ratio (CR), total asset turnover (TATO), return on assets (ROA), debt to asset ratio (DAR), current asset to total asset ratio (CATA), corruption perception index (CPI) and gross domestic product (GDP). The model was estimated through the use of logistic regression and artificial intelligence (AI) models – specifically, fuzzy logic and neural network. These AI models, albeit being more commonly used in the context of engineering and computer science, have proven to be accurate in terms of predictive modeling. Furthermore, the study evaluated which among the three models is the most accurate in predicting fraud occurrence. Logistic regression was used to analyze the independent variables to determine their significance. Findings showed that all the variables, apart from TATO and CATA, were significant. Among them, CR, TATO, DAR, and CATA have a positive effect on the probability of fraud occurrence while ROA, CPI, and GDP have a negative effect on fraud occurrence. The three prediction models were then developed and compared to determine which is best for use by shareholders. Results showed much promise, with the neural network model proving to be the most precise, given the limitations of the study. It produced an accuracy rate of 74%, based on the F-score computed from the confusion matrix. 14.9% were non-fraudulent observations erroneously classified as fraudulent. 12.5% were fraudulent observations erroneously classified as non-fraudulent. This gives the model a total error rate of approximately 27%. The results demonstrated that the model serves its function effectively in predicting fraudulent financial statements, proving that the model could be of assistance in mitigating the widespread effects of fraud.

Keywords: fraud, artificial intelligence, locational factors
INTRODUCTION
From the high-profile accounting scandals of Enron Corporation to the seemingly harmless corporate decisions of Lehman Brothers, history has taught us time and again how devastating the consequences of unethical business practices can be.

Fraud can be defined as the intent to misrepresent, conceal, or omit truths for the purpose of deception or manipulation to the financial detriment of an individual or an organization (Akinyomi, 2010). The propensity and manifestation of fraud vary among the different levels of an organization, with most employees only being able to carry out simple theft, while corrupt managers are able to embezzle large amounts of funds or manipulate financial statements for their benefit.

In recent years, multi-billion dollar companies have been a hub for fraudulent activities; the most popular of them all being Enron. The publicity of Enron’s failure paved the way for the need for stronger controls, policies and procedures in a company. As newer technology becomes available, these controls, policies and procedures are brought up to date. However, as these evolve, the fraudsters evolve with it, updating old methods and finding out ways to bypass illegal practices through the use of loopholes. This has raised the need for new and innovative ways to utilize existing technology to prevent and detect fraud.

As pervasive and inherent as fraud go, the researchers were incited to check if it were possible to develop a model that would aid in predicting the occurrence of fraud, emphasizing the need for early detection as a way to keep fraud to a minimum.

This study seeks to develop an effective and accurate fraud prediction model that will help predict if a company is susceptible to high fraud risk using financial metrics and locational factors. It answers three specific problems:

- How do financial metrics specifically, current ratio, total asset turnover, return on assets, debt to asset ratio, and current assets to total assets ratio - help predict the financial statement fraud occurrence?
- Do locational factors - Gross Domestic Product (GDP) and Corruption Perception Index (CPI) - have a significant impact on the frequency of fraud occurrence?
- Which among these methods - Regression analysis, Fuzzy Logic, and Neural Network - is the most effective and the most accurate in developing a fraud prediction model?

The objectives of this study are consistent with the main goal of developing a fraud prediction model. With this, the study aims:

- To determine which, among Regression, Fuzzy Logic, and Neural Network, is the most effective in developing a fraud prediction model;
- To establish the impact of financial metrics, specifically current ratio, total asset turnover, return on assets, debt to asset ratio, and current assets to total assets ratio, to occurrence of financial statement fraud, and
- To assess whether locational factors - GDP and CPI - have any significant impact on fraud occurrence.

FRAMEWORK

Figure 1 exhibits the different variables that are probable determinants of fraud occurrence. It also shows the different theories that supports the effects of these variables to occurrence of fraud. These are divided into 2 classifications, according to the factors the variables under each group pertain to.
LITERATURE REVIEW

Nature and Occurrence of Fraud

Perpetrators. Contrary to one might think, fraud can be performed by anyone in an organization. According to a 2012 study by the Association of Certified Fraud Examiners (ACFE), they are commonly aged thirty-one to forty-five (31-45) and the instances of male fraudsters are higher than that of females. This is due to the assumption that more men still hold higher positions than women (Coenen, 2008). The report also shows that fraud committed by executives cost greater and harder than fraud committed by a regular employee. However, there are still those fraudulent acts committed by external persons. Other motives may also include but is not limited to, nature and scope of the job, tools/trainings provided, reward recognition system and ethical climate (Singleton, 2010).

Victims. Fraud is most prevalent in companies where there are no controls, no trust, no ethical standards, no profits and no future (Singleton, 2010). Most commonly victimized industries include the banking and financial services sector, the government and public administration sector and the manufacturing sector (ACFE, 2012).

Theories of Occurrence of Fraud

The manifestation of fraud cases has impelled researchers to study these cases and provide theories that will understand the occurrence of fraud, which will be used to prevent fraud from occurring. One of the most notable theories that explain fraud is the fraud triangle, which identified the three key elements of fraud – opportunity, motivation and rationalization. Opportunity is an environment or an impermanent situation that allows for fraud to be committed. Motivation is also known as the motivation to actually perpetrate the fraud. Rationalization is a typical state of conformity, where the individual replaces their own desires for what they believe to be the “greater good”, especially of the organization. The fraud triangle was further developed to the fraud diamond wherein a new element to committing fraud was added, namely capability. Capability means having the skills and knowledge to actually perform the fraud. The fraud diamond was also further developed into the fraud
Methods of fraud

There are many techniques used by individuals in order to deceive intentionally financial statement users for financial gain. The Association of Fraud Examiners (ACFE) enumerated three examples of the methods in which fraud can be committed, one of which is the asset misappropriation. In this, an individual misuses or steals an organization’s assets. The second type is the corruption. It involves the dishonest or illegal behavior especially by powerful people. This may include accepting inappropriate gifts, manipulating business transactions, etc. Lastly, ACFE considers fraudulent statements as a method to commit fraud and by far, the most common method of fraud by high profile companies. This simply include fictitious revenues, improper sales cut-off, failure to record an expense from a current transaction, etc.

Red Flags

Financial metrics. Numerous studies have been conducted in an effort to find effective methods of identifying indicating potentially fraudulent activities. One of proposed methods is ratio analysis.

Various researchers have tried to determine whether or not financial ratios computed from financial statements of fraudulent companies significantly differ from those of nonfraudulent companies. Persons, O. (2011) identified the ten financial ratios and variables commonly used to measure a firm’s financial condition falling under the following categories: financial leverage, profitability, asset composition, liquidity, capital turnover, size, and overall financial position. The author matched samples of fraud and non-fraud firms on the basis of industry and time period. The resulting model correctly identified a large percentage of the fraud firms.

Locational Factors. Corrupt practices are seen to be more prevalent in many emerging and transitional economies today (Wilhelm, 2002). One of the prevailing reasons, as stated by Wilhelm (2002), is that in less developed countries, the cost of living may be high compared to the low salaries. Countries having a higher income may be able to devote more funds to fighting corruption. Corruption puts a negative effect on trust as this hinders commercial activity. This would result to people being less likely to buy, sell or invest in companies with a high level of corruption. This leads to less economic growth, and these forces managers to use “creative accounting” in an effort to attract investors. In addition to corruption, scandals and unethical behavior also reduces efficiency and fairness in markets; thus, decreasing the ability of the firms to adapt to complexity and change (Korsgaard, Schweiger, & Sapienza, 1995; McAllister, 1995).

Another factor to be considered is the level of external regulation. In the United States, Paul Sarbanes and Michael Oxley drafted the Sarbanes-Oxley Act (SOX) in 2002 to protect investors by improving the accuracy and reliability of corporate disclosures made to the public. It established a higher standard for corporate accountability by placing heavier penalties for acts of wrongdoing. It has also drastically changed the role corporate executives by requiring all financial reports to include an internal control report, which is the responsibility of the management, such as sections 302, 404, 802, and 807.
Statistical and Artificial Intelligence Models

Regression. Regression models are statistical tools used for investigating the linear relationship among variables (Gujarati & Porter, 2009). As stated by Sharma and Panigrahi (2012), the logistic regression model is normally used in literature since it can detect fraud up to 95.1% accuracy with significant expectation effect. Although, discrete variables must be transformed into a continuous value which is a function of the probability of the event to occur (Gujarati & Porter, 2009).

Bell and Carcello (2000) also developed a model based on logistic regression. In their study, several fraud risk factors are considered, some of which being: weak internal control environment, company growth, profitability, aggressive attitude of management, interaction with the environment, etc. Spathis (2002) has also employed the logistic regression method in order to come up with a fraud detection model. He used two different input vectors that contain financial ratios. Their report showed that the accuracy rate of the said model is beyond 84%. This simply proves that there really is a potential in detecting fraudulent activity by just using a company’s published financial statements.

Neural Network. Neural network is a computational model that is loosely based on the neuron cell structure of the biological nervous system (Jantzten, 1998). This computational model functions similarly to the natural neurons in the human brain. The process of neural network consists of an input, which can be compared to a synapse in the human brain. Such inputs are multiplied by weights and then computed with a mathematical function, which determines the activation of a neuron (Gershenson, 2013). The calculation of the weights and the hidden layers will lead to the creation of the output.

Neural network offers many advantages relative to other artificial intelligence that can be used in detecting financial fraud. For one, neural network is adaptive- the system’s limitations automatically adjust in order to come up with the correct output for a given input. Thus, this approach less likely is to be affected by accounting manipulations (Feroz, 2000). Second, neural networks can approximate nonlinear functions and naturally models multivariable systems.

A previous study revealed that input vector consisted of financial ratios and qualitative variables, was more effective when fraud detection model was developed using neural network. The model was also compared with standard statistical methods like linear and quadratic discriminant analysis, as well as logistic regression methods (Fanning, 1998).

Another paper illustrated the application of artificial neural networks to test the ability of selected Statement on Auditing Standards (SAS) No. 53 red flags to predict the targets of the SEC investigations. (Feroz, 2000) SAS No. 53 lists several categories of red flags including personnel, financial and audit-oriented red flags. The ANN model successfully distinguishes reporting violators from matched control firms in 81% of the possible cases.

Fuzzy Logic. Fuzzy Logic is a mathematical technique developed by Prof. Lotfi Zadeh in 1965 that is used in evaluating the innate vagueness and imprecision of natural language, as well as the extremely qualitative and ambiguous thinking of humans. Numerous other studies have applied fuzzy logic in various areas of management, business and finance.

In 1998, Deshmukh and Talluru created a rule-based Fuzzy-reasoning system for assessing the risk of management fraud using red flags as linguistic variables that fall under three main categories: condition, motivation, and attitude. The final results proved to be less accurate than previously tested statistical methods.

Ammar, Wright, and Selden (2000) created a multilevel Fuzzy rule-based system in ranking state financial management. Using fuzzy set theory, they successfully developed a
model to measure the effectiveness and rank the performance of state financial management. A similar study was conducted by Chai, Hoogs, & Verschueren (2006). They proposed a method to convert a binary rule-based decision model derived using genetic algorithm into a model that generates fuzzy scores with the objective of ranking company financial statements in the set of potentially fraudulent companies.

**METHODOLOGY**

The study utilized two pools of data, one for the fraudulent companies and the other for the non-fraudulent companies. The fraudulent population used in this study consists of all publicly-listed and delisted companies with a reported material incidence of fraud. The non-fraudulent population consists of companies without any reported material fraud case in their entire existence during the time this study was conducted.

This study used a combination of convenience sampling, wherein members of the population are selected based on their opportune accessibility, and simple random sampling, wherein each member of the population has an equal opportunity of being selected. In total, the group has identified more than one hundred (100) fraudulent companies, from which the researchers have selected forty-five (45), taking into consideration the number of companies per region – Asia, North America, and Europe. The same procedures were used for the non-fraudulent companies, giving a total of ninety (90) companies in the sample. These companies are matched according to the years, industry, region, and any financial ratio within the +/-10% range for any given year. For the purposes of developing the statistical and artificial intelligence models, thirty (30) pairs of fraudulent and non-fraudulent companies were used as the modeling data. The remaining fifteen (15) pairs were divided into training data, for the neural network model, and testing data. Financial information of each company over four (4) years was collected, giving a total of three-hundred and sixty (360) observations.

An analysis of the financial performance of the companies was performed based on the financial metrics of that company covering a period of four years. The researchers have set Year 4 as the year when the fraud was uncovered and Years 1, 2 and 3 as the immediate 3 years prior to the date of the fraud. The financial metrics used for analysis are:

- Current Ratio (Liquidity)
- Total Assets Turnover (Capital turnover)
- Return on Assets (Profitability)
- Total Liability-Total Asset Ratio (Financial Leverage)
- Current Asset-Total Asset Ratio (Asset Composition)

Aside from the financial metrics, locational factors based on the geographical location of the company, specifically the Gross Domestic Product (GDP) and the Corruption Perception Index (CPI), will be included in the study.

In order to achieve the objectives of this research, three models were estimated: the panel logistic regression, the Adaptive Neuro-Fuzzy Inference System (ANFIS), and the back-propagation algorithm neural network. The study utilized two statistical software in estimating the models – Stata, for estimating the panel logistic regression, and Matlab, for estimating the fuzzy logic and neural network models.

A logistic regression analysis was utilized to determine which factors would have a significant impact on the frequency of fraud occurrence. It uses the maximum likelihood approach in estimating the model (Gujarati & Porter, 2009), wherein calculus is used in finding the smallest possible deviance between observed and predicted values. The logistic regression uses different iterations to get the smallest and possible deviance or best fit.
After estimating the model, the coefficients provided is the odds ratio. The bigger the difference between one (1) and the observed odds ratio, the stronger the relationship of the dependent and independent variable is. When the odd ratio is above 1, increasing the independent variable increases the odds that the dependent variables equal 1. Inversely, when the odds ratio is below 1, increasing the independent variable decreases the odds that the dependent variable equals 1. On the other hand, when the odds ratio equals to 1, the independent variable has no effect on the dependent variable (Reyna, 2014).

Another model developed in this study is the Neural Network model. For this study, the researchers used the Backpropagation Algorithm, specifically the Cascade-Forward Backpropagation and Feed-Forward Backpropagation, which is one of the most studied and used algorithms for neural networks learning. The Backpropagation method uses output errors in the output layer to estimate the error in the direct leading layer, and use the leading layer’s error to estimate the previous layer and so on and so forth. In the learning process, each neuron changes its joint weights according to specific rules and finally makes output closer to the expected output (Chao Xi & Erihe, 2013). The main difference between the Cascade-Forward and the Feed-Forward is that the Cascade-Forward only follows one straight path by creating weighted connections from input layer to hidden layer and finally to the output layer. On the other hand, the cascade forward backpropagation model is similar to the feed-forward but it has an additional weighted connections from the input layer to the output layer and the succeeding hidden layers (assuming there are more than 1 hidden layer).

The final artificial intelligence model developed in this study is the Adaptive Neuro-Fuzzy Inference System (ANFIS). Still fundamentally a fuzzy logic controller, ANFIS combines the self-learning capabilities of Artificial Neural Networks (ANN) and the human-like decision-making using membership functions of the Fuzzy Logic Inference System (FLIS). Membership functions describe the degree of which an input belongs in a fuzzy set. For example, a temperature of 37.3°C may be classified as partially high and partially normal. The fuzzy sets are high and normal, and their membership functions map the input (temperature) to a value ranging from 0 to 1 for both sets. One means complete membership to the fuzzy set. Zero means that the input is not a member of the fuzzy set. Any value between one and zero means partial membership to the fuzzy set. Meanwhile, fuzzy rules are if-then rules comprised of the premise and the conclusion. For example, in the context of this study on fraud, a very basic fuzzy rule can be 'if profitability is high, liquidity is low, capital turnover is high, financial leverage is low, asset composition is current, and locational factors are risky, then risk of fraud is high'. Using the ANFIS application in MATLAB, the user can input a data set containing the input variables and corresponding output variable and automate the formulation of rules and membership function, depending on the configuration set by the user.

In selecting which of the discussed models would be most effective in predicting the occurrence of financial statement fraud, the models developed were tested using a new set of fraudulent and non-fraudulent companies that are not part of the sample used to develop the models. The results of which will be analyzed using the following confusion matrix to assess if the models estimated may be used in predicting fraudulent companies.
Table 1. Confusion Matrix

<table>
<thead>
<tr>
<th>Actual</th>
<th>Predicted</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
<td>True Positive</td>
<td>False Positive(Typ Error)</td>
</tr>
<tr>
<td>Positive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>False Negative(Typ Error)</td>
<td>True Negative</td>
</tr>
</tbody>
</table>

PRESENTATION OF FINDINGS, ANALYSIS, AND IMPLICATION

Regression results

The logistic regression model was first estimated for the study with the following equation:

\[
\text{fraud} = \beta_0 + \beta_1 \text{CR} + \beta_2 \text{TAT} + \beta_3 \text{ROA} + \beta_4 \text{TLTA} + \beta_5 \text{CATA} + \beta_6 \text{CPI} + \beta_7 \text{GDP} + \varepsilon
\]

Table 2. Coefficients of the model based on the logistic regression result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal Effects</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>0.0557193</td>
<td>0.012*</td>
</tr>
<tr>
<td>TAT</td>
<td>0.0733808</td>
<td>0.124</td>
</tr>
<tr>
<td>ROA</td>
<td>-2.010935</td>
<td>0.000**</td>
</tr>
<tr>
<td>TLTA</td>
<td>0.3402357</td>
<td>0.047*</td>
</tr>
<tr>
<td>CATA</td>
<td>0.0044471</td>
<td>0.979</td>
</tr>
<tr>
<td>CPI</td>
<td>-0.1204842</td>
<td>0.000**</td>
</tr>
<tr>
<td>GDP</td>
<td>-6.38X10^-7</td>
<td>0.000**</td>
</tr>
</tbody>
</table>

**significant at 1% level
*significant at 5% level

The result showed that all of the variables, apart from TATO and CATA, were significant. Among them, CR, TATO, DAR, and CATA have a positive effect on the probability of fraud occurrence while ROA, CPI, and GDP have a negative effect on fraud occurrence.

The implications of these variables are shown below. Note that the implications provided below are only possible scenarios given the result of the regression.

Table 3. Summary of Implication

<table>
<thead>
<tr>
<th>Variable</th>
<th>Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>Typical fraud schemes involve the overstatement of assets and understatement of liabilities, which may be done through timing differences, improper asset valuations, concealed liabilities and expenses, improper disclosures, and others (ACFE, 2014).</td>
</tr>
<tr>
<td>TATO</td>
<td>Revenues are commonly overstated to promote the image of a company, which may be done through the recording of fictitious revenue, timing differences, premature revenue recognition, and others (ACFE, 2014).</td>
</tr>
</tbody>
</table>
ROA: Expenses may be overstated to account for asset misappropriation through billing schemes, expense reimbursement schemes, check tampering schemes, payroll schemes, and others (ACFE, 2012).

DTA: Asset misappropriation schemes will initially overstate liabilities, which may be accomplished through billing schemes, expense reimbursement schemes, check tampering schemes, payroll schemes, and others (Hall, 2001).

CATA: Firms with higher receivables and inventories have a higher risk of undetected false financial statements (Simunic, 1980).

CPI: The concept of Normative Influence states that people will change their behavior and actions to conform with the majority (Larsen, 1990).

GDP: During times of economic distress, people will be more inclined to commit fraud in order to keep their businesses afloat. (Australian Institute of Criminology, 2011).

The marginal effects results show that DTA has the highest positive effect on the probability of fraud occurrence, having a 34.02% increase in the possibility of fraud for every increase of 1.0 unit in the value of the variable. TATO has the second highest effect on the probability of fraud occurrence (7.34%), followed by CR (5.57%) and CATA (0.4447%).

The marginal effects results show that ROA has the highest negative effect on the probability of fraud occurrence, having a 201.09% decrease in the possibility of fraud for every 1.0 unit increase of the ROA. CPI has the second highest effect (12.05%), followed the GDP (6.38x10^-5).

Creating and Testing the models

After estimating and analyzing the logistic regression model, the neural network and the fuzzy logic models were created using the program Matlab. These models will then be analyzed and compared against one another, on how well they are able to predict correctly the occurrence of fraud in a company. This will be done through the use of the confusion matrix.

Before showing the results of the analysis, it must first be noted that the logistic regression model was not analyzed further since the model was only able to provide 14 results out of 56 that are between 0 and 1. Thus, making the logistic regression model unable to be further analyzed in the confusion matrix.

The summary of the analysis of the confusion matrix are shown below.

<table>
<thead>
<tr>
<th>Table 4. Summary of Analysis of the Confusion Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
</tr>
<tr>
<td>Sensitivity (recall)</td>
</tr>
<tr>
<td>Specificity</td>
</tr>
<tr>
<td>Likelihood Ratio +</td>
</tr>
<tr>
<td>Likelihood Ratio -</td>
</tr>
</tbody>
</table>
Both the sensitivity and specificity show how well the models classify fraudulent and non-fraudulent firms in the testing dataset. As seen from the table above, the NN2 model has the highest sensitivity having a value of 1. This means that the NN2 was able to 100% identify companies with fraudulent financial statements. NN1 ranks second, with a sensitivity of 75%, followed by Neuro Fuzzy, which has a sensitivity of 67.86%.

The order of ranking was reversed when checking for the specificity. The Neuro Fuzzy has a 78.57% specificity. This means that the Neuro Fuzzy was able to correctly classify 78.57% of the non-fraudulent firms correctly. The NN1 and NN2 obtained a specificity of 71.43% and 28.57%, respectively.

The likelihood ratios, both positive and negative, show how likely the model classifies a fraudulent company as fraudulent in comparison to a company who did not commit fraud. The positive likelihood ratio would be best having a value greater than 1 while the negative likelihood ratio would be best having a value less than 1.

Looking at the positive likelihood ratio, it can be seen that all the models have a positive likelihood value greater than 1. This means that all of the models would more likely classify fraudulent firms as fraudulent rather than non-fraudulent. The Neuro Fuzzy model obtained the highest value of 3.17, NN1 with a value of 2.63 and NN2 with a value of 1.4.

The negative likelihood ratios of the models all have a value less than 1. This means that all fraudulent firms are less likely to be classified as non-fraudulent. This tells the same story as the positive likelihood ratio but the models would be ranked inversely with the negative likelihood ratio. The model that has the best negative likelihood ratio is the NN2, with a value of 0, followed by NN1 (0.095), and Neuro Fuzzy (0.409).

After looking at how well the models predicted the testing data set, the study will further analyze both the positive and negative predictive value of the model.

The Neuro Fuzzy has the highest positive predictive value with a score of 76%. This means that the 76% of all the predicted fraudulent companies was actually fraudulent. NN1 follows the Neuro Fuzzy with a value of 72.41%. This means that the model was 72.41% right on all the companies that the model predicted as fraudulent. Last is NN2 with a score of 58.33%. This means that NN2 was only 58.33% accurate in predicting fraudulent companies to be fraudulent.

On another note, NN2 had the highest negative predictive value of 100%. This means that all the non-fraudulent firms predicted by the model all are correctly non-fraudulent. NN1 had a negative predictive value of 74.07%, which means that NN1 was 74.07% correct on all the companies predicted as non-fraudulent. Lastly, the Neuro Fuzzy has a negative predictive value of 70.97%. This means that from all the non-fraudulent firms the Neuro Fuzzy model predicted, 70.97% of those are truly non-fraudulent.
To conclude the analysis of the confusion matrix, the F-score is computed. The F-score is seen as the measure of accuracy in statistical analysis of binary classification. As seen from the results, both NN1 and NN2 have the same F-score, which is also the highest, with a value of 73.68%. This means that both the NN1 and NN2 have an accuracy of 73.68%. On the other hand, the Neuro Fuzzy model has an F-score of 71.70%. This means that the Neuro fuzzy is 71.70% accurate.

**Implications of the Confusion Matrix**

Forecasting models have traditionally been categorized into three main groups: statistical models, theoretical models, and Computational/Artificial Intelligence models.

According to literature, 64% of case studies used statistical models such as the discriminant analysis model, logit model, probit model and decision tree, 11% used theoretical models such as the hazard model and credit risk model, and 25% used artificial intelligence models such as artificial neural networks, fuzzy logic and genetic algorithm. In terms of analytical capabilities, statistical methods rely on the precision, reliability and accuracy of the variables used, whereas artificial intelligence methods are able to process and interpret inaccurate data and tolerate uncertainty and approximation. Moreover, in contrast to the regression model which takes the effect of each variable independently, the artificial intelligence models takes into consideration the combinations of the values of the variables. This is why the artificial intelligence models were able to recognize a pattern in the values of the modeling data to an acceptably accurate degree.

Comparatively, the results of the models are acceptably accurate, considering that, according to available research, the accuracy of traditional credit scoring models used by financial institutions for forecasting the bankruptcy of customers range from approximately 72% to 77.5% (Dadios, 2012). The accuracy rates of all the artificial intelligence models fall within this range, meaning they are reliable enough for the use of professionals in assessing the fraud risk of companies. Among them, NN1 proves to be the best model for the use of the general risk-averse stakeholder, as it has the highest accuracy rate (74%), and it ranks second in term of both sensitivity and specificity. Additionally, NN2 had the highest possible sensitivity score of 1, meaning it correctly predicted all of the fraudulent companies; therefore, users who are only concerned with the prediction of fraudulent companies may prefer to use this model, as is with the case of regulators who are selecting companies to investigate. The neuro-fuzzy model may also have some use for certain stakeholders who are more specific when it comes to the accuracy of predicting non-fraudulent firms, as its specificity ranks first among the three with 78.57%.

**CONCLUSION**

Financial metrics aid in predicting the occurrence of fraud because such monitor the behavior of the financials of a company. For example, a sudden significant increase in revenue without a compensating increase in assets might indicate an occurrence of fraud. Of the six financial ratios we used as variables for this paper, the current ratio, total asset turnover, debt to asset ratio, and current asset to total asset ratio, have a direct relationship with the occurrence of fraud. In other words, as these ratios increase, the probability occurrence of fraud also increases. When these ratios decrease, the probability occurrence of fraud also decreases. On the other hand, the return on asset ratio has an inverse relationship with fraud. As the ratio increases, the probability occurrence of fraud decreases. When it decreases, the probability of fraud occurrence increases.
The results also displayed possible techniques for companies to commit fraud in their financial accounts. For example, current ratio is increased with overstating assets or understating liabilities. On the other hand, a company can show a high total asset turnover ratio by falsified high revenues. High debt to asset ratio may result from asset misappropriation. Current asset over total asset ratio is increased with manipulation of current assets, especially receivables and inventory. A low return on asset ratio may indicate overstatement of assets, billing scheme, expense reimbursement scheme, etc. To complete, asset misappropriation is the most common form of fraud that can be committed by a company.

The locational factors, Gross Domestic Product (GDP) and Corruption Perception Index (CPI), were assessed to have a significant impact on fraud occurrence. Both have an inverse relationship with the probability of the occurrence of fraud. Regarding CPI, when a company is included in a country in which the perceived level of corruption is high (low CPI), the probability of fraud occurrence is also high. Regarding GDP, when a company is included in a country with low GDP, there is a higher incentive for a company to perpetrate fraud to maintain an image.

As for the two Artificial Intelligence models developed in this study, the results proved to be promising. Based on the f-score computed from the confusion matrix, two of the neural network models created, NN1 and NN2, and the neuro-fuzzy model all had accuracy rates of over 70%, although NN1 and NN2 both scored the highest with 74%. Their differences lie in their sensitivity and specificity, whether they correctly predicted more positives or negatives. NN1 was the most accurate in terms of the f-score (74%) and ranked second in both sensitivity (75%) and specificity (71%). NN2 also had an f-score of (74%) and ranked first in sensitivity (100%) and last in specificity (29%). The Neuro Fuzzy model ranked slightly lower than the neural network models in terms of accuracy (72%) and ranked first in specificity (79%) and last in sensitivity (69%). In general, stakeholders would be more inclined to use the model that balances risk-aversion and precision; therefore, NN1 was selected as the best model for the general risk-averse user. However, depending on the user’s needs in terms of sensitivity and specificity, NN2 and the neuro fuzzy model may still prove to be useful in certain situations.

**RECOMMENDATIONS**

**For corporate directors and shareholders**

The management should design a strong set of internal controls that would alleviate the risk of fraud occurrence. In addition to such controls, the management could also integrate the use of the model established in this study in their internal control procedures. Earlier detection of possible fraudulent behavior is more beneficial to the company as it saves them time and cost.

The researchers would like to emphasize that the models developed are merely additional controls that the company might want to take upon themselves to implement. These models do not intend to replace existing internal control procedures, but merely as a supplement to strengthen such procedures.

This study has also proved that the Corruption Perception Index (CPI) is significant in the prevalence of fraudulent activities in a country/region. If corporate directors decide to expand their businesses overseas, the perceived corruption level in that country/region should be taken into consideration, despite that country having the right market and a good credit rating.
For investors

The study covered the profitability, liquidity, capital turnover, financial leverage and the asset composition of a company; and through the methods carried out, was able to show that these metrics do have an effect on the risk of fraud occurrence in a company. The red flags identified through this study may be of assistance to investors as they perform preliminary investigations on the companies they want to invest in. Risk-averse investors would want to avoid investing in companies that have a high fraud risk because this will affect their returns in the long term.

For financial institutions

As financial institutions assess a business’ credit risk, liquidity risk also forms a huge part in the decision on whether they will allow businesses to make loans, the documentation and legal covenants they will require, and how much they are going to lend out. This study has shown that liquidity, measured by the current ratio, is a significant variable in determining whether there is an occurrence of fraud in a company. In fact, the study showed that high liquidity might indicate high fraud risk. Although being highly liquid may prove to be attractive in the eyes of financial institutions, they should remain skeptical until further assessments are made.

For government agencies

For government agencies like the Bureau of Internal Revenue (BIR), knowing whether a company is into practicing fraudulent activities may be prima facie evidence on whether they are paying the right amount of taxes. As shown in the red flag analysis, a low return on assets ratio may indicate high fraud risk. Having a lower return on assets ratio may mean having little to no net income, thus enabling the company to pay lower taxes. The BIR may further investigate situations like this in order to ensure that companies are not evading taxes.

For the accounting profession

The models used in this study are especially relevant in the realm of risk-based auditing, forensic accounting and fraud examiners in general. The red flags identified in the study can be used as guidance in identifying possible risk of misstatements during the initial risk assessment stage of audit planning. It will help them become more efficient in their work as they can devote more time and resources in obtaining audit evidence in those accounts that have higher fraud risk. Forensic accountants and fraud examiners specialize in uncovering illegal financial practices in companies. In this study, we have a model that has a 74% accuracy rate in predicting fraudulent activities in a company. This model may be integrated with their procedures as well. It can act as a baseline in determining how high of a risk a company is in terms of being viewed as fraudulent.

For the general public

The study may also help in reducing the level of poverty in a country. Fraud, especially corruption, is a major factor in the fight of a nation against poverty. Predicting the occurrence of fraud can aid organizations in monitoring whether the operations performed internally are objective and fair. This would foster employment security by being a detective control that will help management detect fraud occurrence and mitigate its effects, which will then lead to lower possibility of businesses closing down. Additionally, the models can be used to check for improper disclosures of income and assets, which have a big impact on government revenues,
which can be used for country development (i.e. alleviation of the poor and infrastructure development).

For the academe and future research efforts

The study has shown that the Artificial Intelligence models are actually relevant to the world of fraud prediction and detection, as NN1 produced the best percentage of accuracy with the when it comes to predicting fraudulent activities in a company. Integrating discussions on the relevance of Artificial Intelligence models may prove to be beneficial in the long run. The academe can also now think of pursuing other similar studies that might make use of the Artificial Intelligence models. In the case of this study, engineering and computer science methods can actually be intertwined with problems that are in the realm of accounting.

Fraud occurrence can only be painted accurately based on the number of cases tackled at a time. With this, the researches recommend that the sample size be increased in order to accommodate other regions such as South America. Having a larger sample size will increase the accuracy of the models and the results in general. Including other regions may also better explain the significance of location when it comes to fraud occurrence. Future studies can also take into consideration the possibility of breaking up the study per industry or per country, instead of being aggregated into one big international bubble, as shown in this research. It will limit the scope of the study, making it very relevant to that specific country or industry as deeper details can be obtained. The researchers of this study also recommend the usage of other Artificial Intelligence models, such as the Genetic Algorithm model. It would be another basis of comparison, aside from the three (3) models already discussed.

SIMULATION

For better appreciation, the researchers applied the best fraud prediction model obtained to three (3) possible real-life situations while presenting the results of the other fraud prediction models estimated in the study for reference purposes.

Case 1:
Mark Lopez is a CPA working for an established audit firm in the Philippines. The busy audit season is just starting and Mark had wanted to try a more efficient way to perform audit procedures on his two (2) clients in the Philippines. By being able to predict possible fraudulent activities undertaken by his clients, Mark felt that this would help him organize his workload by focusing his attention on the company that has possible fraudulent accounts first before the others. Relevant financial data for the year 200A from the two companies are listed below (in millions). Note: Company A’s data has been taken from a real life fraudulent company (One.Tel). Company B’s data has been taken from a real life non-fraudulent company. Both company data have not been used before in this study.

<table>
<thead>
<tr>
<th></th>
<th>Company A</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Return on Assets</strong></td>
<td>0.08187</td>
<td>0.07756</td>
</tr>
<tr>
<td><strong>Current Ratio</strong></td>
<td>1.17864</td>
<td>1.25739</td>
</tr>
<tr>
<td><strong>Total Asset Turnover</strong></td>
<td>1.65646</td>
<td>0.47591</td>
</tr>
<tr>
<td><strong>Financial Leverage</strong></td>
<td>0.56445</td>
<td>0.55877</td>
</tr>
<tr>
<td><strong>Asset Composition</strong></td>
<td>0.22850</td>
<td>0.16113</td>
</tr>
</tbody>
</table>
The results have shown that Company A has the possibility of being classified as fraudulent, while Company B, the opposite. Both companies have been correctly predicted by the model. Given that Company A has a higher possibility of having illegal practices, Mark, should focus his attention on the said company first in order to bring into light the fraudulent practices being undertaken by the company, if there really were after substantive procedures, as soon as possible.

**Results of the other models, for reference purposes:*

<table>
<thead>
<tr>
<th></th>
<th>Co. A</th>
<th>Prediction</th>
<th>Co. B</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.53399</td>
<td>Fraud</td>
<td>0.458181</td>
<td>N-Fraud</td>
</tr>
<tr>
<td>NN2</td>
<td>0.32118</td>
<td>N-Fraud</td>
<td>0.061485</td>
<td>N-Fraud</td>
</tr>
<tr>
<td>N-F</td>
<td>4.39</td>
<td>Fraud</td>
<td>2.47</td>
<td>Fraud</td>
</tr>
</tbody>
</table>

**Case 2:**

3JW Company is a financial Institution in the Philippines that provides mutual fund services. One of the company’s mutual funds invests solely on stocks. Given this, it makes it susceptible to dire consequences if such investments come from a fraudulent company. 3JW Company would want to mitigate the risk of providing zero to negative returns to its investors. The firm enlists the help of experts in order to possibly predict the involvement of two (2) potential investors’ in fraudulent activities, before letting them participate in the mutual fund. Relevant financial data for the year 2008 from the two companies are listed below. *Note: Company A’s data has been taken from a real life fraudulent company (Texaco). Company B’s data has been taken from a real life non-fraudulent company. Both data sets have not been used before in this study.*

<table>
<thead>
<tr>
<th></th>
<th>Company A*</th>
<th>Company B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Assets</td>
<td>(0.202786)</td>
<td>0.091353</td>
</tr>
<tr>
<td>Current Ratio</td>
<td>1.674041</td>
<td>1.530610</td>
</tr>
<tr>
<td>Total Asset Turnover</td>
<td>0.455172</td>
<td>1.472051</td>
</tr>
<tr>
<td>Financial Leverage</td>
<td>0.341832</td>
<td>0.574235</td>
</tr>
<tr>
<td>Asset Composition</td>
<td>0.437548</td>
<td>0.461633</td>
</tr>
</tbody>
</table>
The results have shown that both companies have the possibility of being classified as fraudulent. Company A has been correctly predicted as fraudulent. Company B, however, has been predicted to be fraudulent despite it not being fraudulent in the first place. This goes to show that 3JW Company should further investigate or deny the participations of both companies as a way to mitigate fraud risk.

**Results of the other models, for reference purposes:**

<table>
<thead>
<tr>
<th></th>
<th>Co. A</th>
<th>Prediction</th>
<th>Co. B</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>0.53399</td>
<td>Fraud</td>
<td>0.458181</td>
<td>N-Fraud</td>
</tr>
<tr>
<td>NN2</td>
<td>0.32118</td>
<td>N-Fraud</td>
<td>0.061485</td>
<td>N-Fraud</td>
</tr>
<tr>
<td>N-F</td>
<td>4.39</td>
<td>Fraud</td>
<td>2.47</td>
<td>Fraud</td>
</tr>
</tbody>
</table>

**Case 3:**

Run Against Tax Evaders (RATE) is a program initiated by the DOF & BIR to investigate and prosecute individuals and/or entities engaged in tax evasion and other criminal violations of the National Internal Revenue Code of the Philippines. The fraudulent activities covered by the RATE program includes offenses relating to income, offenses relating to deductions and other violations such as making false entries in book and records to reduce tax liability. John Gonzales is a BIR employee under the RATE program conducting a preliminary investigation on Company XXX, to establish whether there is prima facie existence of fraud. Company XXX was brought into attention by an anonymous phone call through one of BIR’s offices. Relevant financial data for the year 200C from Company XXX is listed below. Note: Company XXX’s data has been taken from a real life fraudulent company (Rite Aid). This dataset has not been used in the study before.

<table>
<thead>
<tr>
<th></th>
<th>Company A*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Assets</td>
<td>(0.09681)</td>
</tr>
<tr>
<td>Current Ratio</td>
<td>1.75905</td>
</tr>
<tr>
<td>Total Asset Turnover</td>
<td>2.11758</td>
</tr>
<tr>
<td>Financial Leverage</td>
<td>0.85105</td>
</tr>
<tr>
<td>Asset Composition</td>
<td>0.42844</td>
</tr>
</tbody>
</table>

John’s preliminary investigation consisted of verifying whether the allegations towards Company XXX are plausible. He enlisted the help of experts to help him determine the possibility of fraud in Company XXX through its available financial data. Once the prima facie
existence of fraud has been established, a formal investigation may be initiated through the issuance of a Letter of Authority (LOA) against the company.

<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company XXX</strong></td>
</tr>
<tr>
<td><strong>Prediction</strong></td>
</tr>
<tr>
<td>NN1 Model</td>
</tr>
<tr>
<td>Fraud</td>
</tr>
</tbody>
</table>

The results have shown Company XXX has the possibility of being classified as fraudulent. It has been correctly predicted as fraudulent. The anonymous phone call proved to be a good tip as the company being questioned is actually predicted to be fraudulent. After site visits, interviews and other necessary procedures to substantiate the possibility of fraud, BIR can now launch a formal investigation on Company XXX.

**Results of the other models, for reference purposes:**

<table>
<thead>
<tr>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company. XXX</strong></td>
</tr>
<tr>
<td>Regression</td>
</tr>
<tr>
<td>NN2</td>
</tr>
<tr>
<td>N-F</td>
</tr>
</tbody>
</table>

REFERENCES


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Guidelines for Contributors

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The objective of the *Asia Pacific Business & Economics Perspective (Perspectives)* is to publish high-quality theoretical, empirical, business case studies, policy research and methodological research in the fields of business and economics.

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In line with the objective of *Perspectives*, priority shall be given to the following submissions:

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- **Empirical research**: Studies that re-examine important empirical work using alternative theoretical or empirical frameworks, or a different data set. These studies often involve experimental designs and multivariate techniques that examine relationships among variables.
- **Business case studies**: Studies that illustrate best practices of companies or industries on emerging business concepts.
- **Policy research**: Studies that use business field research to enact policies on an economy, country, or community.
- **Methodological research**: Studies that present new approaches in analyzing data or addressing research problems.
- **Review articles**: Surveys that review and critically evaluate the literature. A review article must go beyond summarizing previous research. It must provide a critical and integrative evaluation of prior research, develop a conceptual framework to explain contradictory findings and suggest directions for further research.

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*Perspectives* is a bi-annual peer reviewed journal of APBERS Conferences and the Asia Pacific Business and Economics Research Society. The two issues are released every summer and winter in Japan, which coincides with, but not limited to, the APBERS Conferences.
Our double blind peer-review process is composed of faculty from Ritsumeikan Asia Pacific University, Japan, keynote speakers from the APUBERS Conferences, and academic networks of the editors from scholarly journals. We do not charge for review fee, hence, the peer review process is determined based on the matching of the topic and the expertise of the reviewer.

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